

THE 528 MAGNETIC LAYER GROUP TYPES

Diagrams of symmetry elements and of the general position
Origin
Asymmetric unit
Symmetry operations
Generators selected
Positions
Symmetry of special projections

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6.1.21	p_{112}/m	10.4.48	c_p211
6.2.22	$p_{112}/m1'$	10.5.49	$c_p2'11$
6.3.23	p_{112}'/m		
6.4.24	p_{112}/m'	11.1.50	pm_{11}
6.5.25	p_{112}'/m'	11.2.51	$pm_{11}1'$
6.6.26	$p_{2a}112/m$	11.3.52	$pm'11$

11.4.53	$p_{2a}m11$	15.5.80	$p2_1'/m$
11.5.54	$p_{2b}m11$	15.6.81	$p_{2b}2_1'/m'11$
11.6.55	$p_{2b}m'11$	15.7.82	$p_{2b}2_1/m11$
11.7.56	$p_c m11$	16.1.83	$p2/b11$
12.1.57	$pb11$	16.2.84	$p2/b111'$
12.2.58	$pb111'$	16.3.85	$p2/b'11$
12.3.59	$pb'11$	16.4.86	$p2'/b'11$
12.4.60	$p_{2a}b11$	16.5.87	$p2'/b11$
13.1.61	$cm11$	16.6.88	$p_{2a}2'/b'11$
13.2.62	$cm111'$	16.7.89	$p_{2a}2/b11$
13.3.63	$cm'11$	17.1.90	$p2_1/b11$
13.4.64	$c_p m11$	17.2.91	$p2_1/b111'$
13.5.65	$c_p m'11$	17.3.92	$p2_1/b'11$
14.1.66	$p2/m11$	17.4.93	$p2_1'/b'11$
14.2.67	$p2/m111'$	17.5.94	$p2_1'/b11$
14.3.68	$p2/m'11$	18.1.95	$c2/m11$
14.4.69	$p2'/m11$	18.2.96	$c2/m111'$
14.5.70	$p2'/m'11$	18.3.97	$c2/m'11$
14.6.71	$p_{2a}2'/m'11$	18.4.98	$c2'/m'11$
14.7.72	$p_{2b}2'/m'11$	18.5.99	$c2'/m11$
14.8.73	$p_c 2/m11$	18.6.100	$c_p 2/m11$
14.9.74	$p_{2a}2/m11$	18.7.101	$c_p 2/m'11$
14.10.75	$p_{2b}2/m11$	18.8.102	$c_p 2'/m'11$
15.1.76	$p2_1/m11$	18.9.103	$c_p 2'/m11$
15.2.77	$p2_1/m111'$	19.1.104	$p222$
15.3.78	$p2_1/m'11$	19.2.105	$p2221'$
15.4.79	$p2_1'/m'11$		

19.3.106	$p2'2'2$	23.4.132	$pmm'2'$
19.4.107	$p22'2'$	23.5.133	$p_{2a}m'm'2$
19.5.108	$p_{2a}2'2'2$	23.6.134	p_cmm2
19.6.109	p_c222	23.7.135	$p_{2a}mm2$
19.7.110	$p_{2a}222$	24.1.136	$pma2$
20.1.111	$p2_122$	24.2.137	$pma21'$
20.2.112	$p2_1221'$	24.3.138	$pm'a'2$
20.3.113	$p2_12'2'$	24.4.139	$pm'a'2'$
20.4.114	$p2_1'22'$	24.5.140	$pma'2'$
20.5.115	$p2_1'2'2$	24.6.141	$p_{2b}m'a'2$
20.6.116	$p_{2b}2_1'2'2$	24.7.142	$p_{2b}ma2$
20.7.117	$p_{2b}2_122$	25.1.143	$pba2$
21.1.118	$p2_12_12$	25.2.144	$pba21'$
21.2.119	$p2_12_121'$	25.3.145	$pb'a'2$
21.3.120	$p2_1'2_1'2$	25.4.146	$pba'2'$
21.4.121	$p2_1'2_1'2'$	26.1.147	$cmm2$
22.1.122	$c222$	26.2.148	$cmm21'$
22.2.123	$c2221'$	26.3.149	$cm'm'2$
22.3.124	$c2'2'2$	26.4.150	$cmm'2'$
22.4.125	$c22'2'$	26.5.151	c_pmm2
22.5.126	c_p222	26.6.152	$c_p m'm'2$
22.6.127	$c_p2'2'2$	26.7.153	$c_pmm'2'$
22.7.128	$c_p2'22'$	27.1.154	$pm2m$
23.1.129	$pmm2$	27.2.155	$pm2m1'$
23.2.130	$pmm21'$	27.3.156	$pm'2m'$
23.3.131	$pm'm'2$	27.4.157	$pm2'm'$

27.5.158	$pm'2'm$	30.5.185	$pb2'b'$
27.6.159	$p_{2b}m'2m'$	30.6.186	$p_{2a}b'2b'$
27.7.160	$p_{2b}m'2'm$	30.7.187	$p_{2a}b2b$
27.8.161	$p_{2b}m2'm'$	31.1.188	$pm2a$
27.9.162	$p_{2a}m'2m'$	31.2.189	$pm2a1'$
27.10.163	p_cm2m	31.3.190	$pm'2a'$
27.11.164	$p_cm'2m'$	31.4.191	$pm'2'a$
27.12.165	$p_{2a}m2m$	31.5.192	$pm2'a'$
27.13.166	$p_{2b}m2m$	31.6.193	$p_{2b}m2'a'$
28.1.167	$pm2_1b$	31.7.194	$p_{2b}m'2'a$
28.2.168	$pm2_1b1'$	31.8.195	$p_{2b}m'2a'$
28.3.169	$pm'2_1b'$	31.9.196	$p_{2b}m2a$
28.4.170	$pm'2_1'b$	32.1.197	$pm2_1n$
28.5.171	$pm2_1'b'$	32.2.198	$pm2_1n1'$
28.6.172	$p_{2a}m2_1'b'$	32.3.199	$pm'2_1n'$
28.7.173	$p_{2a}m2_1b$	32.4.200	$pm'2_1'n$
29.1.174	$pb2_1m$	32.5.201	$pm2_1'n'$
29.2.175	$pb2_1m1'$	33.1.202	$pb2_1a$
29.3.176	$pb'2_1m'$	33.2.203	$pb2_1a1'$
29.4.177	$pb2_1'm'$	33.3.204	$pb'2_1a'$
29.5.178	$pb'2_1'm$	33.4.205	$pb'2_1'a$
29.6.179	$p_{2a}b'2_1m'$	33.5.206	$pb2_1'a'$
29.7.180	$p_{2a}b2_1m$	34.1.207	$pb2n$
30.1.181	$pb2b$	34.2.208	$pb2n1'$
30.2.182	$pb2b1'$	34.3.209	$pb'2n'$
30.3.183	$pb'2b'$	34.4.210	$pb2'h'$
30.4.184	$pb'2'b$		

34.5.211	pb'2'n	37.9.238	p _{2a} m'm'm
35.1.212	cm2m	37.10.239	p _{2a} m'mm'
35.2.213	cm2m1'	37.11.240	p _c mmm
35.3.214	cm'2m'	37.12.241	p _c mm'm'
35.4.215	cm2'm'	37.13.242	p _{2a} mmm
35.5.216	cm'2'm	38.1.243	pmaa
35.6.217	c _p m2m	38.2.244	pmaa1'
35.7.218	c _p m'2m'	38.3.245	pm'a'a'
35.8.219	c _p m2'm'	38.4.246	pma'a'
35.9.220	c _p m'2'm	38.5.247	pm'a'a
36.1.221	cm2a	38.6.248	pm'aa'
36.2.222	cm2a1'	38.7.249	pm'aa
36.3.223	cm'2a'	38.8.250	pmaa'
36.4.224	cm2'a'	38.9.251	pma'a
36.5.225	cm'2'a	38.10.252	p _{2b} m'aa'
36.6.226	c _p m2a	38.11.253	p _{2b} ma'a'
36.7.227	c _p m'2a'	38.12.254	p _{2b} m'a'a
36.8.228	c _p m2'a'	38.13.255	p _{2b} maa
36.9.229	c _p m'2'a	39.1.256	pban
37.1.230	pmmm	39.2.257	pban1'
37.2.231	pmmm1'	39.3.258	pb'a'n'
37.3.232	pm'm'm'	39.4.259	pb'a'n
37.4.233	pm'm'm	39.5.260	pba'n'
37.5.234	pmm'm'	39.6.261	pban'
37.6.235	pmmm'	39.7.262	pba'n
37.7.236	pmm'm	40.1.263	pmam
37.8.237	p _{2a} mm'm'	40.2.264	pmam1'

40.3.265	pm'a'm'	42.4.292	pm'an'
40.4.266	pm'am'	42.5.293	pm'a'n
40.5.267	pm'a'm	42.6.294	pma'n'
40.6.268	pma'm'	42.7.295	pma'n
40.7.269	pma'm	42.8.296	pman'
40.8.270	pmam'	42.9.297	pm'an
40.9.271	pm'am		
40.10.272	p _{2b} m'am'	43.1.298	pbaa
40.11.273	p _{2b} m'a'm	43.2.299	pbaa1'
40.12.274	p _{2b} ma'm'	43.3.300	pb'a'a'
40.13.275	p _{2b} mam	43.4.301	pba'a'
		43.5.302	pb'aa'
41.1.276	pmma	43.6.303	pb'a'a
41.2.277	pmma1'	43.7.304	pb'aa
41.3.278	pm'm'a'	43.8.305	pbaa'
41.4.279	pm'm'a	43.9.306	pba'a
		44.1.307	pbam
41.5.280	pm'ma'	44.2.308	pbam1'
41.6.281	pm'm'a'	44.3.309	pb'a'm'
41.7.282	pmma'	44.4.310	pb'a'm
41.8.283	pm'm'a	44.5.311	pba'm'
41.9.284	pm'ma	44.6.312	pbam'
41.10.285	p _{2b} m'ma'	44.7.313	pba'm
41.11.286	p _{2b} m'm'a		
41.12.287	p _{2b} mm'a'	45.1.314	pbma
41.13.288	p _{2b} mma	45.2.315	pbma1'
		45.3.316	pb'm'a'
42.1.289	pman	45.4.317	pb'ma'
42.2.290	pman1'	45.5.318	pbm'a'
42.3.291	pm'a'n'		

45.6.319	pb'm'a	48.3.345	cm'm'e'
45.7.320	pbm'a	48.4.346	cm'm'e
45.8.321	pb'ma	48.5.347	cmm'e'
45.9.322	pbma'	48.6.348	cmme'
		48.7.349	cmm'e
46.1.323	pmmn	48.8.350	c _p m'm'e'
46.2.324	pmmn1'	48.9.351	c _p m'me'
46.3.325	pm'm'n'	48.10.352	c _p mm'e'
46.4.326	pm'm'n	48.11.353	c _p mme'
46.5.327	pmm'n'		
46.6.328	pmmn'	49.1.354	p4
46.7.329	pmm'n	49.2.355	p41'
		49.3.356	p4'
47.1.330	cmmm	49.4.357	p _p 4
47.2.331	cmmm1'		
47.3.332	cm'm'm'	50.1.358	p $\bar{4}$
47.4.333	cm'm'm	50.2.359	p $\bar{4}$ 1'
47.5.334	cmm'm'	50.3.360	p $\bar{4}$ '
47.6.335	cmmm'	50.4.361	p _p $\bar{4}$
47.7.336	cmm'm	51.1.362	p4/m
47.8.337	c _p mmm	51.2.363	p4/m1'
47.9.338	c _p m'm'm'	51.3.364	p4/m'
47.10.339	c _p m'm'm	51.4.365	p4'/m'
47.11.340	c _p mm'm'	51.5.366	p4'/m
47.12.341	c _p mmm'	51.6.367	p _p 4/m'
47.13.342	c _p mm'm	51.7.368	p _p 4/m
48.1.343	cmme	52.1.369	p4/n
48.2.344	cmme1'	52.2.370	p4/n1'

52.3.371	$p4/n'$	56.5.397	$p4'b'm$
52.4.372	$p4'/n'$	57.1.398	$p\bar{4}2m$
52.5.373	$p4'/n$	57.2.399	$p\bar{4}2m1'$
53.1.374	$p422$	57.3.400	$p\bar{4}2'm'$
53.2.375	$p4221'$	57.4.401	$p\bar{4}'2m'$
53.3.376	$p42'2'$	57.5.402	$p\bar{4}'2'm$
53.4.377	$p4'22'$	57.6.403	$p_p\bar{4}2m$
53.5.378	$p4'2'2$	57.7.404	$p_p\bar{4}2'm'$
53.6.379	$p_p42'2'$	58.1.405	$p\bar{4}2_1m$
53.7.380	p_p422	58.2.406	$p\bar{4}2_1m1'$
54.1.381	$p42_12$	58.3.407	$p\bar{4}2_1'm'$
54.2.382	$p42_121'$	58.4.408	$p\bar{4}'2_1m'$
54.3.383	$p42_1'2'$	58.5.409	$p\bar{4}'2_1'm$
54.4.384	$p4'2_12'$	59.1.410	$p\bar{4}m2$
54.5.385	$p4'2_1'2$	59.2.411	$p\bar{4}m21'$
55.1.386	$p4mm$	59.3.412	$p\bar{4}m'2'$
55.2.387	$p4mm1'$	59.4.413	$p\bar{4}'m'2'$
55.3.388	$p4m'm'$	59.5.414	$p\bar{4}'m'2$
55.4.389	$p4'mm'$	59.6.415	$p_p\bar{4}m2$
55.5.390	$p4'm'm$	59.7.416	$p_p\bar{4}m'2'$
55.6.391	$p_p4m'm'$	60.1.417	$p\bar{4}b2$
55.7.392	p_p4mm	60.2.418	$p\bar{4}b21'$
56.1.393	$p4bm$	60.3.419	$p\bar{4}b'2'$
56.2.394	$p4bm1'$	60.4.420	$p\bar{4}'b'2'$
56.3.395	$p4b'm'$	60.5.421	$p\bar{4}'b'2$
56.4.396	$p4'bm'$	61.1.422	$p4/mmm$

61.2.423	$p4/mmm1'$	63.7.450	$p4'/m'bm'$
61.3.424	$p4/m'm'm'$	63.8.451	$p4'/mbm'$
61.4.425	$p4/mm'm'$	63.9.452	$p4'/mb'm$
61.5.426	$p4/m'mm$	64.1.453	$p4/nmm$
61.6.427	$p4'/m'm'm$	64.2.454	$p4/nmm1'$
61.7.428	$p4'/m'mm'$	64.3.455	$p4/n'm'm'$
61.8.429	$p4'/mmm'$	64.4.456	$p4/nm'm'$
61.9.430	$p4'/mm'm$	64.5.457	$p4/n'mm$
61.10.431	$p_p4/m'm'm'$	64.6.458	$p4'/n'm'm$
61.11.432	$p_p4/mm'm'$	64.7.459	$p4'/n'mm'$
61.12.433	$p_p4/m'mm$	64.8.460	$p4'/nmm'$
61.13.434	p_p4/mmm	64.9.461	$p4'/nm'm$
62.1.435	$p4/nbm$	65.1.462	$p3$
62.2.436	$p4/nbm1'$	65.2.463	$p31'$
62.3.437	$p4/n'b'm'$	66.1.464	$p\bar{3}$
62.4.438	$p4/nb'm'$	66.2.465	$p\bar{3}1'$
62.5.439	$p4/n'bm$	66.3.466	$p\bar{3}'$
62.6.440	$p4'/n'b'm$	67.1.467	$p312$
62.7.441	$p4'/n'bm'$	67.2.468	$p3121'$
62.8.442	$p4'/nbm'$	67.3.469	$p312'$
62.9.443	$p4'/nb'm$	68.1.470	$p321$
63.1.444	$p4/mbm$	68.2.471	$p3211'$
63.2.445	$p4/mbm1'$	68.3.472	$p32'1$
63.3.446	$p4/m'b'm'$	69.1.473	$p3m1$
63.4.447	$p4/mb'm'$	69.2.474	$p3m11'$
63.5.448	$p4/m'bm$		
63.6.449	$p4'/m'b'm$		

69.3.475	$p3m'1$	76.1.500	$p622$
70.1.476	$p31m$	76.2.501	$p6221'$
70.2.477	$p31m1'$	76.3.502	$p62'2'$
70.3.478	$p31m'$	76.4.503	$p6'22'$
71.1.479	$p\bar{3}1m$	76.5.504	$p6'2'2'$
71.2.480	$p\bar{3}1m1'$	77.1.505	$p6mm$
71.3.481	$p\bar{3}'1m'$	77.2.506	$p6mm1'$
71.4.482	$p\bar{3}1m'$	77.3.507	$p6m'm'$
71.5.483	$p\bar{3}'1m$	77.4.508	$p6'mm'$
72.1.484	$p\bar{3}m1$	77.5.509	$p6'm'm$
72.2.485	$p\bar{3}m11'$	78.1.510	$p\bar{6}m2$
72.3.486	$p\bar{3}'m1'$	78.2.511	$p\bar{6}m21'$
72.4.487	$p\bar{3}m1'$	78.3.512	$p\bar{6}m'2'$
72.5.488	$p\bar{3}'m1$	78.4.513	$p\bar{6}'m2'$
73.1.489	$p6$	78.5.514	$p\bar{6}'m'2'$
73.2.490	$p61'$	79.1.515	$p\bar{6}2m$
73.3.491	$p6'$	79.2.516	$\bar{6}2m1'$
74.1.492	$p\bar{6}$	79.3.517	$\bar{6}2'm'$
74.2.493	$p\bar{6}1'$	79.4.518	$p\bar{6}'2m'$
74.3.494	$p\bar{6}'$	79.5.519	$p\bar{6}2'm$
75.1.495	$p6/m$	80.1.520	$p6/mmm$
75.2.496	$p6/m1'$	80.2.521	$p6/mmm1'$
75.3.497	$p6/m'$	80.3.522	$p6/m'm'm'$
75.4.498	$p6'/m'$	80.4.523	$p6/mm'm'$
75.5.499	$p6'/m$	80.5.524	$p6/m'mm$
		80.6.525	$p6'/m'mm'$

80.7.526 $p6'/m'm'm$

80.8.527 $p6'/mmm'$

80.9.528 $p6'/mm'm$

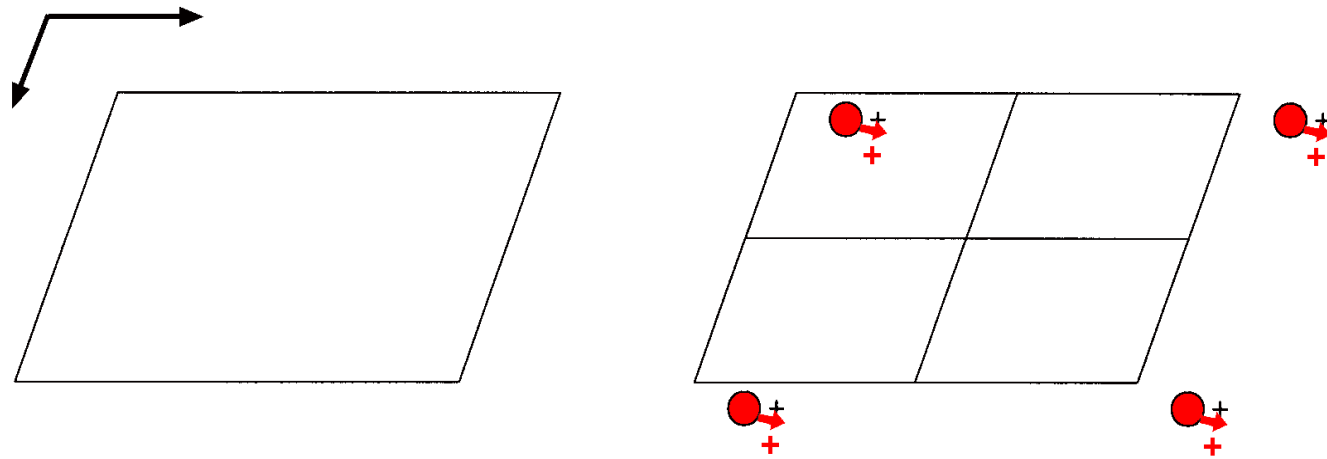
p1

1

Triclinic/Oblique

No. 1.1.1

p1



Origin arbitrary

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates
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1 a 1	(1) x,y,z [u,v,w]
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Symmetry of special projections

Along [001] $p1$ $a^* = a_p$ $b^* = b_p$ Origin at $0,0,z$	Along [100] $p111$ $a^* = b_p$ Origin at $x,0,0$	Along [010] $p111$ $a^* = a_p$ Origin at $0,y,0$
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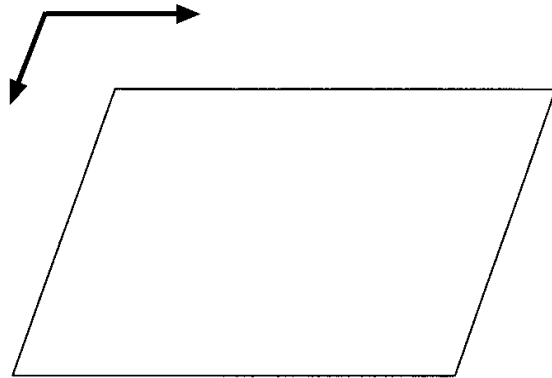
p11'

No. 1.2.2

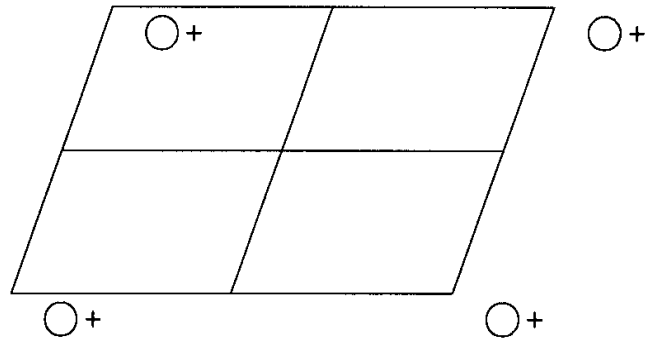
11'

p11'

Triclinic/Oblique



1'



Origin arbitrary 1'

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1$

Symmetry operations

For 1 + set
(1) 1
(1|0,0,0)

For 1' + set
(1) 1'
(1|0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
1 a 11'	(1) x,y,z	[0,0,0]

Symmetry of special projections

Along [001] p11'	Along [100] p1111'	Along [010] p1111'
$\mathbf{a}^* = \mathbf{a}_p$ $\mathbf{b}^* = \mathbf{b}_p$	$\mathbf{a}^* = \mathbf{b}_p$	$\mathbf{a}^* = \mathbf{a}_p$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

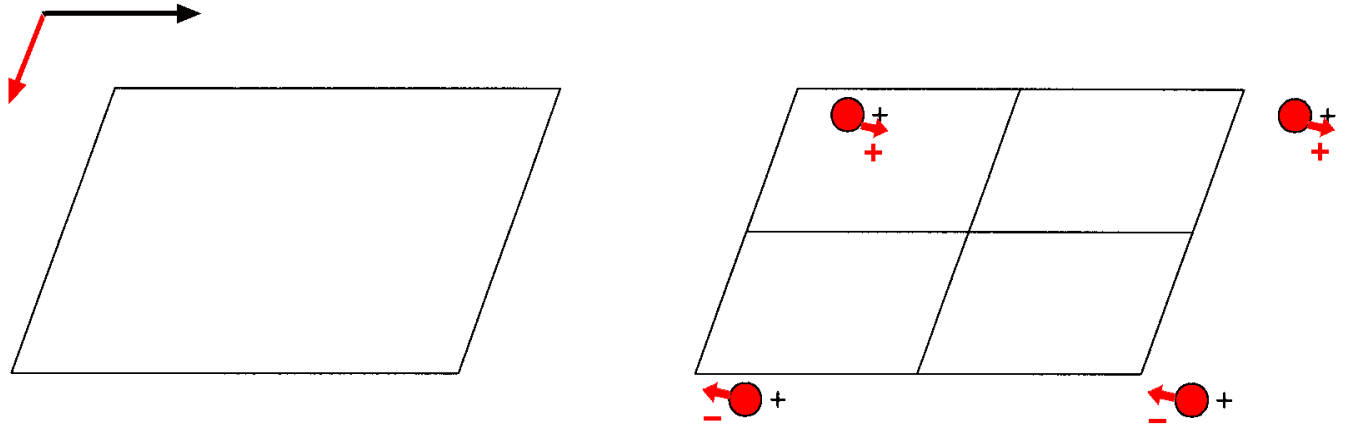
$p_{2a}1$

$11'$

Triclinic/Oblique

No. 1.3.3

$p_{2a}1$



Origin arbitrary

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1$

Symmetry operations

For $(0,0,0) +$ set
(1) 1
(1| $0,0,0$)

For $(1,0,0)'$ + set
(1) $t'(1,0,0)$
(1| $1,0,0$)'

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$

Positions

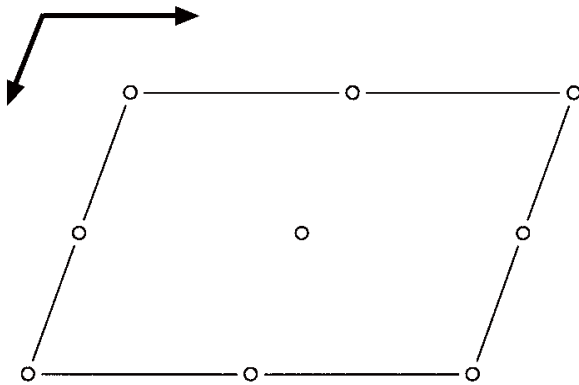
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		$(0,0,0)+$
1 a 1	(1) x,y,z [u,v,w]	

Symmetry of special projections

Along [001] $p_{2a^*}1$ $a^* = a_p$ $b^* = b_p$ Origin at 0,0,z	Along [100] $p11'$ $a^* = b_p$ Origin at x,0,0	Along [010] $p_{2a^*}1$ $a^* = a_p$ Origin at 0,y,0
---	--	---

$p\bar{1}$

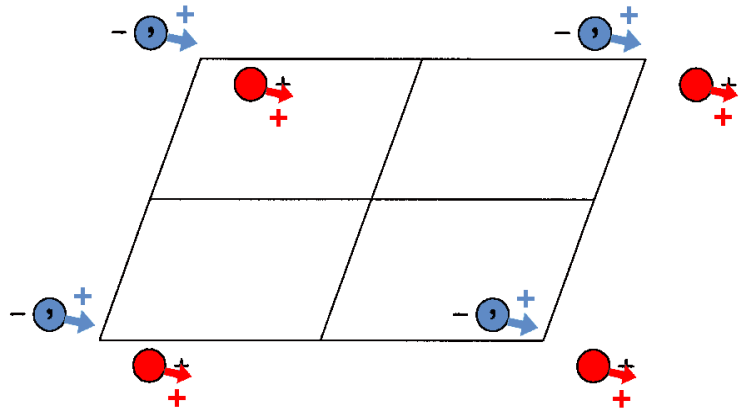
No. 2.1.4



$\bar{1}$

$p\bar{1}$

Triclinic/Oblique



Origin at $\bar{1}$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

(1) 1 $(1|0,0,0)$ (2) $\bar{1}$ $0,0,0$
 $(\bar{1}|0,0,0)$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

	Coordinates	
Wyckoff letter, Site symmetry		
2 e $\bar{1}$	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},\bar{z} [u,v,w]
1 d $\bar{1}$	$1/2,1/2,0$ [u,v,w]	
1 c $\bar{1}$	$1/2,0,0$ [u,v,w]	
1 b $\bar{1}$	$0,1/2,0$ [u,v,w]	
1 a $\bar{1}$	$0,0,0$ [u,v,w]	

Symmetry of special projections

Along [001] $p2'$ $a^* = a_p$ $b^* = b_p$ Origin at 0,0,z	Along [100] $p2'11$ $a^* = b_p$ Origin at x,0,0	Along [010] $p2'11$ $a^* = a_p$ Origin at 0,y,0
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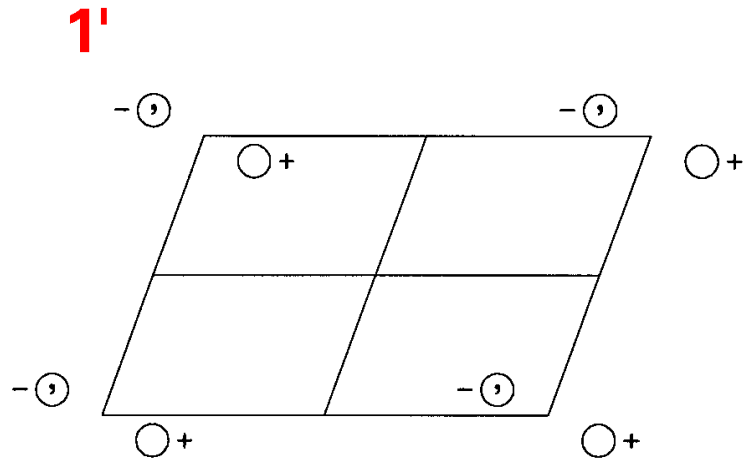
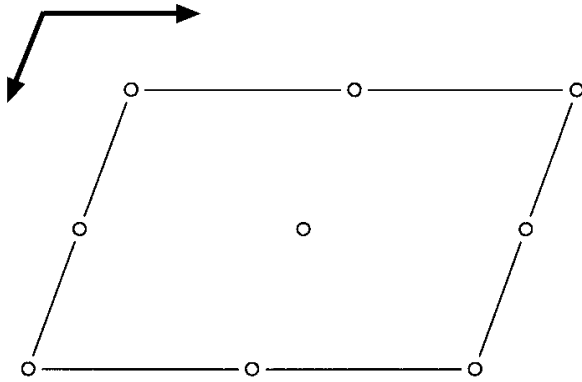
$p\bar{1}1'$

No. 2.2.5

$\bar{1}1'$

$p\bar{1}1'$

Triclinic/Oblique



Origin at $\bar{1}1'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

For 1 + set

(1) 1	(2) $\bar{1}$ 0,0,0
(1 0,0,0)	($\bar{1}$ 0,0,0)

For 1' + set

(1) 1'	(2) $\bar{1}'$ 0,0,0
(1 0,0,0)'	($\bar{1}$ 0,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); $1'$

Positions

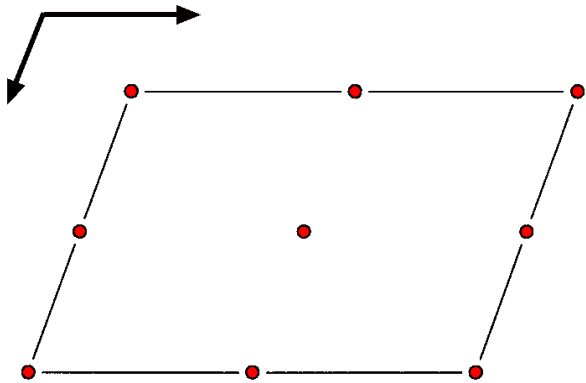
Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1' +$
2 e $11'$	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},\bar{z} [0,0,0]
1 d $\bar{1}1'$	$1/2,1/2,0$ [0,0,0]	
1 c $\bar{1}1'$	$1/2,0,0$ [0,0,0]	
1 b $\bar{1}1'$	$0,1/2,0$ [0,0,0]	
1 a $\bar{1}1'$	$0,0,0$ [0,0,0]	

Symmetry of special projections

Along [001] $p21'$ $a^* = a_p$ $b^* = b_p$ Origin at 0,0,z	Along [100] $p2111'$ $a^* = b_p$ Origin at x,0,0	Along [010] $p2111'$ $a^* = a_p$ Origin at 0,y,0
--	--	--

$p\bar{1}$ '

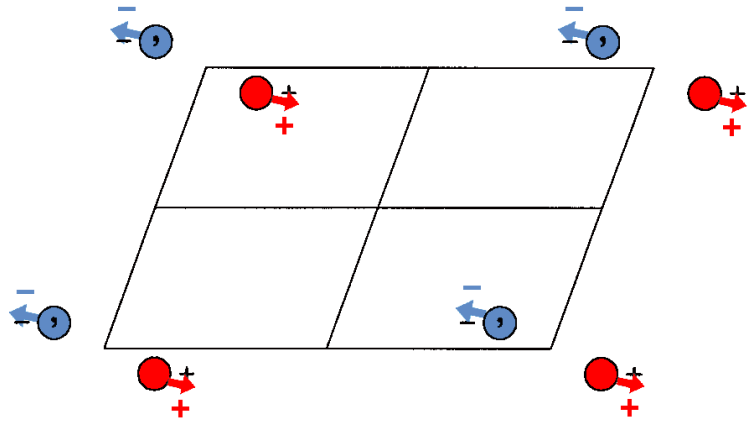
No. 2.3.6



$\bar{1}$ '

$p\bar{1}$ '

Triclinic/Oblique



Origin at $\bar{1}$ '

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

- (1) 1 $(1|0,0,0)$ (2) $\bar{1}$ ' $0,0,0$
 $(\bar{1}|0,0,0)'$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]
2 e $\bar{1}'$	$(1) x,y,z$ [u,v,w]	$(2) \bar{x},\bar{y},\bar{z}$ [\bar{u},\bar{v},\bar{w}]
1 d $\bar{1}'$	$1/2, 1/2, 0$ [0,0,0]	
1 c $\bar{1}'$	$1/2, 0, 0$ [0,0,0]	
1 b $\bar{1}'$	$0, 1/2, 0$ [0,0,0]	
1 a $\bar{1}'$	$0, 0, 0$ [0,0,0]	

Symmetry of special projections

Along [001] $p21'$ $a^* = a_p$ $b^* = b_p$ Origin at 0,0,z	Along [100] $p211'$ $a^* = b_p$ Origin at x,0,0	Along [010] $p2111'$ $a^* = a_p$ Origin at 0,y,0
--	---	--

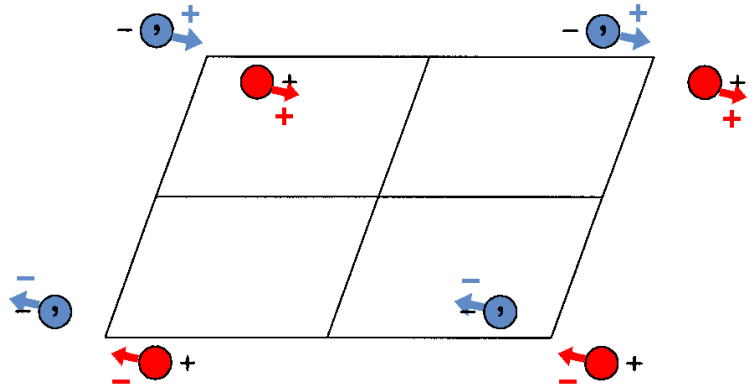
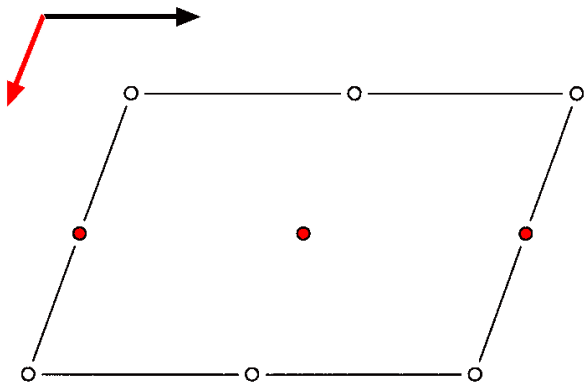
$p_{2a}\bar{1}$

No. 2.4.7

$\bar{1}1'$

$p_{2a}\bar{1}$

Triclinic/Oblique



Origin at $\bar{1}$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

For $(0,0,0)$ + set
 (1) 1 (2) $\bar{1}$ $0,0,0$
 $(1|0,0,0)$ $(\bar{1}|0,0,0)$

For $(1,0,0)'$ + set
 (1) t' $(1,0,0)$ (2) $\bar{1}'$ $1/2,0,0$
 $(1|1,0,0)'$ $(\bar{1}'|1,0,0)'$

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2)

Positions

Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	(1,0,0)' +
2 e $\bar{1}$	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]
1 d $\bar{1}'$	1/2,1/2,0 [0,0,0]	
1 c $\bar{1}'$	1/2,0,0 [0,0,0]	
1 b $\bar{1}$	0,1/2,0 [u,v,w]	
1 a $\bar{1}$	0,0,0 [u,v,w]	

Symmetry of special projections

Along [001] $p_{2a^*}2'$ $a^* = a_p$ $b^* = b_p$ Origin at 1/2,0,z	Along [100] $p2111'$ $a^* = b_p$ Origin at x,0,0	Along [010] $p_{2a^*}211$ $a^* = a_p$ Origin at 0,y,0
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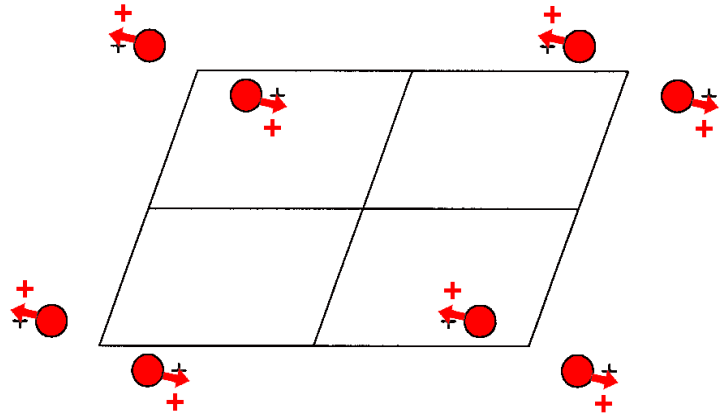
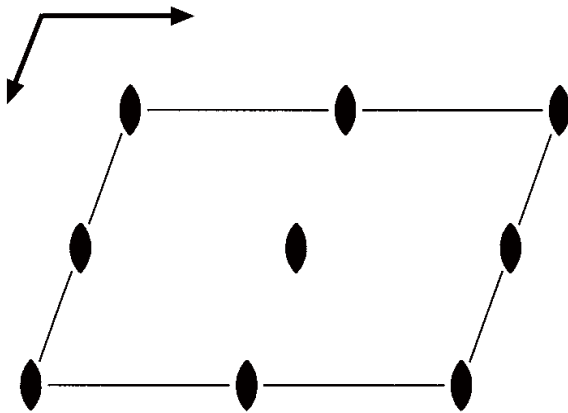
p112

No. 3.1.8

2

Monoclinic/Oblique

p112



Origin on 2

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

Multiplicity,
Wyckoff letter,
Site symmetry

2 e 1 (1) x,y,z [u,v,w] (2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]

1 d 2 $1/2,1/2,z$ [0,0,w]

1 c 2 $1/2,0,z$ [0,0,w]

1 b 2 $0,1/2,z$ [0,0,w]

1 a 2 $0,0,z$ [0,0,w]

Symmetry of special projections

Along [001] $p2$
 $a^* = a$ $b^* = b$
Origin at 0,0,z

Along [100] $p1m'1$
 $a^* = b_p$
Origin at x,0,0

Along [010] $p1m'1$
 $a^* = a_p$
Origin at 0,y,0

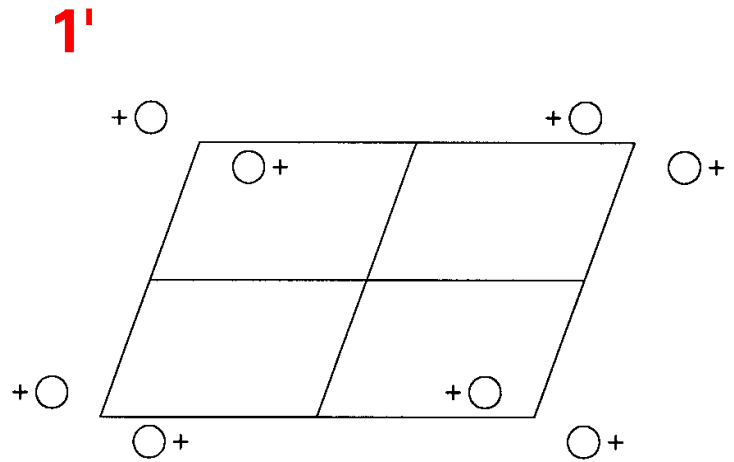
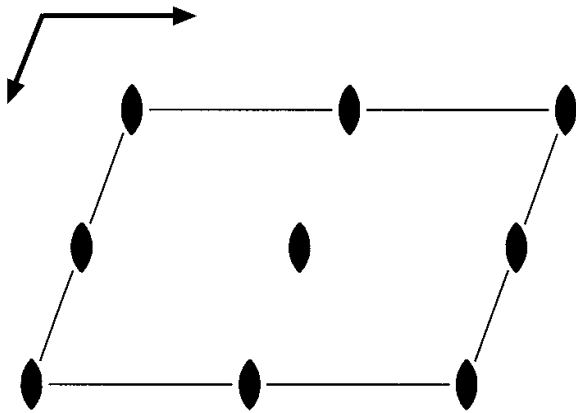
p1121'

No. 3.2.9

21'

p1121'

Monoclinic/Oblique



Origin on 21'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

For 1 + set

(1) 1	(2) 2 0,0,z
(1 0,0,0)	(2 _z 0,0,0)

For 1' + set

(1) 1'	(2) 2' 0,0,z
(1 0,0,0)'	(2' _z 0,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); $1'$

Positions

Multiplicity,
Wyckoff letter,
Site symmetry

		1+	1' +
2 e	11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]
1 d	21'	$1/2,1/2,z$ [0,0,0]	
1 c	21'	$1/2,0,z$ [0,0,0]	
1 b	21'	$0,1/2,z$ [0,0,0]	
1 a	21'	$0,0,z$ [0,0,0]	

Symmetry of special projections

Along [001] $p21'$ $\mathbf{a}^* = \mathbf{a}$ $\mathbf{b}^* = \mathbf{b}$ Origin at $0,0,z$	Along [100] $p1m11'$ $\mathbf{a}^* = \mathbf{b}_p$ Origin at $x,0,0$	Along [010] $p1m11'$ $\mathbf{a}^* = \mathbf{a}_p$ Origin at $0,y,0$
--	--	--

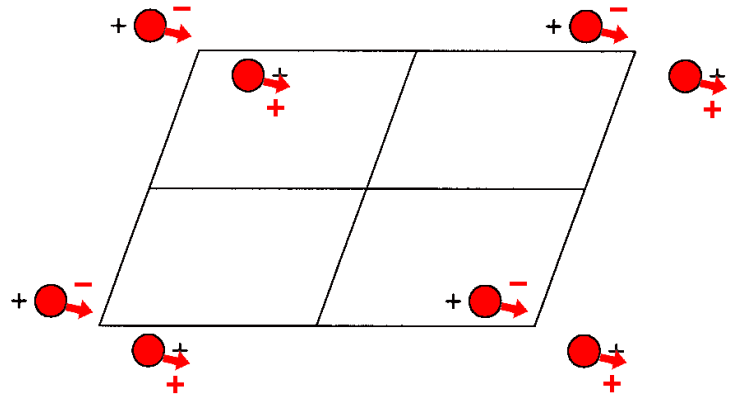
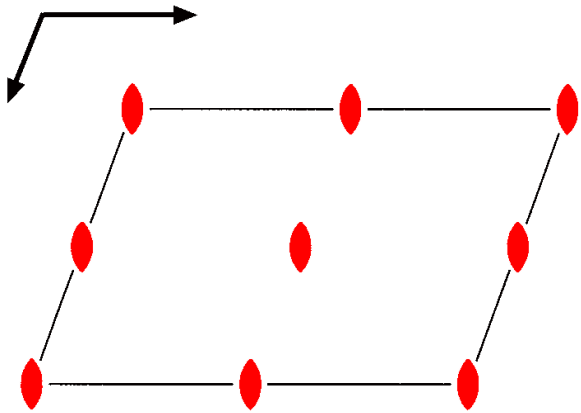
p112'

No. 3.3.10

2'

p112'

Monoclinic/Oblique



Origin on 2'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 0,0,z
(2_z|0,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

Multiplicity,
Wyckoff letter,
Site symmetry

2 e 1 (1) $x,y,z [u,v,w]$ (2) $\bar{x},\bar{y},z [u,v,\bar{w}]$

1 d 2' $1/2,1/2,z [u,v,0]$

1 c 2' $1/2,0,z [u,v,0]$

1 b 2' $0,1/2,z [u,v,0]$

1 a 2' $0,0,z [u,v,0]$

Symmetry of special projections

Along [001] $p2'$
 $a^* = a$ $b^* = b$
Origin at $0,0,z$

Along [100] $p1m1$
 $a^* = b_p$
Origin at $x,0,0$

Along [010] $p1m1$
 $a^* = a_p$
Origin at $0,y,0$

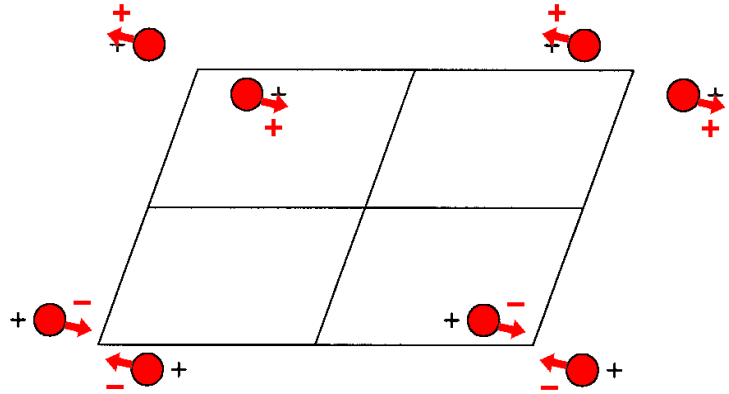
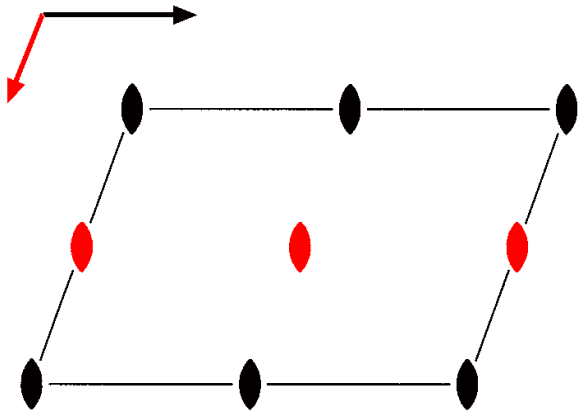
$p_{2a}112$

No. 3.4.11

$21'$

$p_{2a}112$

Monoclinic/Oblique



Origin on 2

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) 2 $0,0,z$
(1 $0,0,0$)	(2 _z $0,0,0$)

For $(1,0,0)'$ + set

(1) t' $(1,0,0)$	(2) 2' $1/2,0,z$
(1 $1,0,0$)'	(2 _z $1,0,0$)'

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2)

Positions

Multiplicity,
Wyckoff letter,
Site symmetry

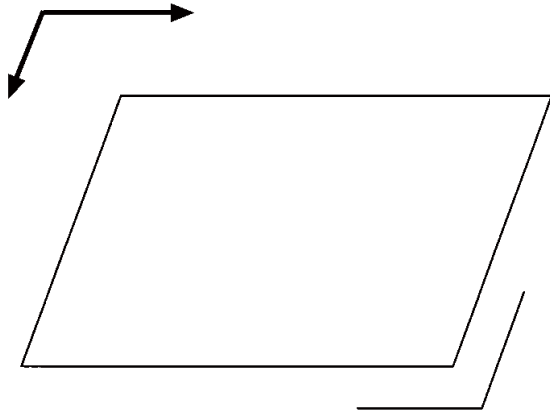
		(0,0,0)+	(1,0,0)' +
2 e 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
1 d 2'	1/2,1/2,z [u,v,0]		
1 c 2'	1/2,0,z [u,v,0]		
1 b 2	0,1/2,z [0,0,w]		
1 a 2	0,0,z [0,0,w]		

Symmetry of special projections

Along [001] $p_{2a^*}2$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p1m11'$ $a^* = b_p$ Origin at x,0,0	Along [010] $p_{2a^*}1m'1$ $a^* = a_p$ Origin at 0,y,0
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p11m

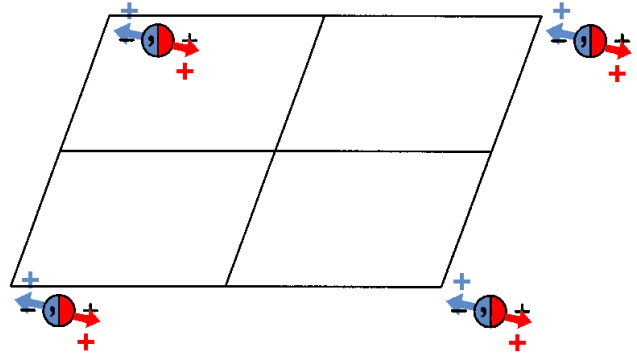
No. 4.1.12



m

p11m

Monoclinic/Oblique



Origin on mirror plane m

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) m $x,y,0$
(m_z |0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 b 1	(1) x,y,z [u,v,w]	(2) x,y,\bar{z} [\bar{u},\bar{v},w]
1 a m	$x,y,0$ [0,0,w]	

Symmetry of special projections

Along [001] $p11'$ $\mathbf{a}^* = \mathbf{a}$ $\mathbf{b}^* = \mathbf{b}$ Origin at 0,0,z	Along [100] $p11m$ $\mathbf{a}^* = \mathbf{b}_p$ Origin at x,0,0	Along [010] $p11m$ $\mathbf{a}^* = \mathbf{a}_p$ Origin at 0,y,0
--	--	--

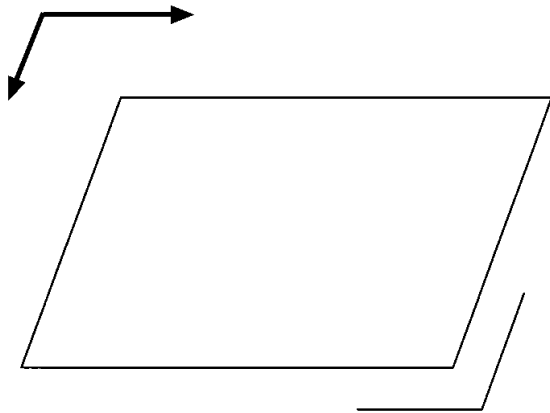
p11m1'

No. 4.2.13

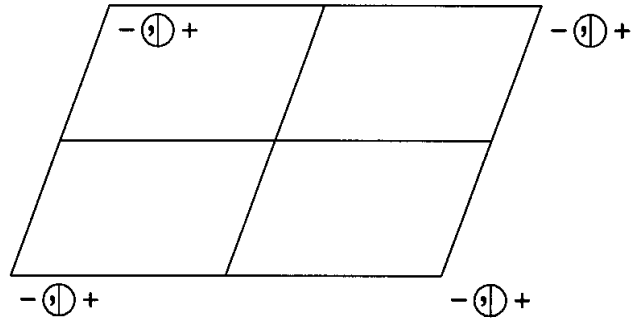
m1'

p11m1'

Monoclinic/Oblique



1'



Origin on mirror plane $m1'$

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For 1 + set

- | | |
|-----------|-----------------|
| (1) 1 | (2) $m \ x,y,0$ |
| (1 0,0,0) | (m_z 0,0,0) |

For 1' + set

- | | |
|------------|------------------|
| (1) 1' | (2) $m' \ x,y,0$ |
| (1 0,0,0)' | (m_z 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
2 b 11'	(1) x,y,z [0,0,0]	(2) x,y, \bar{z} [0,0,0]
1 a m1'	x,y,0 [0,0,0]	

Symmetry of special projections

Along [001] p11'	Along [100] p11m1'	Along [010] p11m1'
$a^* = a$ $b^* = b$	$a^* = b_p$	$a^* = a_p$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

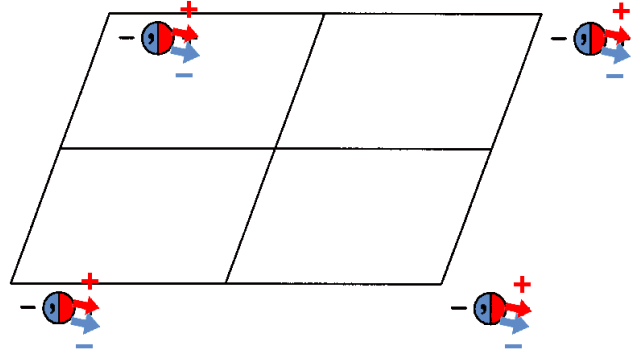
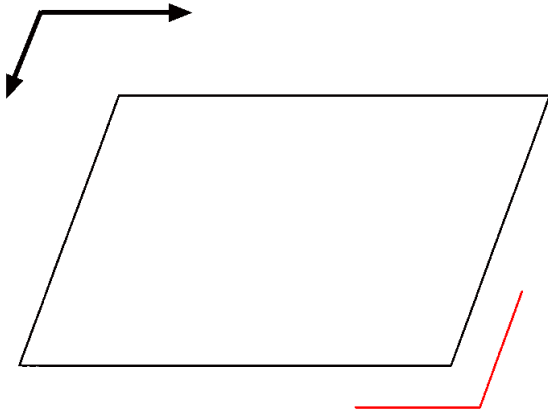
p11m'

No. 4.3.14

m'

p11m'

Monoclinic/Oblique



Origin on mirror plane m'

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) m' x,y,0
(m_z|0,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 b 1	(1) x,y,z [u,v,w]	(2) x,y,\bar{z} [u,v, \bar{w}]
1 a m'	$x,y,0$ [u,v,0]	

Symmetry of special projections

Along [001] p1 $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p11m' $a^* = b_p$ Origin at x,0,0	Along [010] p11m' $a^* = a_p$ Origin at 0,y,0
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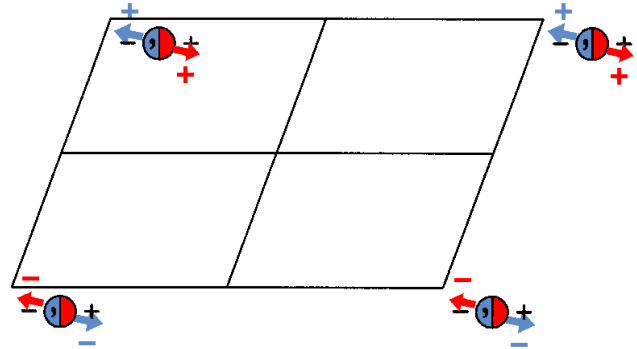
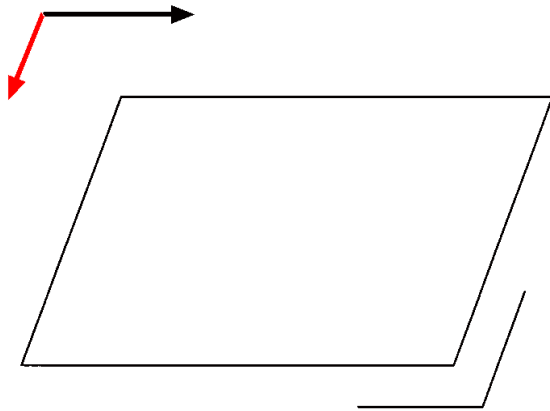
$p_{2a}11m$

No. 4.4.15

$m1'$

$p_{2a}11m$

Monoclinic/Oblique



Origin on mirror plane m

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $m \ x,y,0$
(1 0,0,0)	(m_z 0,0,0)

For $(1,0,0)'$ + set

(1) $t' (1,0,0)$	(2) $a' (1,0,0) \ x,y,0$
(1 1,0,0)'	(m_z 1,0,0)'

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(1,0,0)' +
2	b 1	(1) x,y,z [u,v,w]	(2) x,y,\bar{z} [\bar{u},\bar{v},w]
1	a m	$x,y,0$ [0,0,w]	

Symmetry of special projections

Along [001] $p11'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p11m1'$ $a^* = b_p$ Origin at x,0,0	Along [010] $p_{2a^*}11m$ $a^* = a_p$ Origin at 0,y,0
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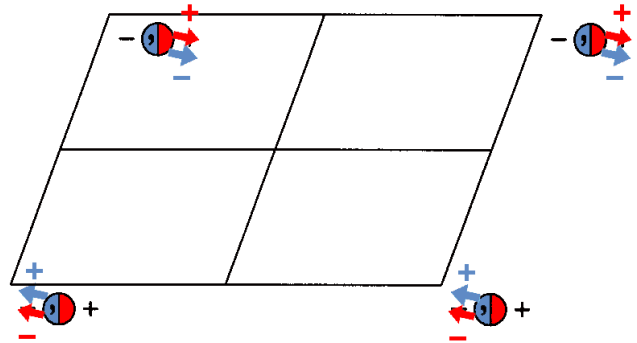
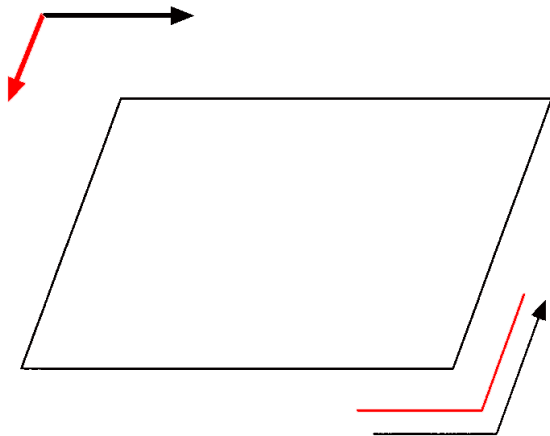
$p_{2a}11m'$

No. 4.5.16

$m1'$

$p_{2a}11m'$

Monoclinic/Oblique



Origin on mirror plane m'

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $m' \ x,y,0$
(1 0,0,0)	$(m_z 0,0,0)'$

For $(1,0,0)'$ + set

(1) $t' (1,0,0)$	(2) $a (1,0,0) \ x,y,0$
(1 1,0,0)'	$(m_z 1,0,0)$

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		$(0,0,0)+$	$(1,0,0)'+$
2	$b\ 1$	(1) x,y,z [u,v,w]	(2) x,y,\bar{z} [u,v, \bar{w}]
1	$a\ m'$	$x,y,0$ [u,v,0]	

Symmetry of special projections

Along [001] $p_{2a}1$ $a^* = a\ b^* = b$ Origin at 0,0,z	Along [100] $p11m1'$ $a^* = b_p$ Origin at x,0,0	Along [010] $p_{2a}11m'$ $a^* = a_p$ Origin at 0,y,0
--	--	--

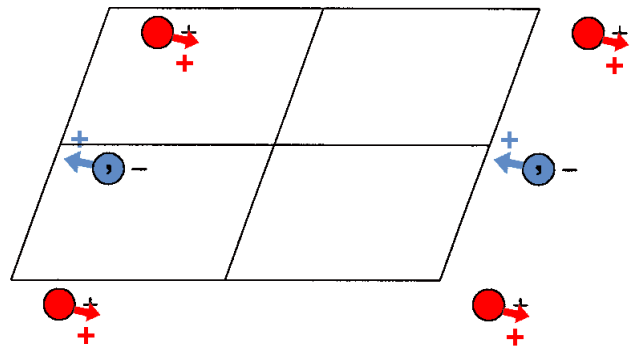
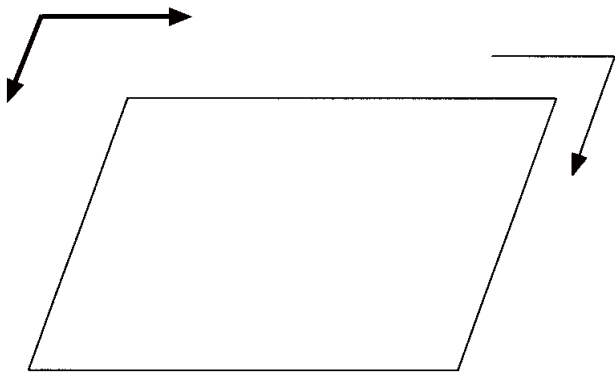
p11a

No. 5.1.17

m

p11a

Monoclinic/Oblique



Origin on glide plane a

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) a $(1/2,0,0)$ x,y,0
(m_z|1/2,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 a 1	(1) x,y,z [u,v,w]	(2) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]

Symmetry of special projections

Along [001] $p_{2a^*}1$ $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] $p11m$ $a^* = b_p$ Origin at x,0,0	Along [010] $p11g$ $a^* = a_p$ Origin at 0,y,0
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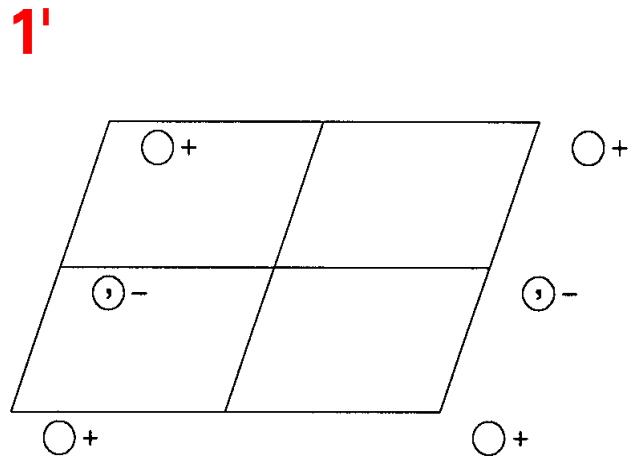
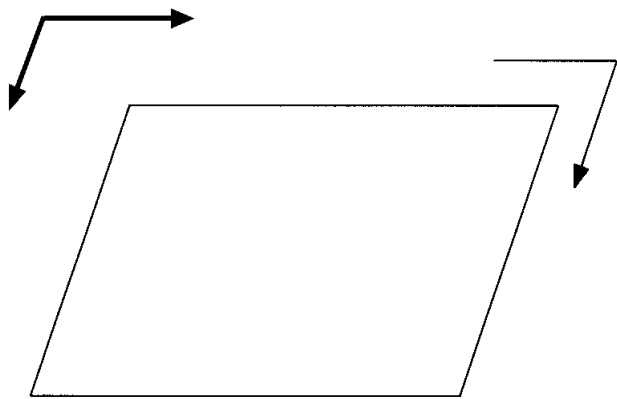
p11a1'

No. 5.2.18

m1'

p11a1'

Monoclinic/Oblique



Origin on glide plane a1'

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For 1 + set

(1) 1	(2) a (1/2,0,0) x,y,0
(1 0,0,0)	(m _z 1/2,0,0)

For 1' + set

(1) 1'	(2) a' (1/2,0,0) x,y,0
(1 0,0,0)'	(m _z ' 1/2,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
2 a 11'	(1) x,y,z [0,0,0]	(2) $x+1/2,y,\bar{z}$ [0,0,0]

Symmetry of special projections

Along [001] $p11'$ $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] $p11m1'$ $a^* = b_p$ Origin at x,0,0	Along [010] $p11g1'$ $a^* = a_p$ Origin at 0,y,0
--	--	--

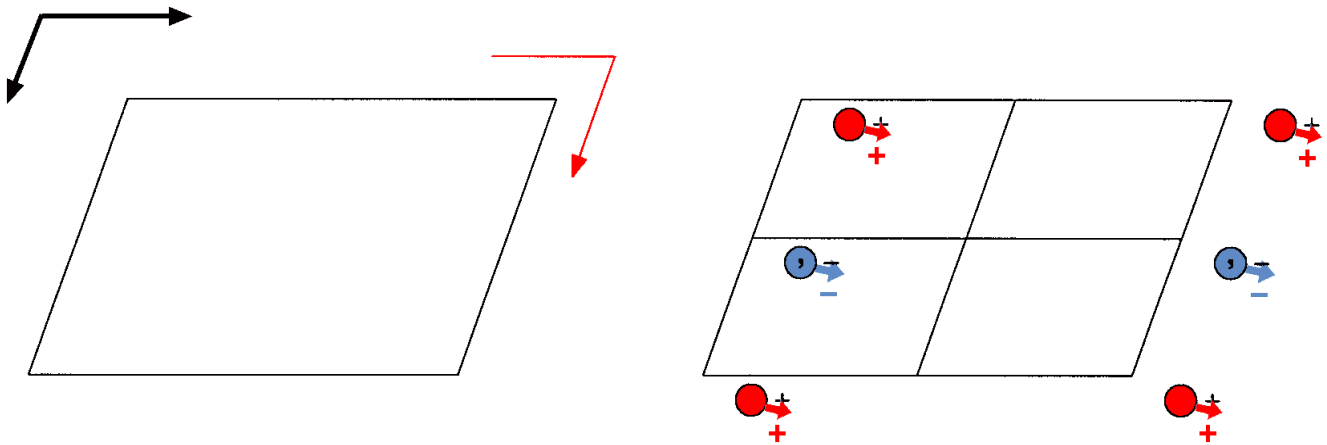
p11a'

No. 5.3.19

m'

p11a'

Monoclinic/Oblique



Origin on glide plane a'

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) a' (1/2,0,0) x,y,0
(m_z|1/2,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 a 1	(1) x,y,z [u,v,w]	(2) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]

Symmetry of special projections

Along [001] $p1$ $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] $p11m'$ $a^* = b_p$ Origin at x,0,0	Along [010] $p11g'$ $a^* = a_p$ Origin at 0,y,0
--	---	---

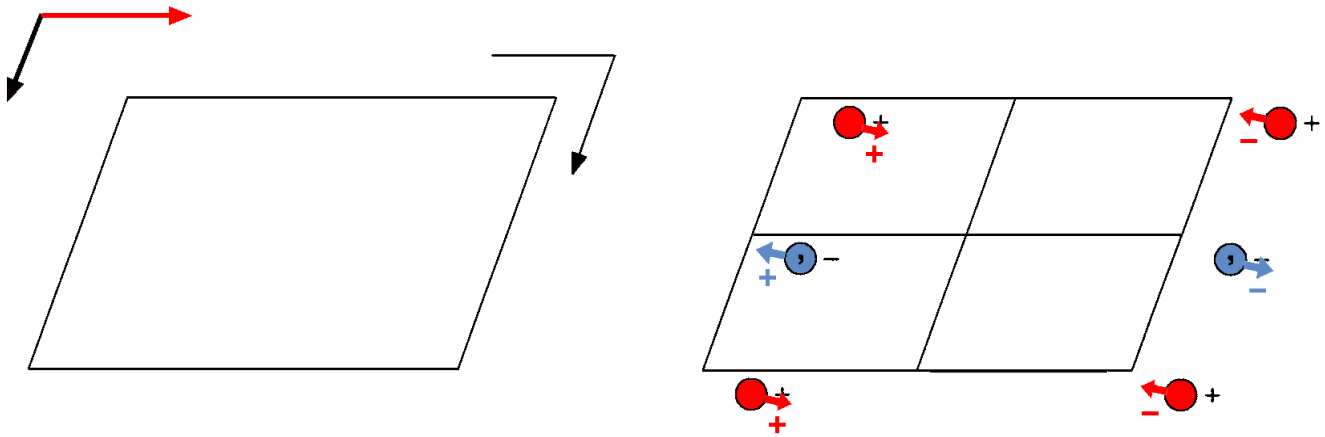
$p_{2b}11a$

No. 5.4.20

$m1'$

$p_{2b}11a$

Monoclinic/Oblique



Origin on glide plane a

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) a	$(1/2,0,0)$	$x,y,0$
$(1 0,0,0)$	$(m_z $	$1/2,0,0)$	

For $(0,1,0)'$ + set

(1) t'	$(0,1,0)$	(2) a'	$(1/2,1,0)$	$x,y,0$
$(1 0,1,0)'$	$(m_z $	$1/2,1,0)'$		

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(0,1,0)' +
2	a 1	(1) x,y,z [u,v,w]	(2) x+1/2,y,z̄ [ū,ṽ,w]

Symmetry of special projections

Along [001] p _{2a*} 1 a* = a/2 b* = a/2+b Origin at 0,0,z	Along [100] p11m a* = b _p Origin at x,0,0	Along [010] p11g1' a* = a _p Origin at 0,y,0
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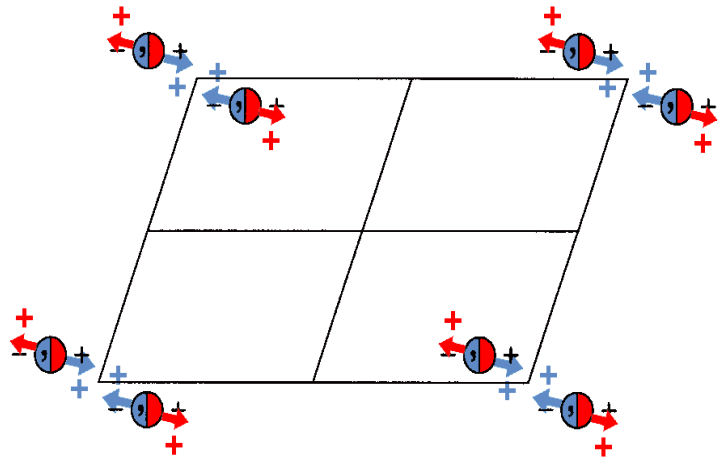
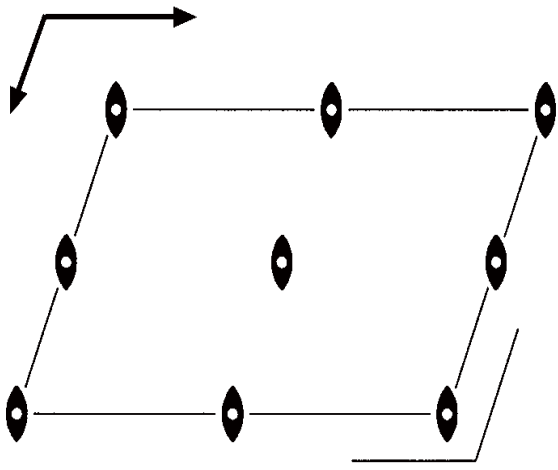
p112/m

2/m

Monoclinic/Oblique

No. 6.1.21

p112/m



Origin at center (2/m)

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

$$(1) 1 \\ (1|0,0,0)$$

$$(2) 2 \quad 0,0,z \\ (2_z|0,0,0)$$

$$(3) \bar{1} \quad 0,0,0 \\ (\bar{1}|0,0,0)$$

$$(4) m \quad x,y,0 \\ (m_z|0,0,0)$$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
4 j 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	
	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) x,y,\bar{z} [\bar{u},\bar{v},w]	
2 i m	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	
2 h 2	$1/2,1/2,z$ [0,0,w]	$1/2,1/2,\bar{z}$ [0,0,w]	
2 g 2	$1/2,0,z$ [0,0,w]	$1/2,0,\bar{z}$ [0,0,w]	
2 f 2	$0,1/2,z$ [0,0,w]	$0,1/2,\bar{z}$ [0,0,w]	
2 e 2	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]	
1 d 2/m	$1/2,1/2,0$ [0,0,w]		
1 c 2/m	$0,1/2,0$ [0,0,w]		
1 b 2/m	$1/2,0,0$ [0,0,w]		
1 a 2/m	$0,0,0$ [0,0,w]		

Symmetry of special projections

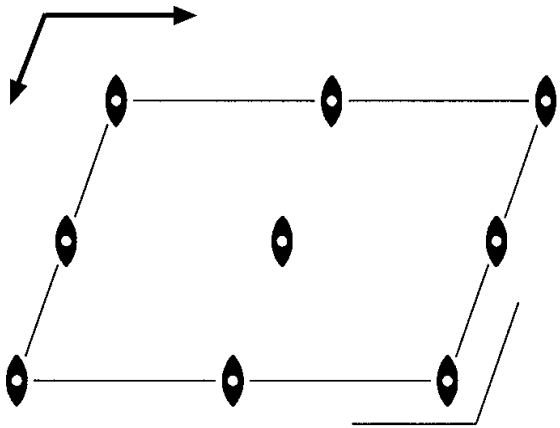
Along [001] $p21'$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p2'm'm$
 $a^* = b_p$
 Origin at x,0,0

Along [010] $p2'm'm$
 $a^* = a_p$
 Origin at 0,y,0

p112/m1'

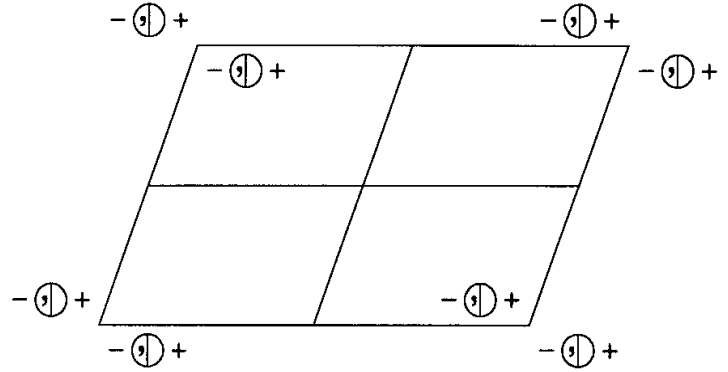
No. 6.2.22



2/m1'

p112/m1'

1'



Monoclinic/Oblique

Origin at center (2/m1')

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|-----------|-------------------------|---------------------------|-------------------------|
| (1) 1 | (2) $2 \quad 0,0,z$ | (3) $\bar{1} \quad 0,0,0$ | (4) $m \quad x,y,0$ |
| (1 0,0,0) | (2 _z 0,0,0) | ($\bar{1}$ 0,0,0) | (m _z 0,0,0) |

For 1' + set

- | | | | |
|------------|---------------------------|----------------------------|---------------------------|
| (1) 1' | (2) $2' \quad 0,0,z$ | (3) $\bar{1}' \quad 0,0,0$ | (4) $m' \quad x,y,0$ |
| (1 0,0,0)' | (2' _z 0,0,0)' | ($\bar{1}'$ 0,0,0)' | (m' _z 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); 1'
Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1 +	1' +
4 j 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]
	(3) \bar{x},\bar{y},\bar{z} [0,0,0]	(4) x,y, \bar{z} [0,0,0]
2 i m1'	x,y,0 [0,0,0]	$\bar{x},\bar{y},0$ [0,0,0]
2 h 21'	1/2,1/2,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]
2 g 21'	1/2,0,z [0,0,0]	1/2,0, \bar{z} [0,0,0]
2 f 21'	0,1/2,z [0,0,0]	0,1/2, \bar{z} [0,0,0]
2 e 21'	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]
1 d 2/m1'	1/2,1/2,0 [0,0,0]	
1 c 2/m1'	0,1/2,0 [0,0,0]	
1 b 2/m1'	1/2,0,0 [0,0,0]	
1 a 2/m1'	0,0,0 [0,0,0]	

Symmetry of special projections

Along [001] p21' a* = a b* = b Origin at 0,0,z	Along [100] p2mm1' a* = b _p Origin at x,0,0	Along [010] p2mm1' a* = a _p Origin at 0,y,0
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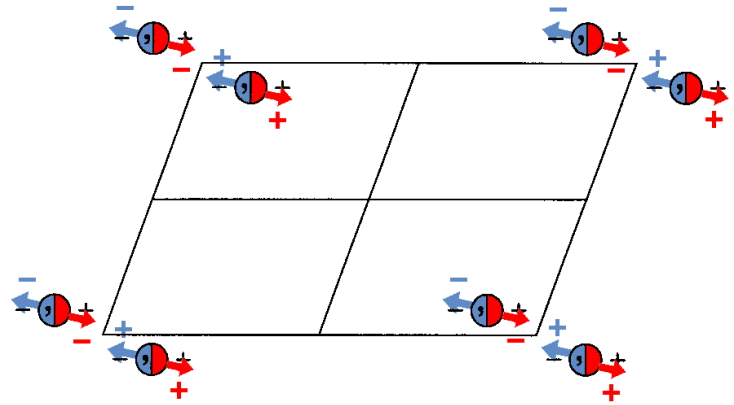
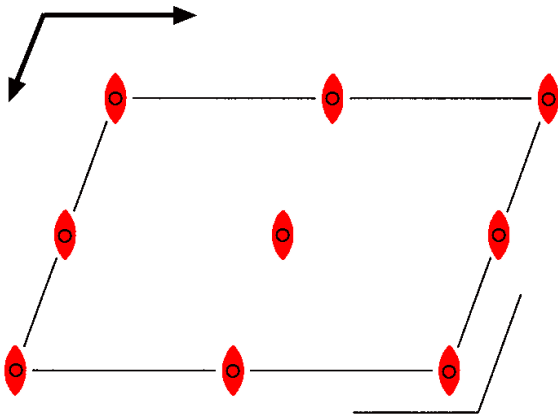
p112'/m

No. 6.3.23

2'/m

p112'/m

Monoclinic/Oblique



Origin at center (2'/m)

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'_z$ 0,0,z
($2'_z$ |0,0,0)'

(3) $\bar{1}'$ 0,0,0
($\bar{1}'$ |0,0,0)'

(4) m $x,y,0$
(m_z |0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]
4 j 1	(1) x,y,z [u,v,w] (3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(2) \bar{x},\bar{y},z [u,v, \bar{w}] (4) x,y,\bar{z} [\bar{u},\bar{v},w]
2 i m	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0, \bar{w}]
2 h 2'	$1/2,1/2,z$ [u,v,0]	$1/2,1/2,\bar{z}$ [$\bar{u},\bar{v},0$]
2 g 2'	$1/2,0,z$ [u,v,0]	$1/2,0,\bar{z}$ [$\bar{u},\bar{v},0$]
2 f 2'	$0,1/2,z$ [u,v,0]	$0,1/2,\bar{z}$ [$\bar{u},\bar{v},0$]
2 e 2'	$0,0,z$ [u,v,0]	$0,0,\bar{z}$ [$\bar{u},\bar{v},0$]
1 d 2'/m	$1/2,1/2,0$ [0,0,0]	
1 c 2'/m	$0,1/2,0$ [0,0,0]	
1 b 2'/m	$1/2,0,0$ [0,0,0]	
1 a 2'/m	$0,0,0$ [0,0,0]	

Symmetry of special projections

Along [001] $p21'$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p2mm$
 $a^* = b_p$
 Origin at x,0,0

Along [010] $p2mm$
 $a^* = a_p$
 Origin at 0,y,0

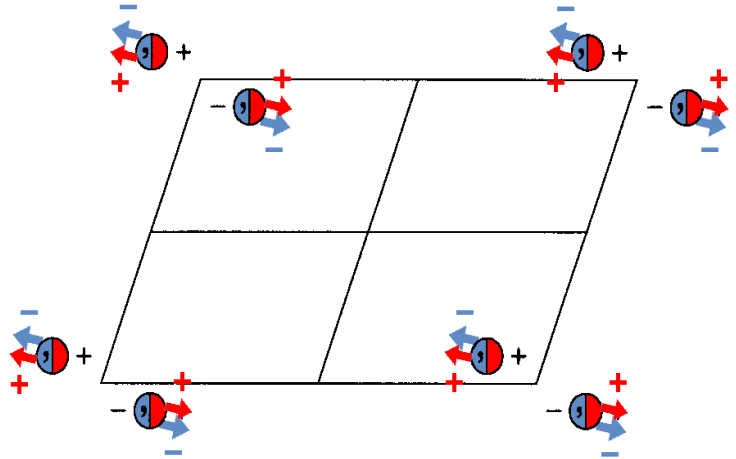
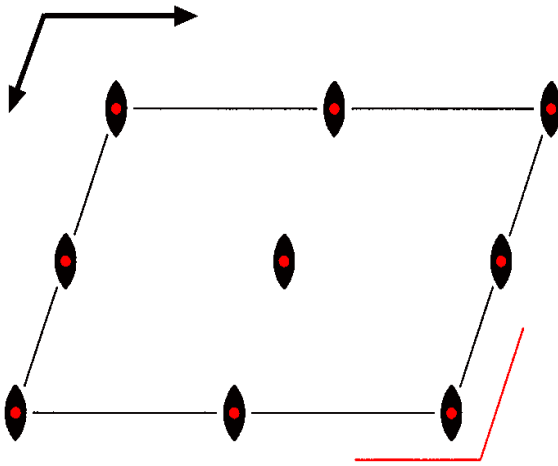
p112/m'

No. 6.4.24

2/m'

p112/m'

Monoclinic/Oblique



Origin at center (2/m')

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2 \quad 0,0,z$
(2_z |0,0,0)

(3) $\bar{1} \quad 0,0,0$
($\bar{1}$ |0,0,0)

(4) $m' \quad x,y,0$
(m_z |0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1)	(2)
4 j 1	$x,y,z [u,v,w]$	$\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
	$\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	$x,y,\bar{z} [u,v,\bar{w}]$
2 i m'	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [\bar{u},\bar{v},0]$
2 h 2	$1/2,1/2,z [0,0,w]$	$1/2,1/2,\bar{z} [0,0,w]$
2 g 2	$1/2,0,z [0,0,w]$	$1/2,0,\bar{z} [0,0,w]$
2 f 2	$0,1/2,z [0,0,w]$	$0,1/2,\bar{z} [0,0,w]$
2 e 2	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$
1 d 2/m'	$1/2,1/2,0 [0,0,0]$	
1 c 2/m'	$0,1/2,0 [0,0,0]$	
1 b 2/m'	$1/2,0,0 [0,0,0]$	
1 a 2/m'	$0,0,0 [0,0,0]$	

Symmetry of special projections

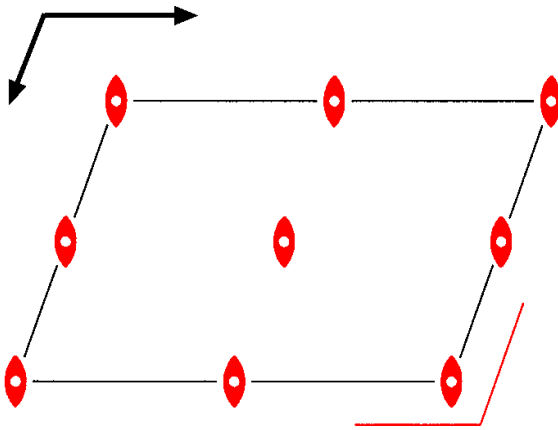
Along [001] p2
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] p2m'm'
 $a^* = b_p$
 Origin at x,0,0

Along [010] p2m'm'
 $a^* = a_p$
 Origin at 0,y,0

$p112'/m'$

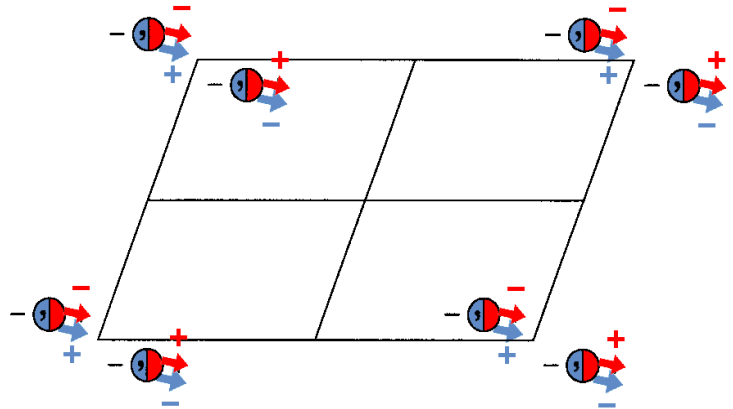
No. 6.5.25



$2'/m'$

$p112'/m'$

Monoclinic/Oblique



Origin at center ($2'/m'$)

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

(1) 1
 $(1|0,0,0)$

(2) $2' \ 0,0,z$
 $(2'_z|0,0,0)'$

(3) $\bar{1} \ 0,0,0$
 $(\bar{1}|0,0,0)$

(4) $m' \ x,y,0$
 $(m'_z|0,0,0)'$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1)	(2)
4 j 1	$x,y,z [u,v,w]$	$\bar{x},\bar{y},z [u,v,\bar{w}]$
	$\bar{x},\bar{y},\bar{z} [u,v,w]$	$x,y,\bar{z} [u,v,\bar{w}]$
2 i m'	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [u,v,0]$
2 h 2'	$1/2,1/2,z [u,v,0]$	$1/2,1/2,\bar{z} [u,v,0]$
2 g 2'	$1/2,0,z [u,v,0]$	$1/2,0,\bar{z} [u,v,0]$
2 f 2'	$0,1/2,z [u,v,0]$	$0,1/2,\bar{z} [u,v,0]$
2 e 2'	$0,0,z [u,v,0]$	$0,0,\bar{z} [u,v,0]$
1 d 2'/m'	$1/2,1/2,0 [u,v,0]$	
1 c 2'/m'	$0,1/2,0 [u,v,0]$	
1 b 2'/m'	$1/2,0,0 [u,v,0]$	
1 a 2'/m'	$0,0,0 [u,v,0]$	

Symmetry of special projections

Along [001] $p2'$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p2'mm'$
 $a^* = b_p$
 Origin at x,0,0

Along [010] $p2'mm'$
 $a^* = a_p$
 Origin at 0,y,0

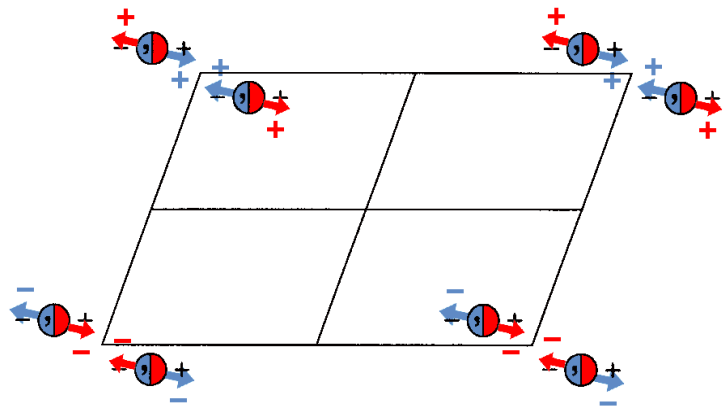
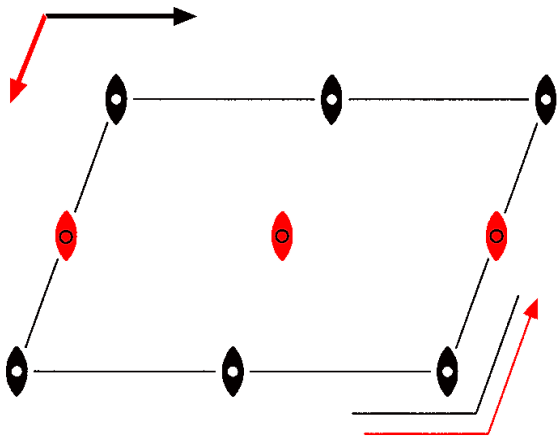
$p_{2a}112/m$

No. 6 .6.26

$2/m1'$

$p_{2a}112/m$

Monoclinic/Oblique



Origin at center ($2/m$)

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|-----------|-------------------------|-----------------------|-----------------|
| (1) 1 | (2) $2_{0,0,z}$ | (3) $\bar{1}_{0,0,0}$ | (4) $m_{x,y,0}$ |
| (1 0,0,0) | (2 _z 0,0,0) | ($\bar{1}$ 0,0,0) | (m_z 0,0,0) |

For $(1,0,0)'$ + set

- | | | | |
|-----------------|--------------------------|--------------------------|------------------|
| (1) $t'(1,0,0)$ | (2) $2'_{1/2,0,z}$ | (3) $\bar{1}'_{1/2,0,0}$ | (4) $a'(1,0,0)$ |
| (1 1,0,0)' | (2 _z 1,0,0)' | ($\bar{1}$ 1,0,0)' | (m_z 1,0,0)' |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)
Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(1,0,0)' +
4 j 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
	(3) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(4) $x,y,\bar{z} [\bar{u},\bar{v},w]$
2 i m	$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,w]$
2 h 2'	$1/2,1/2,z [u,v,0]$	$1/2,1/2,\bar{z} [\bar{u},\bar{v},0]$
2 g 2'	$1/2,0,z [u,v,0]$	$1/2,0,\bar{z} [\bar{u},\bar{v},0]$
2 f 2	$0,1/2,z [0,0,w]$	$0,1/2,\bar{z} [0,0,w]$
2 e 2	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$
1 d 2'/m	$1/2,1/2,0 [0,0,0]$	
1 c 2/m	$0,1/2,0 [0,0,w]$	
1 b 2'/m	$1/2,0,0 [0,0,0]$	
1 a 2/m	$0,0,0 [0,0,w]$	

Symmetry of special projections

Along [001] $p21'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p2mm1'$ $a^* = b_p$ Origin at x,0,0	Along [010] $p_{2a}2mm'$ $a^* = a_p$ Origin at 1/2,y,0
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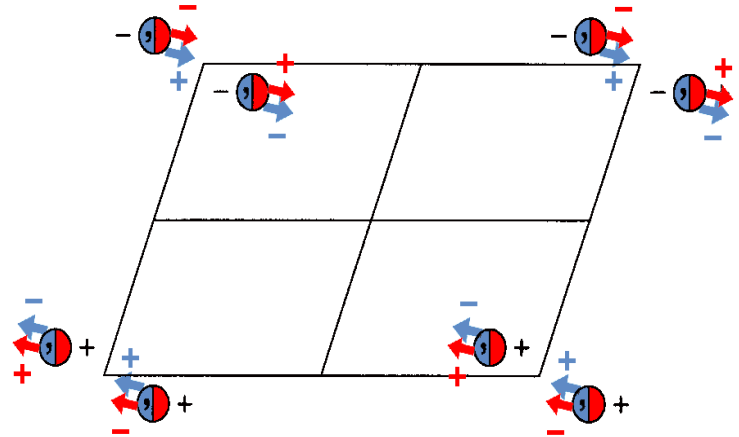
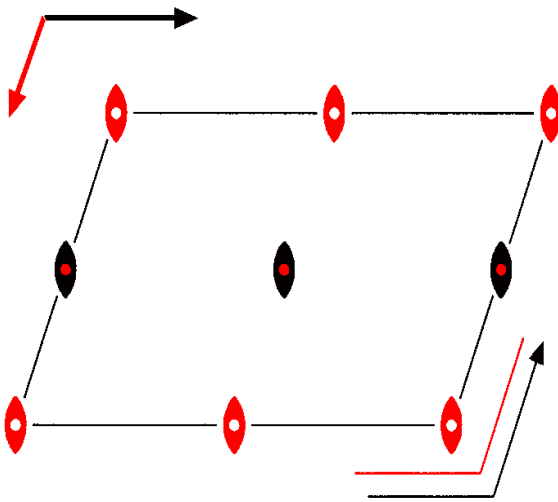
$p_{2a}112'/m'$

No. 6.7.27

$2/m1'$

$p_{2a}112'/m'$

Monoclinic/Oblique



Origin at center ($2'/m'$)

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|---------------|----------------------|-------------------------|----------------------|
| (1) 1 | (2) $2' \ 0,0,z$ | (3) $\bar{1} \ 0,0,0$ | (4) $m' \ x,y,0$ |
| (1 $0,0,0$) | (2_z $0,0,0$)' | ($\bar{1}$ $0,0,0$) | (m_z $0,0,0$)' |

For $(1,0,0)$ ' + set

- | | | | |
|--------------------|---------------------|--------------------------|---------------------------|
| (1) $t' \ (1,0,0)$ | (2) $2 \ 1/2,0,z$ | (3) $\bar{1}' \ 1/2,0,0$ | (4) $a \ (1,0,0) \ x,y,0$ |
| (1 $1,0,0$)' | (2_z $1,0,0$) | ($\bar{1}$ $1,0,0$)' | (m_z $1,0,0$) |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)
Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(1,0,0)' +
4 j 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [u,v,\bar{w}]$
	(3) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(4) $x,y,\bar{z} [u,v,\bar{w}]$
2 i m'	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [u,v,0]$
2 h 2	$1/2,1/2,z [0,0,w]$	$1/2,1/2,\bar{z} [0,0,\bar{w}]$
2 g 2	$1/2,0,z [0,0,w]$	$1/2,0,\bar{z} [0,0,\bar{w}]$
2 f $2'$	$0,1/2,z [u,v,0]$	$0,1/2,\bar{z} [u,v,0]$
2 e $2'$	$0,0,z [u,v,0]$	$0,0,\bar{z} [u,v,0]$
1 d $2/m'$	$1/2,1/2,0 [0,0,0]$	
1 c $2'/m'$	$0,1/2,0 [u,v,0]$	
1 b $2/m'$	$1/2,0,0 [0,0,0]$	
1 a $2'/m'$	$0,0,0 [u,v,0]$	

Symmetry of special projections

Along [001] $p2$ $a^* = a$ $b^* = b$ Origin at $1/2,0,z$	Along [100] $p2mm1'$ $a^* = b_p$ Origin at $x,0,0$	Along [010] $p_{2a}2m'm'$ $a^* = a_p$ Origin at $1/2,y,0$
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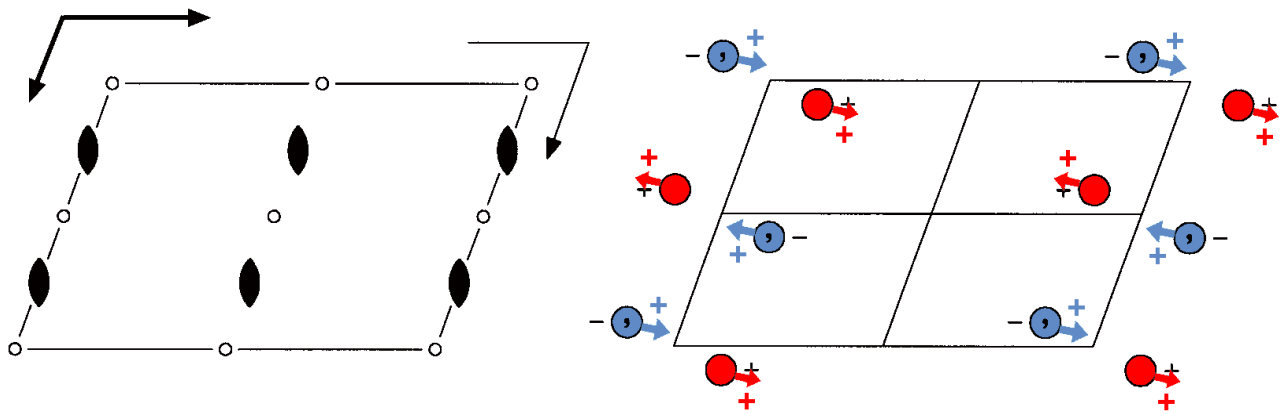
p112/a

2/m

Monoclinic/Oblique

No. 7.1.28

p112/a



Origin at $\bar{1}$ on glide plane a

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $1/4,0,z$
(2_z|1/2,0,0)

(3) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(4) a (1/2,0,0) x,y,0
(m_z|1/2,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y},z$ [\bar{u},\bar{v},w]
4 e 1	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]
2 d 2	$1/4,1/2,z$ [0,0,w]	$3/4,1/2,\bar{z}$ [0,0,w]
2 c 2	$1/4,0,z$ [0,0,w]	$3/4,0,\bar{z}$ [0,0,w]
2 b $\bar{1}$	$0,1/2,0$ [u,v,w]	$1/2,1/2,0$ [\bar{u},\bar{v},w]
2 a $\bar{1}$	$0,0,0$ [u,v,w]	$1/2,0,0$ [\bar{u},\bar{v},w]

Symmetry of special projections

Along [001] $p_{2a^*}2$ $a^* = a/2$ $b^* = b$ Origin at $1/2,0,z$	Along [100] $p2'm'm$ $a^* = b_p$ Origin at $x,0,0$	Along [010] $p2'm'g$ $a^* = a_p$ Origin at $0,y,0$
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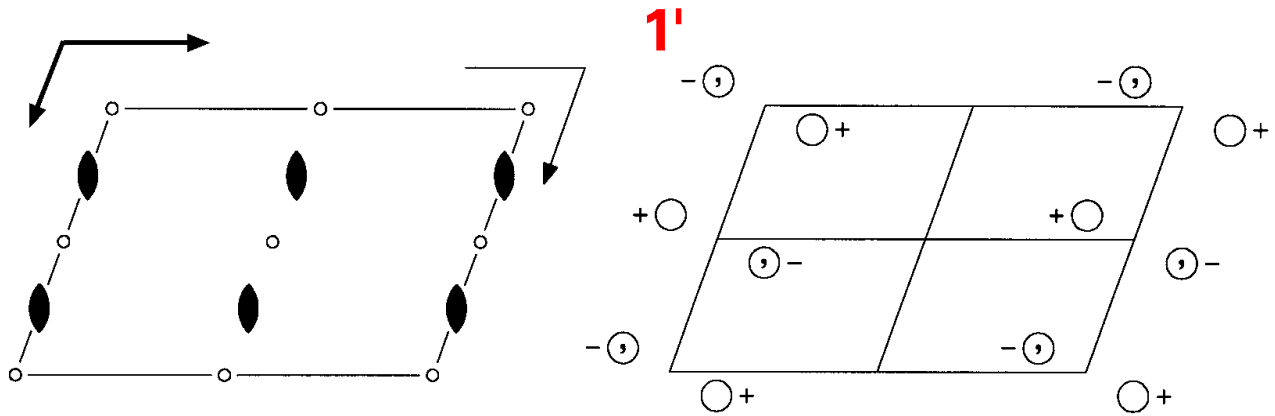
p112/a1'

2/m1'

Monoclinic/Oblique

No. 7.2.29

p112/a1'



Origin at $\bar{1}1'$ on glide plane a_1'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|--------------------|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4,0,z$
(2 _z 1/2,0,0) | (3) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (4) a (1/2,0,0) x,y,0
(m _z 1/2,0,0) |
|--------------------|--|--|--|

For 1' + set

- | | | | |
|----------------------|--|---|--|
| (1) 1'
(1 0,0,0)' | (2) 2' $1/4,0,z$
(2 _z 1/2,0,0)' | (3) $\bar{1}'$ 0,0,0
($\bar{1}'$ 0,0,0)' | (4) a' (1/2,0,0)' x,y,0
(m _z ' 1/2,0,0)' |
|----------------------|--|---|--|

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1' +$
4 e $11'$	(1) x,y,z [0,0,0]	(2) $\bar{x}+1/2,\bar{y},z$ [0,0,0]
	(3) \bar{x},\bar{y},\bar{z} [0,0,0]	(4) $x+1/2,y,\bar{z}$ [0,0,0]
2 d $21'$	$1/4,1/2,z$ [0,0,0]	$3/4,1/2,\bar{z}$ [0,0,0]
2 c $21'$	$1/4,0,z$ [0,0,0]	$3/4,0,\bar{z}$ [0,0,0]
2 b $\bar{1}1'$	$0,1/2,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]
2 a $\bar{1}1'$	$0,0,0$ [0,0,0]	$1/2,0,0$ [0,0,0]

Symmetry of special projections

Along [001] $p21'$ $a^* = a/2$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2mm1'$ $a^* = b_p$ Origin at $x,0,0$	Along [010] $p2mg1'$ $a^* = a_p$ Origin at $0,y,0$
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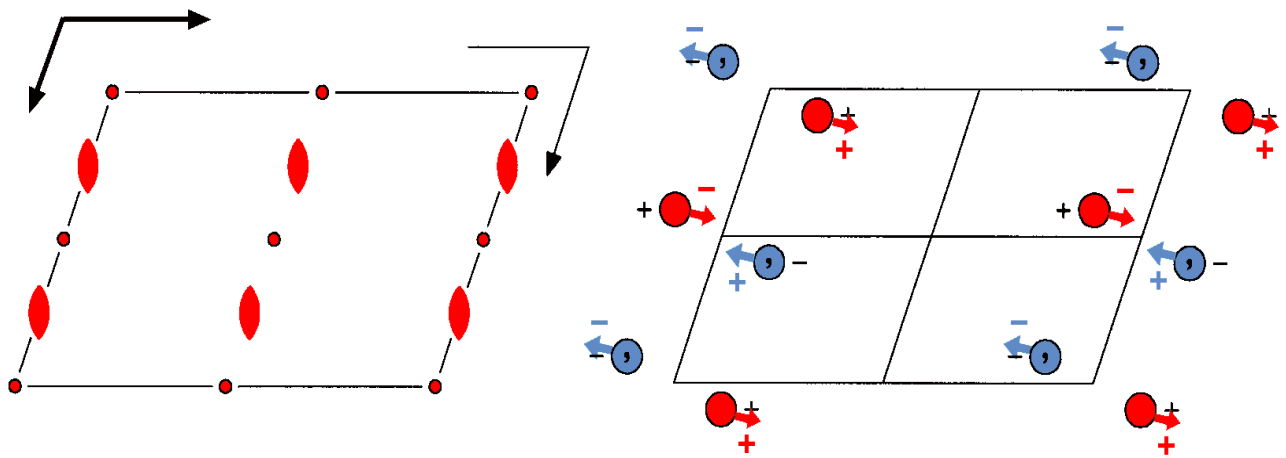
p112'/a

2'/m

Monoclinic/Oblique

No. 7.3.30

p112'/a



Origin at $\bar{1}$ on glide plane a

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'_z$ $1/4, 0, z$
($2'_z$ | $1/2, 0, 0$)'

(3) $\bar{1}$ $0, 0, 0$
($\bar{1}$ | $0, 0, 0$)'

(4) a ($1/2, 0, 0$) x,y,0
(m_z | $1/2, 0, 0$)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]
4 e 1	(3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(4) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]
2 d 2'	$1/4,1/2,z$ [u,v,0]	$3/4,1/2,\bar{z}$ [$\bar{u},\bar{v},0$]
2 c 2'	$1/4,0,z$ [u,v,0]	$3/4,0,\bar{z}$ [$\bar{u},\bar{v},0$]
2 b $\bar{1}$ '	$0,1/2,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]
2 a $\bar{1}$ '	$0,0,0$ [0,0,0]	$1/2,0,0$ [0,0,0]

Symmetry of special projections

Along [001] $p_{2a^*}2$ $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] $p2mm$ $a^* = b_p$ Origin at x,0,0	Along [010] $p2mg$ $a^* = a_p$ Origin at 0,y,0
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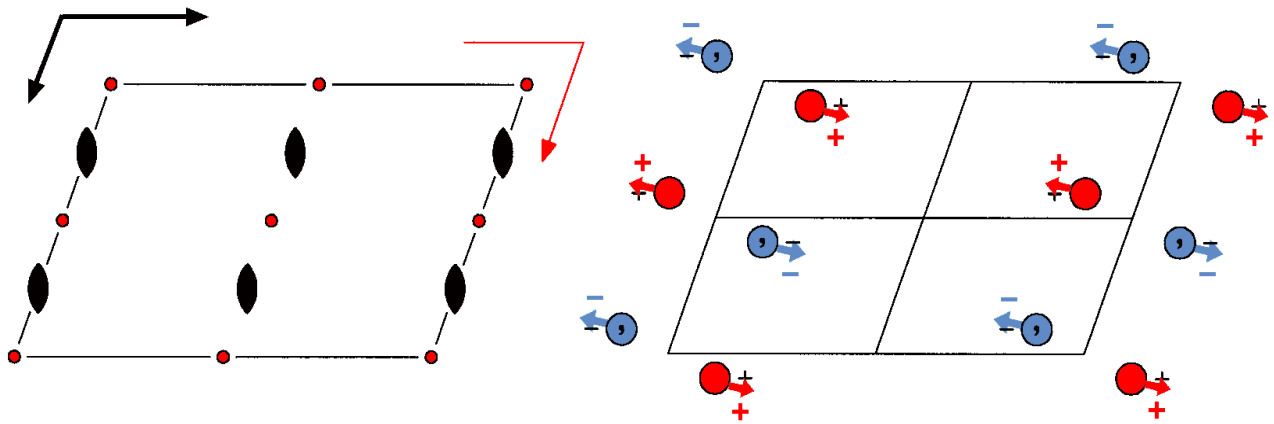
p112/a'

2/m'

Monoclinic/Oblique

No. 7.4.31

p112/a'



Origin at $\bar{1}$ ' on glide plane a'

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $1/4,0,z$
(2_z|1/2,0,0)

(3) $\bar{1}$ ' 0,0,0
($\bar{1}$ '|0,0,0)'

(4) a' (1/2,0,0) x,y,0
(m_z|1/2,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1)	(2)
4 e 1	$x, y, z [u, v, w]$	$\bar{x} + 1/2, \bar{y}, z [\bar{u}, \bar{v}, w]$
	$\bar{x}, \bar{y}, \bar{z} [\bar{u}, \bar{v}, \bar{w}]$	$x + 1/2, y, \bar{z} [u, v, \bar{w}]$
2 d 2	$1/4, 1/2, z [0, 0, w]$	$3/4, 1/2, \bar{z} [0, 0, \bar{w}]$
2 c 2	$1/4, 0, z [0, 0, w]$	$3/4, 0, \bar{z} [0, 0, \bar{w}]$
2 b $\bar{1}'$	$0, 1/2, 0 [0, 0, 0]$	$1/2, 1/2, 0 [0, 0, 0]$
2 a $\bar{1}'$	$0, 0, 0 [0, 0, 0]$	$1/2, 0, 0 [0, 0, 0]$

Symmetry of special projections

Along [001] $p2$ $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] $p2m'm'$ $a^* = b_p$ Origin at x,0,0	Along [010] $p2m'g'$ $a^* = a_p$ Origin at 0,y,0

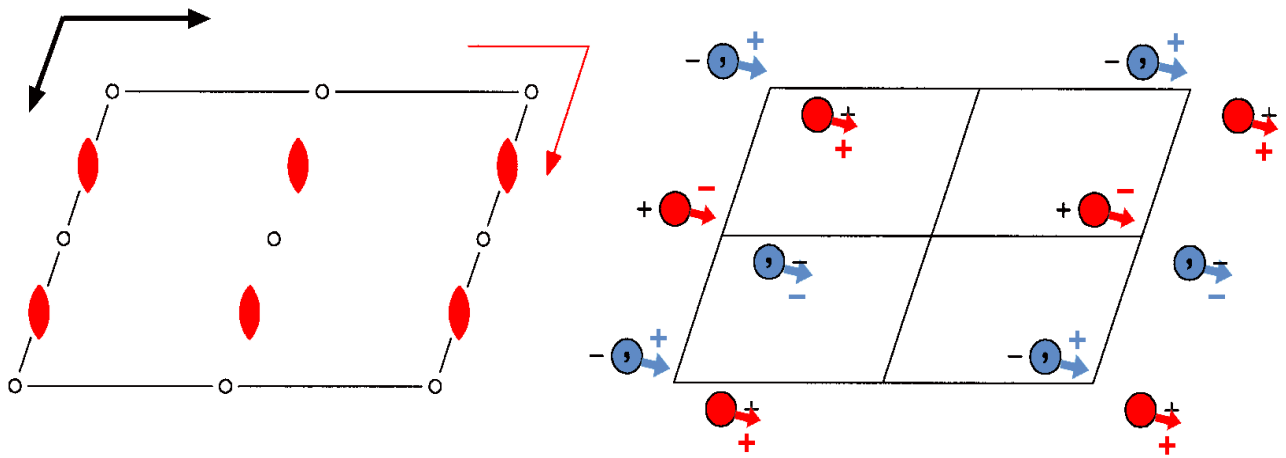
p112'/a'

2'/m'

Monoclinic/Oblique

No. 7.5.32

p112'/a'



Origin at $\bar{1}$ on glide plane a'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'_z$ $1/4, 0, z$
($2'_z$ | $1/2, 0, 0$)'

(3) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(4) a'_x ($1/2, 0, 0$) $x, y, 0$
(m_x | $1/2, 0, 0$)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]
4 e 1	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]
	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]
2 d 2'	$1/4,1/2,z$ [u,v,0]	$3/4,1/2,\bar{z}$ [u,v,0]
2 c 2'	$1/4,0,z$ [u,v,0]	$3/4,0,\bar{z}$ [u,v,0]
2 b $\bar{1}$	$0,1/2,0$ [u,v,w]	$1/2,1/2,0$ [u,v, \bar{w}]
2 a $\bar{1}$	$0,0,0$ [u,v,w]	$1/2,0,0$ [u,v, \bar{w}]

Symmetry of special projections

Along [001] $p2'$ $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] $p2'mm'$ $a^* = b_p$ Origin at x,0,0	Along [010] $p2'mg'$ $a^* = a_p$ Origin at 0,y,0
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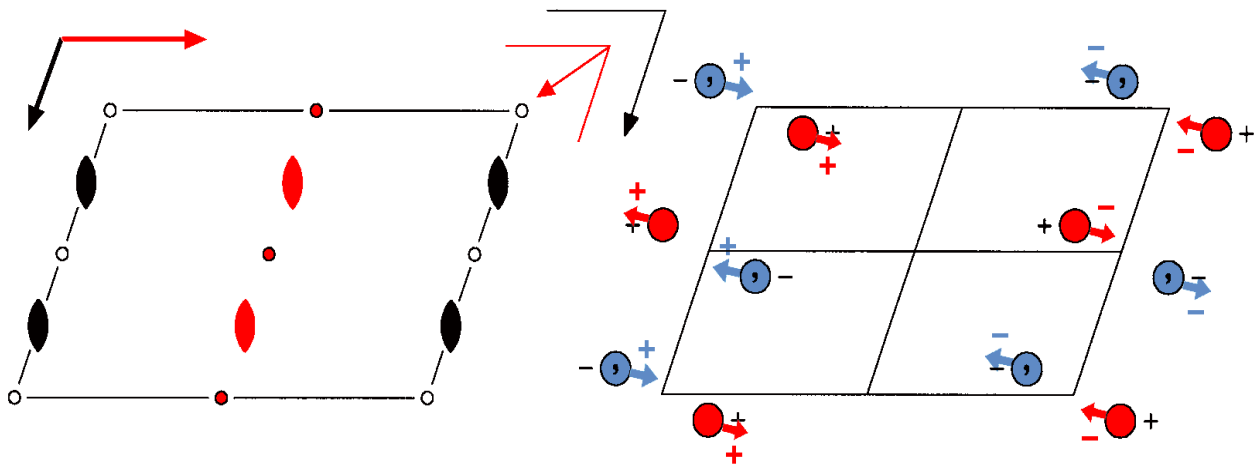
$p_{2b}112/a$

$2/m1'$

Monoclinic/Oblique

No. 7.6.33

$p_{2b}112/a$



Origin at $\bar{1}$ on glide plane a

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|--------------------|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4,0,z$
(2 _z 1/2,0,0) | (3) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (4) a (1/2,0,0) x,y,0
(m _z 1/2,0,0) |
|--------------------|--|--|--|
- For (0,1,0)' + set
- | | | | |
|------------------------------|--|--|---|
| (1) t' (0,1,0)
(1 0,1,0)' | (2) 2' $1/4,1/2,z$
(2 _z 1/2,1,0)' | (3) $\bar{1}$ ' 0,1/2,0
($\bar{1}$ ' 0,1,0)' | (4) n' (1/2,1,0) x,y,0
(m _z ' 1/2,1,0)' |
|------------------------------|--|--|---|

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(0,1,0)'+$
4 e 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,\bar{y},z [\bar{u},\bar{v},w]$
	(3) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(4) $x+1/2,y,\bar{z} [\bar{u},\bar{v},w]$
2 d $2'$	$1/4,1/2,z [u,v,0]$	$3/4,1/2,\bar{z} [\bar{u},\bar{v},0]$
2 c 2	$1/4,0,z [0,0,w]$	$3/4,0,\bar{z} [0,0,w]$
2 b $\bar{1}'$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$
2 a $\bar{1}$	$0,0,0 [u,v,w]$	$1/2,0,0 [\bar{u},\bar{v},w]$

Symmetry of special projections

Along $[001]$ $p_{2a^*}2$	Along $[100]$ $p2'm'm$	Along $[010]$ $p2mg1'$
$a^* = a/2$ $b^* = a/2+b$	$a^* = b_p$	$a^* = a_p$
Origin at $1/2,0,z$	Origin at $x,0,0$	Origin at $0,y,0$

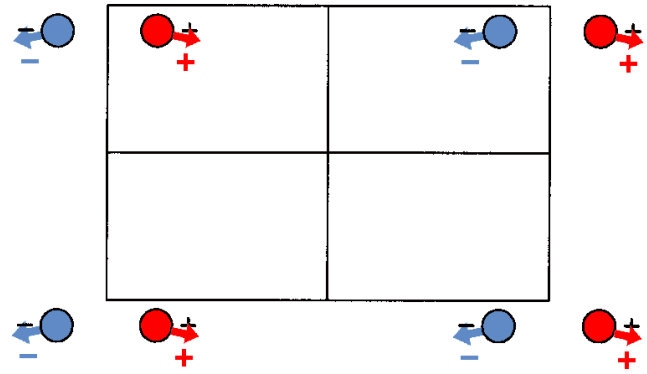
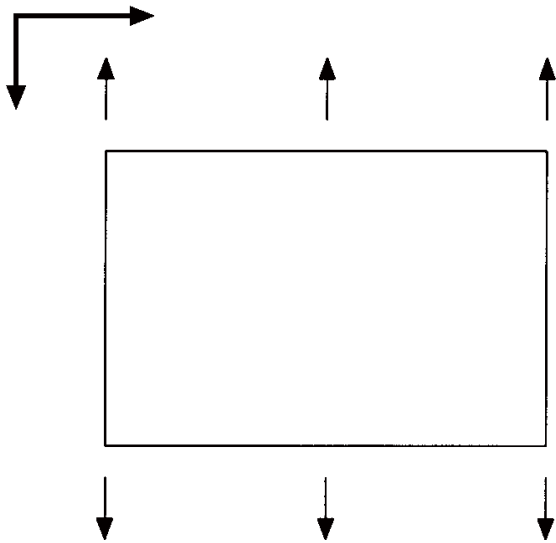
p211

No. 8.1.34

2

Monoclinic/Rectangular

p211



Origin on 2

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2 $x,0,0$
(2_x|0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

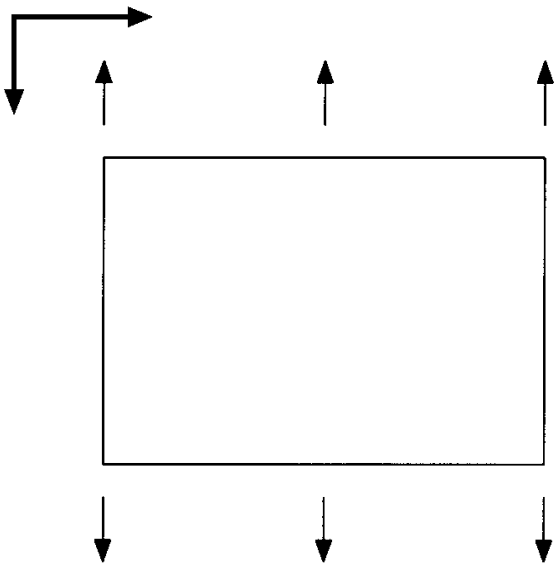
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]
2 c 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]
1 b 2	$x,1/2,0$ [u,0,0]	
1 a 2	$x,0,0$ [u,0,0]	

Symmetry of special projections

Along [001] $p1m'$ $a^* = b_p$ $b^* = -a$ Origin at 0,0,z	Along [100] $p211$ $a^* = b$ Origin at x,0,0	Along [010] $p11m'$ $a^* = a$ Origin at 0,y,0
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p2111'

No. 8.2.35

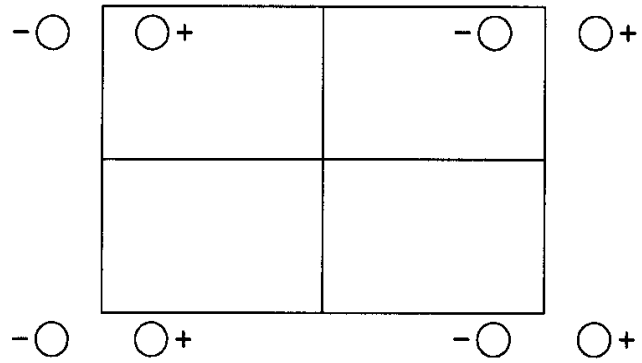


21'

Monoclinic/Rectangular

p2111'

1'



Origin on 21'

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2$

Symmetry operations

For 1 + set

(1) 1	(2) 2 $x,0,0$
(1 0,0,0)	(2 _x 0,0,0)

For 1' + set

(1) 1'	(2) 2' $x,0,0$
(1 0,0,0)'	(2' _x 0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
2 c 11'	(1) x,y,z [0,0,0]	(2) x, \bar{y} , \bar{z} [0,0,0]
1 b 21'	x,1/2,0 [0,0,0]	
1 a 21'	x,0,0 [0,0,0]	

Symmetry of special projections

Along [001] p1m11' $\mathbf{a}^* = \mathbf{b}_p$ $\mathbf{b}^* = -\mathbf{a}$ Origin at 0,0,z	Along [100] p2111' $\mathbf{a}^* = \mathbf{b}$ Origin at x,0,0	Along [010] p11m1' $\mathbf{a}^* = \mathbf{a}$ Origin at 0,y,0
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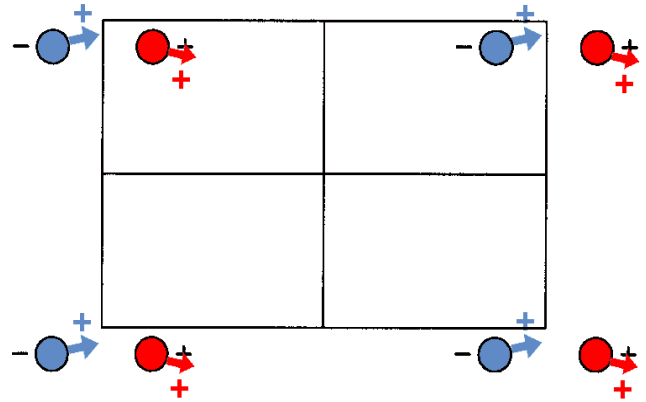
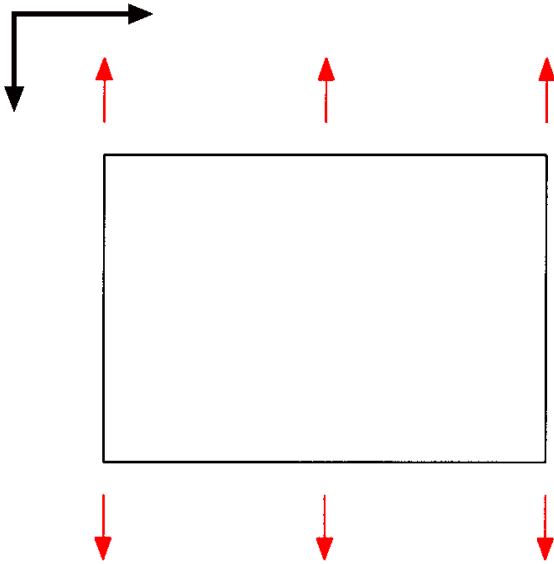
p2'11

No. 8.3.36

2'

Monoclinic/Rectangular

p2'11



Origin on 2'

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2' x,0,0
(2_x|0,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 c 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]
1 b 2'	$x,1/2,0$ [0,v,w]	
1 a 2'	$x,0,0$ [0,v,w]	

Symmetry of special projections

Along [001] $p1m1$ $a^* = b_p$ $b^* = -a$ Origin at 0,0,z	Along [100] $p2'11$ $a^* = b$ Origin at x,0,0	Along [010] $p11m$ $a^* = a$ Origin at 0,y,0
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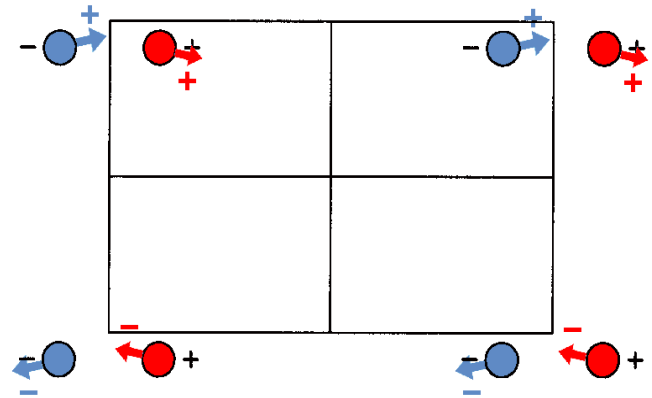
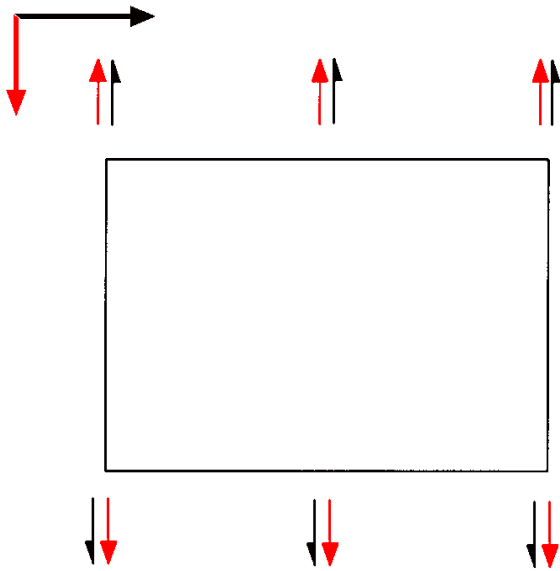
$p_{2a}2'11$

No. 8.4.37

$21'$

Monoclinic/Rectangular

$p_{2a}2'11$



Origin on 2

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $2' \ x,0,0$
(1 $0,0,0$)	(2_x $0,0,0$)'

For $(1,0,0)'$ + set

(1) $t' (1,0,0)$	(2) $2 (1,0,0) \ x,0,0$
(1 $1,0,0$)'	(2_x $1,0,0$)

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u},v,w]
2 c 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u},v,w]
1 b 2'	$x,1/2,0$ [u,v,0]	
1 a 2'	$x,0,0$ [u,v,0]	

Symmetry of special projections

Along [001] $p_{2b^*}1m1$ $a^* = b_p$ $b^* = -a$ Origin at 0,0,z	Along [100] $p2111'$ $a^* = b$ Origin at x,0,0	Along [010] $p_{2a^*}11m$ $a^* = a$ Origin at 0,y,0
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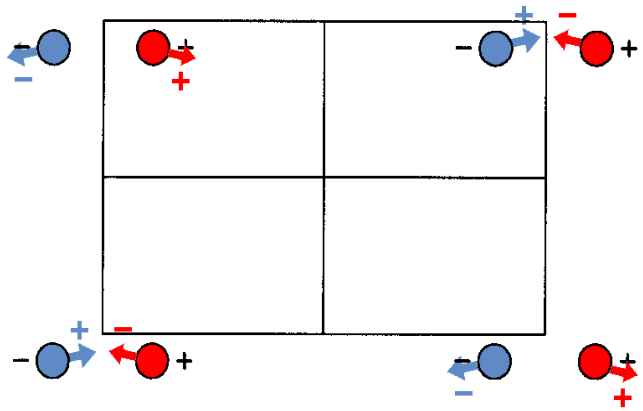
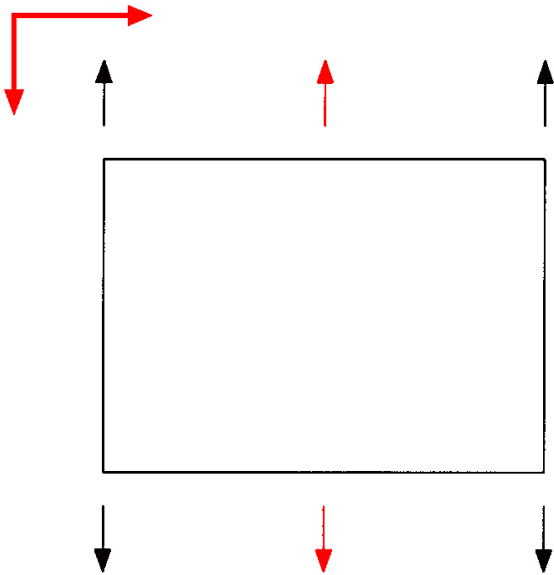
p_c211

No. 8.5.38

$21'$

Monoclinic/Rectangular

p_c211



Origin on 2

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0) +$ set

(1) 1	(2) 2
$(1 0,0,0)$	$(2_x 0,0,0)$

For $(0,1,0)' +$ set

(1) $t' (0,1,0)$	(2) $2' x, 1/2, 0$
$(1 0,1,0)'$	$(2_x 0,1,0)'$

Generators selected (1); t(1,0,0)[']; t(0,1,0)[']; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(0,1,0) ['] +
2	c 1	(1) x,y,z [u,v,w]	(2) x, \bar{y} , \bar{z} [u, \bar{v} , \bar{w}]
1	b 2'	x,1/2,0 [0,v,w]	
1	a 2	x,0,0 [u,0,0]	

Symmetry of special projections

Along [001] p _c *1m1	Along [100] p2111 [']	Along [010] p11m1 [']
a* = b _p b* = -a	a* = b	a* = a
Origin at 0,1/2,z	Origin at x,0,0	Origin at 0,y,0

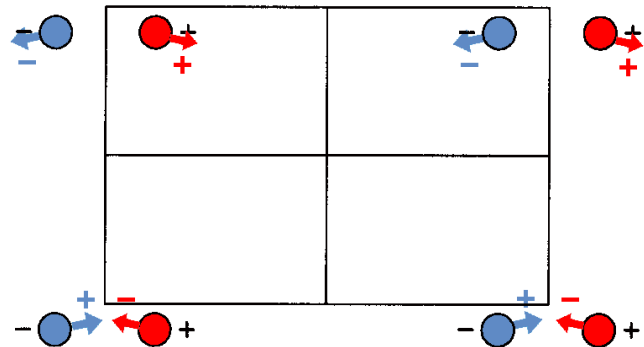
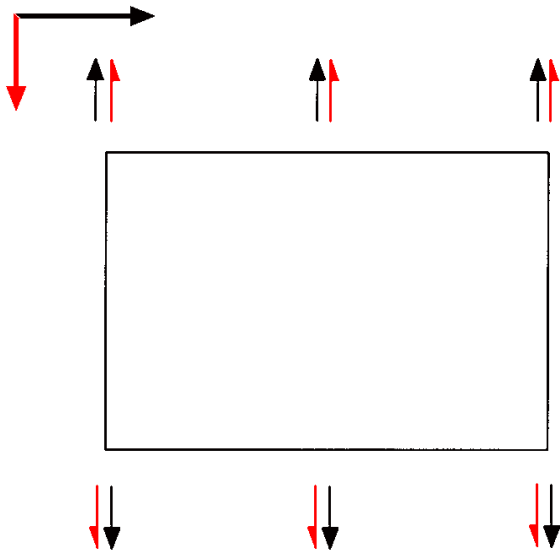
$p_{2a}211$

No. 8.6.39

$21'$

Monoclinic/Rectangular

$p_{2a}211$



Origin on 2

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) 2	$x,0,0$
(1 $0,0,0$)	(2 _x $0,0,0$)	

For $(1,0,0)'$ + set

(1) t' ($1,0,0$)	(2) $2'$ ($1,0,0$)	$x,0,0$
(1 $1,0,0$)'	(2 _x $1,0,0$)'	

Generators selected (1); t(1,0,0)[']; t(0,1,0); (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(1,0,0) ['] +
2	c 1	(1) x,y,z [u,v,w]	(2) x, \bar{y} , \bar{z} [u, \bar{v} , \bar{w}]
1	b 2	x,1/2,0 [u,0,0]	
1	a 2	x,0,0 [u,0,0]	

Symmetry of special projections

Along [001] p _{2b*} 1m'1	Along [100] p2111'	Along [010] p _{2a*} 11m'
$\mathbf{a}^* = \mathbf{b}_p$ $\mathbf{b}^* = -\mathbf{a}$	$\mathbf{a}^* = \mathbf{b}$	$\mathbf{a}^* = \mathbf{a}$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

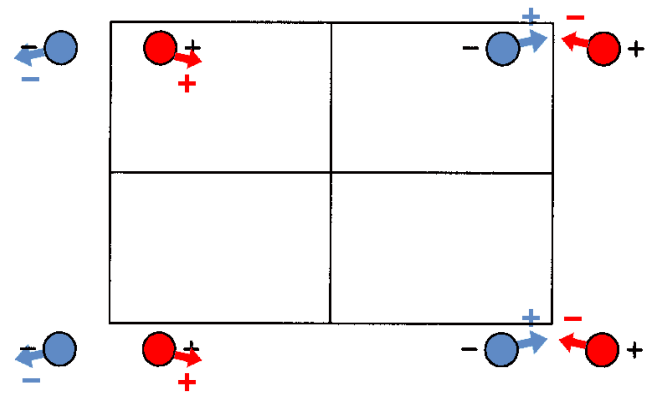
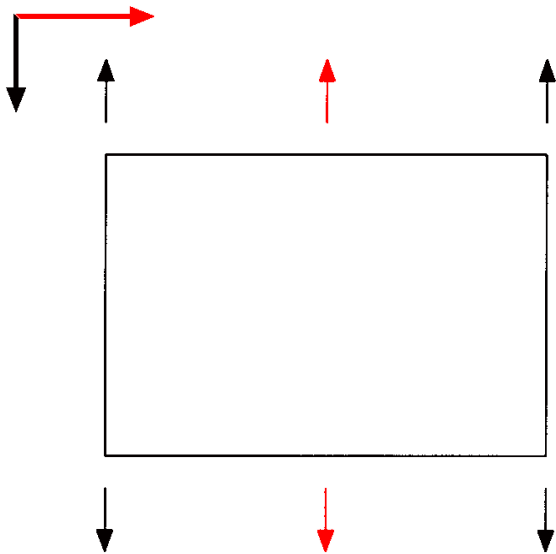
$p_{2b}211$

No. 8.7.40

$21'$

Monoclinic/Rectangular

$p_{2b}211$



Origin on 2

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) 2 $x,0,0$
(1 0,0,0)	(2 _x 0,0,0)

For $(0,1,0)'$ + set

(1) t' $(0,1,0)$	(2) 2' $x,1/2,0$
(1 0,1,0)'	(2 _x 0,1,0)'

Generators selected (1); t(1,0,0); t(0,1,0)'; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0)+	(0,1,0)' +
2	c 1	(1) x,y,z [u,v,w]	(2) x, \bar{y} , \bar{z} [u, \bar{v} , \bar{w}]
1	b 2'	x,1/2,0 [0,v,w]	
1	a 2	x,0,0 [u,0,0]	

Symmetry of special projections

Along [001] p _{2a} *1m1	Along [100] p _{2a} *211	Along [010] p11m1'
$\mathbf{a}^* = \mathbf{b}_p$ $\mathbf{b}^* = -\mathbf{a}$	$\mathbf{a}^* = \mathbf{b}$	$\mathbf{a}^* = \mathbf{a}$
Origin at 1/2,0,z	Origin at x,0,0	Origin at 0,y,0

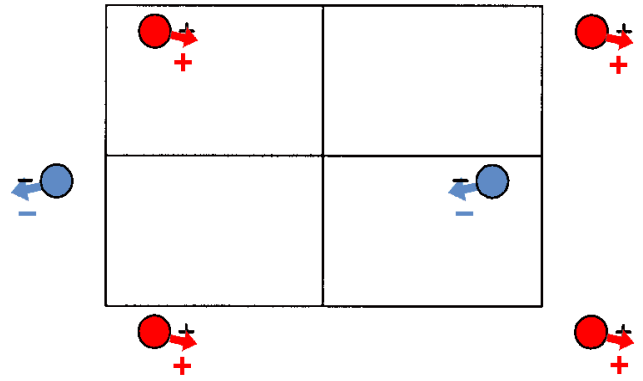
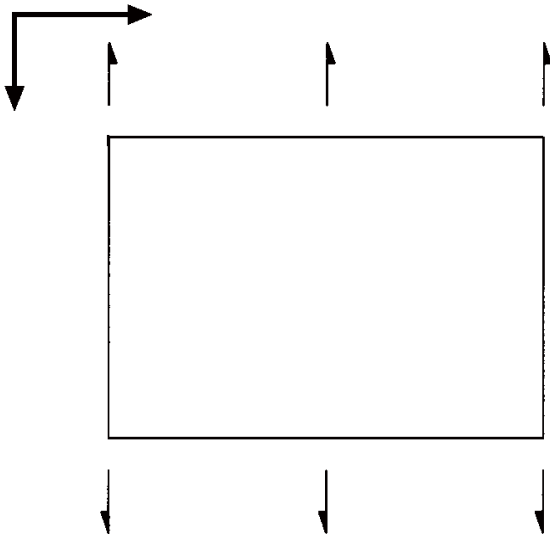
p2₁,11

No. 9.1.41

2

Monoclinic/Rectangular

p2₁,11



Origin on 2₁

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 (1/2,0,0) x,0,0
(2_x|1/2,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 a 1	(1) x,y,z [u,v,w]	(2) $x+1/2,\bar{y},\bar{z}$ [u, \bar{v} , \bar{w}]

Symmetry of special projections

Along [001] $p1g'$ $a^* = b_p$ $b^* = -a$ Origin at 0,0,z	Along [100] $p211$ $a^* = b$ Origin at x,0,0	Along [010] $p11g'$ $a^* = a$ Origin at 0,y,0
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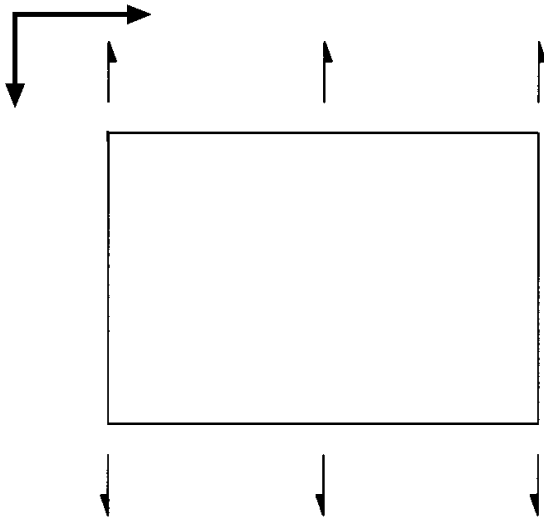
$p2_111'$

No. 9.2.42

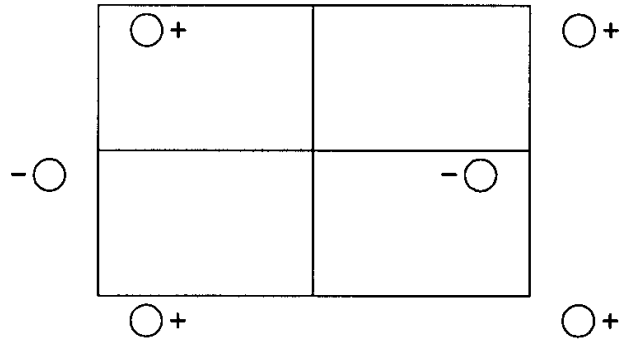
$21'$

$p2_111'$

Monoclinic/Rectangular



$1'$



Origin on $2_11'$

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2$

Symmetry operations

For $1 +$ set

(1) 1	(2) 2 $(1/2, 0, 0)$ $x, 0, 0$
$(1 0, 0, 0)$	$(2_x 1/2, 0, 0)$

For $1' +$ set

(1) $1'$	(2) $2'$ $(1/2, 0, 0)$ $x, 0, 0$
$(1 0, 0, 0)'$	$(2_x 1/2, 0, 0)'$

Generators selected (1); t(1,0,0); t(0,1,0); (2); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
2 a 11'	(1) x,y,z [0,0,0]	(2) x+1/2,y,z̄ [0,0,0]

Symmetry of special projections

Along [001] p1g11'	Along [100] p2111'	Along [010] p11g1'
$\mathbf{a}^* = \mathbf{b}_p$ $\mathbf{b}^* = -\mathbf{a}$	$\mathbf{a}^* = \mathbf{b}$	$\mathbf{a}^* = \mathbf{a}$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

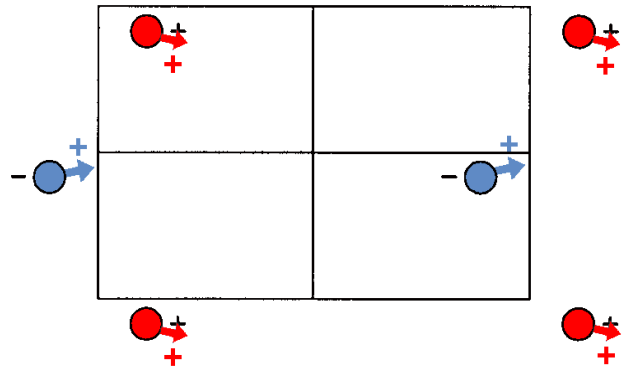
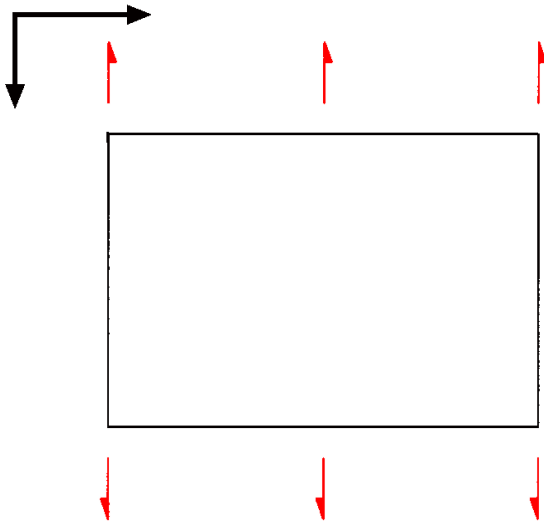
$p2_1'11$

No. 9.3.43

$2'$

Monoclinic/Rectangular

$p2_1'11$



Origin on $2_1'$

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2$

Symmetry operations

- (1) 1
 $(1|0,0,0)$
- (2) $2'$ $(1/2,0,0)$ $x,0,0$
 $(2_x|1/2,0,0)'$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 a 1	(1) x,y,z [u,v,w]	(2) $x+1/2,\bar{y},\bar{z}$ [\bar{u} ,v,w]

Symmetry of special projections

Along [001] $p1g1$ $a^* = b_p$ $b^* = -a$ Origin at 0,0,z	Along [100] $p2'11$ $a^* = b$ Origin at x,0,0	Along [010] $p11g$ $a^* = a$ Origin at 0,y,0
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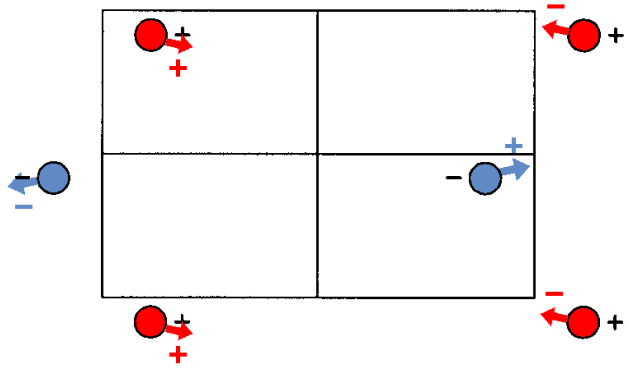
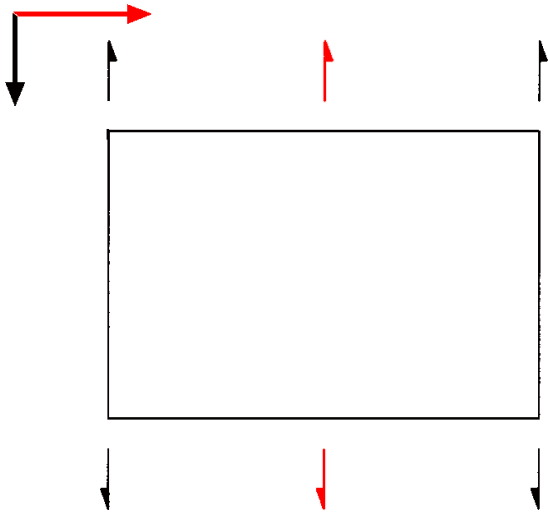
$p_{2b}2_111$

No. 9.4.44

$2_1'$

$p_{2b}2_111$

Monoclinic/Rectangular



Origin on 2_1

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) 2	$(1/2,0,0)$	$x,0,0$
$(1 0,0,0)$	$(2_x $	$1/2,0,0)$	

For $(0,1,0)'$ + set

(1) t'	$(0,1,0)$	(2) $2'$	$(1/2,0,0)$	$x,1/2,0$
$(1 0,1,0)'$	$(2_x $	$1/2,1,0)'$		

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		$(0,0,0)+$	$(0,1,0)'+$
2	a 1	(1) x,y,z [u,v,w]	(2) $x+1/2,\bar{y},\bar{z}$ [u, \bar{v} , \bar{w}]

Symmetry of special projections

Along [001] $p1g1$ $a^* = b_p$ $b^* = -a$ Origin at $0,1/2,z$	Along [100] $p_{2a^*}211$ $a^* = b$ Origin at $x,0,0$	Along [010] $p11g1'$ $a^* = a$ Origin at $0,y,0$
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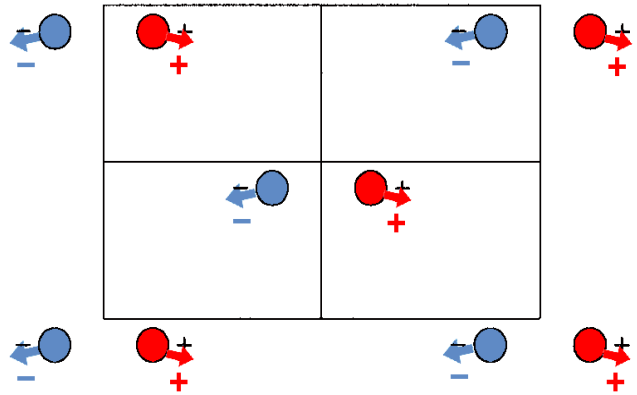
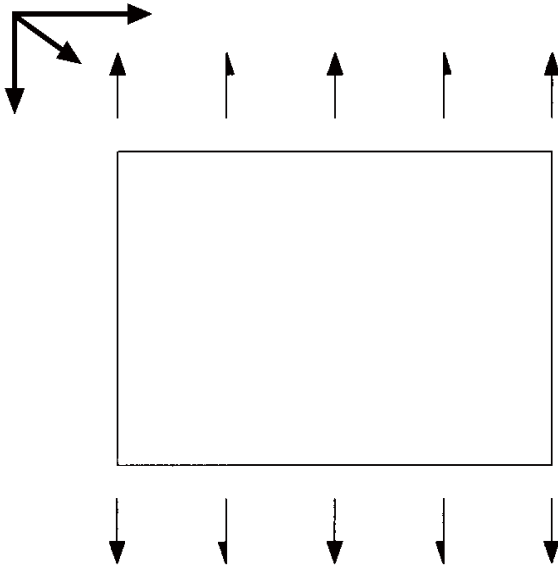
c211

2

Monoclinic/Rectangular

No. 10.1.45

c211



Origin on 2

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

- For (0,0,0) + set
- (1) 1 (1|0,0,0)
 - (2) 2 $x,0,0$ ($2_x|0,0,0$)
- For (1/2,1/2,0) + set
- (1) t (1/2,1/2,0) (1|1/2,1/2,0)
 - (2) 2 (1/2,0,0) $x,1/4,0$ ($2_x|1/2,1/2,0$)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2)

Positions

		Coordinates	
		(0,0,0) +	(1/2,1/2,0) +
Multiplicity,			
Wyckoff letter,			
Site symmetry			
4	b 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]
2	a 2	$x,0,0$ [u,0,0]	

Symmetry of special projections

Along [001] $c1m'$	Along [100] $p211$	Along [010] $p11m'$
$a^* = b_p$ $b^* = -a$	$a^* = b/2$	$a^* = a/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

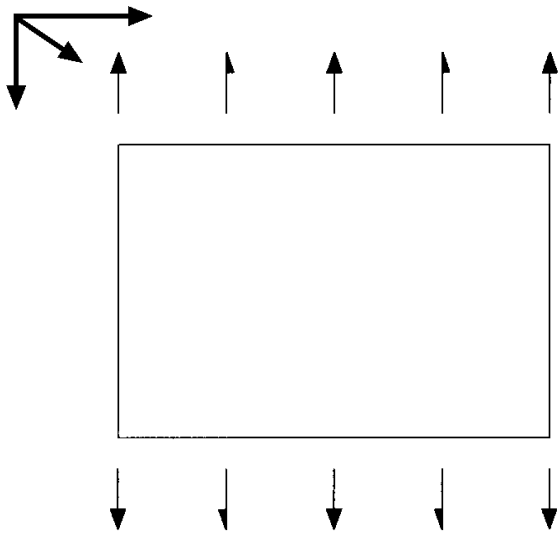
c2111'

21'

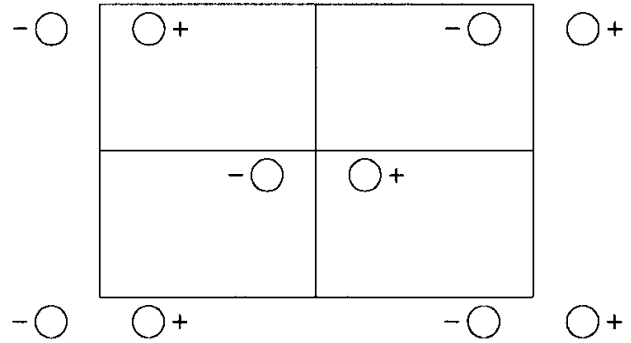
Monoclinic/Rectangular

No. 10.2.46

c2111'



1'



Origin on 21'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For (0,0,0) + set
 (1) 1 (1|0,0,0) (2) 2 x,0,0 (2_x|0,0,0)

For (1/2,1/2,0) + set
 (1) t (1/2,1/2,0) (1|1/2,1/2,0) (2) 2 (1/2,0,0) x,1/4,0 (2_x|1/2,1/2,0)

For (0,0,0)' + set
 (1) 1' (1|0,0,0)' (2) 2' x,0,0 (2_x|0,0,0)'

For (1/2,1/2,0)' + set
 (1) t' (1/2,1/2,0)' (1|1/2,1/2,0) (2) 2' (1/2,0,0) x,1/4,0 (2_x|1/2,1/2,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2); 1'

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
	$(0,0,0) +$	$(1/2,1/2,0) +$
	$(0,0,0)' +$	$(1/2,1/2,0)' +$
4 b 11'	(1) $x,y,z [0,0,0]$	(2) $x,\bar{y},\bar{z} [0,0,0]$
2 a 21'	$x,0,0 [0,0,0]$	

Symmetry of special projections

Along [001] $c1m11'$ $a^* = b_p$ $b^* = -a$ Origin at $0,0,z$	Along [100] $p2111'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p11m1'$ $a^* = a/2$ Origin at $0,y,0$
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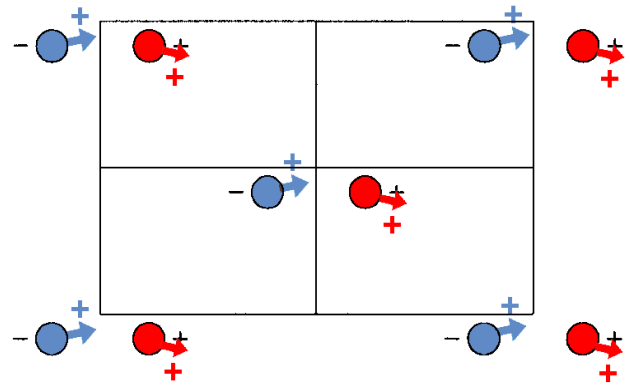
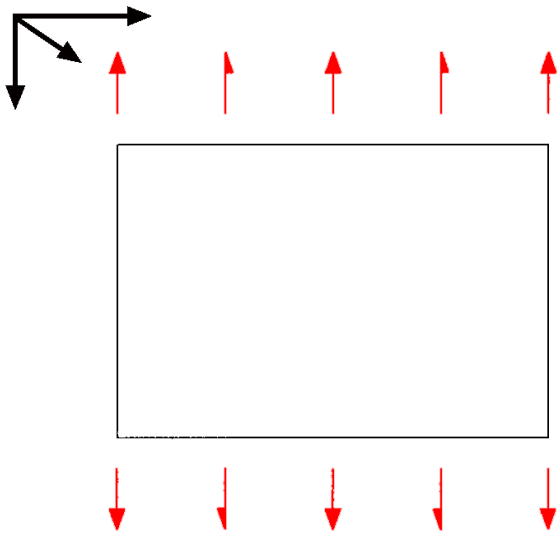
c2'11

2'

Monoclinic/Rectangular

No. 10.3.47

c2'11



Origin on 2'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For (0,0,0) + set
 (1) 1 (2) 2' x,0,0
 (1|0,0,0) (2_x|0,0,0)'

For (1/2,1/2,0) + set
 (1) t (1/2,1/2,0) (2) 2' (1/2,0,0) x,1/4,0
 (1|1/2,1/2,0) (2_x|1/2,1/2,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2)

Positions

		Coordinates	
		(0,0,0) +	(1/2,1/2,0) +
Multiplicity,			
Wyckoff letter,			
Site symmetry			
4	b 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u} ,v,w]
2	a 2'	$x,0,0$ [0,v,w]	

Symmetry of special projections

Along [001] $c1m1$	Along [100] $p2'11$	Along [010] $p11m$
$a^* = b_p$ $b^* = -a$	$a^* = b/2$	$a^* = a/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

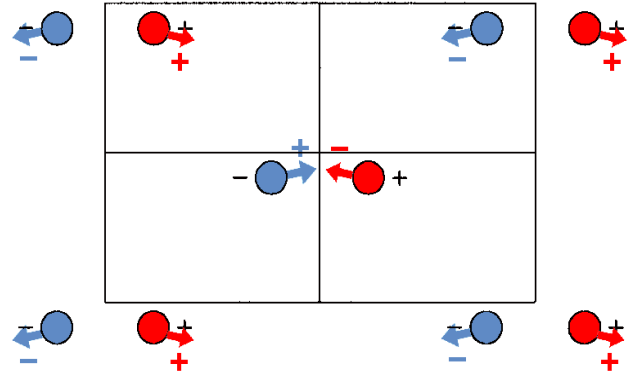
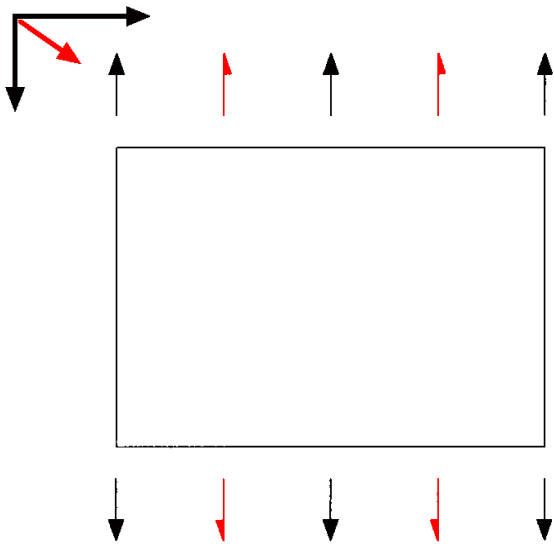
c_p211

$21'$

Monoclinic/Rectangular

No. 10.4.48

c_p211



Origin on 2

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set
 (1) 1 $(1|0,0,0)$ (2) 2 $(2_x|0,0,0)$

For $(1/2,1/2,0)'$ + set
 (1) t' $(1/2,1/2,0)$ (2) $2'$ $(1/2,0,0)$ $x,1/4,0$
 $(1|1/2,1/2,0)'$ $(2_x|1/2,1/2,0)'$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
		$(0,0,0) +$	$(1/2,1/2,0)' +$
4	b 1	(1) $x,y,z [u,v,w]$	(2) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
2	a 2	$x,0,0 [u,0,0]$	

Symmetry of special projections

Along [001] $c_p1m'1$ $a^* = b_p$ $b^* = -a$ Origin at $0,0,z$	Along [100] $p211$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p11m'$ $a^* = a/2$ Origin at $0,y,0$
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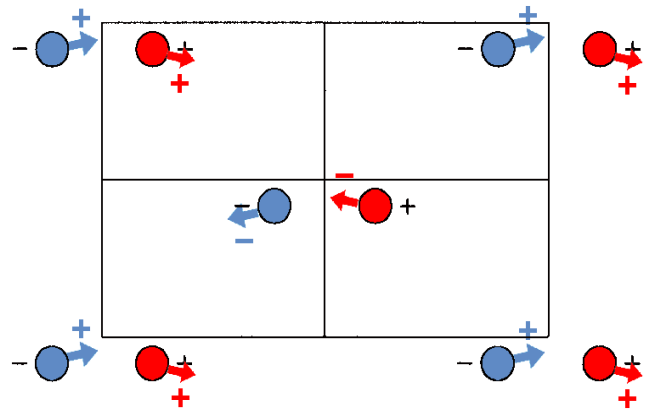
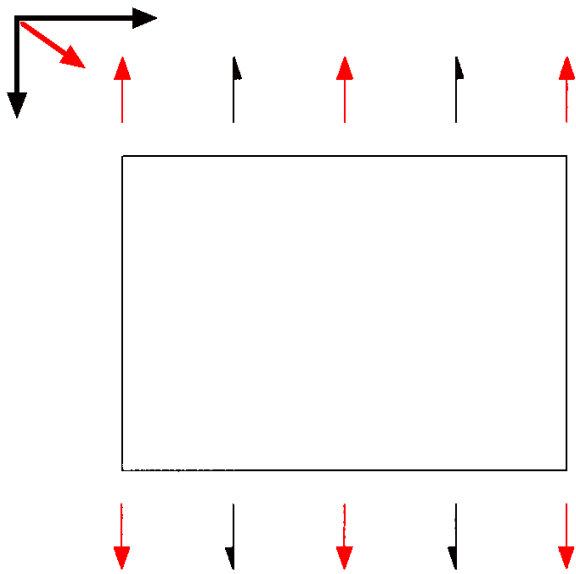
$c_p 2'11$

$2'1'$

Monoclinic/Rectangular

No. 10.5.49

$c_p 2'11$



Origin on $2'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set
 (1) 1 (2) $2' x,0,0$
 (1| $0,0,0$) (2_x| $0,0,0$)'

For $(1/2,1/2,0)'$ + set
 (1) $t' (1/2,1/2,0)$ (2) $2 (1/2,0,0) x,1/4,0$
 (1| $1/2,1/2,0$)' (2_x| $1/2,1/2,0$)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2)

Positions

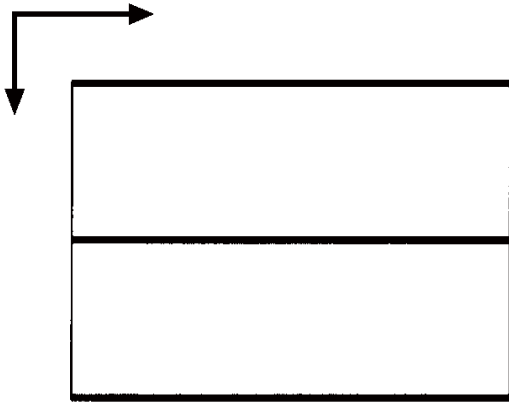
		Coordinates	
		(0,0,0) + (1/2,1/2,0)' +	
Multiplicity, Wyckoff letter, Site symmetry		(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u} ,v,w]
4 b 1			
2 a 2'		$x,0,0$ [0,v,w]	

Symmetry of special projections

Along [001] $c_p 1m1$ $a^* = b_p$ $b^* = -a$ Origin at 0,0,z	Along [100] $p2'11$ $a^* = b/2$ Origin at x,0,0	Along [010] $p11m$ $a^* = a/2$ Origin at 0,y,0
--	---	--

pm11

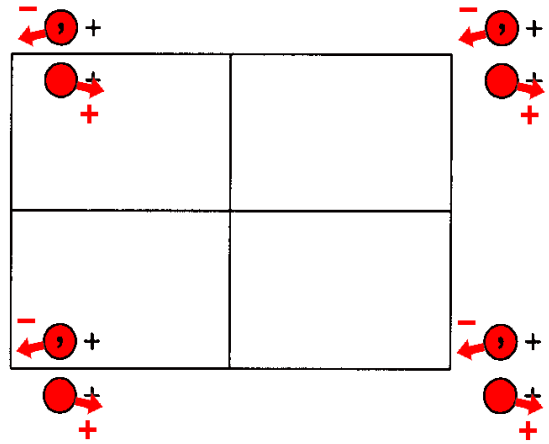
No. 11.1.50



m

pm11

Monoclinic/Rectangular



Origin on mirror plane m

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) m $0,y,z$
(m_x |0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

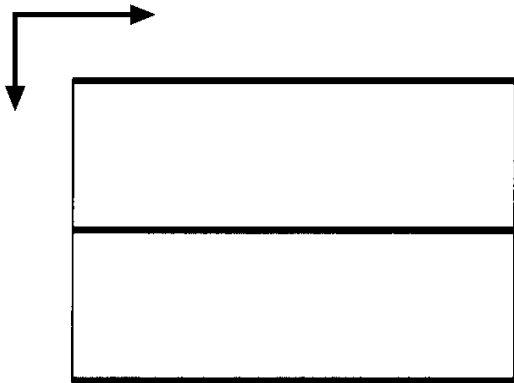
	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,z [u,\bar{v},\bar{w}]$
1 b m	$1/2,y,z [u,0,0]$	
1 a m	$0,y,z [u,0,0]$	

Symmetry of special projections

Along [001] $p1m1$ $a^* = a$ $b^* = b_p$ Origin at $0,0,z$	Along [100] $p1111'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p1m1$ $a^* = a$ Origin at $0,y,0$
--	--	--

pm111'

No. 11.2.51

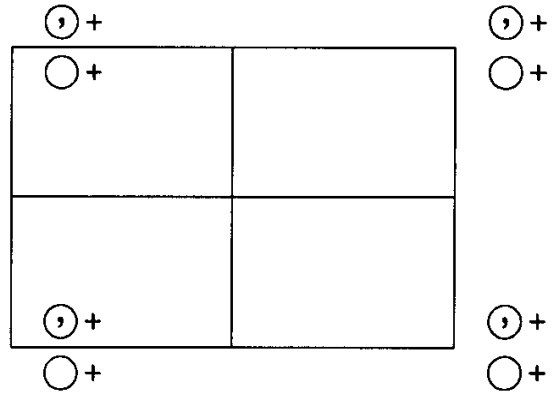


m1'

pm111'

1'

Monoclinic/Rectangular



Origin on mirror plane m1'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

For 1 + set

- | | |
|-----------|-------------------------|
| (1) 1 | (2) m 0,y,z |
| (1 0,0,0) | (m _x 0,0,0) |

For 1' + set

- | | |
|------------|---------------------------|
| (1) 1' | (2) m' 0,y,z |
| (1 0,0,0)' | (m _x ' 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); $1'$

Positions

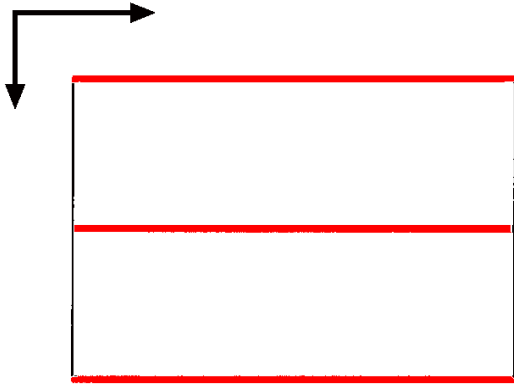
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
2 c 11'	(1) $x,y,z [0,0,0]$	(2) $\bar{x},y,z [0,0,0]$
1 b m1'	$1/2,y,z [0,0,0]$	
1 a m1'	$0,y,z [0,0,0]$	

Symmetry of special projections

Along [001] $p1m11'$ $a^* = a$ $b^* = b_p$ Origin at $0,0,z$	Along [100] $p1111'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p1m11'$ $a^* = a$ Origin at $0,y,0$
--	--	--

pm'11

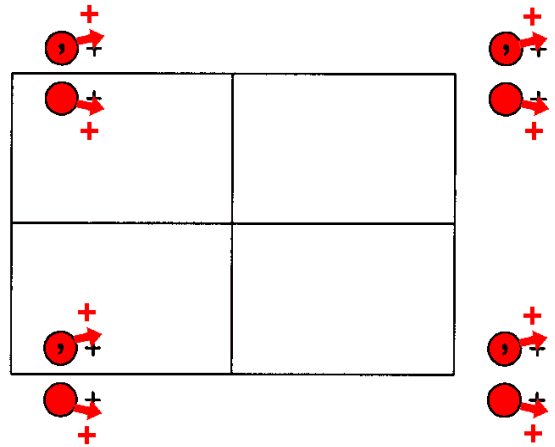
No. 11.3.52



m'

pm'11

Monoclinic/Rectangular



Origin on mirror plane m'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) m' 0,y,z
(m_x|0,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

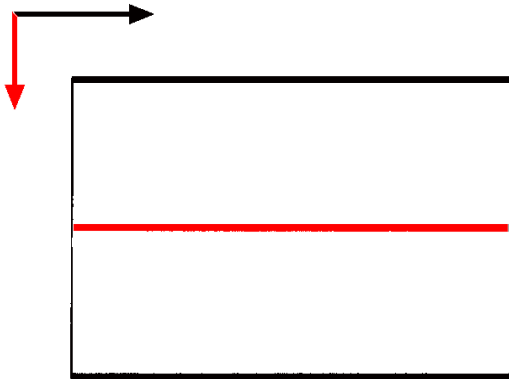
	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,z [\bar{u},v,w]$
1 b m'	$1/2,y,z [0,v,w]$	
1 a m'	$0,y,z [0,v,w]$	

Symmetry of special projections

Along [001] $p1m'1$ $a^* = a$ $b^* = b_p$ Origin at $0,0,z$	Along [100] $p111$ $a^* = b$ Origin at $x,0,0$	Along [010] $p1m'1$ $a^* = a$ Origin at $0,y,0$
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$p_{2a}m11$

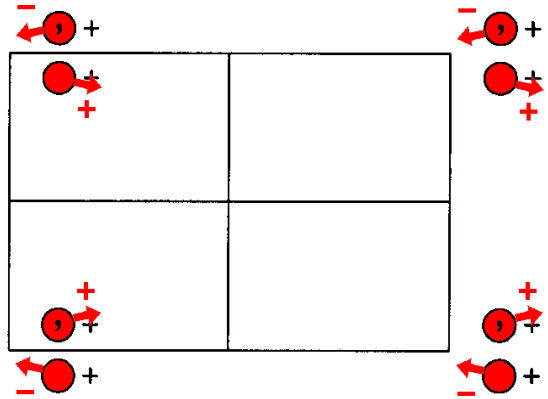
No. 11.4.53



$m1'$

Monoclinic/Rectangular

$p_{2a}m11$



Origin on mirror plane m

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $m \ 0,y,z$
(1 $0,0,0$)	(m_x $0,0,0$)

For $(1,0,0)'$ + set

(1) $t' \ (1,0,0)$	(2) $m' \ 1/2,y,z$
(1 $1,0,0$)'	(m_x $1,0,0$)'

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		$(0,0,0)+$	$(1,0,0)'+$
2	c 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,z [u,\bar{v},\bar{w}]
1	b m'	$1/2,y,z$ [$0,v,w$]	
1	a m	$0,y,z$ [$u,0,0$]	

Symmetry of special projections

Along [001] $p_{2a^*}1m1$ $a^* = a$ $b^* = b_p$ Origin at $0,0,z$	Along [100] $p1111'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p_{2a^*}1m1$ $a^* = a$ Origin at $0,y,0$
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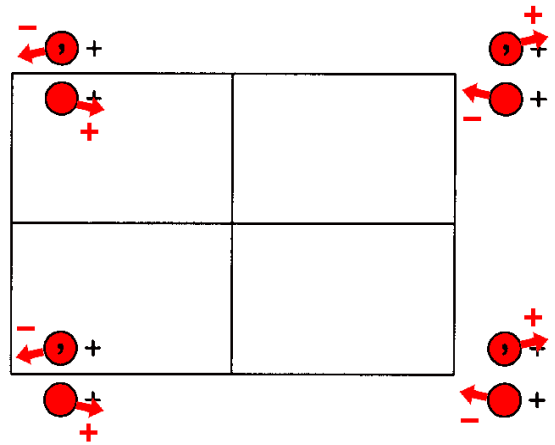
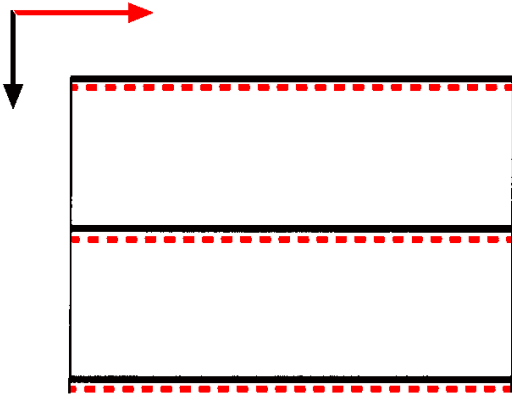
$p_{2b}m11$

No. 11.5.54

$m1'$

$p_{2b}m11$

Monoclinic/Rectangular



Origin on mirror plane m

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $m \ 0,y,z$
$(1 0,0,0)$	$(m_x 0,0,0)$

For $(0,1,0)'$ + set

(1) $t' \ (0,1,0)$	(2) $b' \ (0,1,0) \ 0,y,z$
$(1 0,1,0)'$	$(m_x 0,1,0)'$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2)

Positions

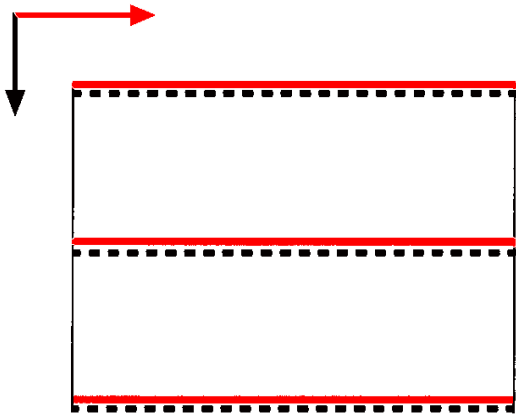
		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		$(0,0,0)+$	$(0,1,0)'+$
2	c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,z [u,\bar{v},\bar{w}]$
1	b m	$1/2,y,z [u,0,0]$	
1	a m	$0,y,z [u,0,0]$	

Symmetry of special projections

Along [001] $p_{2b^*}1m1$ $a^* = a$ $b^* = b_p$ Origin at $0,0,z$	Along [100] $p1111'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p1m11'$ $a^* = a$ Origin at $0,y,0$
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$p_{2b}m'11$

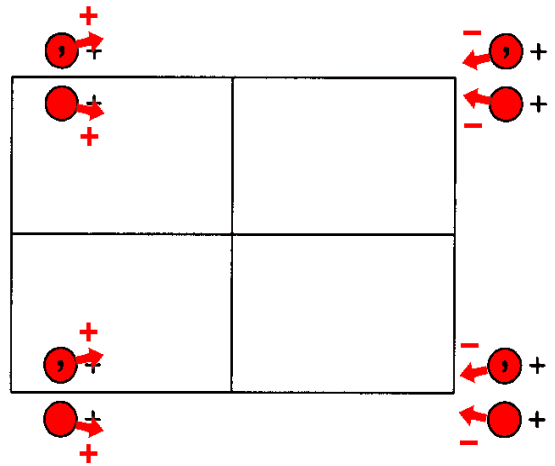
No. 11.6.55



$m1'$

Monoclinic/Rectangular

$p_{2b}m'11$



Origin on mirror plane m'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

For $(0,0,0)$ + set
 (1) 1 (2) $m' \ 0,y,z$
 $(1|0,0,0)$ $(m_x|0,0,0)'$

For $(0,1,0)'$ + set
 (1) $t' \ (0,1,0)$ (2) $b \ (0,1,0) \ 0,y,z$
 $(1|0,1,0)'$ $(m_x|0,1,0)$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		$(0,0,0)+$	$(0,1,0)'+$
2	c 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,z [\bar{u},v,w]
1	b m'	$1/2,y,z$ [$0,v,w$]	
1	a m'	$0,y,z$ [$0,v,w$]	

Symmetry of special projections

Along [001] $p_{2b^*}1m'1$ $a^* = a$ $b^* = b_p$ Origin at $0,0,z$	Along [100] $p_{2a^*}111$ $a^* = b$ Origin at $x,0,0$	Along [010] $p1m11'$ $a^* = a$ Origin at $0,y,0$
--	---	--

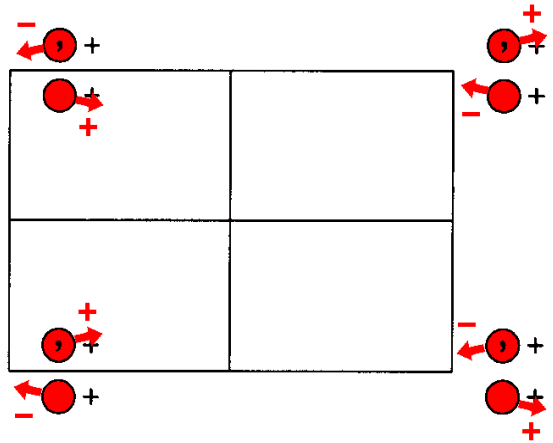
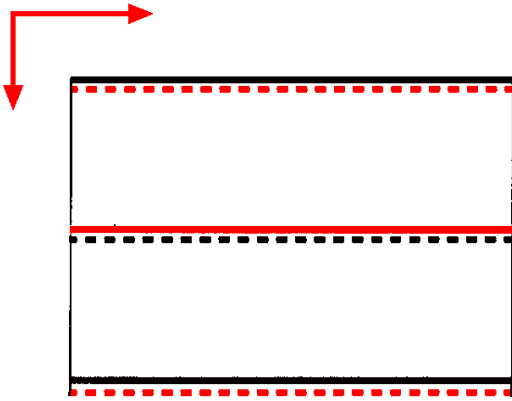
$p_c m11$

No. 11.7.56

$m1'$

$p_c m11$

Monoclinic/Rectangular



Origin on mirror plane m

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $m \ 0,y,z$
$(1 0,0,0)$	$(m_x 0,0,0)$

For $(0,1,0)'$ + set

(1) $t' \ (0,1,0)$	(2) $b' \ (0,1,0) \ 0,y,z$
$(1 0,1,0)'$	$(m_x 0,1,0)'$

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		$(0,0,0)+$	$(0,1,0)'+$
2	$c\ 1$	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,z [u,\bar{v},\bar{w}]$
1	$b\ m'$	$1/2,y,z [0,v,w]$	
1	$a\ m$	$0,y,z [u,0,0]$	

Symmetry of special projections

Along $[001]$ $p_{c^*}1m1$ $a^* = a\ b^* = b_p$ Origin at $0,0,z$	Along $[100]$ $p1111'$ $a^* = b$ Origin at $x,0,0$	Along $[010]$ $p1m11'$ $a^* = a$ Origin at $0,y,0$
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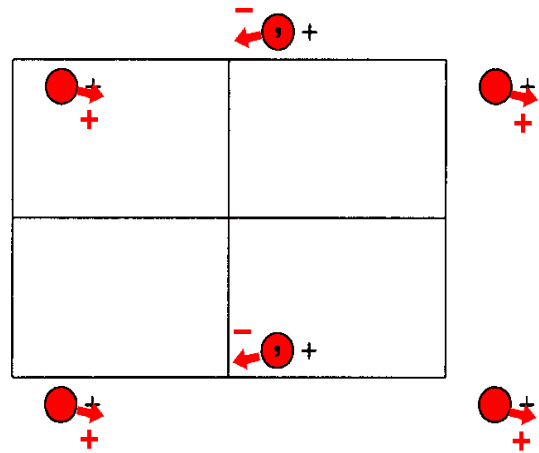
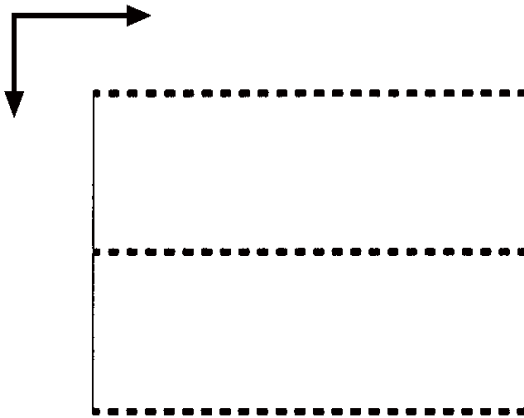
pb11

No. 12.1.57

m

pb11

Monoclinic/Rectangular



Origin on glide plane b

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

- (1) 1
 (1|0,0,0)
- (2) b (0,1/2,0) 0,y,z
 (m_x |0,1/2,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
2 a 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y+1/2,z [u,\bar{v},\bar{w}]$

Symmetry of special projections

Along [001] $p1g1$ $a^* = a$ $b^* = b_p$ Origin at $0,0,z$	Along [100] $p_{2a^*}111$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p1m1$ $a^* = a$ Origin at $0,y,0$
--	---	--

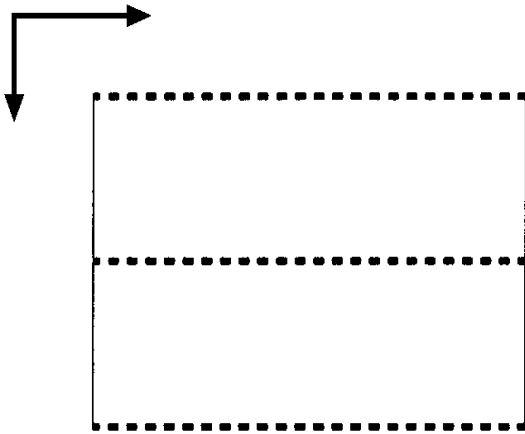
pb111'

No. 12.2.58

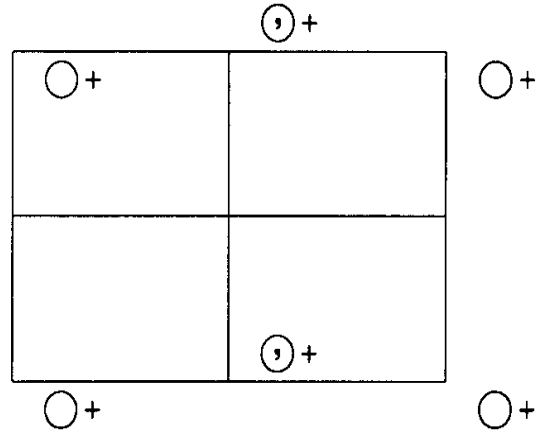
m1'

pb111'

Monoclinic/Rectangular



1'



Origin on glide plane $b1'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

For 1 + set

(1) 1	(2) b	(0,1/2,0)	0,y,z
(1 0,0,0)	(m _x 0,1/2,0)		

For 1' + set

(1) 1'	(2) b'	(0,1/2,0)	0,y,z
(1 0,0,0)'	(m _x 0,1/2,0)'		

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
2 a 11'	(1) x,y,z [0,0,0]	(2) $\bar{x},y+1/2,z$ [0,0,0]

Symmetry of special projections

Along [001] $p1g11'$ $a^* = a$ $b^* = b_p$ Origin at 0,0,z	Along [100] $p1111'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p1m11'$ $a^* = a$ Origin at 0,y,0
--	--	--

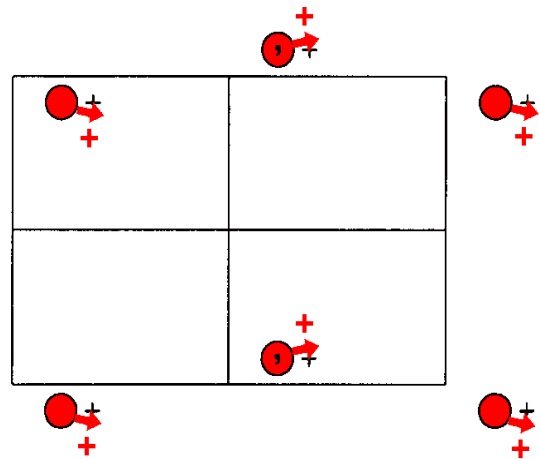
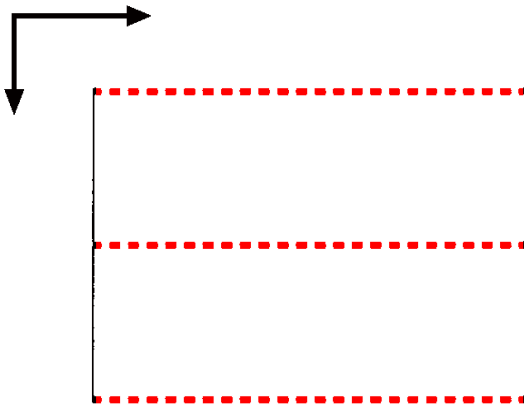
pb'11

No. 12.3.59

m'

pb'11

Monoclinic/Rectangular



Origin on glide plane b'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) b' (0,1/2,0) 0,y,z
(m_x|0,1/2,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

Multiplicity,
Wyckoff letter,
Site symmetry

Coordinates

2 a 1 (1) x,y,z [u,v,w] (2) $\bar{x},y+1/2,z$ [\bar{u},v,w]

Symmetry of special projections

Along [001] $p1g'1$
 $a^* = a$ $b^* = b_p$
Origin at 0,0,z

Along [100] $p111$
 $a^* = b/2$
Origin at x,0,0

Along [010] $p1m'1$
 $a^* = a$
Origin at 0,y,0

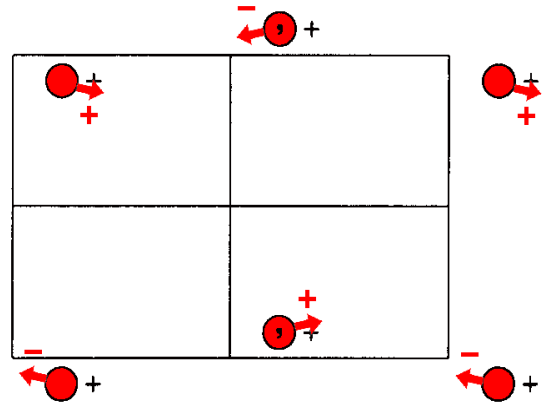
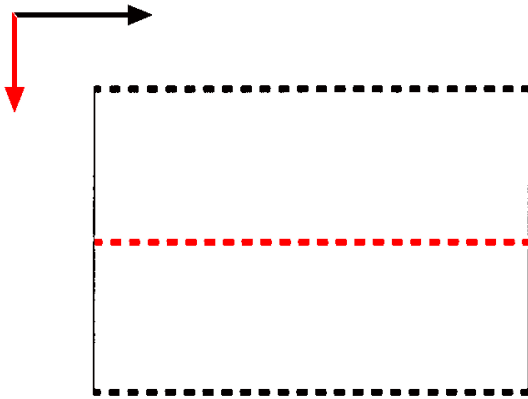
$p_{2a}b11$

No. 12.4.60

$m1'$

$p_{2a}b11$

Monoclinic/Rectangular



Origin on glide plane b

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) b $(0,1/2,0)$ $0,y,z$
$(1 0,0,0)$	$(m_x 0,1/2,0)$

For $(1,0,0)'$ + set

(1) t' $(1,0,0)$	(2) b' $(0,1/2,0)$ $1/2,y,z$
$(1 1,0,0)'$	$(m_x 1,1/2,0)'$

Generators selected (1); $t(1,0,0)1'$; $t(0,1,0)$; (2)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		$(0,0,0)+$	$(1,0,0)'+$
2 a 1	(1) $x,y,z [u,v,w]$		(2) $\bar{x},y+1/2,z [u,\bar{v},\bar{w}]$

Symmetry of special projections

Along [001] $p1g1$ $a^* = a$ $b^* = b_p$ Origin at $0,0,z$	Along [100] $p1111'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p_{2a^*}1m1$ $a^* = a$ Origin at $0,y,0$
--	--	---

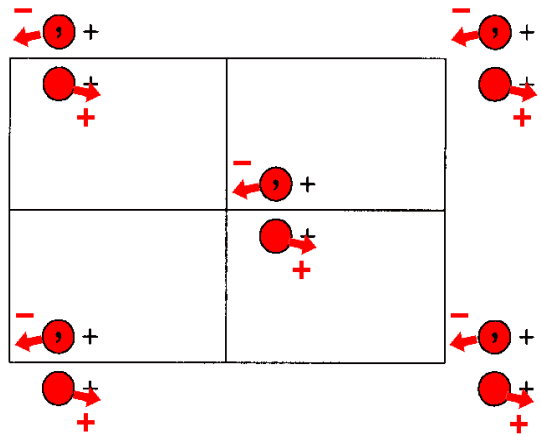
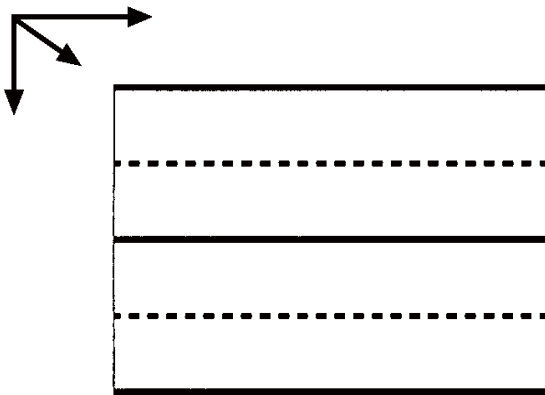
cm11

No. 13.1.61

m

cm11

Monoclinic/Rectangular



Origin on mirror plane m

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

For (0,0,0) + set
 (1) 1 (2) m $0,y,z$
 (1|0,0,0) (m_x |0,0,0)

For (1/2,1/2,0) + set
 (1) t (1/2,1/2,0) (2) b (0,1/2,0) $1/4,y,z$
 (1|1/2,1/2,0) (m_x |1/2,1/2,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2)

Positions

		Coordinates	
		(0,0,0) +	
		(1/2,1/2,0) +	
Multiplicity, Wyckoff letter, Site symmetry		(1) x,y,z [u,v,w]	(2) \bar{x},y,z [u, \bar{v} , \bar{w}]
4 b 1			
2 a m		0,y,z [u,0,0]	

Symmetry of special projections

Along [001] $c1m1$ $a^* = a$ $b^* = b_p$ Origin at 0,0,z	Along [100] $p1111'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p1m1$ $a^* = a/2$ Origin at 0,y,0
--	--	--

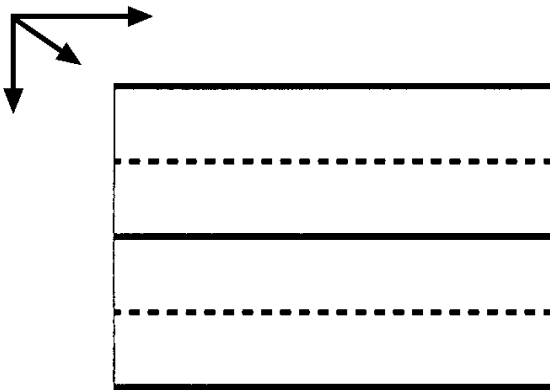
cm111'

No. 13.2.62

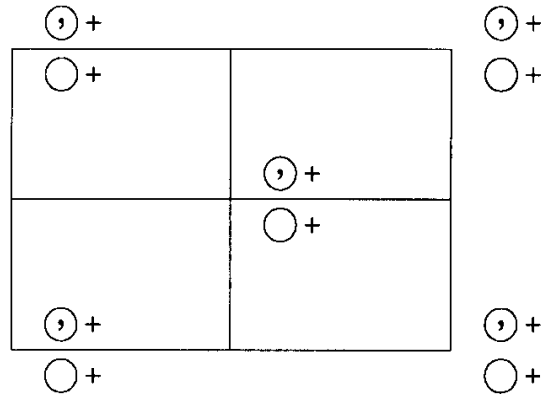
m1'

cm111'

Monoclinic/Rectangular



1'



Origin on mirror plane m1'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

For (0,0,0) + set
 (1) 1 (2) m 0,y,z
 (1|0,0,0) (m_x|0,0,0)

For (1/2,1/2,0) + set
 (1) t (1/2,1/2,0) (2) b (0,1/2,0) 1/4,y,z
 (1|1/2,1/2,0) (m_x|1/2,1/2,0)

For (0,0,0)' + set
 (1) 1' (2) m' 0,y,z
 (1|0,0,0)' (m_x'|0,0,0)'

For (1/2,1/2,0)' + set
 (1) t' (1/2,1/2,0)' (2) b' (0,1/2,0) 1/4,y,z
 (1|1/2,1/2,0)' (m_x'|1/2,1/2,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2); 1'

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
		(0,0,0) +	(1/2,1/2,0) +
		(0,0,0)' +	(1/2,1/2,0)' +
4	b 11'	(1) x,y,z [0,0,0]	(2) \bar{x} ,y,z [0,0,0]
2	a m1'	0,y,z [0,0,0]	

Symmetry of special projections

Along [001] c1m11'	Along [100] p1111'	Along [010] p1m11'
$a^* = a$ $b^* = b_p$	$a^* = b/2$	$a^* = a/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

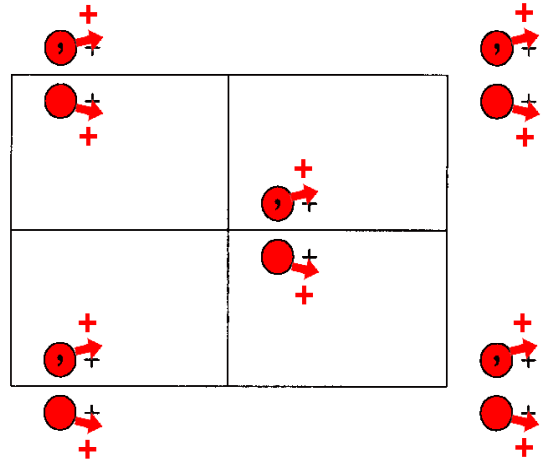
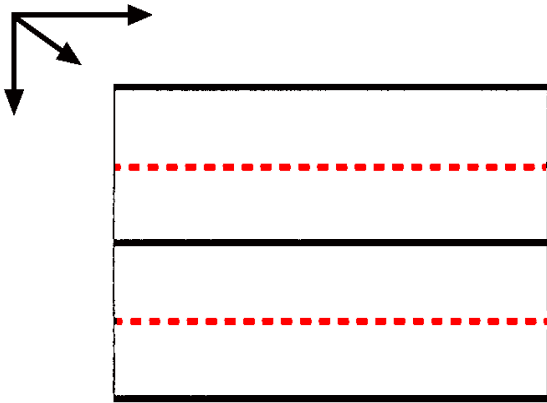
cm'11

No. 13.3.63

m'

cm'11

Monoclinic/Rectangular



Origin on mirror plane m'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

For (0,0,0) + set
 (1) 1 (2) m' 0,y,z
 (1|0,0,0) (m_x|0,0,0)'

For (1/2,1/2,0) + set
 (1) t (1/2,1/2,0) (2) b' (0,1/2,0) 1/4,y,z
 (1|1/2,1/2,0) (m_x|1/2,1/2,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2)

Positions

		Coordinates	
		(0,0,0) +	(1/2,1/2,0) +
Multiplicity, Wyckoff letter, Site symmetry		(1) x,y,z [u,v,w]	(2) \bar{x},y,z [\bar{u} ,v,w]
4	b 1		
2	a m'	0,y,z [0,v,w]	

Symmetry of special projections

Along [001] $c1m'1$ $a^* = a$ $b^* = b_p$ Origin at 0,0,z	Along [100] $p111$ $a^* = b/2$ Origin at x,0,0	Along [010] $p1m'1$ $a^* = a/2$ Origin at 0,y,0
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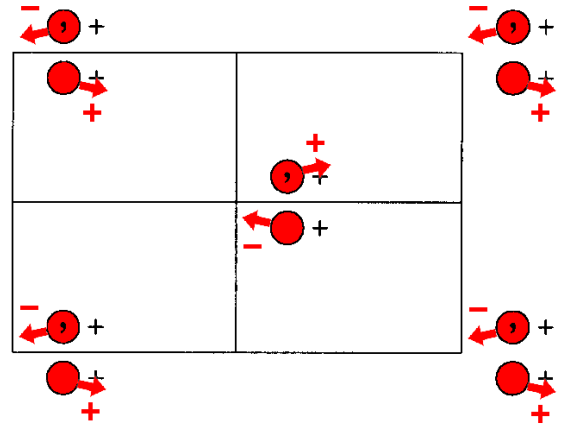
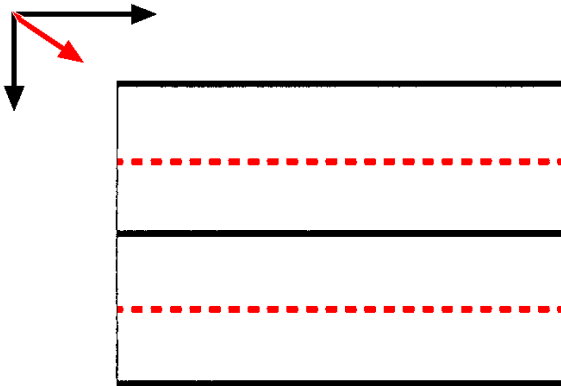
$c_p m11$

No. 13.4.64

$m1'$

$c_p m11$

Monoclinic/Rectangular



Origin on mirror plane m

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $m \ 0,y,z$
$(1 0,0,0)$	$(m_x 0,0,0)$

For $(1/2,1/2,0)'$ + set

(1) $t' \ (1/2,1/2,0)$	(2) $b' \ (0,1/2,0) \ 1/4,y,z$
$(1 1/2,1/2,0)'$	$(m_x 1/2,1/2,0)'$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2)

Positions

		Coordinates	
		(0,0,0) + (1/2,1/2,0)' +	
Multiplicity,	Wyckoff letter,		
Site symmetry			
4	$b\ 1$	(1) x,y,z [u,v,w]	(2) \bar{x},y,z [u, \bar{v} , \bar{w}]
2	$a\ m$	0,y,z [u,0,0]	

Symmetry of special projections

Along [001] $c_p 1m1$	Along [100] $p1111'$	Along [010] $p_{2a^*} 1m1$
$a^* = a$ $b^* = b_p$	$a^* = b/2$	$a^* = a/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

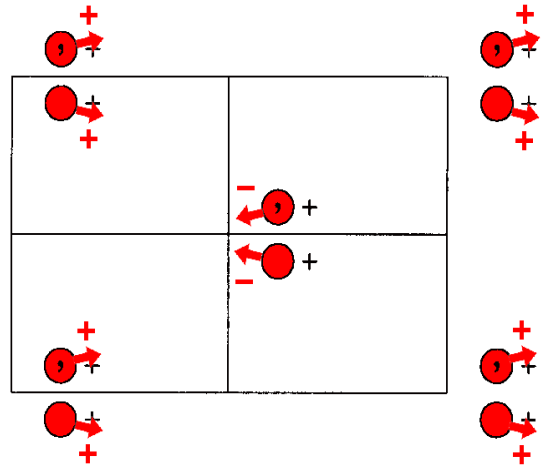
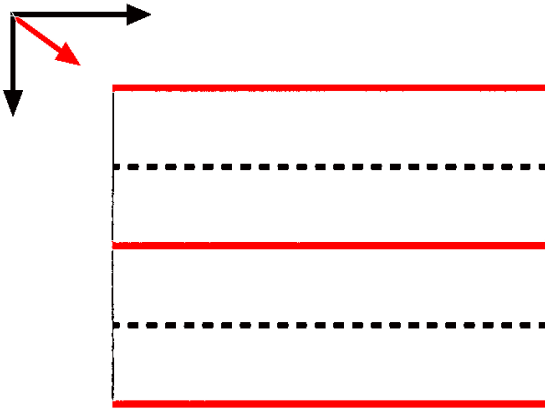
$c_p m'11$

No. 13.5.65

$m1'$

$c_p m'11$

Monoclinic/Rectangular



Origin on mirror plane m'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

For $(0,0,0)$ + set
 (1) 1 (2) $m' \ 0,y,z$
 (1| $0,0,0$) (m_x | $0,0,0$)'

For $(1/2,1/2,0)'$ + set
 (1) $t' \ (1/2,1/2,0)$ (2) $b \ (0,1/2,0) \ 1/4,y,z$
 (1| $1/2,1/2,0$)' (m_x | $1/2,1/2,0$)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2)

Positions

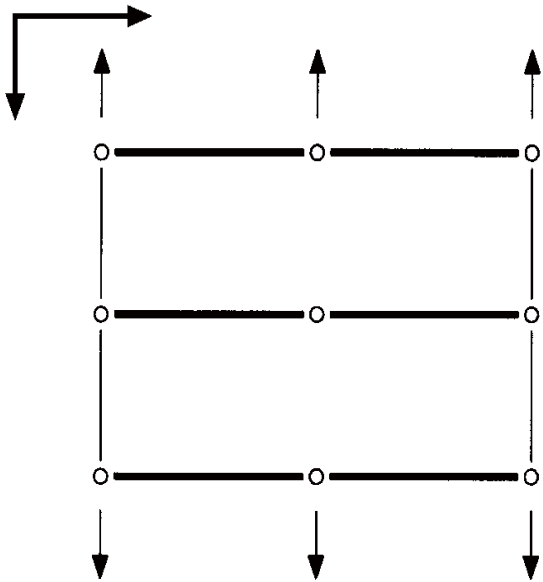
		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
		$(0,0,0) +$	$(1/2,1/2,0)' +$
4	$b\ 1$	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,z [\bar{u},v,w]$
2	$a\ m'$	$0,y,z [0,v,w]$	

Symmetry of special projections

Along [001] $c_p 1m'1$ $a^* = a\ b^* = b_p$ Origin at $0,0,z$	Along [100] $p_{2a^*} 111$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p_{2a^*} 1m1$ $a^* = a/2$ Origin at $1/4,y,0$
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p2/m11

No. 14.1.66



Origin at center (2/m)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $x,0,0$
(2_x |0,0,0)

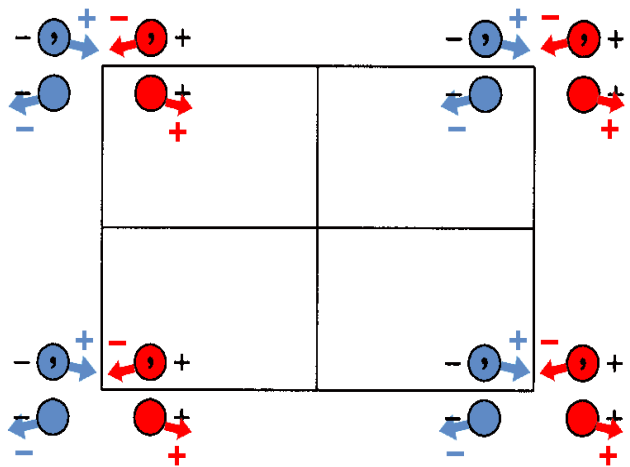
(3) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(4) m 0,y,z
(m_x |0,0,0)

2/m

p2/m11

Monoclinic/Rectangular



Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

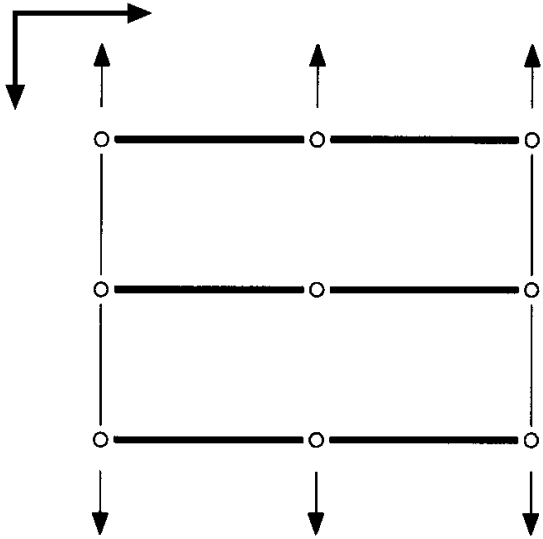
	Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]
4 i 1		(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]
		(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) \bar{x},y,z [u, \bar{v} , \bar{w}]
2 h m		$1/2,y,z$ [u,0,0]	$1/2,\bar{y},\bar{z}$ [u,0,0]
2 g m		$0,y,z$ [u,0,0]	$0,\bar{y},\bar{z}$ [u,0,0]
2 f 2		$x,1/2,0$ [u,0,0]	$\bar{x},1/2,0$ [u,0,0]
2 e 2		$x,0,0$ [u,0,0]	$\bar{x},0,0$ [u,0,0]
1 d 2/m		$1/2,1/2,0$ [u,0,0]	
1 c 2/m		$0,1/2,0$ [u,0,0]	
1 b 2/m		$1/2,0,0$ [u,0,0]	
1 a 2/m		$0,0,0$ [u,0,0]	

Symmetry of special projections

Along [001] $p2'mm'$ $a^* = a$ $b^* = b_p$ Origin at 0,0,z	Along [100] $p2111'$ $a^* = b$ Origin at x,0,0	Along [010] $p2'mm'$ $a^* = a$ Origin at 0,y,0
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$p2/m111'$

No. 14.2.67

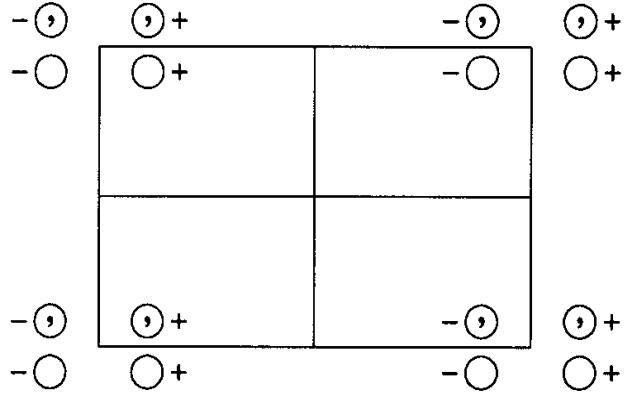


$2/m1'$

$p2/m111'$

Monoclinic/Rectangular

$1'$



Origin at center ($2/m1'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For 1 + set

- | | | | |
|--------------------------|--------------------------------------|--|--------------------------------------|
| (1) 1
($1 0,0,0$) | (2) 2_x $x,0,0$
($2_x 0,0,0$) | (3) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$) | (4) m_y $0,y,z$
($m_x 0,0,0$) |
|--------------------------|--------------------------------------|--|--------------------------------------|

For $1'$ + set

- | | | | |
|----------------------------|---|---|---|
| (1) $1'$
($1 0,0,0$)' | (2) $2'_x$ $x,0,0$
($2'_x 0,0,0$)' | (3) $\bar{1}'$ $0,0,0$
($\bar{1}' 0,0,0$)' | (4) m'_y $0,y,z$
($m'_x 0,0,0$)' |
|----------------------------|---|---|---|

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); 1'

Positions

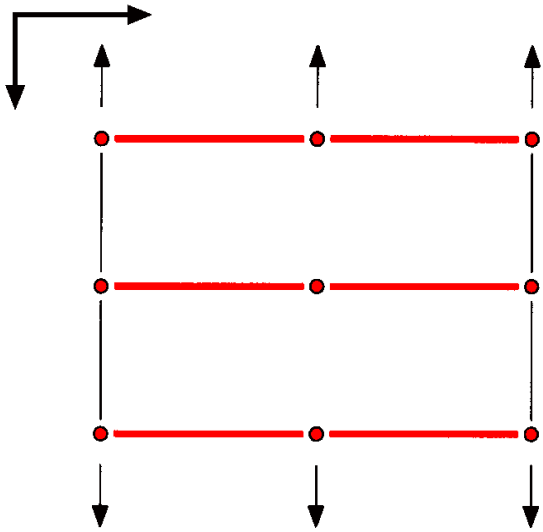
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 i 11'	(1) x,y,z [0,0,0]	(2) x, \bar{y} , \bar{z} [0,0,0]
	(3) \bar{x} , \bar{y} , \bar{z} [0,0,0]	(4) \bar{x} ,y,z [0,0,0]
2 h m1'	1/2,y,z [0,0,0]	1/2, \bar{y} , \bar{z} [0,0,0]
2 g m1'	0,y,z [0,0,0]	0, \bar{y} , \bar{z} [0,0,0]
2 f 21'	x,1/2,0 [0,0,0]	\bar{x} ,1/2,0 [0,0,0]
2 e 21'	x,0,0 [0,0,0]	\bar{x} ,0,0 [0,0,0]
1 d 2/m1'	1/2,1/2,0 [0,0,0]	
1 c 2/m1'	0,1/2,0 [0,0,0]	
1 b 2/m1'	1/2,0,0 [0,0,0]	
1 a 2/m1'	0,0,0 [0,0,0]	

Symmetry of special projections

Along [001] p2mm1' a* = a b* = b _p Origin at 0,0,z	Along [100] p2111' a* = b Origin at x,0,0	Along [010] p2mm1' a* = a Origin at 0,y,0
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$p2/m'11$

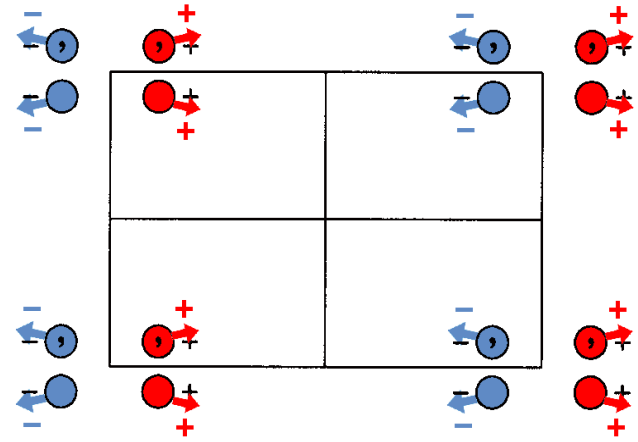
No. 14.3.68



$2/m'$

$p2/m'11$

Monoclinic/Rectangular



Origin at center ($2/m'$)

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1/2$

Symmetry operations

(1) 1
 $(1|0,0,0)$

(2) $2_x|0,0,0$
 $(2_x|0,0,0)$

(3) $\bar{1}'|0,0,0$
 $(\bar{1}'|0,0,0)'$

(4) $m'_y|0,y,z$
 $(m'_y|0,0,0)'$

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

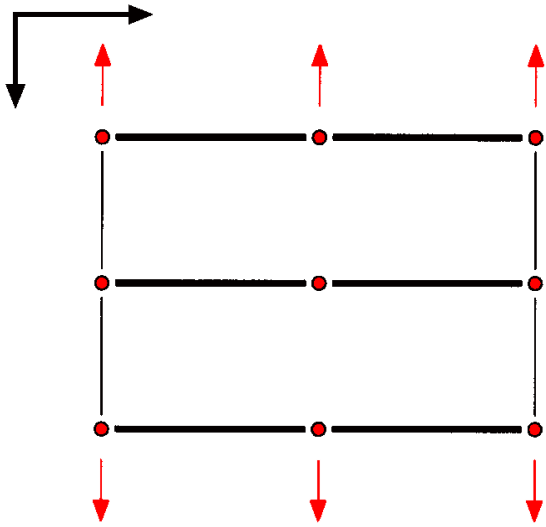
	Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]
4	i 1	(1) x,y,z [u,v,w] (3) \bar{x},\bar{y},\bar{z} [\bar{u} , \bar{v} , \bar{w}]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}] (4) \bar{x},y,z [\bar{u} ,v,w]
2	h m'	1/2,y,z [0,v,w]	1/2, \bar{y},\bar{z} [0, \bar{v} , \bar{w}]
2	g m'	0,y,z [0,v,w]	0, \bar{y},\bar{z} [0, \bar{v} , \bar{w}]
2	f 2	x,1/2,0 [u,0,0]	\bar{x} ,1/2,0 [\bar{u} ,0,0]
2	e 2	x,0,0 [u,0,0]	\bar{x} ,0,0 [\bar{u} ,0,0]
1	d 2/m'	1/2,1/2,0 [0,0,0]	
1	c 2/m'	0,1/2,0 [0,0,0]	
1	b 2/m'	1/2,0,0 [0,0,0]	
1	a 2/m'	0,0,0 [0,0,0]	

Symmetry of special projections

Along [001] p2m'm'	Along [100] p211	Along [010] p2m'm'
$a^* = a$ $b^* = b_p$	$a^* = b$	$a^* = a$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

$p2'/m11$

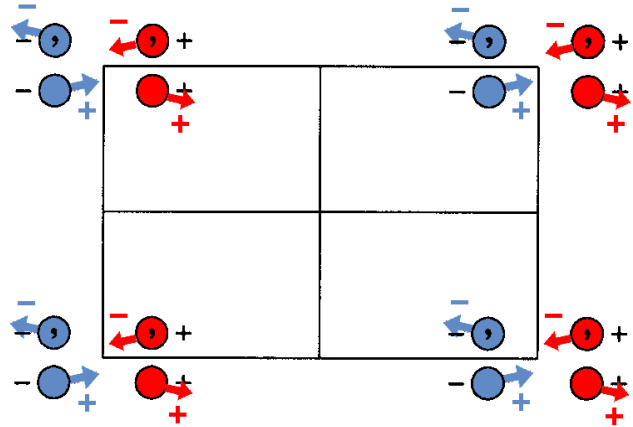
No. 14.4.69



$2'/m$

$p2'/m11$

Monoclinic/Rectangular



Origin at center ($2'/m$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
 $(1|0,0,0)$

(2) $2'_x$ $x,0,0$
 $(2'_x|0,0,0)'$

(3) $\bar{1}'$ $0,0,0$
 $(\bar{1}'|0,0,0)'$

(4) m $0,y,z$
 $(m_x|0,0,0)$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

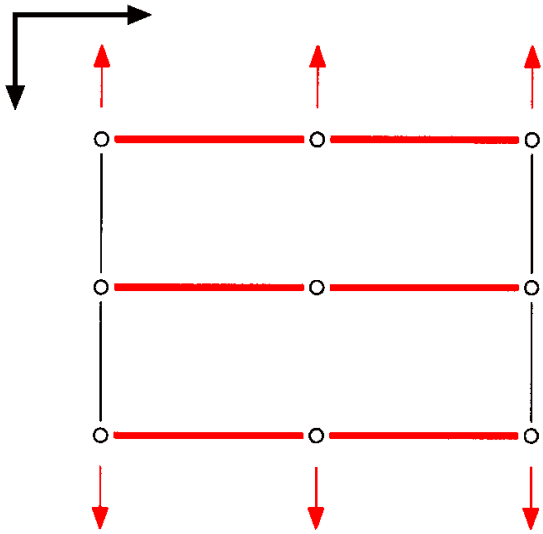
	Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u},v,w]
4	i 1	(1) x,y,z [u,v,w] (3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(2) x,\bar{y},\bar{z} [\bar{u},v,w] (4) \bar{x},y,z [u, \bar{v},\bar{w}]
2	h m	$1/2,y,z$ [u,0,0]	$1/2,\bar{y},\bar{z}$ [$\bar{u},0,0$]
2	g m	$0,y,z$ [u,0,0]	$0,\bar{y},\bar{z}$ [$\bar{u},0,0$]
2	f 2'	$x,1/2,0$ [0,v,w]	$\bar{x},1/2,0$ [0, \bar{v},\bar{w}]
2	e 2'	$x,0,0$ [0,v,w]	$\bar{x},0,0$ [0, \bar{v},\bar{w}]
1	d 2'/m	$1/2,1/2,0$ [0,0,0]	
1	c 2'/m	$0,1/2,0$ [0,0,0]	
1	b 2'/m	$1/2,0,0$ [0,0,0]	
1	a 2'/m	$0,0,0$ [0,0,0]	

Symmetry of special projections

Along [001] p2mm $a^* = a$ $b^* = b_p$ Origin at 0,0,z	Along [100] p2111' $a^* = b$ Origin at x,0,0	Along [010] p2mm $a^* = a$ Origin at 0,y,0
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$p2'/m'11$

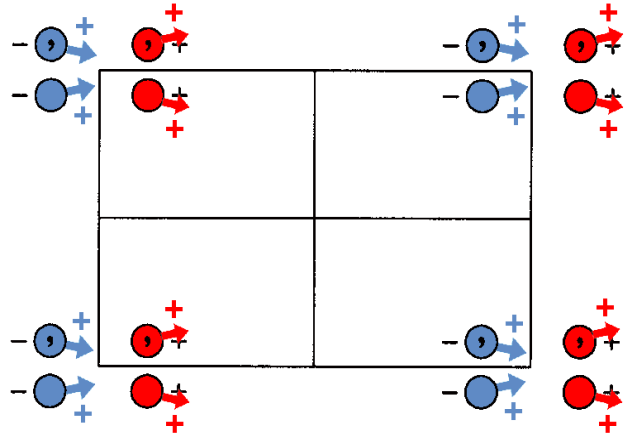
No. 14.5.70



$2'/m'$

$p2'/m'11$

Monoclinic/Rectangular



Origin at center ($2'/m'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
 $(1|0,0,0)$

(2) $2'_x$ $x,0,0$
 $(2'_x|0,0,0)'$

(3) $\bar{1}$ $0,0,0$
 $(\bar{1}|0,0,0)$

(4) m'_y $0,y,z$
 $(m'_y|0,0,0)'$

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

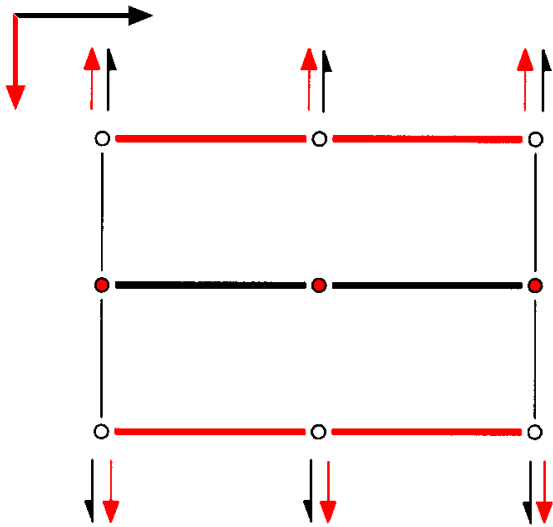
	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
4 i 1	(1) x,y,z [u,v,w]	(2) x, \bar{y} , \bar{z} [\bar{u} ,v,w]
	(3) \bar{x} , \bar{y} , \bar{z} [u,v,w]	(4) \bar{x} ,y,z [\bar{u} ,v,w]
2 h m'	1/2,y,z [0,v,w]	1/2, \bar{y} , \bar{z} [0,v,w]
2 g m'	0,y,z [0,v,w]	0, \bar{y} , \bar{z} [0,v,w]
2 f 2'	x,1/2,0 [0,v,w]	\bar{x} ,1/2,0 [0,v,w]
2 e 2'	x,0,0 [0,v,w]	\bar{x} ,0,0 [0,v,w]
1 d 2'/m'	1/2,1/2,0 [0,v,w]	
1 c 2'/m'	0,1/2,0 [0,v,w]	
1 b 2'/m'	1/2,0,0 [0,v,w]	
1 a 2'/m'	0,0,0 [0,v,w]	

Symmetry of special projections

Along [001] p2'mm'	Along [100] p2'11	Along [010] p2'm'm
$a^* = b_p$ $b^* = -a$	$a^* = b$	$a^* = a$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

$p_{2a}2'/m'11$

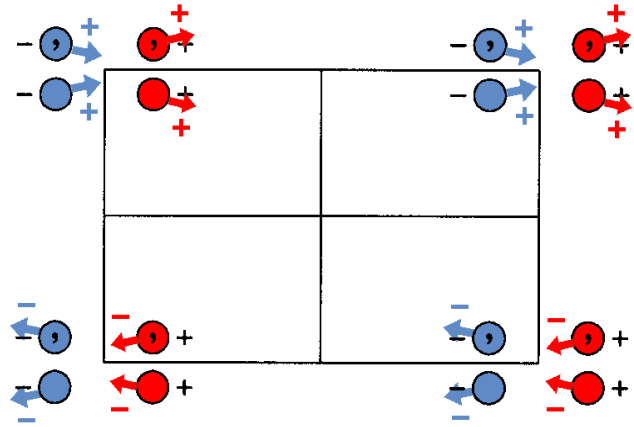
No. 14.6.71



$2/m1'$

Monoclinic/Rectangular

$p_{2a}2'/m'11$



Origin at center ($2'/m'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For (0,0,0) + set

- | | | | |
|-----------------|-------------------------|---------------------------|-------------------------|
| (1) 1 | (2) $2'_x x, 0, 0$ | (3) $\bar{1} 0, 0, 0$ | (4) $m'_y 0, y, z$ |
| (1) $ 0, 0, 0$ | (2) $(2'_x 0, 0, 0)'$ | (3) $(\bar{1} 0, 0, 0)$ | (4) $(m'_x 0, 0, 0)'$ |

For (1,0,0)' + set

- | | | | |
|----------------------|-----------------------|-----------------------------|-----------------------|
| (1) $t' 1, 0, 0$ | (2) $2 1, 0, 0$ | (3) $\bar{1}' 1/2, 0, 0$ | (4) $m 1/2, y, z$ |
| (1) $(1 1, 0, 0)'$ | (2) $(2_x 1, 0, 0)$ | (3) $(\bar{1}' 1, 0, 0)'$ | (4) $(m_x 1, 0, 0)$ |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)

Positions

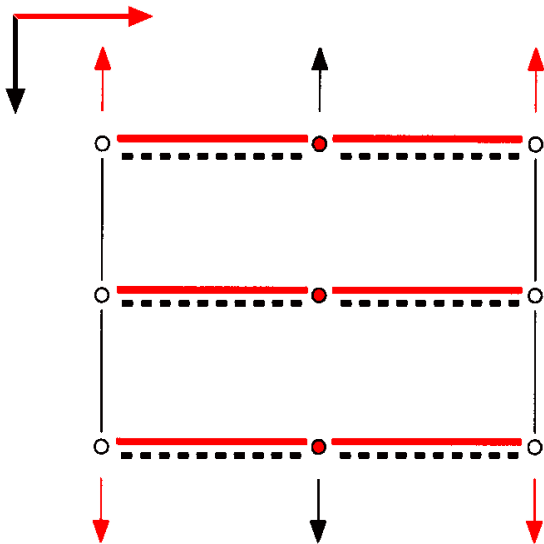
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(1,0,0)' +
4 i 1	(1) $x,y,z [u,v,w]$	(2) $x,\bar{y},\bar{z} [\bar{u},v,w]$
	(3) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(4) $\bar{x},y,z [\bar{u},v,w]$
2 h m	$1/2,y,z [u,0,0]$	$1/2,\bar{y},\bar{z} [\bar{u},0,0]$
2 g m'	$0,y,z [0,v,w]$	$0,\bar{y},\bar{z} [0,v,w]$
2 f 2'	$x,1/2,0 [0,v,w]$	$\bar{x},1/2,0 [0,v,w]$
2 e 2'	$x,0,0 [0,v,w]$	$\bar{x},0,0 [0,v,w]$
1 d 2'/m	$1/2,1/2,0 [0,0,0]$	
1 c 2'/m'	$0,1/2,0 [0,v,w]$	
1 b 2'/m	$1/2,0,0 [0,0,0]$	
1 a 2'/m'	$0,0,0 [0,v,w]$	

Symmetry of special projections

Along [001] $p_{2a}2mm$	Along [100] $p2111'$	Along [010] $p_{2a}2mm$
$a^* = a$ $b^* = b_p$	$a^* = b$	$a^* = a$
Origin at $1/2,0,z$	Origin at $x,0,0$	Origin at $1/2,y,0$

$p_{2b}2'/m'11$

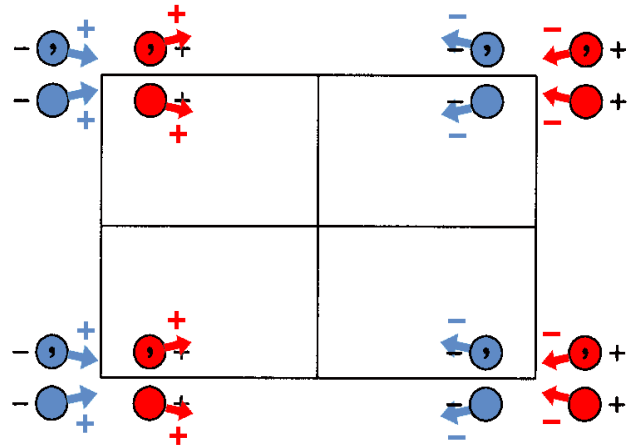
No. 14.7.72



$2/m1'$

Monoclinic/Rectangular

$p_{2b}2'/m'11$



Origin at center ($2'/m'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1
 (1|0,0,0)

(2) $2'_x$ x,0,0
 ($2'_x$ |0,0,0)'

(3) $\bar{1}$ 0,0,0
 ($\bar{1}$ |0,0,0)

(4) m'_y 0,y,z
 (m'_y |0,0,0)'

For $(0,1,0)$ ' + set

(1) t'_x (0,1,0)
 (1|0,1,0)'

(2) $2'_x$ x,1/2,0
 ($2'_x$ |0,1,0)

(3) $\bar{1}'$ 0,1/2,0
 ($\bar{1}'$ |0,1,0)'

(4) b (0,1,0) 0,y,z
 (m'_y |0,1,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3)

Positions

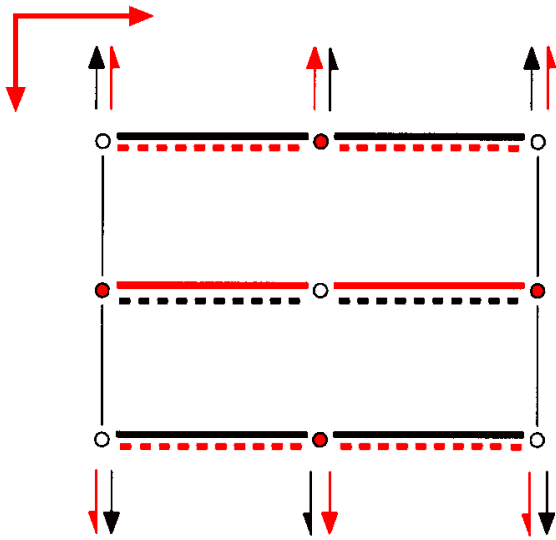
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,1,0)' +
4 i 1	(1) $x,y,z [u,v,w]$	(2) $x,\bar{y},\bar{z} [\bar{u},v,w]$
	(3) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(4) $\bar{x},y,z [\bar{u},v,w]$
2 h m'	$1/2,y,z [0,v,w]$	$1/2,\bar{y},\bar{z} [0,v,w]$
2 g m'	$0,y,z [0,v,w]$	$0,\bar{y},\bar{z} [0,v,w]$
2 f 2	$x,1/2,0 [u,0,0]$	$\bar{x},1/2,0 [\bar{u},0,0]$
2 e 2'	$x,0,0 [0,v,w]$	$\bar{x},0,0 [0,v,w]$
1 d 2/m'	$1/2,1/2,0 [0,0,0]$	
1 c 2/m'	$0,1/2,0 [0,0,0]$	
1 b 2'/m'	$1/2,0,0 [0,v,w]$	
1 a 2'/m'	$0,0,0 [0,v,w]$	

Symmetry of special projections

Along [001] $p_{2a^*}2m'm'$	Along [100] $p_{2a^*}211$	Along [010] $p2mm1'$
$a^* = b_p$ $b^* = -a$	$a^* = b$	$a^* = a$
Origin at $0,1/2,z$	Origin at $x,1/2,0$	Origin at $0,y,0$

$p_c2/m11$

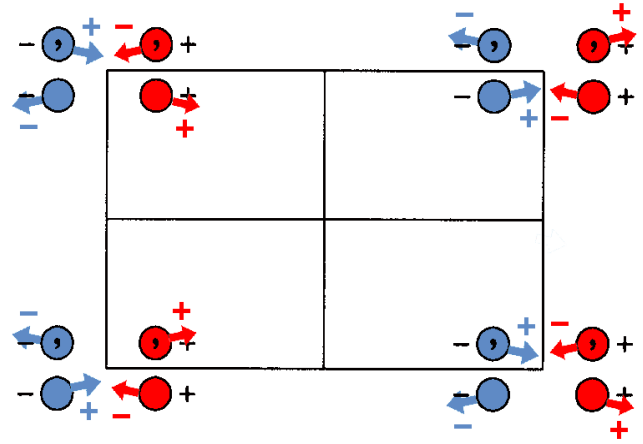
No. 14.8.73



$2/m1'$

$p_c2/m11$

Monoclinic/Rectangular



Origin at center ($2/m$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1
 $(1|0,0,0)$

(2) 2 $x,0,0$
 $(2_x|0,0,0)$

(3) $\bar{1}$ $0,0,0$
 $(\bar{1}|0,0,0)$

(4) m $0,y,z$
 $(m_x|0,0,0)$

For $(0,1,0)'$ + set

(1) t' $(0,1,0)$
 $(1|0,1,0)'$

(2) $2'$ $x,1/2,0$
 $(2_x|0,1,0)'$

(3) $\bar{1}'$ $0,1/2,0$
 $(\bar{1}'|0,1,0)'$

(4) b' $(0,1,0)$ $0,y,z$
 $(m_x|0,1,0)'$

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3)

Positions

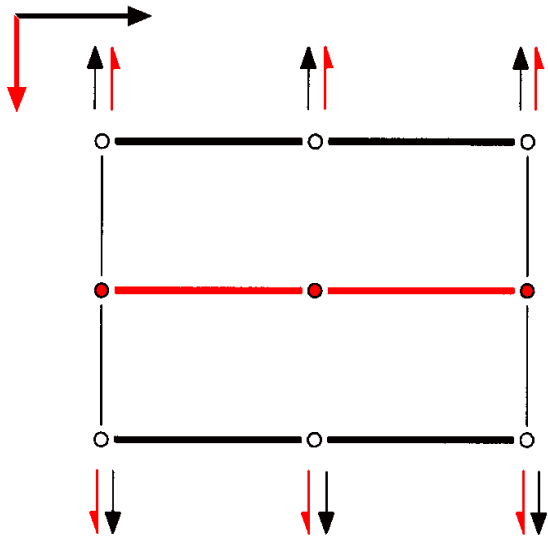
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,1,0)' +
4 i 1	(1) $x,y,z [u,v,w]$	(2) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(3) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(4) $\bar{x},y,z [u,\bar{v},\bar{w}]$
2 h m'	$1/2,y,z [0,v,w]$	$1/2,\bar{y},\bar{z} [0,\bar{v},\bar{w}]$
2 g m	$0,y,z [u,0,0]$	$0,\bar{y},\bar{z} [u,0,0]$
2 f $2'$	$x,1/2,0 [0,v,w]$	$\bar{x},1/2,0 [0,\bar{v},\bar{w}]$
2 e 2	$x,0,0 [u,0,0]$	$\bar{x},0,0 [u,0,0]$
1 d $2'/m'$	$1/2,1/2,0 [0,v,w]$	
1 c $2'/m$	$0,1/2,0 [0,0,0]$	
1 b $2'/m'$	$1/2,0,0 [0,0,0]$	
1 a $2'/m$	$0,0,0 [u,0,0]$	

Symmetry of special projections

Along [001] p_c2mm $a^* = a$ $b^* = b_p$ Origin at $0,1/2,z$	Along [100] $p2111'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2mm1'$ $a^* = a$ Origin at $0,y,0$
--	--	--

$p_{2a}2/m11$

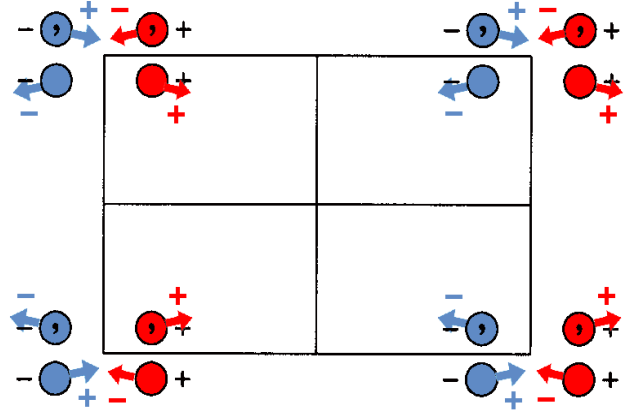
No. 14.9.74



$2/m1'$

Monoclinic/Rectangular

$p_{2a}2/m11$



Origin at center ($2/m$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|-----------|---------------------|---------------------------|---------------------|
| (1) 1 | (2) $2 \quad x,0,0$ | (3) $\bar{1} \quad 0,0,0$ | (4) $m \quad 0,y,z$ |
| (1 0,0,0) | (2_x 0,0,0) | ($\bar{1}$ 0,0,0) | (m_x 0,0,0) |

For $(1,0,0)'$ + set

- | | | | |
|------------------------|------------------------|------------------------------|------------------------|
| (1) $t' \quad (1,0,0)$ | (2) $2' \quad (1,0,0)$ | (3) $\bar{1}' \quad 1/2,0,0$ | (4) $m' \quad 1/2,y,z$ |
| (1 1,0,0)' | (2_x 1,0,0)' | ($\bar{1}$ 1,0,0)' | (m_x 1,0,0)' |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)

Positions

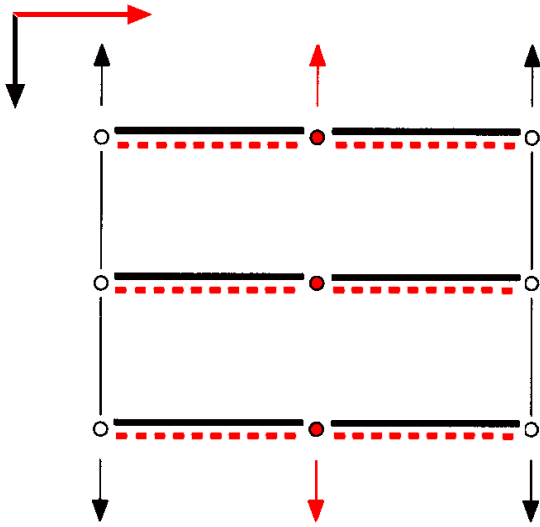
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(1,0,0)'+$
4 i 1	(1) $x,y,z [u,v,w]$	(2) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(3) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(4) $\bar{x},y,z [u,\bar{v},\bar{w}]$
2 h m'	$1/2,y,z [0,v,w]$	$1/2,\bar{y},\bar{z} [0,\bar{v},\bar{w}]$
2 g m	$0,y,z [u,0,0]$	$0,\bar{y},\bar{z} [u,0,0]$
2 f 2	$x,1/2,0 [u,0,0]$	$\bar{x},1/2,0 [u,0,0]$
2 e 2	$x,0,0 [u,0,0]$	$\bar{x},0,0 [u,0,0]$
1 d $2/m'$	$1/2,1/2,0 [0,0,0]$	
1 c $2/m$	$0,1/2,0 [u,0,0]$	
1 b $2/m'$	$1/2,0,0 [0,0,0]$	
1 a $2/m$	$0,0,0 [u,0,0]$	

Symmetry of special projections

Along [001] $p_{2a}2m'm'$	Along [100] $p2111'$	Along [010] $p_{2a}2m'm'$
$a^* = a$ $b^* = b_p$	$a^* = b$	$a^* = a$
Origin at $1/2,0,z$	Origin at $x,0,0$	Origin at $1/2,y,0$

$p_{2b}2/m11$

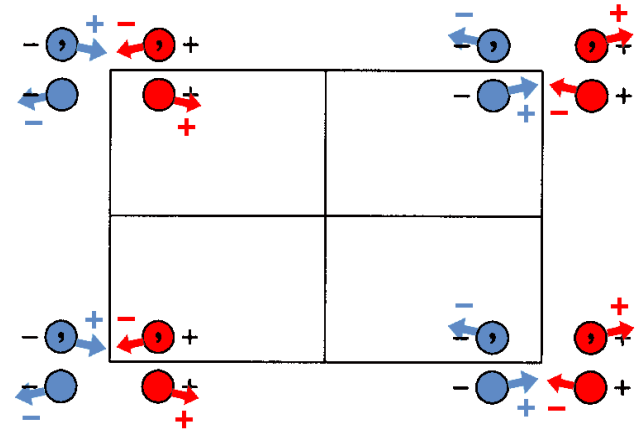
No. 14.10.75



$2/m1'$

$p_{2b}2/m11$

Monoclinic/Rectangular



Origin at center ($2/m$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1
 $(1|0,0,0)$

(2) 2_x $x,0,0$
 $(2_x|0,0,0)$

(3) $\bar{1}$ $0,0,0$
 $(\bar{1}|0,0,0)$

(4) m_y $0,y,z$
 $(m_y|0,0,0)$

For $(0,1,0)'$ + set

(1) t' $(0,1,0)$
 $(1|0,1,0)'$

(2) $2'_x$ $x,1/2,0$
 $(2'_x|0,1,0)'$

(3) $\bar{1}'$ $0,1/2,0$
 $(\bar{1}'|0,1,0)'$

(4) b'_y $(0,1,0)$ $0,y,z$
 $(m'_y|0,1,0)'$

Generators selected (1); t(1,0,0); t(0,1,0)'; (2); (3)

Positions

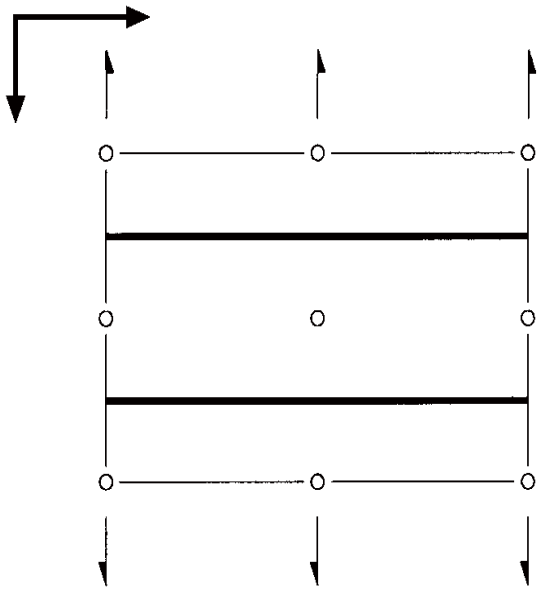
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,1,0)' +
4 i 1	(1) x,y,z [u,v,w]	(2) x, \bar{y} , \bar{z} [u, \bar{v} , \bar{w}]
	(3) \bar{x} , \bar{y} , \bar{z} [u,v,w]	(4) \bar{x} ,y,z [u, \bar{v} , \bar{w}]
2 h m	1/2,y,z [u,0,0]	1/2, \bar{y} , \bar{z} [u,0,0]
2 g m	0,y,z [u,0,0]	0, \bar{y} , \bar{z} [u,0,0]
2 f 2'	x,1/2,0 [0,v,w]	\bar{x} ,1/2,0 [0, \bar{v} , \bar{w}]
2 e 2	x,0,0 [u,0,0]	\bar{x} ,0,0 [u,0,0]
1 d 2'/m	1/2,1/2,0 [0,0,0]	
1 c 2'/m	0,1/2,0 [0,0,0]	
1 b 2/m	1/2,0,0 [u,0,0]	
1 a 2/m	0,0,0 [u,0,0]	

Symmetry of special projections

Along [001] p _{2a} *2mm	Along [100] p2111'	Along [010] p2mm1'
a* = b _p b* = -a	a* = b	a* = a
Origin at 0,1/2,z	Origin at x,0,0	Origin at 0,y,0

p2₁/m11

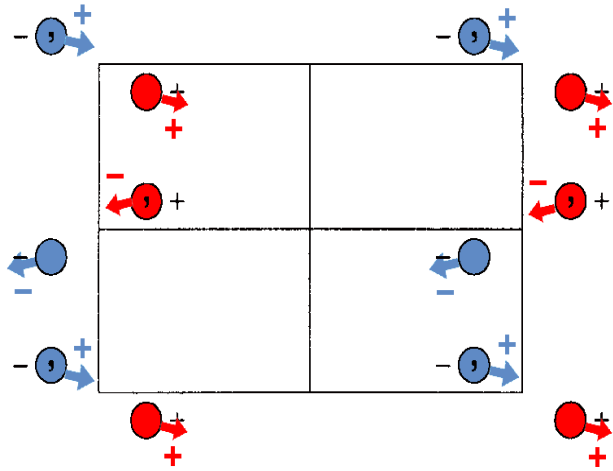
No. 15.1.76



2/m

Monoclinic/Rectangular

p2₁/m11



Origin at $\bar{1}$ on 2₁

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

- (1) 1 (1|0,0,0) (2) 2 (1/2,0,0) x,0,0 (2_x|1/2,0,0) (3) $\bar{1}$ 0,0,0 ($\bar{1}$ |0,0,0) (4) m 1/4,y,z (m_x|1/2,0,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) x+1/2,y,z [u,v,w]
4 d 1	(1) x,y,z [u,v,w]	(2) x+1/2,y,z [u,v,w]
	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) $\bar{x}+1/2,y,z$ [u,v,w]
2 c m	1/4,y,z [u,0,0]	3/4,y,z [u,0,0]
2 b $\bar{1}$	0,1/2,0 [u,v,w]	1/2,1/2,0 [u,v,w]
2 a $\bar{1}$	0,0,0 [u,v,w]	1/2,0,0 [u,v,w]

Symmetry of special projections

Along [001] p2'mg' a* = a b* = b _p Origin at 0,0,z	Along [100] p2111' a* = b Origin at x,0,0	Along [010] p2'mg' a* = a Origin at 0,y,0
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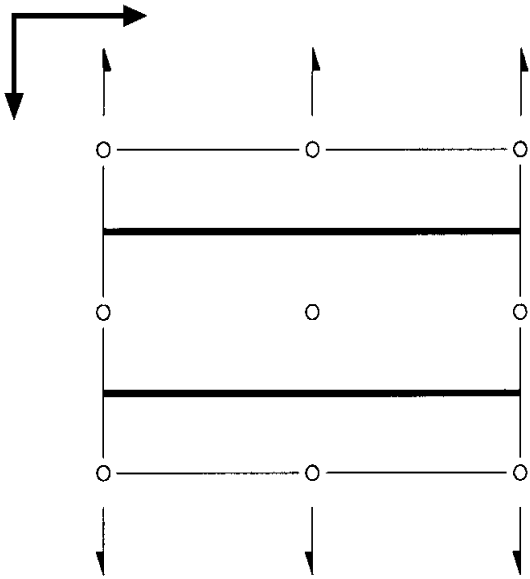
p2₁/m111'

No. 15.2.77

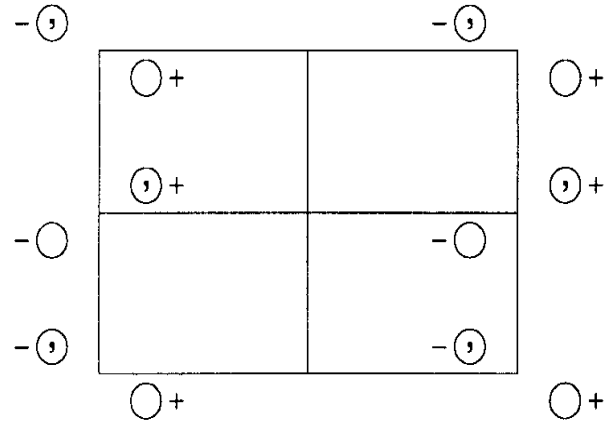
2/m1'

p2₁/m111'

Monoclinic/Rectangular



1'



Origin at $\bar{1}1'$ on $2_11'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

For 1 + set

(1) 1 (1 0,0,0)	(2) 2 (1/2,0,0) x,0,0 (2 _x 1/2,0,0)	(3) $\bar{1}$ 0,0,0 ($\bar{1}$ 0,0,0)	(4) m 1/4,y,z (m _x 1/2,0,0)
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For 1' + set

(1) 1' (1 0,0,0)'	(2) 2' (1/2,0,0) x,0,0 (2 _x 1/2,0,0)'	(3) $\bar{1}'$ 0,0,0 ($\bar{1}'$ 0,0,0)'	(4) m' 1/4,y,z (m _x 1/2,0,0)'
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Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); $1'$

Positions

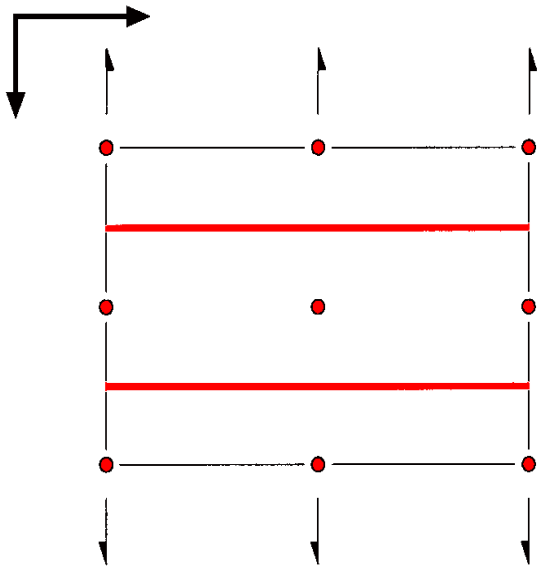
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1'+$
4 d $11'$	(1) x,y,z [0,0,0]	(2) $x+1/2,\bar{y},\bar{z}$ [0,0,0]
	(3) \bar{x},\bar{y},z [0,0,0]	(4) $\bar{x}+1/2,y,z$ [0,0,0]
2 c $m1'$	$1/4,y,z$ [0,0,0]	$3/4,\bar{y},\bar{z}$ [0,0,0]
2 b $\bar{1}1'$	$0,1/2,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]
2 a $\bar{1}1'$	$0,0,0$ [0,0,0]	$1/2,0,0$ [0,0,0]

Symmetry of special projections

Along [001] $p2mg1'$ $a^* = a$ $b^* = b_p$ Origin at $0,0,z$	Along [100] $p2111'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2mg1'$ $a^* = a$ Origin at $0,y,0$
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$p2_1/m'11$

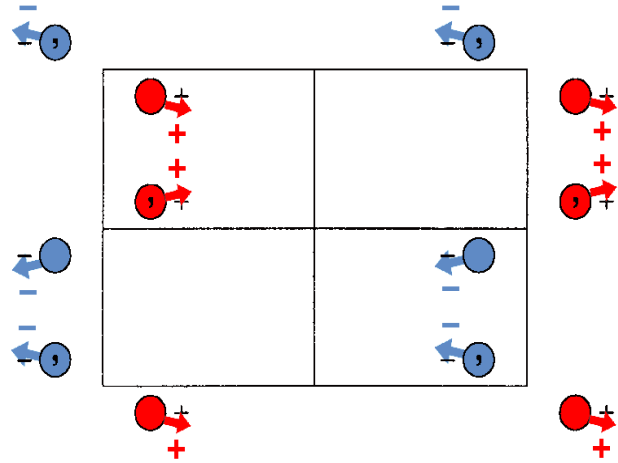
No. 15.3.78



$2/m'$

$p2_1/m'11$

Monoclinic/Rectangular



Origin at $\bar{1}$ on 2_1

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

(1) 1
 $(1|0,0,0)$

(2) 2 $(1/2,0,0)$ $x,0,0$
 $(2_x|1/2,0,0)$

(3) $\bar{1}$ $0,0,0$
 $(\bar{1}|0,0,0)'$

(4) m' $1/4,y,z$
 $(m_x|1/2,0,0)'$

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

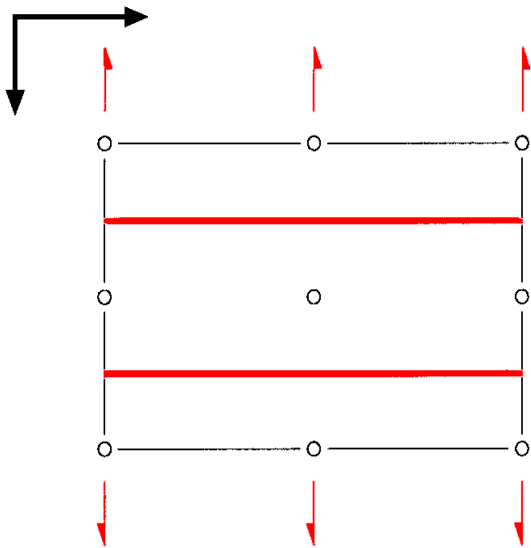
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1)	(2)
4 d 1	(1) x,y,z [u,v,w]	(2) x+1/2,ȳ,z̄ [u,v̄,w̄]
	(3) x̄,ȳ,z̄ [ū,v̄,w̄]	(4) x̄+1/2,y,z [ū,v,w]
2 c m'	1/4,y,z [0,v,w]	3/4,ȳ,z̄ [0,v̄,w̄]
2 b $\bar{1}$ '	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]
2 a $\bar{1}$ '	0,0,0 [0,0,0]	1/2,0,0 [0,0,0]

Symmetry of special projections

Along [001] p2m'g' a* = a b* = b _p Origin at 0,0,z	Along [100] p211 a* = b Origin at x,0,0	Along [010] p2m'g' a* = a Origin at 0,y,0
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$p2_1'/m'11$

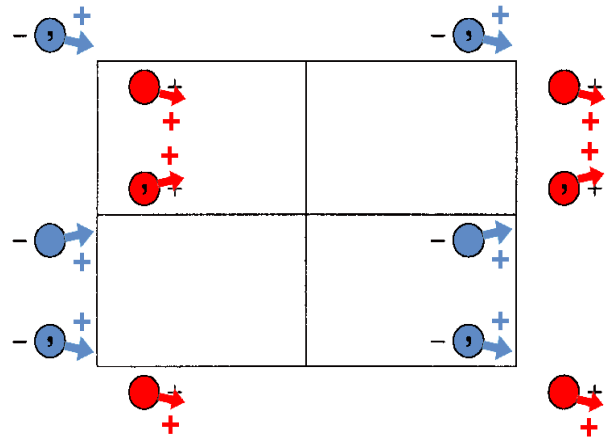
No. 15.4.79



$2'/m'$

Monoclinic/Rectangular

$p2_1'/m'11$



Origin at $\bar{1}$ on $2_1'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) $2'$ (1/2,0,0) $x,0,0$
(2_x |1/2,0,0)'
- (3) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)
- (4) m' 1/4,y,z
(m_x |1/2,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

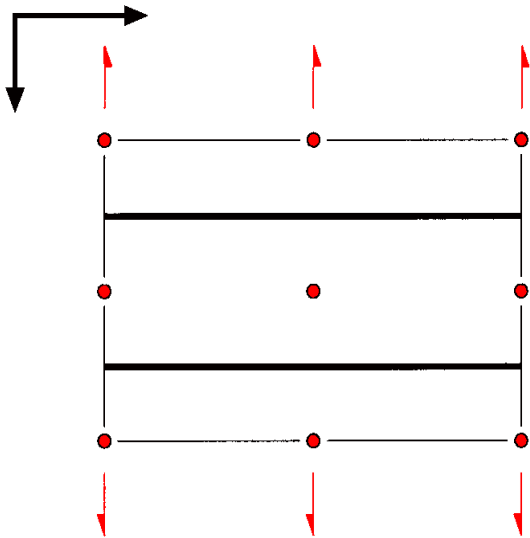
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $x+1/2,\bar{y},\bar{z}$ [\bar{u} ,v,w]
4 d 1	(1) x,y,z [u,v,w]	(2) $x+1/2,\bar{y},\bar{z}$ [\bar{u} ,v,w]
	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) $\bar{x}+1/2,y,z$ [\bar{u} ,v,w]
2 c m'	$1/4,y,z$ [0,v,w]	$3/4,\bar{y},\bar{z}$ [0,v,w]
2 b $\bar{1}$	$0,1/2,0$ [u,v,w]	$1/2,1/2,0$ [\bar{u} ,v,w]
2 a $\bar{1}$	$0,0,0$ [u,v,w]	$1/2,0,0$ [\bar{u} ,v,w]

Symmetry of special projections

Along [001] $p2'm'g$ $a^* = a$ $b^* = b_p$ Origin at 0,0,z	Along [100] $p2'11$ $a^* = b$ Origin at x,0,0	Along [010] $p2'm'g$ $a^* = a$ Origin at 0,y,0
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$p2_1'/m11$

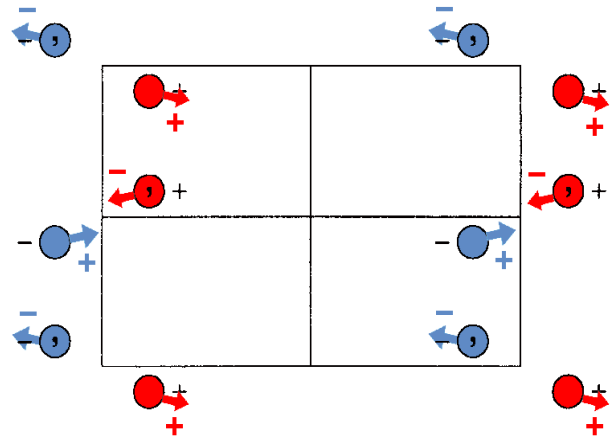
No. 15.5.80



$2'/m$

Monoclinic/Rectangular

$p2_1'/m11$



Origin at $\bar{1}$ on $2_1'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

(1) 1
($1|0,0,0$)

(2) $2'$ ($1/2,0,0$) $x,0,0$
($2_x|1/2,0,0$)'

(3) $\bar{1}$ ($0,0,0$)
($\bar{1}|0,0,0$)'

(4) m ($1/4,y,z$)
($m_x|1/2,0,0$)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

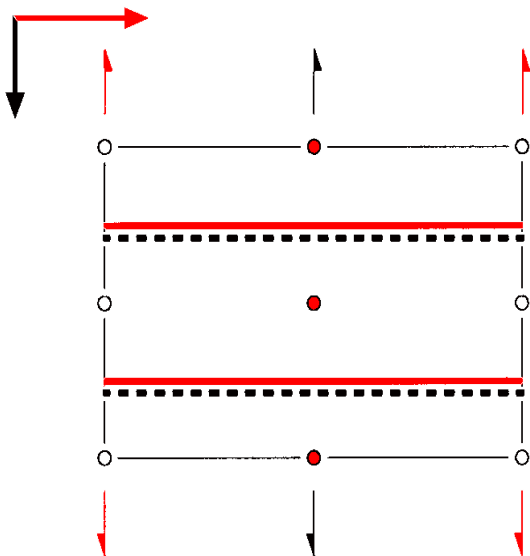
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) x+1/2,y,z̄ [ū,v,w]
4 d 1	(1) x,y,z [u,v,w]	(2) x+1/2,y,z̄ [ū,v,w]
	(3) x̄,y,z̄ [ū,v,w̄]	(4) x̄+1/2,y,z [u,v̄,w̄]
2 c m	1/4,y,z [u,0,0]	3/4,y,z̄ [ū,0,0]
2 b $\bar{1}$ '	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]
2 a $\bar{1}$ '	0,0,0 [0,0,0]	1/2,0,0 [0,0,0]

Symmetry of special projections

Along [001] p2mg a* = a b* = b _p Origin at 0,0,z	Along [100] p2111' a* = b Origin at x,0,0	Along [010] p2mg a* = a Origin at 0,y,0
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$p_{2b}2_1'/m'11$

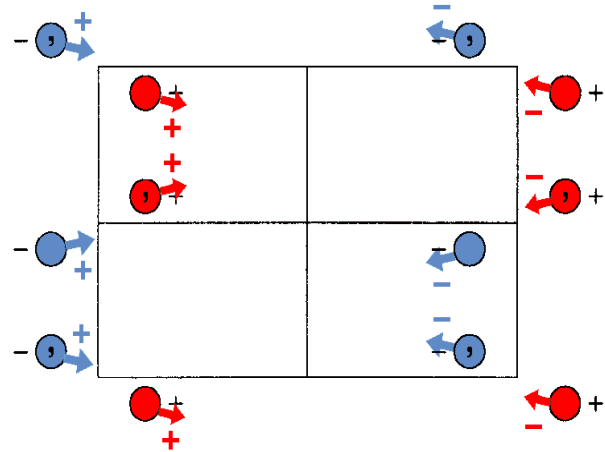
No. 15.6.81



$2/m1'$

Monoclinic/Rectangular

$p_{2b}2_1'/m'11$



Origin at $\bar{1}$ on $2_1'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $2'$ $(1/2,0,0)$	$x,0,0$	(3) $\bar{1}$ $0,0,0$	(4) m' $1/4,y,z$
$(1 0,0,0)$	$(2_x 1/2,0,0)'$		$(\bar{1} 0,0,0)$	$(m_x 1/2,0,0)'$

For $(0,1,0)'$ + set

(1) t' $(0,1,0)$	(2) 2 $(1/2,0,0)$	$x,1/2,0$	(3) $\bar{1}'$ $0,1/2,0$	(4) b $(0,1,0)$
$(1 0,1,0)'$	$(2_x 1/2,1,0)$		$(\bar{1}' 0,1,0)'$	$(m_x 1/2,1,0)$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3)

Positions

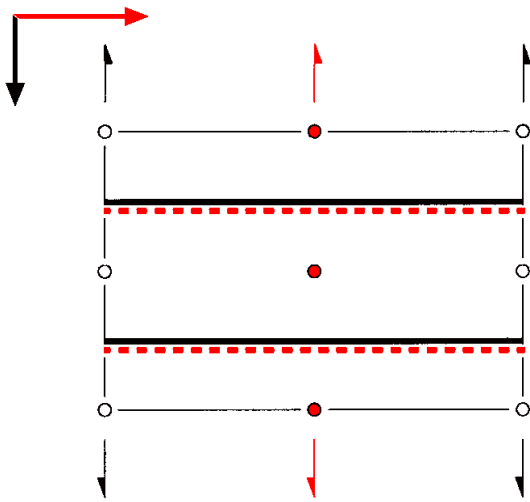
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)_+$	$(0,1,0)'$ +
4 d 1	(1) $x,y,z [u,v,w]$	(2) $x+1/2,\bar{y},\bar{z} [\bar{u},v,w]$
	(3) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(4) $\bar{x}+1/2,y,z [\bar{u},v,w]$
2 c m'	$1/4,y,z [0,v,w]$	$3/4,\bar{y},\bar{z} [0,v,w]$
2 b $\bar{1}'$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$
2 a $\bar{1}$	$0,0,0 [u,v,w]$	$1/2,0,0 [\bar{u},v,w]$

Symmetry of special projections

Along [001] $p_{2b}2_1m'g'$	Along [100] $p_{2a}2_11$	Along [010] $p2mg1'$
$a^* = a \quad b^* = b_p$	$a^* = b$	$a^* = a$
Origin at $0,1/2,z$	Origin at $x,1/2,0$	Origin at $0,y,0$

$p_{2b}2_1/m11$

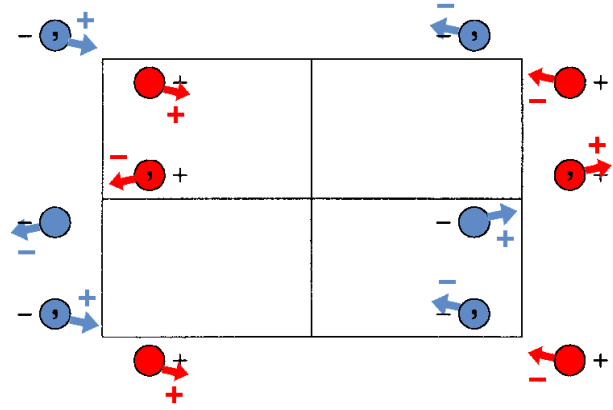
No. 15.7.82



$2/m1'$

Monoclinic/Rectangular

$p_{2b}2_1/m11$



Origin at $\bar{1}$ on 2_1

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) 2 $(1/2,0,0)$ $x,0,0$	(3) $\bar{1}$ $0,0,0$	(4) m $1/4,y,z$
$(1 0,0,0)$	$(2_x 1/2,0,0)$	$(\bar{1} 0,0,0)$	$(m_x 1/2,0,0)$

For $(0,1,0)'$ + set

(1) t' $(0,1,0)$	(2) $2'$ $(1/2,0,0)$ $x,1/2,0$	(3) $\bar{1}'$ $0,1/2,0$	(4) b' $(0,1,0)$ $1/4,y,z$
$(1 0,1,0)'$	$(2_x 1/2,1,0)'$	$(\bar{1}' 0,1,0)'$	$(m_x 1/2,1,0)'$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)_+$	$(0,1,0)'$ +
4 d 1	(1) $x,y,z [u,v,w]$	(2) $x+1/2,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(3) $\bar{x},\bar{y},z [u,v,w]$	(4) $\bar{x}+1/2,y,z [u,\bar{v},\bar{w}]$
2 c m	$1/4,y,z [u,0,0]$	$3/4,\bar{y},\bar{z} [u,0,0]$
2 b $\bar{1}'$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$
2 a $\bar{1}$	$0,0,0 [u,v,w]$	$1/2,0,0 [u,\bar{v},\bar{w}]$

Symmetry of special projections

Along [001] $p_{2b}2mg$	Along [100] $p2111'$	Along [010] $p2mg1'$
$a^* = a \quad b^* = b_p$	$a^* = b$	$a^* = a$
Origin at $0,1/2,z$	Origin at $x,0,0$	Origin at $0,y,0$

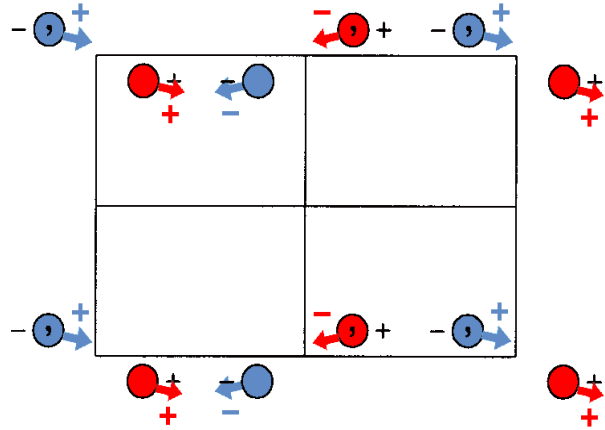
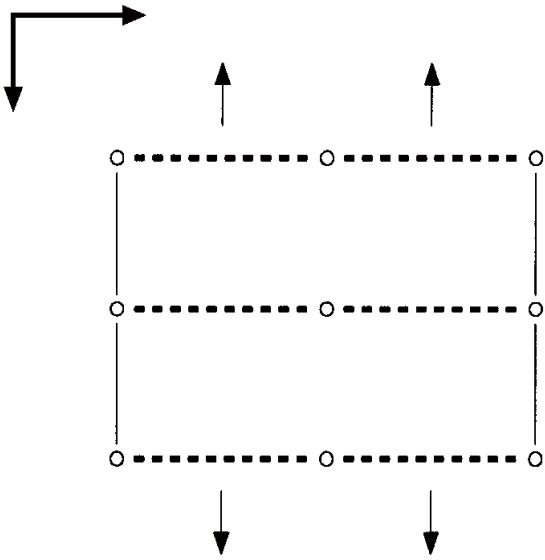
p2/b11

No. 16.1.83

2/m

Monoclinic/Rectangular

p2/b11



Origin at $\bar{1}$ on glide plane b

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $x, 1/4, 0$
(2_x |0, 1/2, 0)

(3) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(4) b (0, 1/2, 0) 0,y,z
(m_x |0, 1/2, 0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $x,\bar{y}+1/2,\bar{z}$ [u, \bar{v} , \bar{w}]
4 d 1	(1) x,y,z [u,v,w]	(2) $x,\bar{y}+1/2,\bar{z}$ [u, \bar{v} , \bar{w}]
	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) $\bar{x},y+1/2,z$ [u, \bar{v} , \bar{w}]
2 c 2	$x,1/4,0$ [u,0,0]	$\bar{x},3/4,0$ [u,0,0]
2 b $\bar{1}$	$1/2,0,0$ [u,v,w]	$1/2,1/2,0$ [u, \bar{v} , \bar{w}]
2 a $\bar{1}$	$0,0,0$ [u,v,w]	$0,1/2,0$ [u, \bar{v} , \bar{w}]

Symmetry of special projections

Along [001] $p2'm'g$ $a^* = b_p$ $b^* = -a$ Origin at 0,0,z	Along [100] $p_{2a^*}211$ $a^* = b/2$ Origin at $x,1/4,0$	Along [010] $p2'mm'$ $a^* = a$ Origin at 0,y,0
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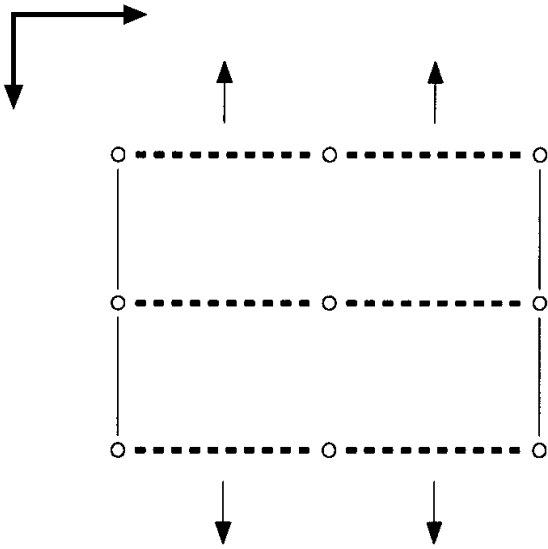
p2/b111'

No. 16.2.84

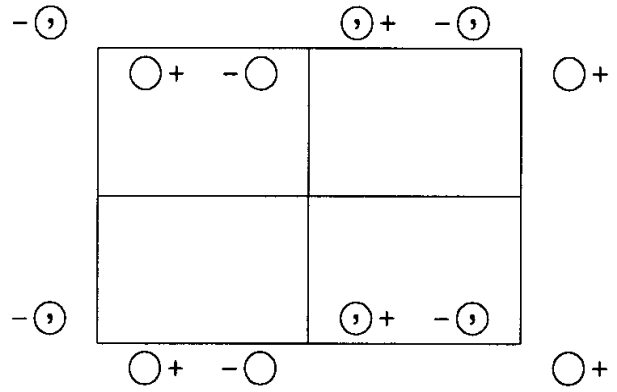
2/m1'

p2/b111'

Monoclinic/Rectangular



1'



Origin at $\bar{1}1'$ on glide plane $b1'$

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

For 1 + set

(1) 1
(1|0,0,0)

(2) 2 $x, 1/4, 0$
(2_x |0,1/2,0)

(3) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(4) b (0,1/2,0) 0,y,z
(m_x |0,1/2,0)

For 1' + set

(1) 1'
(1|0,0,0)'

(2) 2' $x, 1/4, 0$
(2_x |0,1/2,0)'

(3) $\bar{1}'$ 0,0,0
($\bar{1}$ |0,0,0)'

(4) b' (0,1/2,0) 0,y,z
(m_x |0,1/2,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1)	(2)
4 d 11'	(1) x,y,z [0,0,0]	(2) x, \bar{y} +1/2, \bar{z} [0,0,0]
	(3) \bar{x} , \bar{y} , \bar{z} [0,0,0]	(4) \bar{x} ,y+1/2,z [0,0,0]
2 c 21'	x,1/4,0 [0,0,0]	\bar{x} ,3/4,0 [0,0,0]
2 b $\bar{1}1'$	1/2,0,0 [0,0,0]	1/2,1/2,0 [0,0,0]
2 a $\bar{1}1'$	0,0,0 [0,0,0]	0,1/2,0 [0,0,0]

Symmetry of special projections

Along [001] p2mg1'	Along [100] p2111'	Along [010] p2mm1'
$a^* = b_p$, $b^* = -a$	$a^* = b/2$	$a^* = a$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

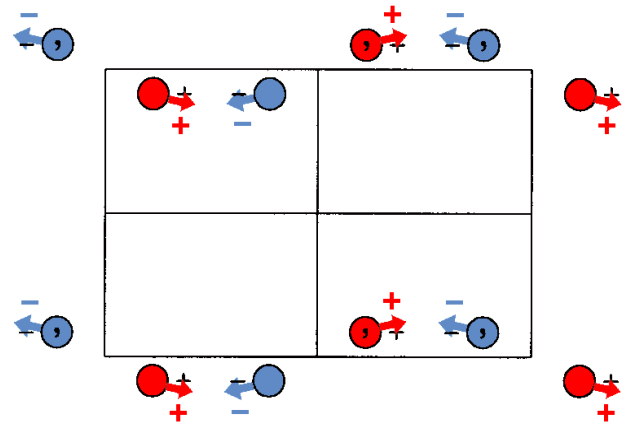
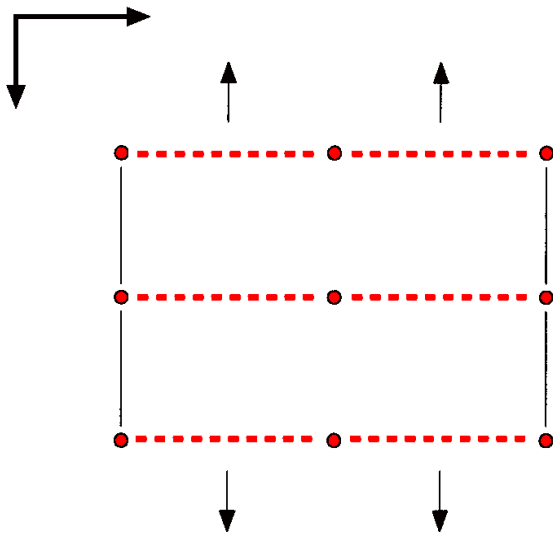
p2/b'11

No. 16.3.85

2/m'

p2/b'11

Monoclinic/Rectangular



Origin at $\bar{1}$ on glide plane b'

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $x, 1/4, 0$
(2_x |0, 1/2, 0)

(3) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)'

(4) b' (0, 1/2, 0) 0,y,z
(m_x |0, 1/2, 0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $x,\bar{y}+1/2,\bar{z}$ [u,\bar{v},\bar{w}]
4 d 1	(1) x,y,z [u,v,w]	(2) $x,\bar{y}+1/2,\bar{z}$ [u,\bar{v},\bar{w}]
	(3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(4) $\bar{x},y+1/2,z$ [\bar{u},v,w]
2 c 2	$x,1/4,0$ [$u,0,0$]	$\bar{x},3/4,0$ [$\bar{u},0,0$]
2 b $\bar{1}'$	$1/2,0,0$ [$0,0,0$]	$1/2,1/2,0$ [$0,0,0$]
2 a $\bar{1}'$	$0,0,0$ [$0,0,0$]	$0,1/2,0$ [$0,0,0$]

Symmetry of special projections

Along [001] $p2m'g'$ $a^* = b_p$, $b^* = -a$ Origin at $0,0,z$	Along [100] $p211$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p2m'm'$ $a^* = a$ Origin at $0,y,0$
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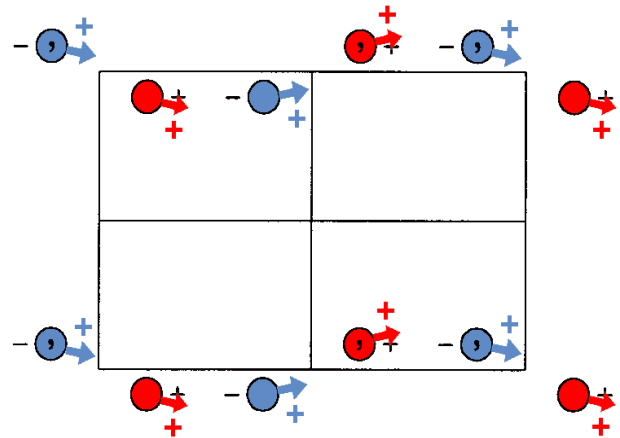
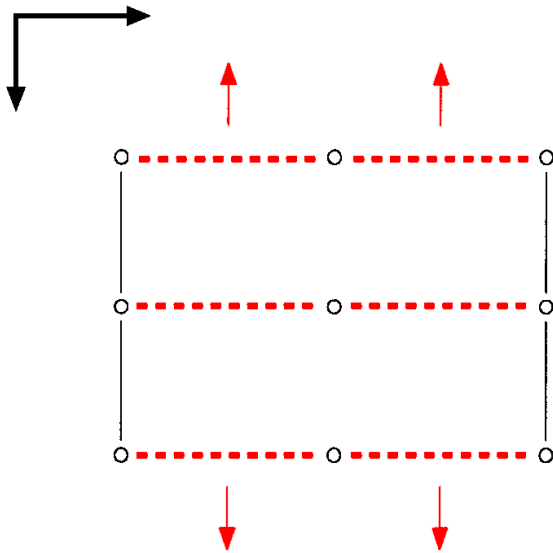
p2'/b'11

No. 16.4.86

2'/m'

p2'/b'11

Monoclinic/Rectangular



Origin at $\bar{1}$ on glide plane b'

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'_x$ $x, 1/4, 0$
($2'_x$ | $0, 1/2, 0$)'

(3) $\bar{1}$ $0, 0, 0$
($\bar{1}$ | $0, 0, 0$)

(4) b' $(0, 1/2, 0)$ $0, y, z$
(m_x | $0, 1/2, 0$)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $x,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]
4 d 1	(1) x,y,z [u,v,w]	(2) $x,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]
	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) $\bar{x},y+1/2,z$ [\bar{u},v,w]
2 c 2'	$x,1/4,0$ [0,v,w]	$\bar{x},3/4,0$ [0,v,w]
2 b $\bar{1}$	$1/2,0,0$ [u,v,w]	$1/2,1/2,0$ [\bar{u},v,w]
2 a $\bar{1}$	$0,0,0$ [u,v,w]	$0,1/2,0$ [\bar{u},v,w]

Symmetry of special projections

Along [001] $p2'mg'$ $a^* = b_p$, $b^* = -a$ Origin at 0,0,z	Along [100] $p2'11$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2'm'm$ $a^* = a$ Origin at 0,y,0
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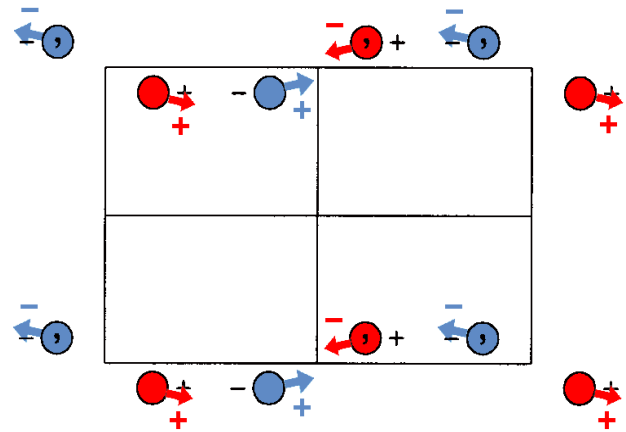
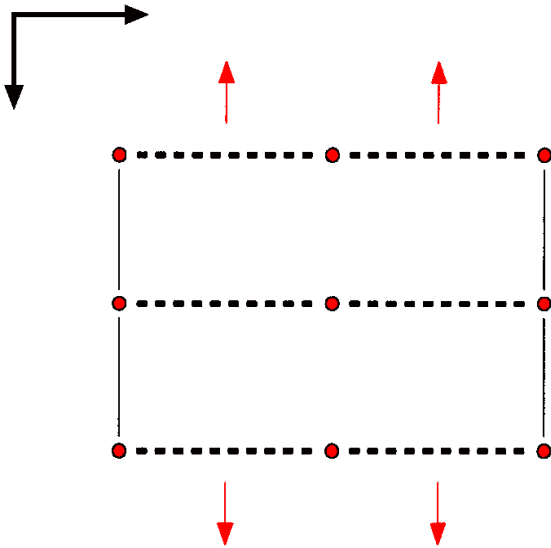
p2'/b11

No. 16.5.87

2'/m

Monoclinic/Rectangular

p2'/b11



Origin at $\bar{1}$ on glide plane b

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'_x$ $x, 1/4, 0$
($2'_x$ | $0, 1/2, 0$)'

(3) $\bar{1}$ $0, 0, 0$
($\bar{1}$ | $0, 0, 0$)'

(4) b $(0, 1/2, 0)$ $0, y, z$
(m_x | $0, 1/2, 0$)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $x,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]
4 d 1	(1) x,y,z [u,v,w]	(2) $x,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]
	(3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(4) $\bar{x},y+1/2,z$ [u,\bar{v},\bar{w}]
2 c 2'	$x,1/4,0$ [0,v,w]	$\bar{x},3/4,0$ [0, \bar{v},\bar{w}]
2 b $\bar{1}'$	$1/2,0,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]
2 a $\bar{1}'$	$0,0,0$ [0,0,0]	$0,1/2,0$ [0,0,0]

Symmetry of special projections

Along [001] $p2mg$ $a^* = b_p$ $b^* = -a$ Origin at 0,0,z	Along [100] $p_{2a^*}211$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2mm$ $a^* = a$ Origin at 0,y,0
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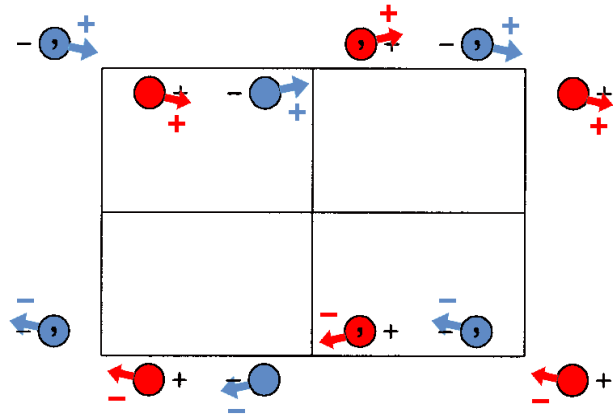
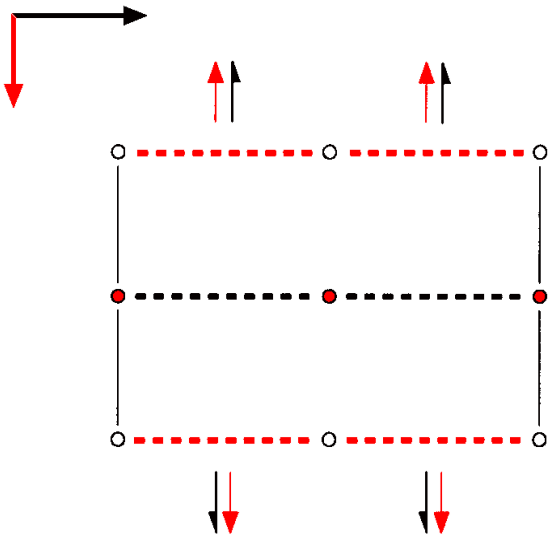
$p_{2a}2'/b'11$

No. 16.6.88

$2/m1'$

$p_{2a}2'/b'11$

Monoclinic/Rectangular



Origin at $\bar{1}$ on glide plane b'

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--------------------|--|--|--|
| (1) 1
(1 0,0,0) | (2) $2'_x$ $x,1/4,0$
(2_x 0,1/2,0)' | (3) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (4) b' (0,1/2,0) $0,y,z$
(m_x 0,1/2,0)' |
|--------------------|--|--|--|

For $(1,0,0)'$ + set

- | | | | |
|----------------------------------|--|---|--|
| (1) t'_x (1,0,0)
(1 1,0,0)' | (2) 2 (1,0,0) $x,1/4,0$
(2_x 1,1/2,0) | (3) $\bar{1}'$ 1/2,0,0
($\bar{1}'$ 1,0,0)' | (4) b (0,1/2,0) $1/2,y,z$
(m_x 1,1/2,0) |
|----------------------------------|--|---|--|

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(1,0,0)'+$
4 d 1	(1) $x,y,z [u,v,w]$	(2) $x,\bar{y}+1/2,\bar{z} [\bar{u},v,w]$
	(3) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(4) $\bar{x},y+1/2,z [\bar{u},v,w]$
2 c 2'	$x,1/4,0 [0,v,w]$	$\bar{x},3/4,0 [0,v,w]$
2 b $\bar{1}'$	$1/2,0,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$
2 a $\bar{1}$	$0,0,0 [u,v,w]$	$0,1/2,0 [\bar{u},v,w]$

Symmetry of special projections

Along [001] $p_{2b}2'mg'$	Along [100] $p2111'$	Along [010] $p_{2a}2'm'm$
$a^* = b_p$ $b^* = -a$	$a^* = b/2$	$a^* = a$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $0,y,0$

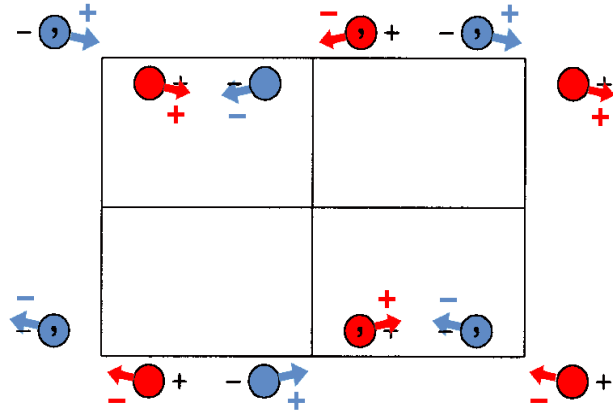
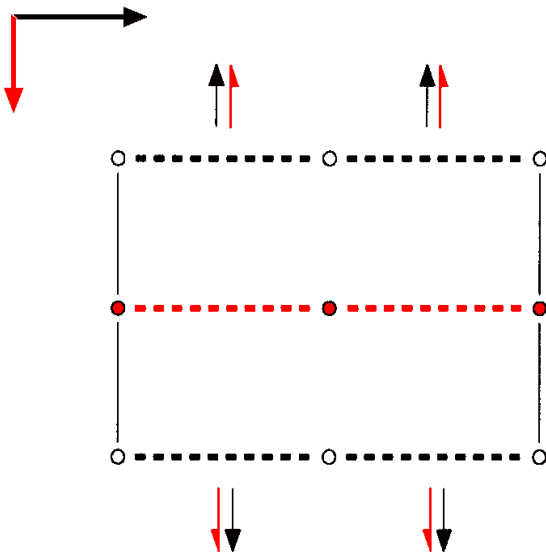
$p_{2a}2/b11$

No. 16.7.89

$2/m1'$

$p_{2a}2/b11$

Monoclinic/Rectangular



Origin at $\bar{1}$ on glide plane b

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|-------------------|-------------------------|---------------------------|---------------------------------|
| (1) 1 | (2) $2_x x, 1/4, 0$ | (3) $\bar{1} 0, 0, 0$ | (4) $b (0, 1/2, 0) 0, y, z$ |
| (1) $1 0, 0, 0$ | (2) $(2_x 0, 1/2, 0)$ | (3) $(\bar{1} 0, 0, 0)$ | (4) $(m_x 0, 1/2, 0)$ |

For $(1,0,0)'$ + set

- | | | | |
|----------------------|----------------------------------|-----------------------------|------------------------------------|
| (1) $t' (1, 0, 0)$ | (2) $2' (1, 0, 0) x, 1/4, 0$ | (3) $\bar{1}' 1/2, 0, 0$ | (4) $b' (0, 1/2, 0) 1/2, y, z$ |
| (1) $(1 1, 0, 0)'$ | (2) $(2_x 1, 1/2, 0)'$ | (3) $(\bar{1}' 1, 0, 0)'$ | (4) $(m_x 1, 1/2, 0)'$ |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(1,0,0)'+$
4 d 1	(1) $x,y,z [u,v,w]$	(2) $x,\bar{y}+1/2,\bar{z} [u,\bar{v},\bar{w}]$
	(3) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(4) $\bar{x},y+1/2,z [u,\bar{v},\bar{w}]$
2 c 2	$x,1/4,0 [u,0,0]$	$\bar{x},3/4,0 [u,0,0]$
2 b $\bar{1}'$	$1/2,0,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$
2 a $\bar{1}$	$0,0,0 [u,v,w]$	$0,1/2,0 [u,\bar{v},\bar{w}]$

Symmetry of special projections

Along [001] $p_{2b}2m'g'$
 $a^* = b_p$ $b^* = -a$
 Origin at $1/2,0,z$

Along [100] $p2111'$
 $a^* = b/2$
 Origin at $x,0,0$

Along [010] $p_{2a}2m'm'$
 $a^* = a$
 Origin at $1/2,y,0$

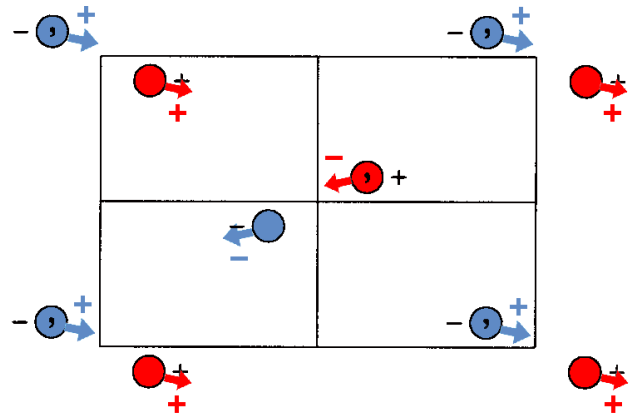
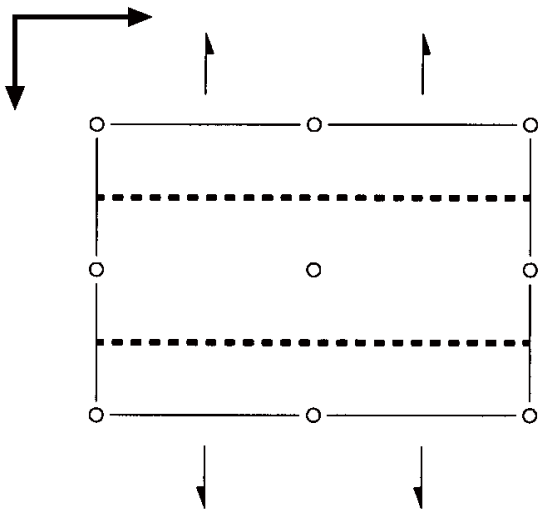
p2₁/b11

No. 17.1.90

2/m

p2₁/b11

Monoclinic/Rectangular



Origin at $\bar{1}$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 (1/2,0,0) $x, 1/4, 0$
(2_x|1/2,1/2,0)

(3) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(4) b (0,1/2,0) $1/4, y, z$
(m_x|1/2,1/2,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) x+1/2,y+1/2,z [u,v,w]
4 c 1	(1) x,y,z [u,v,w]	(2) x+1/2,y+1/2,z [u,v,w]
	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [u,v,w]
2 b $\bar{1}$	0,1/2,0 [u,v,w]	1/2,0,0 [u,v,w]
2 a $\bar{1}$	0,0,0 [u,v,w]	1/2,1/2,0 [u,v,w]

Symmetry of special projections

Along [001] p2'gg' a* = a b* = b _p Origin at 0,0,z	Along [100] p _{2a*} 211 a* = b/2 Origin at x,1/4,0	Along [010] p2'mg' a* = a Origin at 0,y,0
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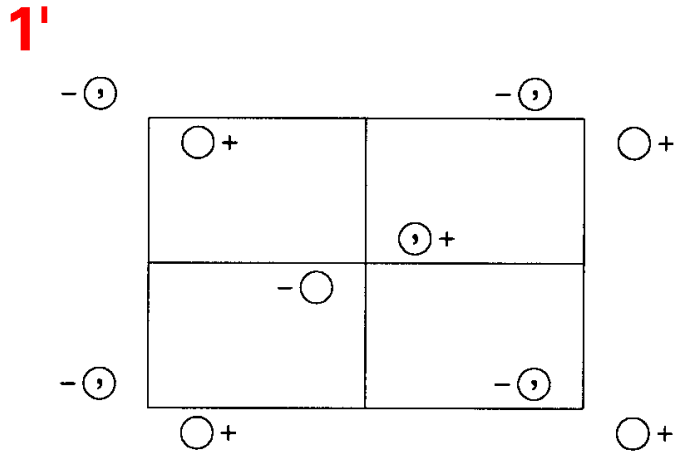
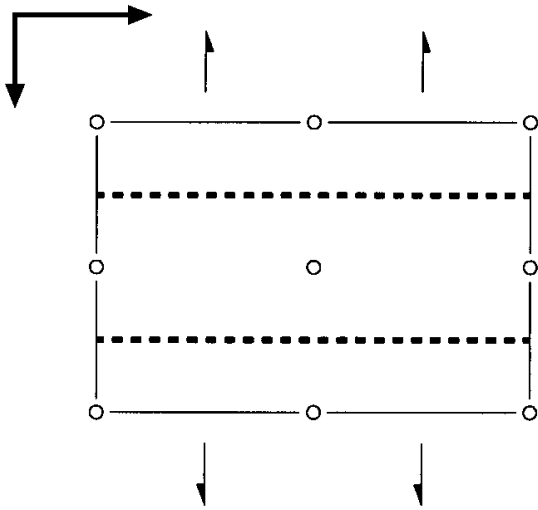
$p2_1/b111'$

No. 17.2.91

$2/m1'$

$p2_1/b111'$

Monoclinic/Rectangular



Origin at $\bar{1}1'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

For $1 +$ set

(1) 1	(2) $2 (1/2, 0, 0) \quad x, 1/4, 0$	(3) $\bar{1} \quad 0, 0, 0$	(4) $b (0, 1/2, 0) \quad 1/4, y, z$
$(1 0, 0, 0)$	$(2_x 1/2, 1/2, 0)$	$(\bar{1} 0, 0, 0)$	$(m_x 1/2, 1/2, 0)$

For $1' +$ set

(1) $1'$	(2) $2' (1/2, 0, 0) \quad x, 1/4, 0$	(3) $\bar{1}' \quad 0, 0, 0$	(4) $b' (0, 1/2, 0) \quad 1/4, y, z$
$(1 0, 0, 0)'$	$(2_x 1/2, 1/2, 0)'$	$(\bar{1}' 0, 0, 0)'$	$(m_x 1/2, 1/2, 0)'$

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 c 11'	(1) x,y,z [0,0,0]	(2) x+1/2,y+1/2,z̄ [0,0,0]
	(3) x̄,ȳ,z̄ [0,0,0]	(4) x̄+1/2,y+1/2,z [0,0,0]
2 b 11'	0,1/2,0 [0,0,0]	1/2,0,0 [0,0,0]
2 a 11'	0,0,0 [0,0,0]	1/2,1/2,0 [0,0,0]

Symmetry of special projections

Along [001] p2gg1' a* = a b* = b _p Origin at 0,0,z	Along [100] p2111' a* = b/2 Origin at x,0,0	Along [010] p2mg1' a* = a Origin at 0,y,0
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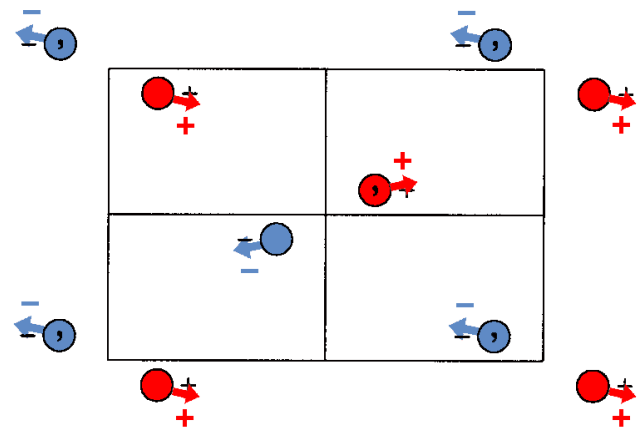
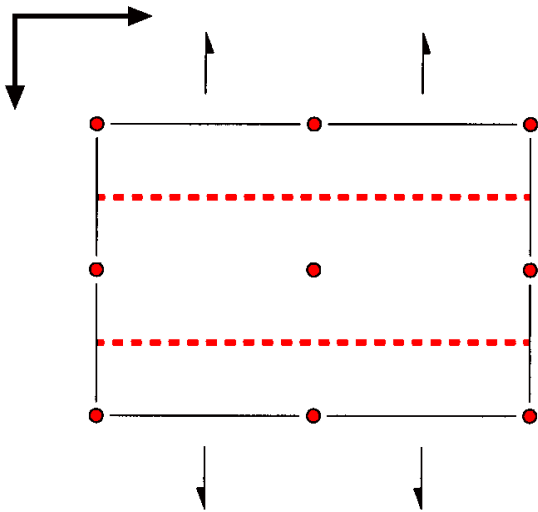
p2₁/b'11

No. 17.3.92

2/m'

p2₁/b'11

Monoclinic/Rectangular



Origin at $\bar{1}$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2 (1/2,0,0) $x, 1/4, 0$
(2_x|1/2,1/2,0)
- (3) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)'
- (4) b' (0,1/2,0) 1/4,y,z
(m_x|1/2,1/2,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) x+1/2,y+1/2,z [u,v,w]
4 c 1	(1) x,y,z [u,v,w]	(2) x+1/2,y+1/2,z [u,v,w]
	(3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(4) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},\bar{v},\bar{w}]
2 b $\bar{1}$ '	0,1/2,0 [0,0,0]	1/2,0,0 [0,0,0]
2 a $\bar{1}$ '	0,0,0 [0,0,0]	1/2,1/2,0 [0,0,0]

Symmetry of special projections

Along [001] p2g'g' a* = a b* = b _p Origin at 0,0,z	Along [100] p211 a* = b/2 Origin at x,1/4,0	Along [010] p2m'g' a* = a Origin at 0,y,0
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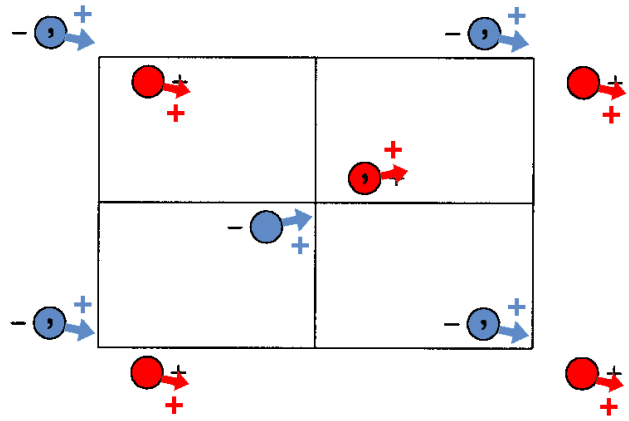
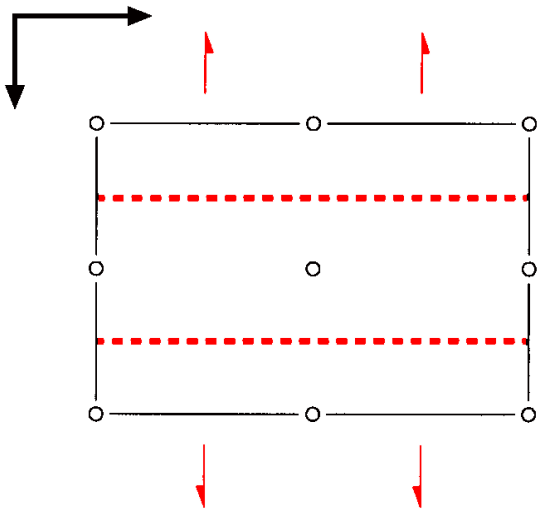
$p2_1'/b'11$

No. 17.4.93

$2'/m'$

$p2_1'/b'11$

Monoclinic/Rectangular



Origin at $\bar{1}$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

- (1) 1
 $(1|0,0,0)$
- (2) $2'$ $(1/2,0,0)$ $x,1/4,0$ $(2_x|1/2,1/2,0)'$
- (3) $\bar{1}$ $0,0,0$ $(\bar{1}|0,0,0)$
- (4) b' $(0,1/2,0)$ $1/4,y,z$ $(m_x|1/2,1/2,0)'$

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) x+1/2,y+1/2,z̄ [ū,v,w]
4 c 1	(1) x,y,z [u,v,w]	(2) x+1/2,y+1/2,z̄ [ū,v,w]
	(3) x̄,ȳ,z̄ [u,v,w]	(4) x̄+1/2,y+1/2,z [ū,v,w]
2 b $\bar{1}$	0,1/2,0 [u,v,w]	1/2,0,0 [ū,v,w]
2 a $\bar{1}$	0,0,0 [u,v,w]	1/2,1/2,0 [ū,v,w]

Symmetry of special projections

Along [001] p2'gg' a* = b _p b* = - a Origin at 0,0,z	Along [100] p2'11 a* = b/2 Origin at x,1/4,0	Along [010] p2'm'g a* = a Origin at 0,y,0
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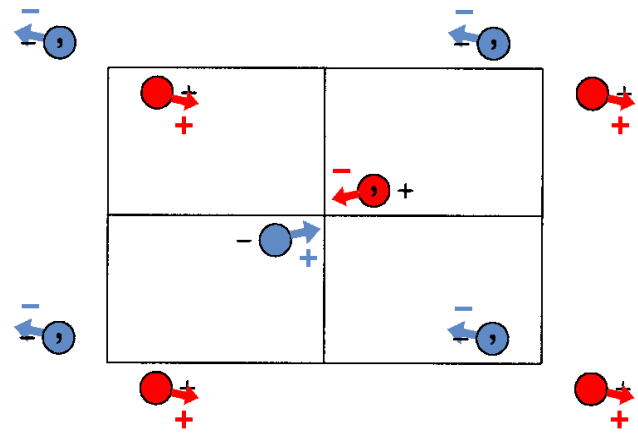
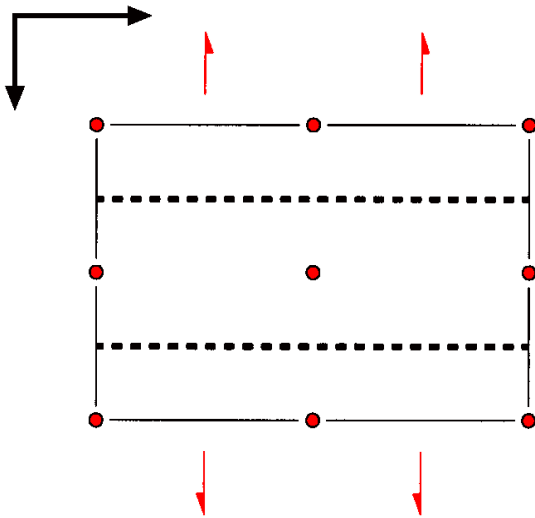
$p2_1/b11$

No. 17.5.94

$2'/m$

$p2_1/b11$

Monoclinic/Rectangular



Origin at $\bar{1}$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'$ (1/2,0,0) $x, 1/4, 0$ (3) $\bar{1}$ 0,0,0
(2_x |1/2,1/2,0)' ($\bar{1}$ |0,0,0)'

(4) b (0,1/2,0) 1/4,y,z
(m_x |1/2,1/2,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) x+1/2,y+1/2,z [ū,v,w]
4 c 1	(1) x,y,z [u,v,w]	(2) x+1/2,y+1/2,z [ū,v,w]
	(3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(4) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [u,\bar{v},\bar{w}]
2 b $\bar{1}'$	0,1/2,0 [0,0,0]	1/2,0,0 [0,0,0]
2 a $\bar{1}'$	0,0,0 [0,0,0]	1/2,1/2,0 [0,0,0]

Symmetry of special projections

Along [001] p2gg $a^* = a$ $b^* = b_p$ Origin at 0,0,z	Along [100] p _{2a*} 211 $a^* = b/2$ Origin at x,0,0	Along [010] p2mg $a^* = a$ Origin at 0,y,0
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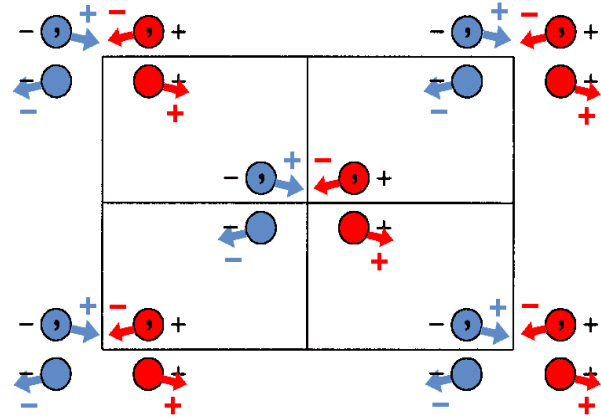
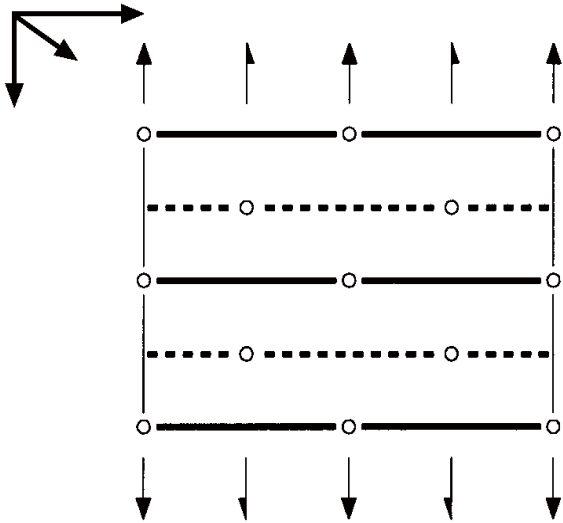
c2/m11

2/m

Monoclinic/Rectangular

No. 18.1.95

c2/m11



Origin at center (2/m)

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

For (0,0,0) + set

- | | | | |
|-----------|-------------------------|---------------------|-------------------------|
| (1) 1 | (2) 2 $x,0,0$ | (3) $\bar{1}$ 0,0,0 | (4) m 0,y,z |
| (1 0,0,0) | (2 _x 0,0,0) | ($\bar{1}$ 0,0,0) | (m _x 0,0,0) |

For (1/2,1/2,0) + set

- | | | | |
|-------------------|-----------------------------|-------------------------|-----------------------------|
| (1) t (1/2,1/2,0) | (2) 2 (1/2,0,0) $x,1/4,0$ | (3) $\bar{1}$ 1/4,1/4,0 | (4) b (0,1/2,0) 1/4,y,z |
| (1 1/2,1/2,0) | (2 _x 1/2,1/2,0) | ($\bar{1}$ 1/2,1/2,0) | (m _x 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	(1/2,1/2,0) +
8 f 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]
	(3) \bar{x},\bar{y},\bar{z} [u,v,w]	(4) \bar{x},y,z [u, \bar{v} , \bar{w}]
4 e m	0,y,z [u,0,0]	0, \bar{y},\bar{z} [u,0,0]
4 d 2	x,0,0 [u,0,0]	\bar{x} ,0,0 [u,0,0]
4 c $\bar{1}$	1/4,1/4,0 [u,v,w]	1/4,3/4,0 [u, \bar{v} , \bar{w}]
2 b 2/m	1/2,0,0 [u,0,0]	
2 a 2/m	0,0,0 [u,0,0]	

Symmetry of special projections

Along [001] $c2'mm'$ $a^* = a$ $b^* = b_p$ Origin at 0,0,z	Along [100] $p2111'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2'mm'$ $a^* = a/2$ Origin at 0,y,0
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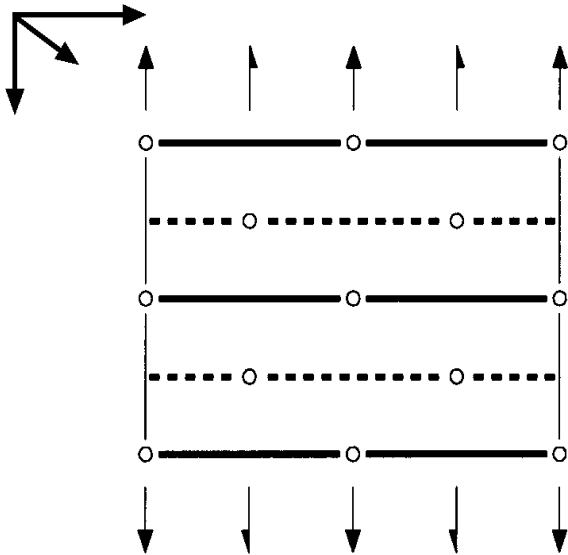
c2/m11'

2/m1'

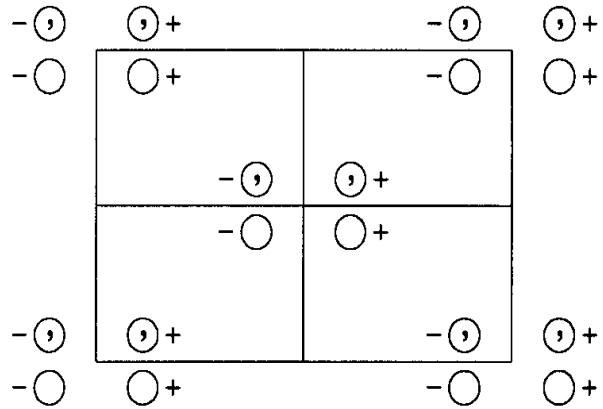
Monoclinic/Rectangular

No. 18.2.96

c2/m11'



1'



Origin at center (2/m1')

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

For (0,0,0) + set

- | | | | |
|-----------|--------------------------|---------------------|--------------------------|
| (1) 1 | (2) 2 _x x,0,0 | (3) $\bar{1}$ 0,0,0 | (4) m _y 0,y,z |
| (1 0,0,0) | (2 _x 0,0,0) | ($\bar{1}$ 0,0,0) | (m _x 0,0,0) |

For (1/2,1/2,0) + set

- | | | | |
|-------------------|-----------------------------|-------------------------|-----------------------------|
| (1) t (1/2,1/2,0) | (2) 2 (1/2,0,0) x,1/4,0 | (3) $\bar{1}$ 1/4,1/4,0 | (4) b (0,1/2,0) 1/4,y,z |
| (1 1/2,1/2,0) | (2 _x 1/2,1/2,0) | ($\bar{1}$ 1/2,1/2,0) | (m _x 1/2,1/2,0) |

For (0,0,0)' + set

- | | | | |
|------------|---------------------------|-----------------------|---------------------------|
| (1) 1' | (2) 2' x,0,0 | (3) $\bar{1}$ ' 0,0,0 | (4) m' _y 0,y,z |
| (1 0,0,0)' | (2 _x ' 0,0,0)' | ($\bar{1}$ ' 0,0,0)' | (m _x ' 0,0,0)' |

For (1/2,1/2,0)' + set

- | | | | |
|---------------------|-------------------------------|---------------------------|-------------------------------|
| (1) t' (1/2,1/2,0)' | (2) 2' (1/2,0,0) x,1/4,0 | (3) $\bar{1}$ ' 1/4,1/4,0 | (4) b' (0,1/2,0) 1/4,y,z |
| (1 1/2,1/2,0)' | (2 _x ' 1/2,1/2,0)' | ($\bar{1}$ ' 1/2,1/2,0)' | (m _x ' 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	(1/2,1/2,0) +
	(0,0,0)' +	(1/2,1/2,0)' +
8 f 11'	(1) x,y,z [0,0,0]	(2) x, \bar{y} , \bar{z} [0,0,0]
	(3) \bar{x} , \bar{y} , \bar{z} [0,0,0]	(4) \bar{x} ,y,z [0,0,0]
4 e m1'	0,y,z [0,0,0]	0, \bar{y} , \bar{z} [0,0,0]
4 d 21'	x,0,0 [0,0,0]	\bar{x} ,0,0 [0,0,0]
4 c $\bar{1}$ 1'	1/4,1/4,0 [0,0,0]	1/4,3/4,0 [0,0,0]
2 b 2/m1'	1/2,0,0 [0,0,0]	
2 a 2/m1'	0,0,0 [0,0,0]	

Symmetry of special projections

Along [001] c2mm1' $\mathbf{a}^* = \mathbf{a}$ $\mathbf{b}^* = \mathbf{b}_p$ Origin at 0,0,z	Along [100] p2111' $\mathbf{a}^* = \mathbf{b}/2$ Origin at x,0,0	Along [010] p2mm1' $\mathbf{a}^* = \mathbf{a}/2$ Origin at 0,y,0
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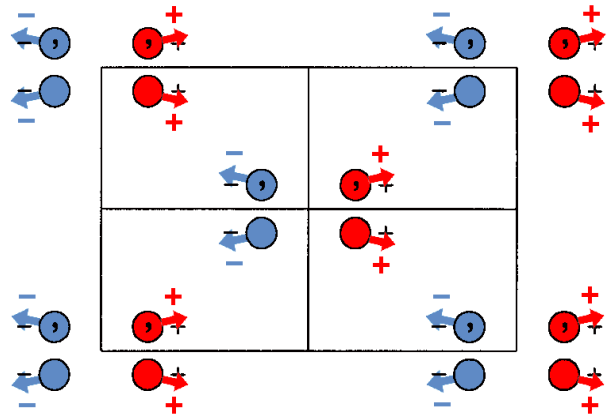
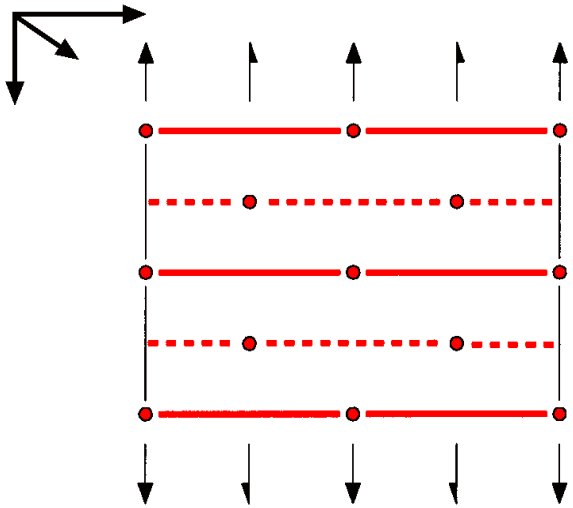
c2/m'11

No. 18.3.97

2/m'

c2/m'11

Monoclinic/Rectangular



Origin at center (2/m')

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|-----------|------------------------------------|-------------------------------|-----------------------------------|
| (1) 1 | (2) 2 | (3) $\bar{1}$ | (4) m' |
| (1 0,0,0) | $x,0,0$
(2 _x 0,0,0) | 0,0,0
($\bar{1}$ 0,0,0)' | 0,y,z
(m _x 0,0,0)' |
- For (1/2,1/2,0) + set
- | | | | |
|---------------|--|---------------------------------------|---|
| (1) t | (2) 2 | (3) $\bar{1}$ | (4) b' |
| (1 1/2,1/2,0) | (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) | 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0)' | (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	(1/2,1/2,0) +
8 f 1	(1) x,y,z [u,v,w]	(2) x, \bar{y} , \bar{z} [u, \bar{v} , \bar{w}]
	(3) \bar{x} , \bar{y} , \bar{z} [\bar{u} , \bar{v} , \bar{w}]	(4) \bar{x} ,y,z [\bar{u} ,v,w]
4 e m'	0,y,z [0,v,w]	0, \bar{y} , \bar{z} [0, \bar{v} , \bar{w}]
4 d 2	x,0,0 [u,0,0]	\bar{x} ,0,0 [\bar{u} ,0,0]
4 c $\bar{1}$ '	1/4,1/4,0 [0,0,0]	1/4,3/4,0 [0,0,0]
2 b 2/m'	1/2,0,0 [0,0,0]	
2 a 2/m'	0,0,0 [0,0,0]	

Symmetry of special projections

Along [001] c2m'm' $a^* = a$ $b^* = b_p$ Origin at 0,0,z	Along [100] p211 $a^* = b/2$ Origin at x,0,0	Along [010] p2m'm' $a^* = a/2$ Origin at 0,y,0
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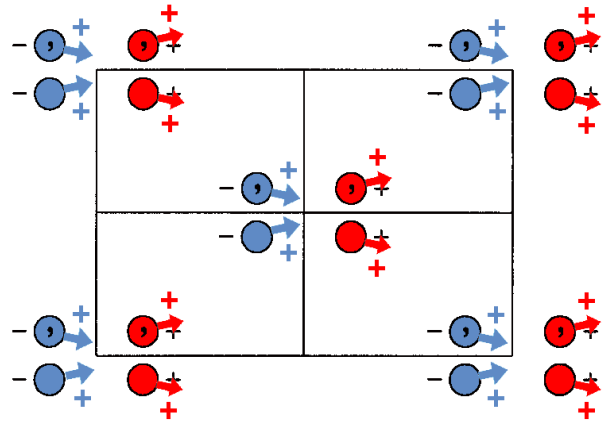
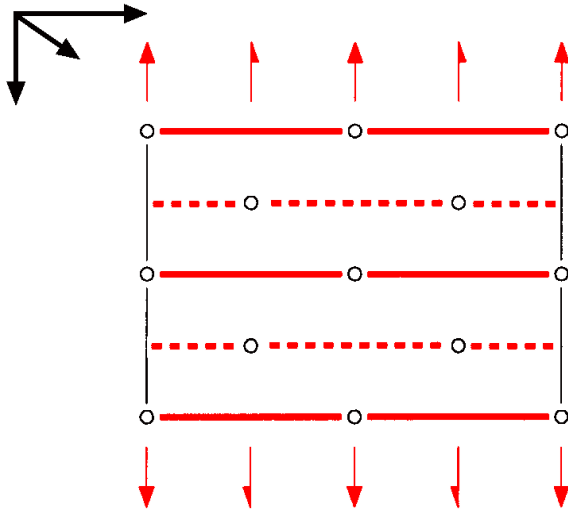
c2'/m'11

No. 18.4.98

2'/m'

c2'/m'11

Monoclinic/Rectangular



Origin at center (2'/m')

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

For (0,0,0) + set

- | | | | |
|-----------|--------------------------|-----------------------|--------------------------|
| (1) 1 | (2) 2' $x,0,0$ | (3) $\bar{1}$ $0,0,0$ | (4) m' $0,y,z$ |
| (1 0,0,0) | (2 _x 0,0,0)' | ($\bar{1}$ 0,0,0) | (m _x 0,0,0)' |

For (1/2,1/2,0) + set

- | | | | |
|-------------------|------------------------------|---------------------------|------------------------------|
| (1) t (1/2,1/2,0) | (2) 2' (1/2,0,0) $x,1/4,0$ | (3) $\bar{1}$ $1/4,1/4,0$ | (4) b' (0,1/2,0) $1/4,y,z$ |
| (1 1/2,1/2,0) | (2 _x 1/2,1/2,0)' | ($\bar{1}$ 1/2,1/2,0) | (m _x 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0) +	(1/2,1/2,0) +
8	f 1	(1) x,y,z [u,v,w]	(2) x, \bar{y} , \bar{z} [\bar{u} ,v,w]
		(3) \bar{x} , \bar{y} , \bar{z} [u,v,w]	(4) \bar{x} ,y,z [\bar{u} ,v,w]
4	e m'	0,y,z [0,v,w]	0, \bar{y} , \bar{z} [0,v,w]
4	d 2'	x,0,0 [0,v,w]	\bar{x} ,0,0 [0,v,w]
4	c $\bar{1}$	1/4,1/4,0 [u,v,w]	1/4,3/4,0 [\bar{u} ,v,w]
2	b 2'/m'	1/2,0,0 [0,v,w]	
2	a 2'/m'	0,0,0 [0,v,w]	

Symmetry of special projections

Along [001] c2'mm'	Along [100] p2'11	Along [010] p2'm'm
$\mathbf{a}^* = \mathbf{b}_p$ $\mathbf{b}^* = -\mathbf{a}$	$\mathbf{a}^* = \mathbf{b}/2$	$\mathbf{a}^* = \mathbf{a}/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

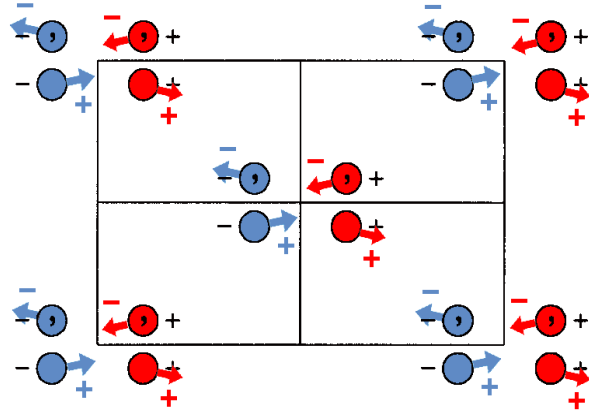
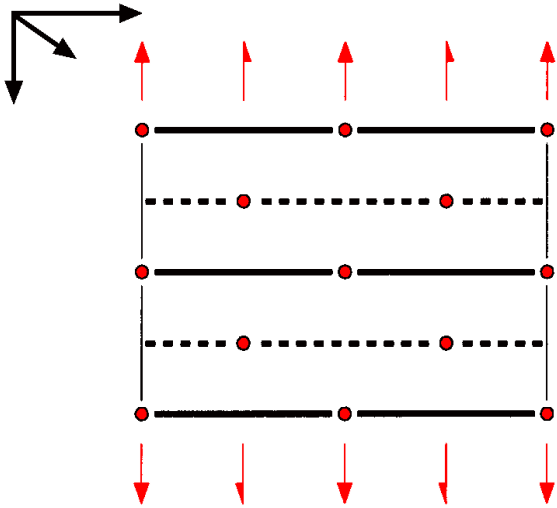
c2'/m11

No. 18.5.99

2'/m

c2'/m11

Monoclinic/Rectangular



Origin at center (2'/m)

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|-----------|--------------------------|----------------------|-------------------------|
| (1) 1 | (2) $2'_x$ x,0,0 | (3) $\bar{1}$ 0,0,0 | (4) m 0,y,z |
| (1 0,0,0) | (2 _x 0,0,0)' | ($\bar{1}$ 0,0,0)' | (m _x 0,0,0) |
- For (1/2,1/2,0) + set
- | | | | | | |
|-------------------|------------------------------|---------|--------------------------|-----------------------------|---------|
| (1) t (1/2,1/2,0) | (2) $2'_x$ (1/2,0,0) | x,1/4,0 | (3) $\bar{1}$ 1/4,1/4,0 | (4) b (0,1/2,0) | 1/4,y,z |
| (1 1/2,1/2,0) | (2 _x 1/2,1/2,0)' | | ($\bar{1}$ 1/2,1/2,0)' | (m _x 1/2,1/2,0) | |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	(1/2,1/2,0) +
8 f 1	(1) x,y,z [u,v,w] (3) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(2) x, \bar{y},\bar{z} [\bar{u},v,w] (4) \bar{x},y,z [u, \bar{v},\bar{w}]
4 e m	0,y,z [u,0,0]	0, \bar{y},\bar{z} [$\bar{u},0,0$]
4 d 2'	x,0,0 [0,v,w]	$\bar{x},0,0$ [0, \bar{v},\bar{w}]
4 c $\bar{1}$ '	1/4,1/4,0 [0,0,0]	1/4,3/4,0 [0,0,0]
2 b 2'/m	1/2,0,0 [0,0,0]	
2 a 2'/m	0,0,0 [0,0,0]	

Symmetry of special projections

Along [001] c2mm	Along [100] p2111'	Along [010] p2mm
$a^* = a$ $b^* = b_p$	$a^* = b/2$	$a^* = a/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

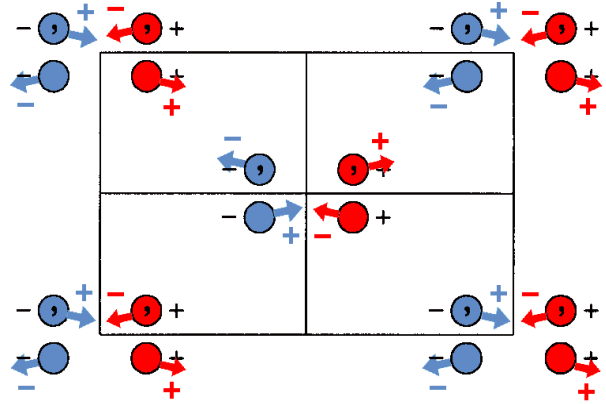
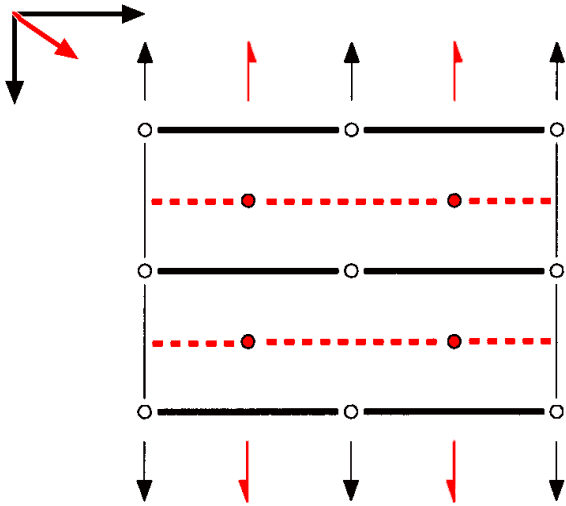
$c_p2/m11$

No. 18.6.100

$2/m1'$

$c_p2/m11$

Monoclinic/Rectangular



Origin at center ($2/m$)

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|---------------|-------------------|-----------------------|-------------------|
| (1) 1 | (2) $2_x 0,0,0$ | (3) $\bar{1} 0,0,0$ | (4) $m_y 0,y,z$ |
| $(1 0,0,0)$ | $(2_x 0,0,0)$ | $(\bar{1} 0,0,0)$ | $(m_x 0,0,0)$ |

For $(1/2,1/2,0)'$ + set

- | | | | |
|----------------------|-----------------------|----------------------------|-----------------------|
| (1) $t' 1/2,1/2,0$ | (2) $2'_x 1/2,0,0$ | (3) $\bar{1}' 1/4,1/4,0$ | (4) $b'_y 0,1/2,0$ |
| $(1 1/2,1/2,0)'$ | $(2'_x 1/2,1/2,0)'$ | $(\bar{1}' 1/2,1/2,0)'$ | $(m'_x 1/2,1/2,0)'$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)^*$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0) +$	$(1/2,1/2,0)^* +$
8 f 1	(1) $x,y,z [u,v,w]$	(2) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(3) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(4) $\bar{x},y,z [u,\bar{v},\bar{w}]$
4 e m	$0,y,z [u,0,0]$	$0,\bar{y},\bar{z} [u,0,0]$
4 d 2	$x,0,0 [u,0,0]$	$\bar{x},0,0 [u,0,0]$
4 c $\bar{1}$	$1/4,1/4,0 [0,0,0]$	$1/4,3/4,0 [0,0,0]$
2 b $2/m$	$1/2,0,0 [u,0,0]$	
2 a $2/m$	$0,0,0 [u,0,0]$	

Symmetry of special projections

Along $[001]$ $c_p2'mm'$ $a^* = a$ $b^* = b_p$ Origin at $0,0,z$	Along $[100]$ $p2111'$ $a^* = b/2$ Origin at $x,0,0$	Along $[010]$ $p2m'm'$ $a^* = a/2$ Origin at $1/4,y,0$
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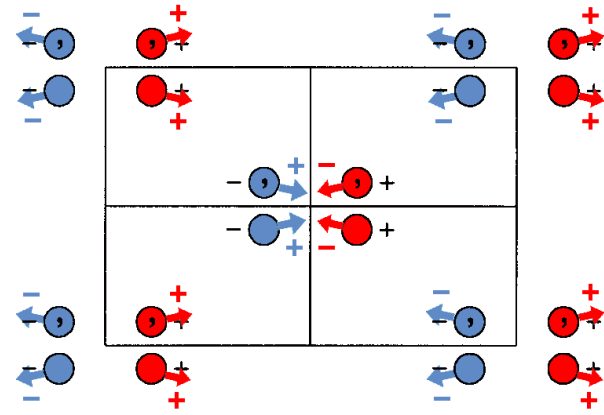
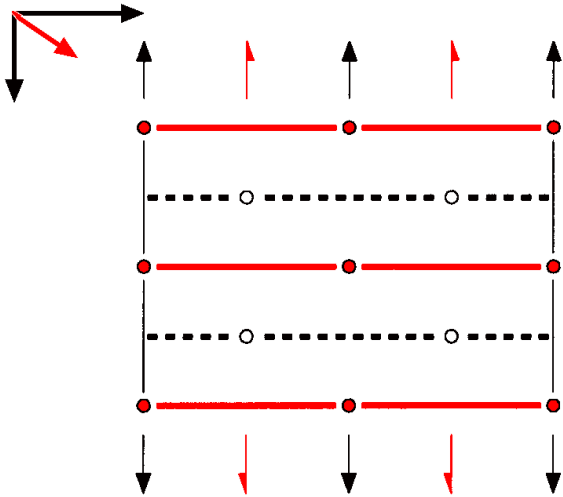
$c_p2/m'11$

No. 18.7.101

$2/m1'$

$c_p2/m'11$

Monoclinic/Rectangular



Origin at center ($2/m'$)

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|-------------|-------------------|------------------------|--------------------|
| (1) 1 | (2) $2_x 0,0,0$ | (3) $\bar{1}' 0,0,0$ | (4) $m'_y 0,y,z$ |
| $(1 0,0,0)$ | $(2_x 0,0,0)$ | $(\bar{1}' 0,0,0)'$ | $(m'_x 0,0,0)'$ |

For $(1/2,1/2,0)'$ + set

- | | | | |
|----------------------|----------------------|----------------------------|--------------------|
| (1) $t' 1/2,1/2,0$ | (2) $2'_x 1/2,0,0$ | (3) $\bar{1}' 1/4,1/4,0$ | (4) $b 0,1/2,0$ |
| $(1 1/2,1/2,0)'$ | $(2'_x 1/2,1/2,0)'$ | $(\bar{1}' 1/2,1/2,0)$ | $(m'_x 1/2,1/2,0)$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0) +$	$(1/2,1/2,0)'$ +
8 f 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]
	(3) \bar{x},\bar{y},\bar{z} [\bar{u} , \bar{v} , \bar{w}]	(4) \bar{x},y,z [\bar{u} ,v,w]
4 e m'	$0,y,z$ [0,v,w]	$0,\bar{y},\bar{z}$ [0, \bar{v} , \bar{w}]
4 d 2	$x,0,0$ [u,0,0]	$\bar{x},0,0$ [\bar{u} ,0,0]
4 c $\bar{1}$	$1/4,1/4,0$ [u,v,w]	$1/4,3/4,0$ [u, \bar{v} , \bar{w}]
2 b $2/m'$	$1/2,0,0$ [0,0,0]	
2 a $2/m'$	$0,0,0$ [0,0,0]	

Symmetry of special projections

Along [001] $c_p2m'm'$ $a^* = a$ $b^* = b_p$ Origin at 0,0,z	Along [100] $p_{2a^*}211$ $a^* = b/2$ Origin at x,0,0	Along [010] $p_{2a^*}2m'm'$ $a^* = a/2$ Origin at 0,y,0
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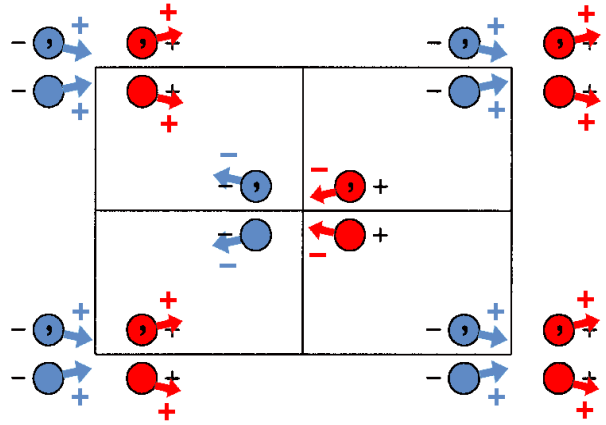
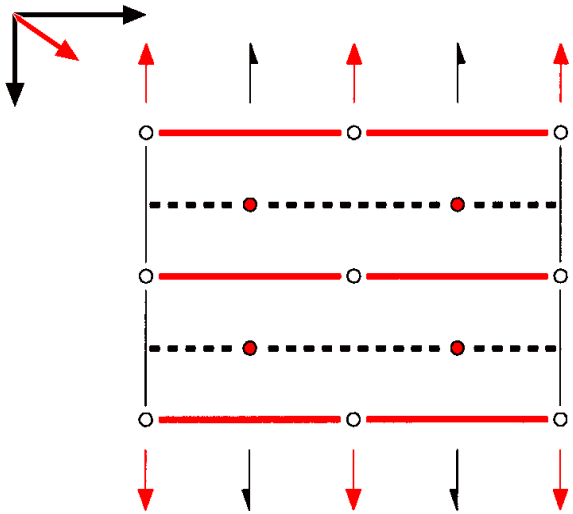
$c_p 2'/m'11$

No. 18.8.102

$2/m1'$

$c_p 2'/m'11$

Monoclinic/Rectangular



Origin at center ($2'/m'$)

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

For (0,0,0) + set

- | | | | |
|-----------|--------------------------|---------------------|------------------|
| (1) 1 | (2) $2'_x$ x,0,0 | (3) $\bar{1}$ 0,0,0 | (4) m'_z 0,y,z |
| (1 0,0,0) | (2 _x 0,0,0)' | ($\bar{1}$ 0,0,0) | (m_x 0,0,0)' |

For (1/2,1/2,0)' + set

- | | | | |
|----------------------|-----------------------------|--------------------------|-------------------------|
| (1) t' (1/2,1/2,0) | (2) 2 (1/2,0,0) x,1/4,0 | (3) $\bar{1}$ 1/4,1/4,0 | (4) b (0,1/2,0) 1/4,y,z |
| (1 1/2,1/2,0)' | (2 _x 1/2,1/2,0) | ($\bar{1}$ 1/2,1/2,0)' | (m_x 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0) +$	$(1/2,1/2,0)' +$
8 f 1	(1) $x,y,z [u,v,w]$	(2) $x,\bar{y},\bar{z} [\bar{u},v,w]$
	(3) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(4) $\bar{x},y,z [\bar{u},v,w]$
4 e m'	$0,y,z [0,v,w]$	$0,\bar{y},\bar{z} [0,v,w]$
4 d $2'$	$x,0,0 [0,v,w]$	$\bar{x},0,0 [0,v,w]$
4 c $\bar{1}'$	$1/4,1/4,0 [0,0,0]$	$1/4,3/4,0 [0,0,0]$
2 b $2'/m'$	$1/2,0,0 [0,v,w]$	
2 a $2'/m'$	$0,0,0 [0,v,w]$	

Symmetry of special projections

Along [001] $c_p 2'mm'$ $a^* = b_p a$ $b^* = -a$ Origin at $0,0,z$	Along [100] $p_{2a} 211$ $a^* = b/2$ Origin at $x,1/4,0$	Along [010] $p_{2a} 2mm$ $a^* = a/2$ Origin at $1/4,y,0$
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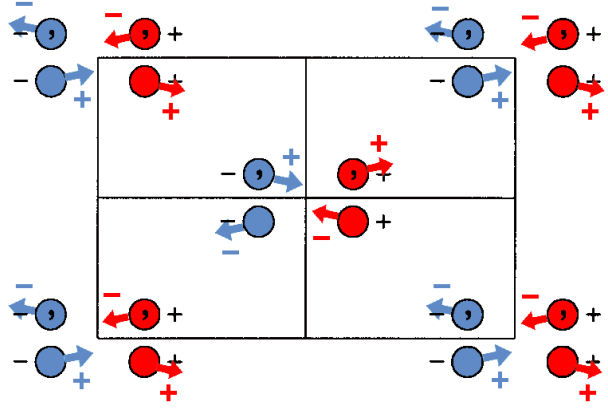
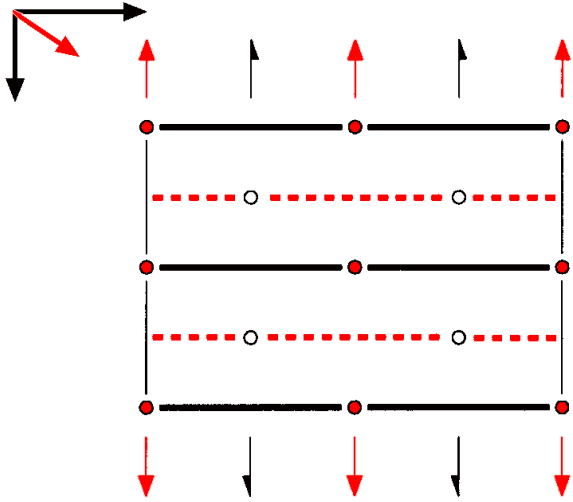
$c_p 2'/m11$

No. 18.9.103

$2/m1'$

$c_p 2'/m11$

Monoclinic/Rectangular



Origin at center ($2'/m$)

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|-------------|------------------|------------------------|-----------------|
| (1) 1 | (2) $2'$ $x,0,0$ | (3) $\bar{1}'$ $0,0,0$ | (4) m $0,y,z$ |
| $(1 0,0,0)$ | $(2_x 0,0,0)'$ | $(\bar{1} 0,0,0)'$ | $(m_x 0,0,0)$ |

For $(1/2,1/2,0)$ + set

- | | | | |
|------------------------|-------------------------------|---------------------------|--------------------------------|
| (1) t' $(1/2,1/2,0)$ | (2) 2 $(1/2,0,0)$ $x,1/4,0$ | (3) $\bar{1}$ $1/4,1/4,0$ | (4) b' $(0,1/2,0)$ $1/4,y,z$ |
| $(1 1/2,1/2,0)'$ | $(2_x 1/2,1/2,0)$ | $(\bar{1} 1/2,1/2,0)$ | $(m_x 1/2,1/2,0)'$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0) +$	$(1/2,1/2,0)' +$
8 f 1	(1) $x,y,z [u,v,w]$	(2) $x,\bar{y},\bar{z} [\bar{u},v,w]$
	(3) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(4) $\bar{x},y,z [u,\bar{v},\bar{w}]$
4 e m	$0,y,z [u,0,0]$	$0,\bar{y},\bar{z} [\bar{u},0,0]$
4 d 2'	$x,0,0 [0,v,w]$	$\bar{x},0,0 [0,\bar{v},\bar{w}]$
4 c $\bar{1}$	$1/4,1/4,0 [u,v,w]$	$1/4,3/4,0 [\bar{u},v,w]$
2 b $2'/m$	$1/2,0,0 [0,0,0]$	
2 a $2'/m$	$0,0,0 [0,0,0]$	

Symmetry of special projections

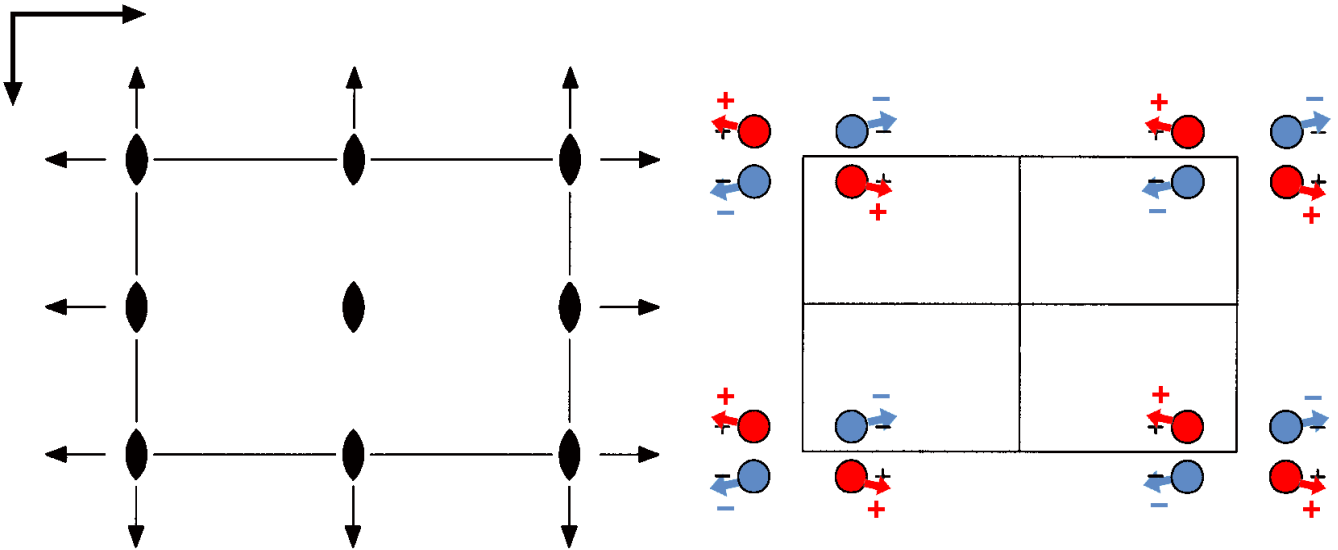
Along [001] $c_p 2mm$ $a^* = a$ $b^* = b_p$ Origin at $0,0,z$	Along [100] $p2111'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p_{2a} 2mm$ $a^* = a/2$ Origin at $0,y,0$
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p222

222
Orthorhombic/Rectangular

N0. 19.1.104

p222



Origin at 222

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 2 0,y,0
(2_y|0,0,0)

(4) 2 x,0,0
(2_x|0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1)	(2)
4 m 1	$x,y,z [u,v,w]$	$\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
	$\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	$x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
2 l ..2	$1/2,1/2,z [0,0,w]$	$1/2,1/2,\bar{z} [0,0,\bar{w}]$
2 k ..2	$0,1/2,z [0,0,w]$	$0,1/2,\bar{z} [0,0,\bar{w}]$
2 j ..2	$1/2,0,z [0,0,w]$	$1/2,0,\bar{z} [0,0,\bar{w}]$
2 i ..2	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,\bar{w}]$
2 h .2.	$1/2,y,0 [0,v,0]$	$1/2,\bar{y},0 [0,\bar{v},0]$
2 g .2.	$0,y,0 [0,v,0]$	$0,\bar{y},0 [0,\bar{v},0]$
2 f 2..	$x,1/2,0 [u,0,0]$	$\bar{x},1/2,0 [\bar{u},0,0]$
2 e 2..	$x,0,0 [u,0,0]$	$\bar{x},0,0 [\bar{u},0,0]$
1 d 222	$1/2,1/2,0 [0,0,0]$	
1 c 222	$0,1/2,0 [0,0,0]$	
1 b 222	$1/2,0,0 [0,0,0]$	
1 a 222	$0,0,0 [0,0,0]$	

Symmetry of special projections

Along [001] $p2m'm'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p2m'm'$ $a^* = b$ Origin at x,0,0	Along [010] $p2m'm'$ $a^* = a$ Origin at 0,y,0
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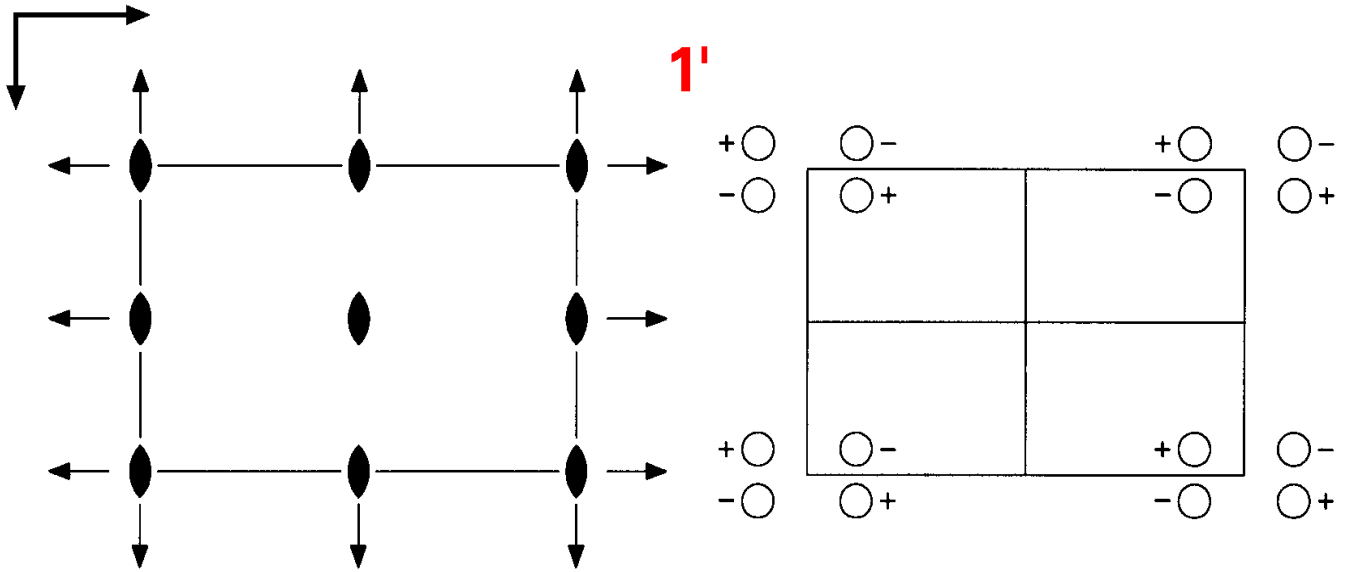
p2221'

N0. 19.2.105

2221'

p2221'

Orthorhombic/Rectangular



Origin at 2221'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For 1 + set

- | | | | |
|--------------------|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2 0,y,0
(2 _y 0,0,0) | (4) 2 x,0,0
(2 _x 0,0,0) |
|--------------------|--|--|--|

For 1' + set

- | | | | |
|----------------------|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 2' 0,y,0
(2 _y 0,0,0)' | (4) 2' x,0,0
(2 _x 0,0,0)' |
|----------------------|--|--|--|

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$1+$	$1'+$
4 m 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]
	(3) \bar{x},y,\bar{z} [0,0,0]	(4) x,\bar{y},\bar{z} [0,0,0]
2 l ..21'	$1/2,1/2,z$ [0,0,0]	$1/2,1/2,\bar{z}$ [0,0,0]
2 k ..21'	$0,1/2,z$ [0,0,0]	$0,1/2,\bar{z}$ [0,0,0]
2 j ..21'	$1/2,0,z$ [0,0,0]	$1/2,0,\bar{z}$ [0,0,0]
2 i ..21'	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]
2 h .2.1'	$1/2,y,0$ [0,0,0]	$1/2,\bar{y},0$ [0,0,0]
2 g .2.1'	$0,y,0$ [0,0,0]	$0,\bar{y},0$ [0,0,0]
2 f 2..1'	$x,1/2,0$ [0,0,0]	$\bar{x},1/2,0$ [0,0,0]
2 e 2..1'	$x,0,0$ [0,0,0]	$\bar{x},0,0$ [0,0,0]
1 d 2221'	$1/2,1/2,0$ [0,0,0]	
1 c 2221'	$0,1/2,0$ [0,0,0]	
1 b 2221'	$1/2,0,0$ [0,0,0]	
1 a 2221'	$0,0,0$ [0,0,0]	

Symmetry of special projections

Along [001] p2mm1'	Along [100] p2mm1'	Along [010] p2mm1'
$a^* = a \quad b^* = b$	$a^* = b$	$a^* = a$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

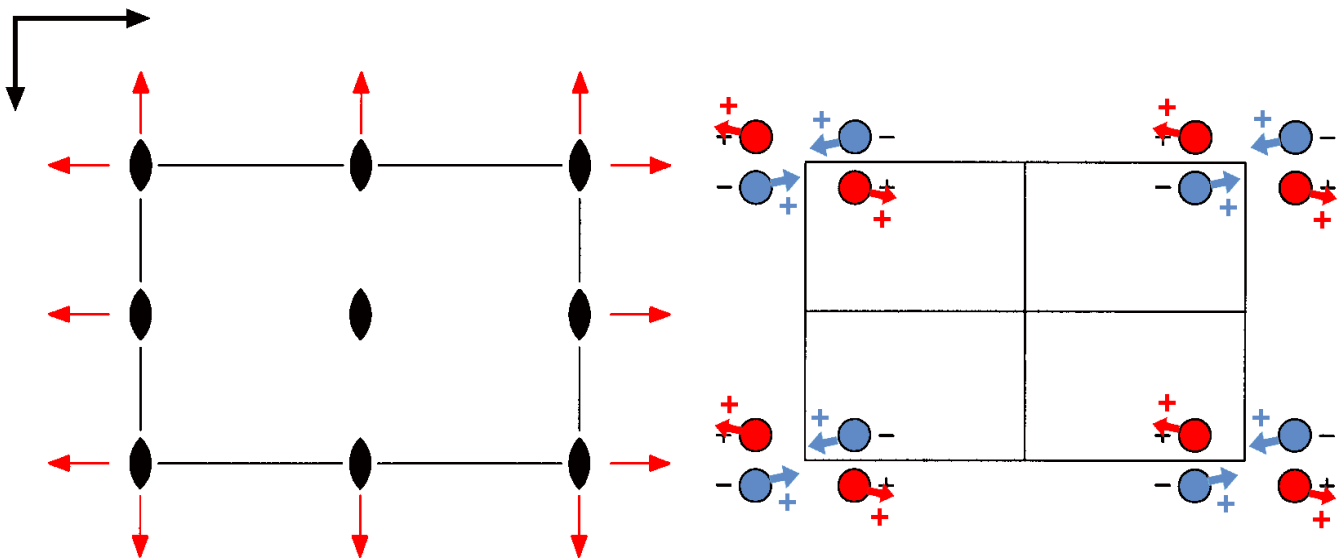
p2'2'2

N0. 19.3.106

2'2'2

p2'2'2

Orthorhombic/Rectangular



Origin at 2'2'2

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 2' 0,y,0
(2'_y|0,0,0)'

(4) 2' x,0,0
(2'_x|0,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
4 m 1	(1)	$x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
	(3)	$\bar{x},y,\bar{z} [u,\bar{v},w]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$
2 l ..2		$1/2,1/2,z [0,0,w]$	$1/2,1/2,\bar{z} [0,0,w]$
2 k ..2		$0,1/2,z [0,0,w]$	$0,1/2,\bar{z} [0,0,w]$
2 j ..2		$1/2,0,z [0,0,w]$	$1/2,0,\bar{z} [0,0,w]$
2 i ..2		$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$
2 h .2'		$1/2,y,0 [u,0,w]$	$1/2,\bar{y},0 [\bar{u},0,w]$
2 g .2'		$0,y,0 [u,0,w]$	$0,\bar{y},0 [\bar{u},0,w]$
2 f 2'..		$x,1/2,0 [0,v,w]$	$\bar{x},1/2,0 [0,\bar{v},w]$
2 e 2'..		$x,0,0 [0,v,w]$	$\bar{x},0,0 [0,\bar{v},w]$
1 d 2'2'2		$1/2,1/2,0 [0,0,w]$	
1 c 2'2'2		$0,1/2,0 [0,0,w]$	
1 b 2'2'2		$1/2,0,0 [0,0,w]$	
1 a 2'2'2		$0,0,0 [0,0,w]$	

Symmetry of special projections

Along [001] p2mm

 $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] p2'm'm

 $a^* = b$

Origin at x,0,0

Along [010] p2'm'm

 $a^* = a$

Origin at 0,y,0

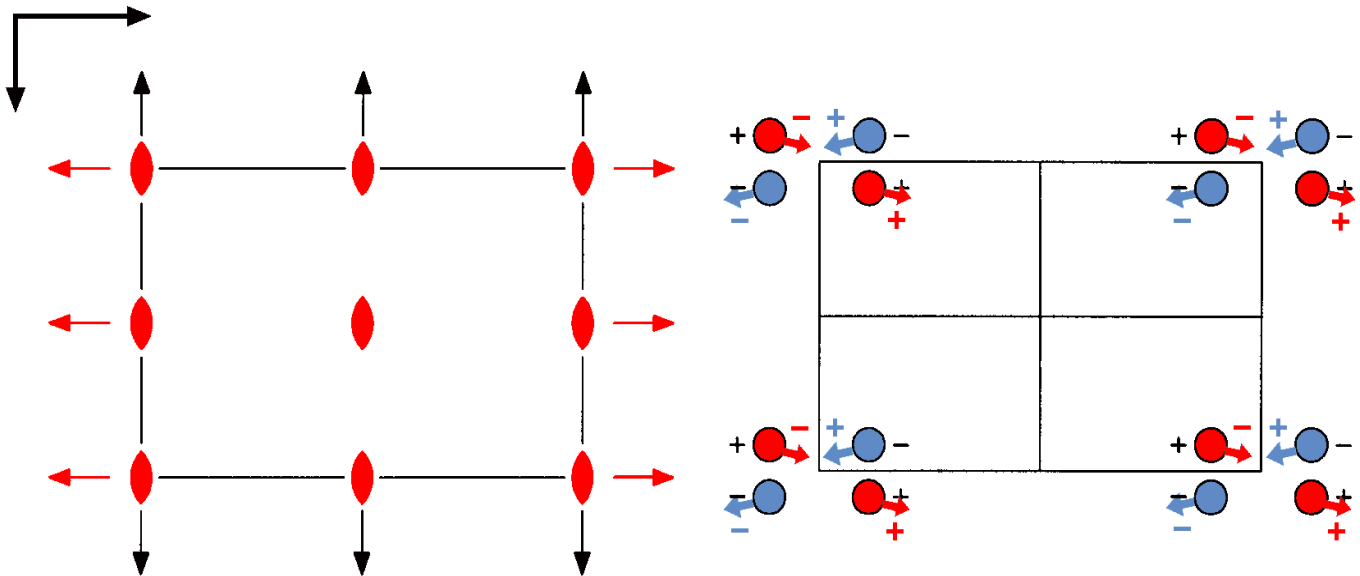
p22'2'

NO. 19.4.107

22'2'

p22'2'

Orthorhombic/Rectangular



Origin at 22'2'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 0,0,z
(2_z|0,0,0)'

(3) 2' 0,y,0
(2_y|0,0,0)'

(4) 2 x,0,0
(2_x|0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
4 m 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]	
	(3) \bar{x},y,\bar{z} [u, \bar{v} ,w]	(4) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]	
2 l ..2'	$1/2,1/2,z$ [u,v,0]	$1/2,1/2,\bar{z}$ [u, \bar{v} ,0]	
2 k ..2'	$0,1/2,z$ [u,v,0]	$0,1/2,\bar{z}$ [u, \bar{v} ,0]	
2 j ..2'	$1/2,0,z$ [u,v,0]	$1/2,0,\bar{z}$ [u, \bar{v} ,0]	
2 i ..2'	$0,0,z$ [u,v,0]	$0,0,\bar{z}$ [u, \bar{v} ,0]	
2 h .2'	$1/2,y,0$ [u,0,w]	$1/2,\bar{y},0$ [u,0, \bar{w}]	
2 g .2'	$0,y,0$ [u,0,w]	$0,\bar{y},0$ [u,0, \bar{w}]	
2 f 2..	$x,1/2,0$ [u,0,0]	$\bar{x},1/2,0$ [u,0,0]	
2 e 2..	$x,0,0$ [u,0,0]	$\bar{x},0,0$ [u,0,0]	
1 d 22'2'	$1/2,1/2,0$ [u,0,0]		
1 c 22'2'	$0,1/2,0$ [u,0,0]		
1 b 22'2'	$1/2,0,0$ [u,0,0]		
1 a 22'2'	$0,0,0$ [u,0,0]		

Symmetry of special projections

Along [001] $p2'mm'$ $a^* = a$ $b^* = b$

Origin at 0,0,z

Along [100] $p2mm$ $a^* = b$

Origin at x,0,0

Along [010] $p2'mm'$ $a^* = a$

Origin at 0,y,0

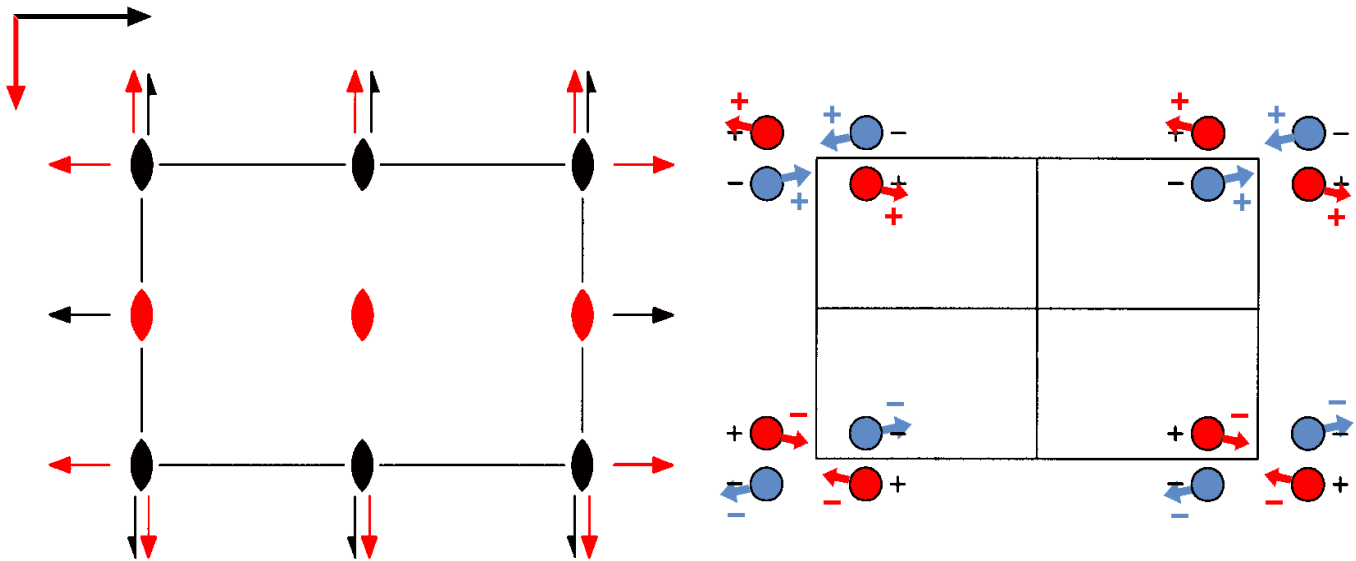
$p_{2a} 2'2'2$

NO. 19.5.108

$2221'$

$p_{2a} 2'2'2$

Orthorhombic/Rectangular



Origin at $2'2'2$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

- For $(0,0,0)$ + set
- | | | | |
|---------------|---------------------|----------------------|----------------------|
| (1) 1 | (2) $2 \quad 0,0,z$ | (3) $2' \quad 0,y,0$ | (4) $2' \quad x,0,0$ |
| (1 $0,0,0$) | (2_z $0,0,0$) | (2_y $0,0,0$)' | (2_x $0,0,0$)' |
- For $(1,0,0)'$ + set
- | | | | |
|------------------------|------------------------|-----------------------|-----------------------------------|
| (1) $t' \quad (1,0,0)$ | (2) $2' \quad 1/2,0,z$ | (3) $2 \quad 1/2,y,0$ | (4) $2 \quad (1,0,0) \quad x,0,0$ |
| (1 $1,0,0$)' | (2_z $1,0,0$)' | (2_y $1,0,0$) | (2_x $1,0,0$) |

Generators selected (1); t(1,0,0)' ; t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(1,0,0)' +
4 m 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
	(3) \bar{x},y,\bar{z} [u, \bar{v} ,w]	(4) x, \bar{y},\bar{z} [\bar{u},v,w]
2 l ..2'	1/2,1/2,z [u,v,0]	1/2,1/2, \bar{z} [$\bar{u},v,0$]
2 k ..2	0,1/2,z [0,0,w]	0,1/2, \bar{z} [0,0,w]
2 j ..2'	1/2,0,z [u,v,0]	1/2,0, \bar{z} [$\bar{u},v,0$]
2 i ..2	0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]
2 h ..2.	1/2,y,0 [0,v,0]	1/2, $\bar{y},0$ [0,v,0]
2 g ..2'.	0,y,0 [u,0,w]	0, $\bar{y},0$ [$\bar{u},0,w$]
2 f 2'..	x,1/2,0 [0,v,w]	$\bar{x},1/2,0$ [0, \bar{v},w]
2 e 2'..	x,0,0 [0,v,w]	$\bar{x},0,0$ [0, \bar{v},w]
1 d 2'22'	1/2,1/2,0 [0,v,0]	
1 c 2'2'2	0,1/2,0 [0,0,w]	
1 b 2'22'	1/2,0,0 [0,v,0]	
1 a 2'2'2	0,0,0 [0,0,w]	

Symmetry of special projections

Along [001] $p_{2a}2mm$	Along [100] $p2mm1'$	Along [010] $p_{2a}2'm'm$
$a^* = a \quad b^* = b$	$a^* = b$	$a^* = a$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

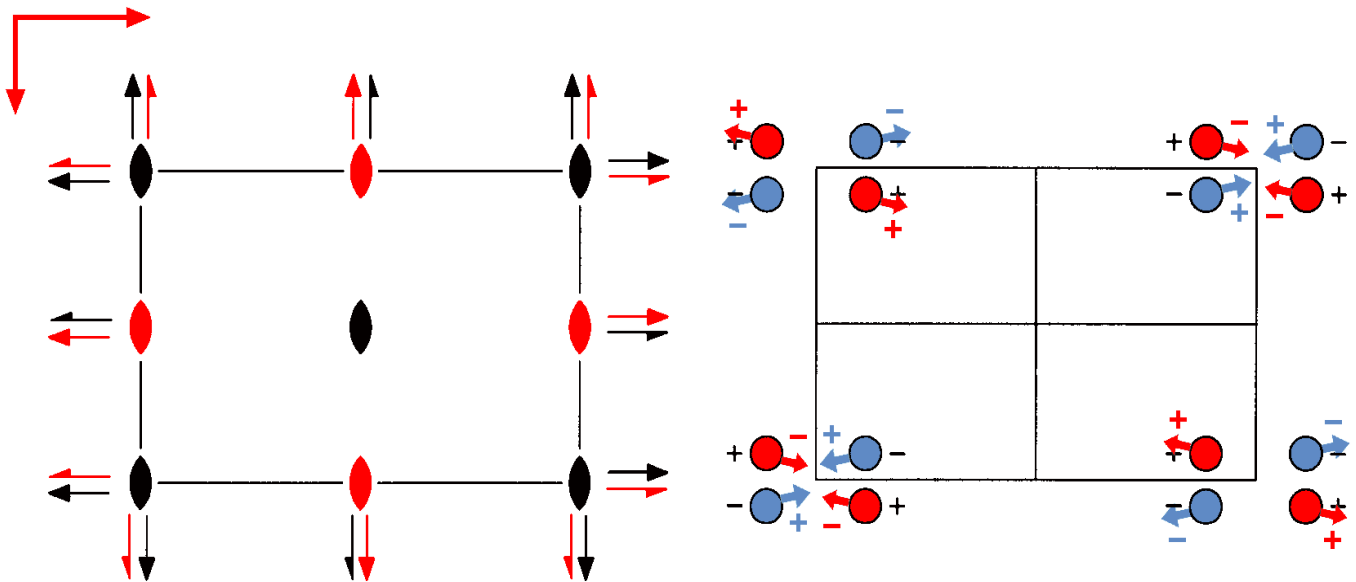
$p_c 222$

NO. 19.6.109

$2221'$

$p_c 222$

Orthorhombic/Rectangular



Origin at 222

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $2 \quad 0,0,z$	(3) $2 \quad 0,y,0$	(4) $2 \quad x,0,0$
(1 $0,0,0$)	(2_z $0,0,0$)	(2_y $0,0,0$)	(2_x $0,0,0$)

For $(0,1,0)'$ + set

(1) $t' \quad (0,1,0)$	(2) $2' \quad 0,1/2,z$	(3) $2' \quad (0,1,0) \quad 0,y,0$	(4) $2' \quad x,1/2,0$
(1 $0,1,0$)'	(2_z $0,1,0$)'	(2_y $0,1,0$)'	(2_x $0,1,0$)'

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,1,0)' +
4 m 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
	(3) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
2 l ..2	$1/2,1/2,z [0,0,w]$	$1/2,1/2,\bar{z} [0,0,w]$
2 k ..2'	$0,1/2,z [u,v,0]$	$0,1/2,\bar{z} [\bar{u},v,0]$
2 j ..2'	$1/2,0,z [u,v,0]$	$1/2,0,\bar{z} [u,\bar{v},0]$
2 i ..2	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,\bar{w}]$
2 h ..2'	$1/2,y,0 [u,0,w]$	$1/2,\bar{y},0 [u,0,\bar{w}]$
2 g ..2	$0,y,0 [0,v,0]$	$0,\bar{y},0 [0,\bar{v},0]$
2 f 2'..	$x,1/2,0 [0,v,w]$	$\bar{x},1/2,0 [0,\bar{v},w]$
2 e 2..	$x,0,0 [u,0,0]$	$\bar{x},0,0 [\bar{u},0,0]$
1 d 2'2'2	$1/2,1/2,0 [0,0,w]$	
1 c 2'2'2'	$0,1/2,0 [0,v,0]$	
1 b 22'2'	$1/2,0,0 [u,0,0]$	
1 a 222	$0,0,0 [0,0,0]$	

Symmetry of special projections

Along [001] p _c 2mm	Along [100] p2mm1'	Along [010] p2mm1'
$\mathbf{a}^* = \mathbf{a} \quad \mathbf{b}^* = \mathbf{b}$	$\mathbf{a}^* = \mathbf{b}$	$\mathbf{a}^* = \mathbf{a}$
Origin at 1/2, 1/2, z	Origin at x, 0, 0	Origin at 0, y, 0

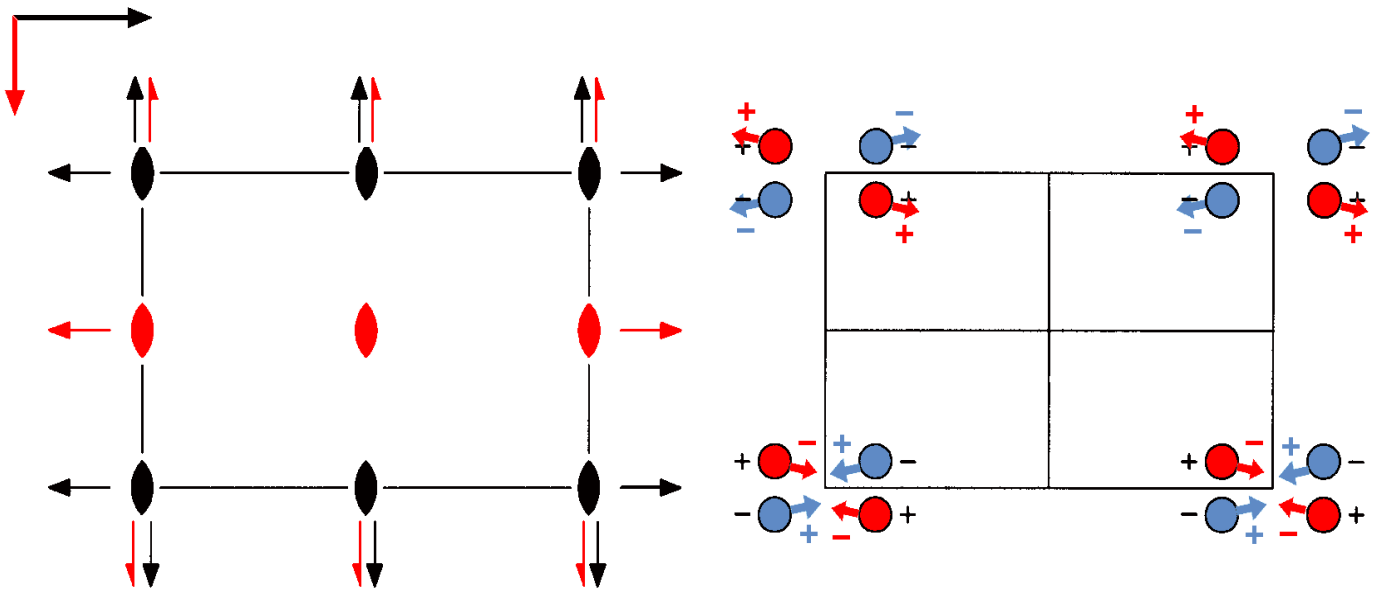
$p_{2a}222$

NO. 19.7.110

222

$p_{2a}222$

Orthorhombic/Rectangular



Origin at 222

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|-----------|-------------------------|-------------------------|-------------------------|
| (1) 1 | (2) 2 $0,0,z$ | (3) 2 $0,y,0$ | (4) 2 $x,0,0$ |
| (1 0,0,0) | (2 _z 0,0,0) | (2 _y 0,0,0) | (2 _x 0,0,0) |
- For (1,0,0)' + set
- | | | | |
|----------------|--------------------------|--------------------------|--------------------------|
| (1) t' (1,0,0) | (2) 2' $1/2,0,z$ | (3) 2' $1/2,y,0$ | (4) 2' (1,0,0) $x,0,0$ |
| (1 1,0,0)' | (2 _z 1,0,0)' | (2 _y 1,0,0)' | (2 _x 1,0,0)' |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(1,0,0)' +
4 m 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
	(3) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(4) x,\bar{y},\bar{z} [u, \bar{v},\bar{w}]
2 l ..2'	$1/2,1/2,z$ [u,v,0]	$1/2,1/2,\bar{z}$ [u, $\bar{v},0$]
2 k ..2	$0,1/2,z$ [0,0,w]	$0,1/2,\bar{z}$ [0,0, \bar{w}]
2 j ..2'	$1/2,0,z$ [u,v,0]	$1/2,0,\bar{z}$ [u, $\bar{v},0$]
2 i ..2	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0, \bar{w}]
2 h ..2'	$1/2,y,0$ [u,0,w]	$1/2,\bar{y},0$ [u,0, \bar{w}]
2 g ..2	$0,y,0$ [0,v,0]	$0,\bar{y},0$ [0, $\bar{v},0$]
2 f 2..	$x,1/2,0$ [u,0,0]	$\bar{x},1/2,0$ [$\bar{u},0,0$]
2 e 2..	$x,0,0$ [u,0,0]	$\bar{x},0,0$ [$\bar{u},0,0$]
1 d 22'2'	$1/2,1/2,0$ [u,0,0]	
1 c 222	$0,1/2,0$ [0,0,0]	
1 b 22'2'	$1/2,0,0$ [u,0,0]	
1 a 222	$0,0,0$ [0,0,0]	

Symmetry of special projections

Along [001] $p_{2a}2m'm'$	Along [100] $p2mm1'$	Along [010] $p_{2a}2m'm'$
$a^* = a$ $b^* = b$	$a^* = b$	$a^* = a$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

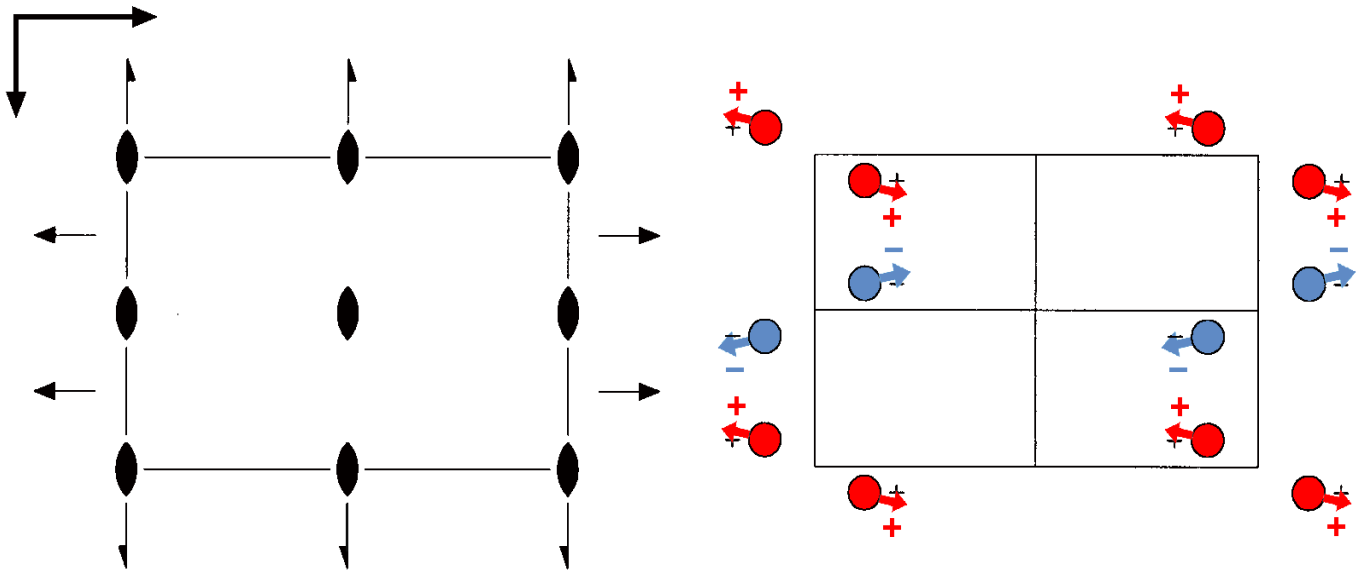
p2₁22

No. 20.1.111

222

p2₁22

Orthorhombic/Rectangular



Origin at 2₁12

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 (1/2,0,0) x,0,0
(2_x|1/2,0,0)

(3) 2 1/4,y,0
(2_y|1/2,0,0)

(4) 2 0,0,z
(2_z|0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $x+1/2,\bar{y},\bar{z}$ [u, \bar{v} , \bar{w}]
4 d 1	(3) $\bar{x}+1/2,y,\bar{z}$ [\bar{u} ,v, \bar{w}]	(4) \bar{x},\bar{y},z [\bar{u} , \bar{v} ,w]
2 c .2.	$1/4,y,0$ [0,v,0]	$3/4,\bar{y},0$ [0, \bar{v} ,0]
2 b ..2	$0,1/2,z$ [0,0,w]	$1/2,1/2,\bar{z}$ [0,0, \bar{w}]
2 a ..2	$0,0,z$ [0,0,w]	$1/2,0,\bar{z}$ [0,0, \bar{w}]

Symmetry of special projections

Along [001] $p2m'g'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p2m'm'$ $a^* = b$ Origin at x,0,0	Along [010] $p2m'g'$ $a^* = a$ Origin at 1/4,y,0
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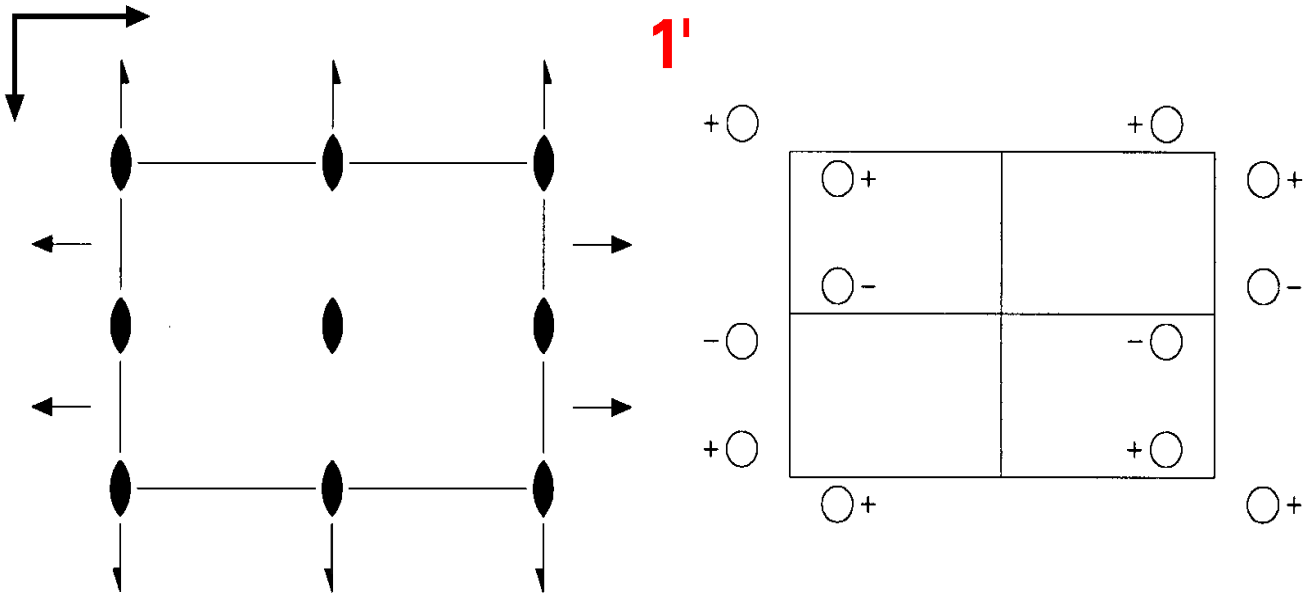
$p2_1221'$

No. 20.2.112

$2221'$

$p2_1221'$

Orthorhombic/Rectangular



Origin at $2_121'$

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- For 1 + set
- | | | | |
|--------------------|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 (1/2,0,0) $x,0,0$
(2 _x 1/2,0,0) | (3) 2 1/4,y,0
(2 _y 1/2,0,0) | (4) 2 0,0,z
(2 _z 0,0,0) |
|--------------------|--|--|--|
- For 1' + set
- | | | | |
|----------------------|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' (1/2,0,0) $x,0,0$
(2 _x 1/2,0,0)' | (3) 2' 1/4,y,0
(2 _y 1/2,0,0)' | (4) 2' 0,0,z
(2 _z 0,0,0)' |
|----------------------|--|--|--|

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 d 11'	(1) x,y,z [0,0,0]	(2) x+1/2,y,ž [0,0,0]
	(3) x̄+1/2,y,ž [0,0,0]	(4) x̄,y,z [0,0,0]
2 c .2.1'	1/4,y,0 [0,0,0]	3/4,y,0 [0,0,0]
2 b ..21'	0,1/2,z [0,0,0]	1/2,1/2,ž [0,0,0]
2 a ..21'	0,0,z [0,0,0]	1/2,0,ž [0,0,0]

Symmetry of special projections

Along [001] p2mg1'	Along [100] p2mm1'	Along [010] p2mg1'
a* = a b* = b	a* = b	a* = a
Origin at 0,0,z	Origin at x,0,0	Origin at 1/4,y,0

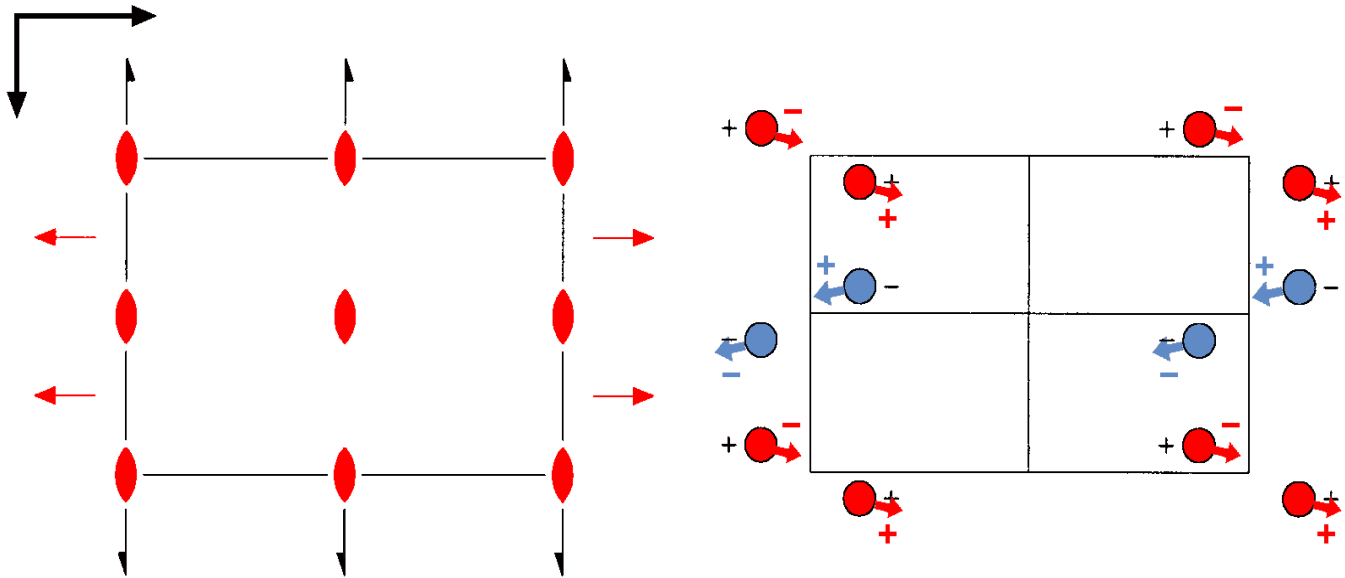
$p2_12'2'$

No. 20.3.113

$2'2'2'$

$p2_12'2'$

Orthorhombic/Rectangular



Origin at $2_112'$

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- (1) 1
 $(1|0,0,0)$
- (2) 2 $(1/2,0,0)$ $x,0,0$
 $(2_x|1/2,0,0)$
- (3) $2'$ $1/4,y,0$
 $(2_y|1/2,0,0)'$
- (4) $2'$ $0,0,z$
 $(2_z|0,0,0)'$

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
4 d 1	(1) x,y,z [u,v,w]	(2) x+1/2,ȳ,z̄ [u,v,w̄]	
	(3) x̄+1/2,y,z̄ [u,v̄,w]	(4) x̄,ȳ,z [u,v,w̄]	
2 c ..2'	1/4,y,0 [u,0,w]	3/4,ȳ,0 [u,0,w̄]	
2 b ..2'	0,1/2,z [u,v,0]	1/2,1/2,z̄ [u,v̄,0]	
2 a ..2'	0,0,z [u,v,0]	1/2,0,z̄ [u,v̄,0]	

Symmetry of special projections

Along [001] p2'mg'	Along [100] p2mm	Along [010] p2'mg'
a* = a b* = b	a* = b	a* = a
Origin at 0,0,z	Origin at x,0,0	Origin at 1/4,y,0

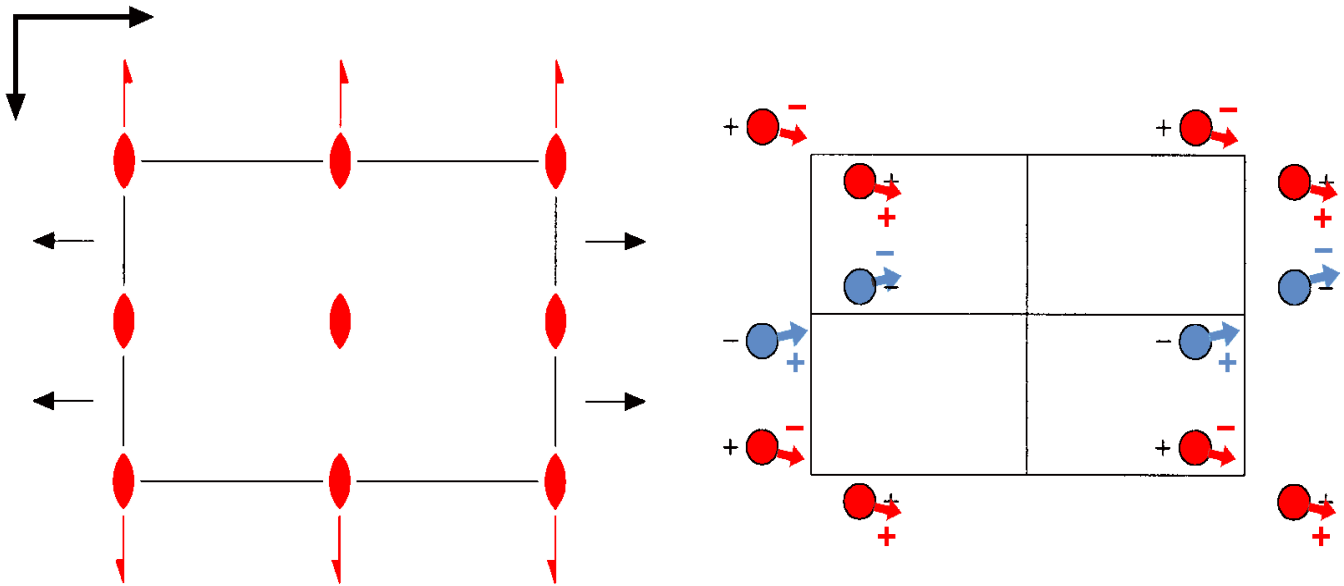
$p2_1'22'$

No. 20.4.114

$2'22'$

$p2_1'22'$

Orthorhombic/Rectangular



Origin at $2_1'12'$

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) $2'$ $(1/2,0,0)$ $x,0,0$
(2_x | $1/2,0,0$)'
- (3) 2 $1/4,y,0$
(2_y | $1/2,0,0$)
- (4) $2'$ $0,0,z$
(2_z | $0,0,0$)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x, y, z [u, v, w]	(2) $x + 1/2, \bar{y}, \bar{z}$ [\bar{u} , v, w]
4 d 1	(3) $\bar{x} + 1/2, y, \bar{z}$ [\bar{u} , v, \bar{w}]	(4) \bar{x}, \bar{y}, z [u, v, \bar{w}]
2 c .2.	$1/4, y, 0$ [0, v, 0]	$3/4, \bar{y}, 0$ [0, v, 0]
2 b ..2'	$0, 1/2, z$ [u, v, 0]	$1/2, 1/2, \bar{z}$ [\bar{u} , v, 0]
2 a ..2'	$0, 0, z$ [u, v, 0]	$1/2, 0, \bar{z}$ [\bar{u} , v, 0]

Symmetry of special projections

Along [001] $p2'm'g$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p2'mm'$ $a^* = b$ Origin at x,0,0	Along [010] $p2mg$ $a^* = a$ Origin at 1/4,y,0
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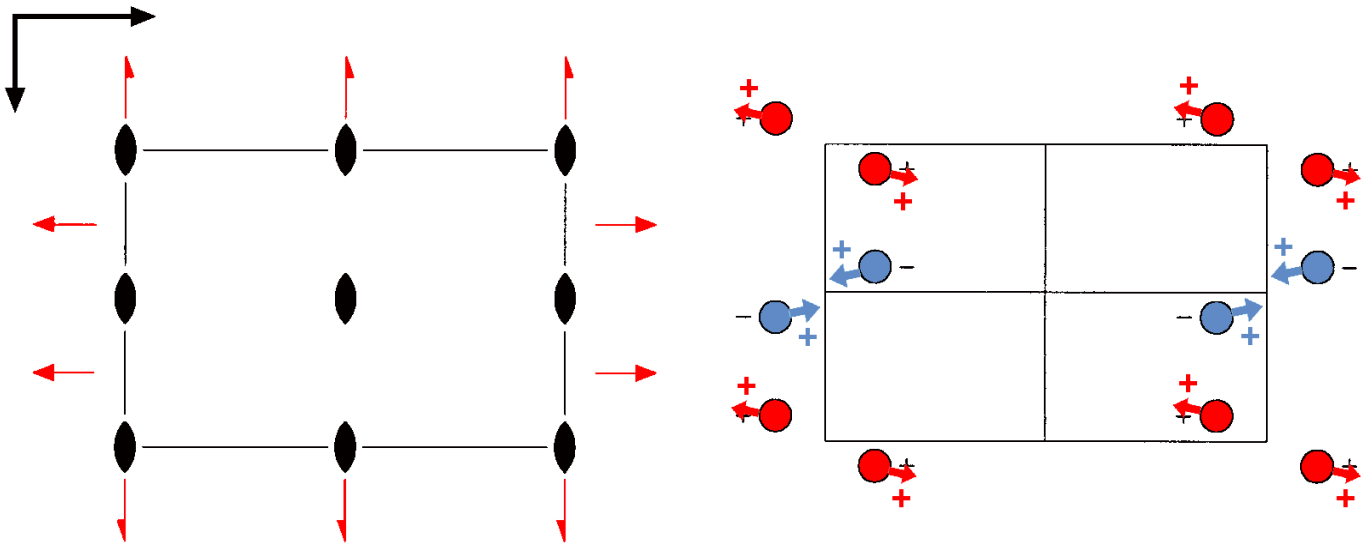
$p2_1'2'2'$

No. 20.5.115

$2'2'2'$

$p2_1'2'2'$

Orthorhombic/Rectangular



Origin at $2_1'12'$

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'$ $(1/2,0,0)$ $x,0,0$
(2_x | $1/2,0,0$)'

(3) $2'$ $1/4,y,0$
(2_y | $1/2,0,0$)'

(4) 2 $0,0,z$
(2_z | $0,0,0$)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x, y, z [u,v,w]	(2) $x+1/2, \bar{y}, \bar{z}$ [\bar{u}, v, w]
4 d 1	(3) $\bar{x}+1/2, y, \bar{z}$ [u, \bar{v} ,w]	(4) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]
2 c .2'	1/4,y,0 [u,0,w]	3/4, \bar{y} ,0 [$\bar{u}, 0, w$]
2 b ..2	0,1/2,z [0,0,w]	1/2,1/2, \bar{z} [0,0,w]
2 a ..2	0,0,z [0,0,w]	1/2,0, \bar{z} [0,0,w]

Symmetry of special projections

Along [001] p2mg $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p2'm'm $a^* = b$ Origin at x,0,0	Along [010] p2'm'g $a^* = a$ Origin at 1/4,y,0
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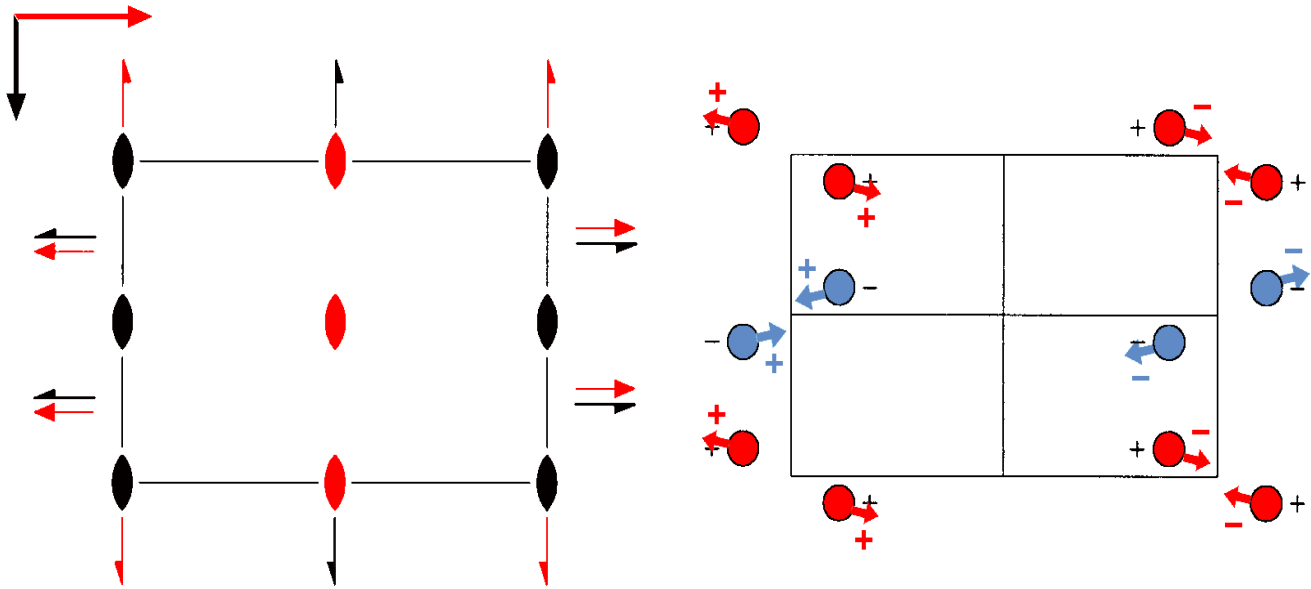
$p_{2b} 2_1'2'2'$

2221'

Orthorhombic/Rectangular

No. 20.6.116

$p_{2b} 2_1'2'2'$



Origin at $2_1'12$

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $2' (1/2,0,0)$	$x,0,0$	(3) $2' 1/4,y,0$	(4) 2 $0,0,z$
(1 $0,0,0$)	(2_x $1/2,0,0$)'		(2_y $1/2,0,0$)'	(2_z $0,0,0$)

For $(0,1,0)'$ + set

(1) $t' (0,1,0)$	(2) 2 $(1/2,0,0)$	$x,1/2,0$	(3) 2 $(0,1,0) 1/4,y,0$	(4) $2' 0,1/2,z$
(1 $0,1,0$)'	(2_x $1/2,1,0$)		(2_y $1/2,1,0$)	(2_z $0,1,0$)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(0,1,0)'+$
4 d 1	(1) $x,y,z [u,v,w]$ (3) $\bar{x}+1/2,y,\bar{z} [u,\bar{v},w]$	(2) $x+1/2,\bar{y},\bar{z} [\bar{u},v,w]$ (4) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
2 c .2'	$1/4,y,0 [u,0,w]$	$3/4,\bar{y},0 [\bar{u},0,w]$
2 b ..2'	$0,1/2,z [u,v,0]$	$1/2,1/2,\bar{z} [u,\bar{v},0]$
2 a ..2	$0,0,z [0,0,w]$	$1/2,0,\bar{z} [0,0,w]$

Symmetry of special projections

Along [001] $p_{2b}2mg$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p_{2a}2m'm'$ $a^* = b$ Origin at x,0,0	Along [010] $p2mg1'$ $a^* = a$ Origin at 1/4,y,0
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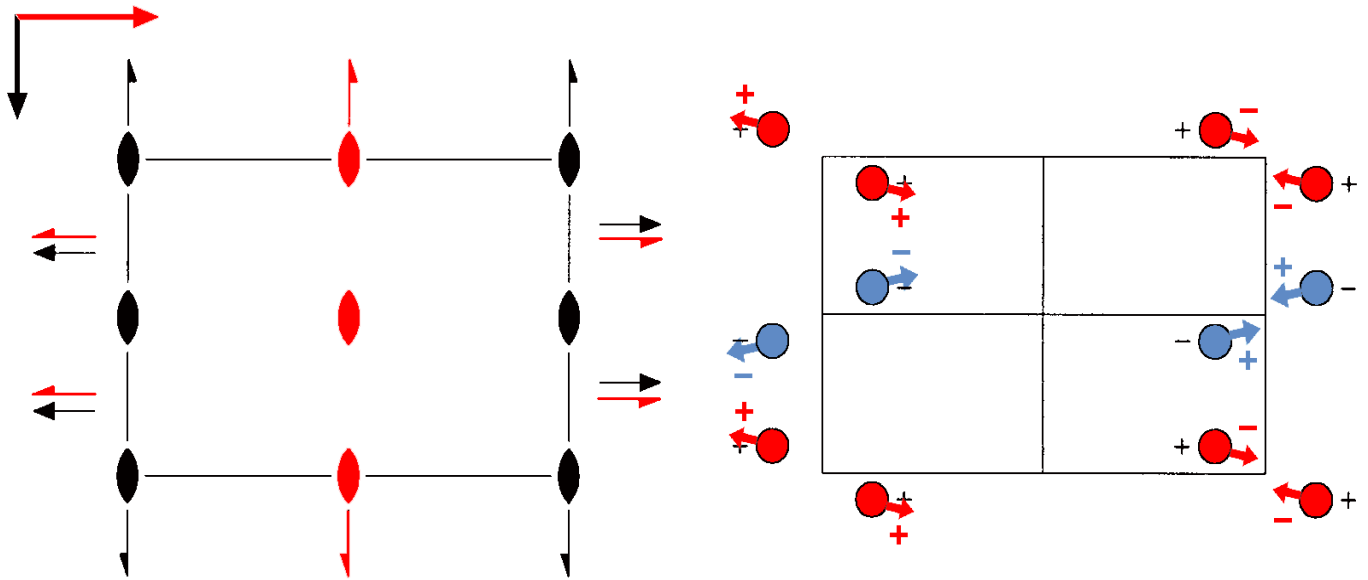
$p_{2b} 2_1 22$

No. 20.7.117

2221'

$p_{2b} 2_1 22$

Orthorhombic/Rectangular



Origin at $2_1 12$

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) 2 $(1/2,0,0)$ $x,0,0$	(3) 2 $1/4,y,0$	(4) 2 $0,0,z$
$(1 0,0,0)$	$(2_x 1/2,0,0)$	$(2_y 1/2,0,0)$	$(2_z 0,0,0)$

For $(0,1,0)'$ + set

(1) t' $(0,1,0)$	(2) $2'$ $(1/2,0,0)$ $x,1/2,0$	(3) $2'$ $(0,1,0)$ $1/4,y,0$	(4) $2'$ $0,1/2,z$
$(1 0,1,0)'$	$(2_x 1/2,1,0)'$	$(2_y 1/2,1,0)'$	$(2_z 0,1,0)'$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,1,0)' +
4 d 1	(1) x,y,z [u,v,w] (3) $\bar{x}+1/2,y,\bar{z}$ [\bar{u},v,\bar{w}]	(2) $x+1/2,\bar{y},\bar{z}$ [u, \bar{v},\bar{w}] (4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
2 c .2.	$1/4,y,0$ [0,v,0]	$3/4,\bar{y},0$ [0, $\bar{v},0$]
2 b ..2'	$0,1/2,z$ [u,v,0]	$1/2,1/2,\bar{z}$ [$\bar{u},v,0$]
2 a ..2	$0,0,z$ [0,0,w]	$1/2,0,\bar{z}$ [0,0, \bar{w}]

Symmetry of special projections

Along [001] $p_{2b}2m'g'$	Along [100] $p_{2a}2m'm'$	Along [010] $p2mg1'$
$a^* = a$ $b^* = b$	$a^* = b$	$a^* = a$
Origin at 0,0,z	Origin at x,0,0	Origin at 1/4,y,0

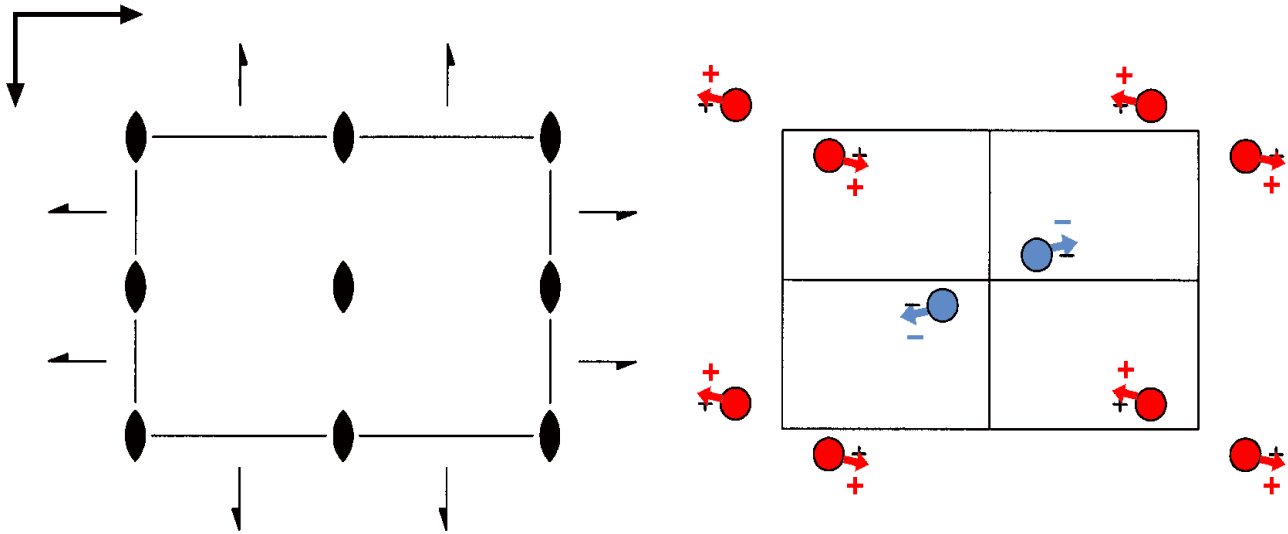
$p2_12_12$

222

Orthorhombic/Rectangular

No. 21.1.118

$p2_12_12$



Origin at intersection of 2 with perpendicular plane containing 2_1 axes

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $0,0,z$
(2_z |0,0,0)

(3) 2 $(0,1/2,0)$ $1/4,y,0$
(2_y | $1/2,1/2,0$)

(4) 2 $(1/2,0,0)$ $x,1/4,0$
(2_x | $1/2,1/2,0$)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x, y, z [u,v,w]	(2) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]
4 c 1	(3) $\bar{x} + 1/2, y + 1/2, \bar{z}$ [\bar{u}, v, \bar{w}]	(4) $x + 1/2, \bar{y} + 1/2, \bar{z}$ [u, \bar{v}, \bar{w}]
2 b ..2	0, 1/2, z [0, 0, w]	1/2, 0, \bar{z} [0, 0, \bar{w}]
2 a ..2	0, 0, z [0, 0, w]	1/2, 1/2, \bar{z} [0, 0, \bar{w}]

Symmetry of special projections

Along [001] p2g'g'	Along [100] p2m'g'	Along [010] p2m'g'
$a^* = a$ $b^* = b$	$a^* = b$	$a^* = a$
Origin at 0, 0, z	Origin at x, 1/4, 0	Origin at 1/4, y, 0

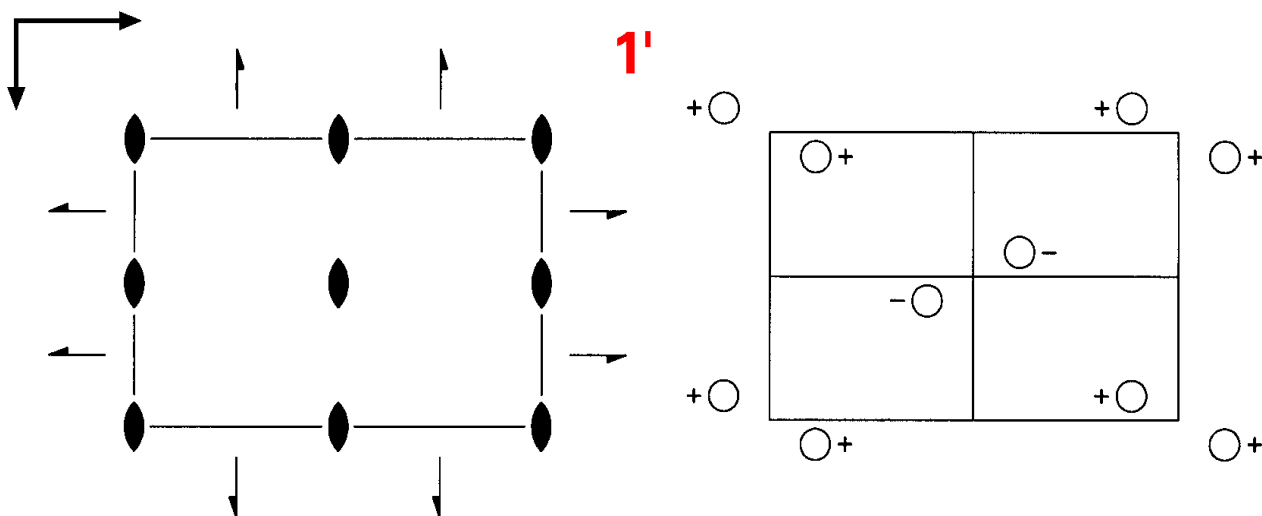
$p2_12_12_1'$

2221'

Orthorhombic/Rectangular

No. 21.2.119

$p2_12_12_1'$



Origin at intersection of $2_1'$ with perpendicular plane containing $2_1'$ axes

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For 1 + set

(1) 1	(2) $2 \quad 0,0,z$	(3) $2 \quad (0,1/2,0) \quad 1/4,y,0$	(4) $2 \quad (1/2,0,0) \quad x,1/4,0$
$(1 0,0,0)$	$(2_z 0,0,0)$	$(2_y 1/2,1/2,0)$	$(2_x 1/2,1/2,0)$

For 1' + set

(1) 1'	(2) $2' \quad 0,0,z$	(3) $2' \quad (0,1/2,0) \quad 1/4,y,0$	(4) $2' \quad (1/2,0,0) \quad x,1/4,0$
$(1 0,0,0)'$	$(2_z 0,0,0)'$	$(2_y 1/2,1/2,0)'$	$(2_x 1/2,1/2,0)'$

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 c 11'	(1) x,y,z [0,0,0] (3) $\bar{x}+1/2,y+1/2,\bar{z}$ [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0] (4) $x+1/2,\bar{y}+1/2,\bar{z}$ [0,0,0]
2 b ..21'	0,1/2,z [0,0,0]	1/2,0, \bar{z} [0,0,0]
2 a ..21'	0,0,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]

Symmetry of special projections

Along [001] p2gg1' $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p2mg1' $a^* = b$ Origin at x,1/4,0	Along [010] p2mg1' $a^* = a$ Origin at 1/4,y,0
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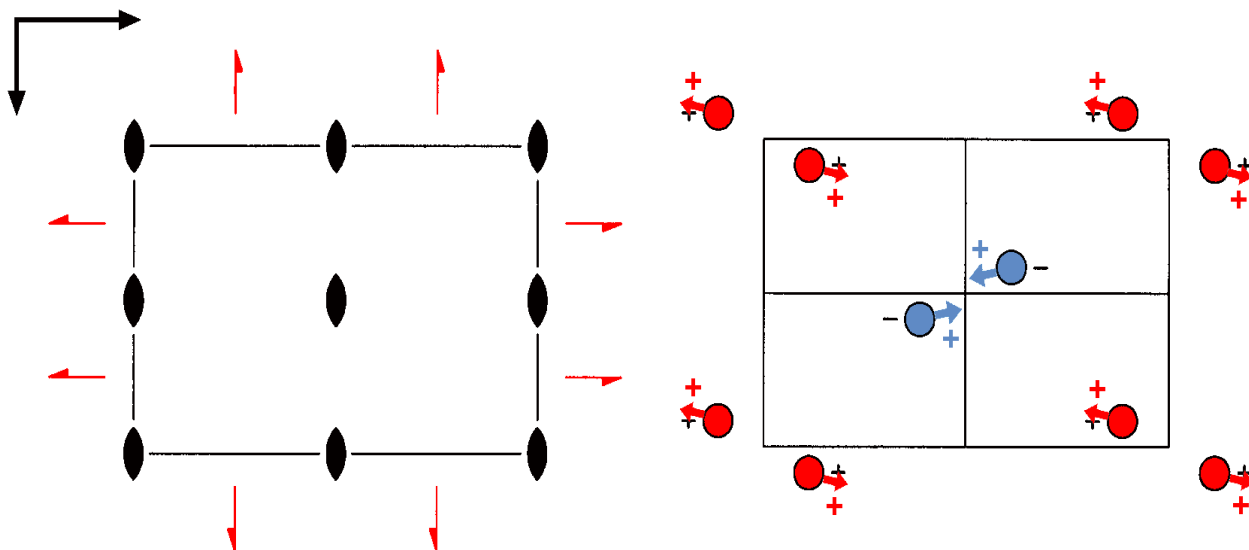
$p2_1'2_1'2$

$2'2'2$

Orthorhombic/Rectangular

No. 21.3.120

$p2_1'2_1'2$



Origin at intersection of 2 with perpendicular plane containing $2_1'$ axes

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $0,0,z$
(2_z |0,0,0)

(3) $2'$ $(0,1/2,0)$ $1/4,y,0$
(2_y | $1/2,1/2,0$)'

(4) $2'$ $(1/2,0,0)$ $x,1/4,0$
(2_x | $1/2,1/2,0$)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x, y, z [u,v,w]	(2) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]
4 c 1	(3) $\bar{x} + 1/2, y + 1/2, \bar{z}$ [u, \bar{v} ,w]	(4) $x + 1/2, \bar{y} + 1/2, \bar{z}$ [\bar{u}, v, w]
2 b ..2	0, 1/2, z [0,0,w]	1/2, 0, \bar{z} [0,0,w]
2 a ..2	0, 0, z [0,0,w]	1/2, 1/2, \bar{z} [0,0,w]

Symmetry of special projections

Along [001] p2gg $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p2'm'g $a^* = b$ Origin at x, 1/4, 0	Along [010] p2'm'g $a^* = a$ Origin at 1/4, y, 0
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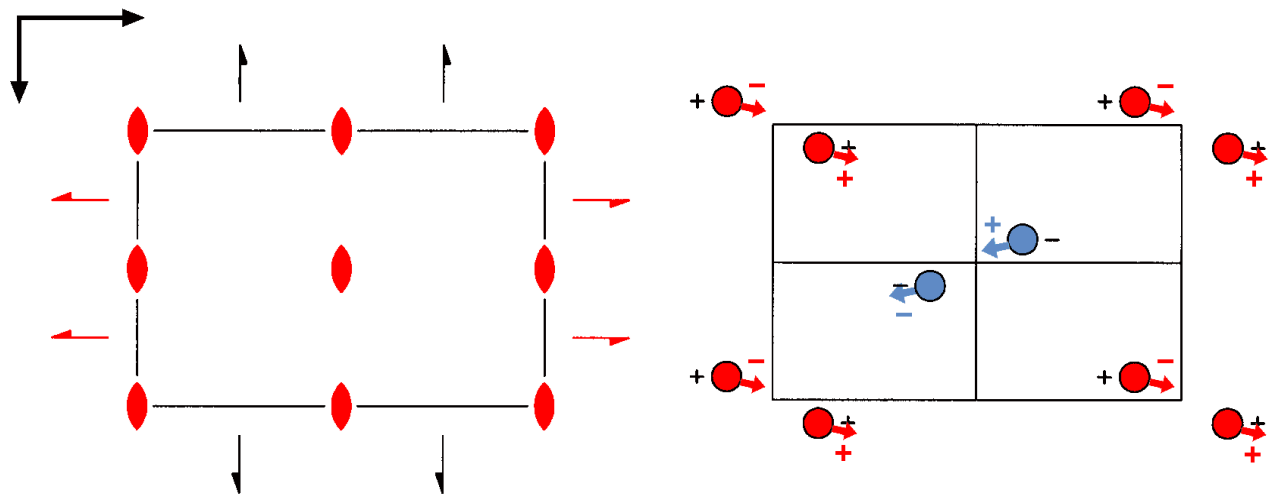
$p2_12_1'2'$

$22'2'$

Orthorhombic/Rectangular

No. 21.4.121

$p2_12_1'2'$



Origin at intersection of $2'$ with perpendicular plane containing 2_1 axes

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'$ 0,0,z
(2_z |0,0,0)'

(3) $2'$ (0,1/2,0) $1/4,y,0$
(2_y |1/2,1/2,0)'

(4) 2 (1/2,0,0) $x,1/4,0$
(2_x |1/2,1/2,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x, y, z [u,v,w]	(2) \bar{x}, \bar{y}, z [u,v, \bar{w}]
4 c 1	(3) $\bar{x} + 1/2, y + 1/2, \bar{z}$ [u, \bar{v} ,w]	(4) $x + 1/2, \bar{y} + 1/2, \bar{z}$ [u, \bar{v}, \bar{w}]
2 b ..2'	0, 1/2, z [u,v,0]	1/2, 0, \bar{z} [u, \bar{v} ,0]
2 a ..2'	0, 0, z [u,v,0]	1/2, 1/2, \bar{z} [u, \bar{v} ,0]

Symmetry of special projections

Along [001] p2'gg' $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p2mg $a^* = b$ Origin at x, 1/4, 0	Along [010] p2'mg' $a^* = a$ Origin at 1/4, y, 0
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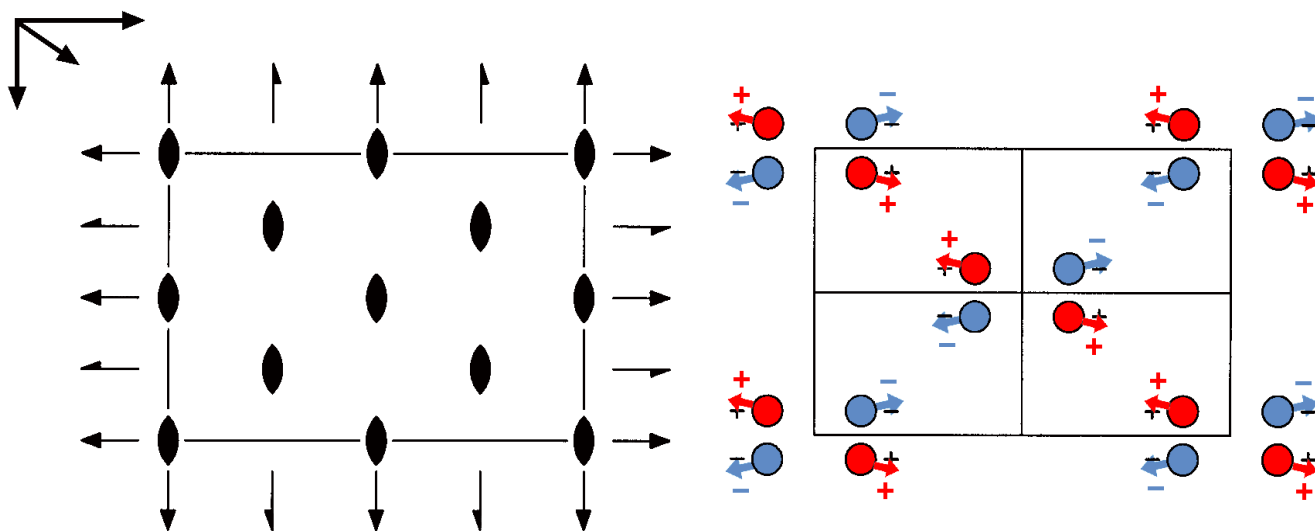
c222

222

Orthorhombic/Rectangular

No. 22.1.122

c222



Origin at 222

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|-----------|-------------------------|-------------------------|-------------------------|
| (1) 1 | (2) 2 $0,0,z$ | (3) 2 $0,y,0$ | (4) 2 $x,0,0$ |
| (1 0,0,0) | (2 _z 0,0,0) | (2 _y 0,0,0) | (2 _x 0,0,0) |
- For (1/2,1/2,0) + set
- | | | | |
|---------------------|-----------------------------|-----------------------------|-----------------------------|
| (1) t $(1/2,1/2,0)$ | (2) 2 $1/4,1/4,z$ | (3) 2 $(0,1/2,0)$ | (4) 2 $(1/2,0,0)$ |
| (1 1/2,1/2,0) | (2 _z 1/2,1/2,0) | (2 _y 1/2,1/2,0) | (2 _x 1/2,1/2,0) |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0) +	(1/2,1/2,0) +
8	h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
		(3) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(4) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]
4	g ..2	1/4,1/4,z [0,0,w]	3/4,1/4, \bar{z} [0,0, \bar{w}]
4	f ..2	0,1/2,z [0,0,w]	0,1/2, \bar{z} [0,0, \bar{w}]
4	e ..2	0,0,z [0,0,w]	0,0, \bar{z} [0,0, \bar{w}]
4	d .2.	0,y,0 [0,v,0]	0, \bar{y} ,0 [0, \bar{v} ,0]
4	c 2..	x,0,0 [u,0,0]	\bar{x} ,0,0 [\bar{u} ,0,0]
2	b 222	0,1/2,0 [0,0,0]	
2	a 222	0,0,0 [0,0,0]	

Symmetry of special projections

Along [001] c2m'm'	Along [100] p2m'm'	Along [010] p2m'm'
$a^* = a$ $b^* = b$	$a^* = b/2$	$a^* = a/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

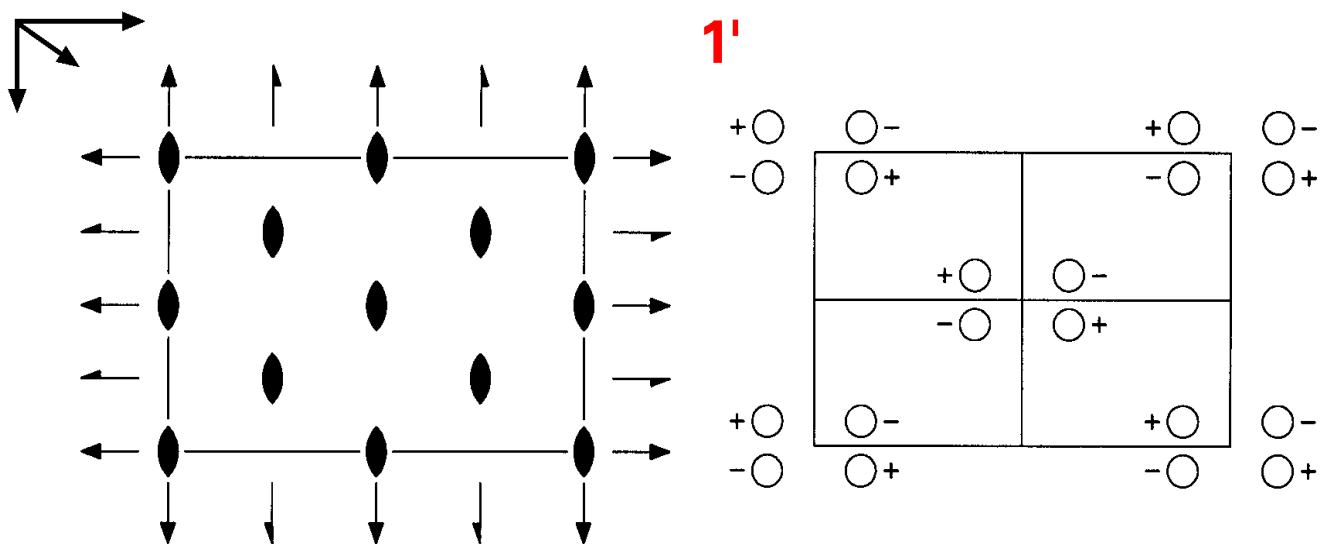
c2221'

2221'

Orthorhombic/Rectangular

No. 22.2.123

c2221'



Origin at 2221'

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|-----------|-------------------------|-------------------------|-------------------------|
| (1) 1 | (2) 2 0,0,z | (3) 2 0,y,0 | (4) 2 x,0,0 |
| (1 0,0,0) | (2 _z 0,0,0) | (2 _y 0,0,0) | (2 _x 0,0,0) |
- For (1/2,1/2,0) + set
- | | | | |
|-------------------|-----------------------------|-----------------------------|-----------------------------|
| (1) t (1/2,1/2,0) | (2) 2 1/4,1/4,z | (3) 2 (0,1/2,0) 1/4,y,0 | (4) 2 (1/2,0,0) x,1/4,0 |
| (1 1/2,1/2,0) | (2 _z 1/2,1/2,0) | (2 _y 1/2,1/2,0) | (2 _x 1/2,1/2,0) |
- For (0,0,0)' + set
- | | | | |
|------------|--------------------------|--------------------------|--------------------------|
| (1) 1' | (2) 2' 0,0,z | (3) 2' 0,y,0 | (4) 2' x,0,0 |
| (1 0,0,0)' | (2 _z 0,0,0)' | (2 _y 0,0,0)' | (2 _x 0,0,0)' |
- For (1/2,1/2,0)' + set
- | | | | |
|--------------------|------------------------------|------------------------------|------------------------------|
| (1) t' (1/2,1/2,0) | (2) 2' 1/4,1/4,z | (3) 2' (0,1/2,0) 1/4,y,0 | (4) 2' (1/2,0,0) x,1/4,0 |
| (1 1/2,1/2,0)' | (2 _z 1/2,1/2,0)' | (2 _y 1/2,1/2,0)' | (2 _x 1/2,1/2,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2); (3); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0) +$	$(1/2,1/2,0) +$
	$(0,0,0)'$ +	$(1/2,1/2,0)'$ +
8 h 11'	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$
	(3) $\bar{x},y,\bar{z} [0,0,0]$	(4) $x,\bar{y},\bar{z} [0,0,0]$
4 g ..21'	$1/4,1/4,z [0,0,0]$	$3/4,1/4,\bar{z} [0,0,0]$
4 f ..21'	$0,1/2,z [0,0,0]$	$0,1/2,\bar{z} [0,0,0]$
4 e ..21'	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$
4 d .2.1'	$0,y,0 [0,0,0]$	$0,\bar{y},0 [0,0,0]$
4 c 2..1'	$x,0,0 [0,0,0]$	$\bar{x},0,0 [0,0,0]$
2 b 2221'	$0,1/2,0 [0,0,0]$	
2 a 2221'	$0,0,0 [0,0,0]$	

Symmetry of special projections

Along [001] $c2mm1'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2mm1'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p2mm1'$ $a^* = a/2$ Origin at $0,y,0$
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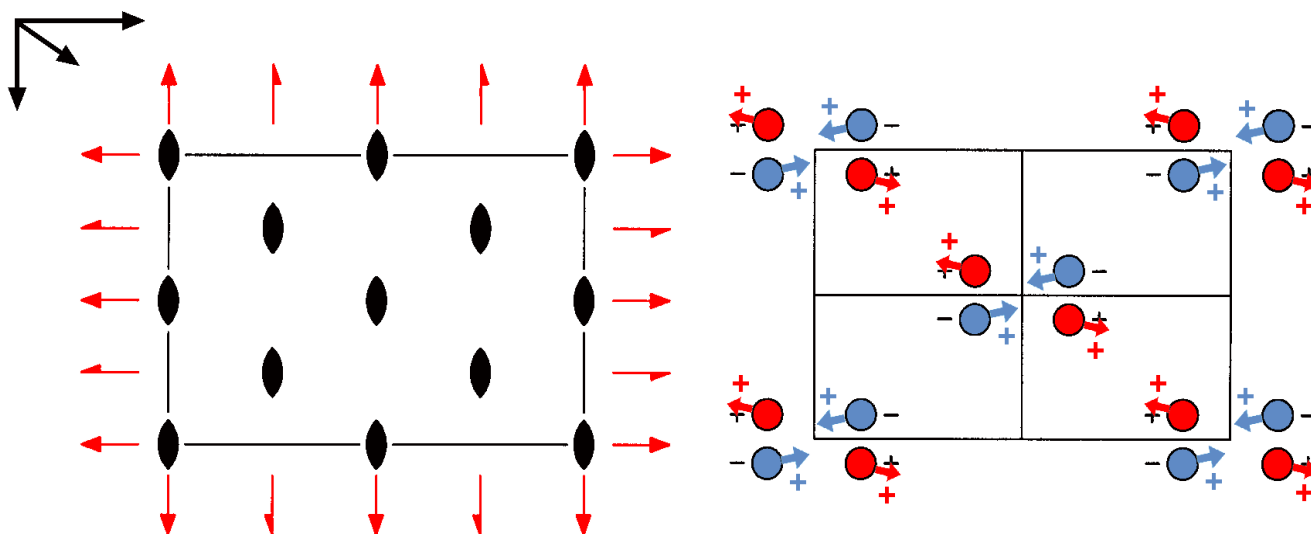
c2'2'2

2'2'2

Orthorhombic/Rectangular

No. 22.3.124

c2'2'2



Origin at 2'2'2

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|-----------|-------------------------|---------------------------|---------------------------|
| (1) 1 | (2) 2 | (3) 2' | (4) 2' |
| (1 0,0,0) | (2 _z 0,0,0) | (2' _y 0,0,0)' | (2' _x 0,0,0)' |
- For (1/2,1/2,0) + set
- | | | | |
|---------------|-----------------------------|------------------------------------|---------------------------------------|
| (1) t | (2) 2 | (3) 2' | (4) 2' |
| (1 1/2,1/2,0) | (2 _z 1/2,1/2,0) | (2' _y 0,1/2,0) 1/4,y,0 | (2' _x 1/2,1/2,0)' x,1/4,0 |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	(1/2,1/2,0) +
8 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
	(3) \bar{x},y,\bar{z} [u,\bar{v},w]	(4) x,\bar{y},\bar{z} [\bar{u},v,w]
4 g ..2	1/4,1/4,z [0,0,w]	3/4,1/4, \bar{z} [0,0,w]
4 f ..2	0,1/2,z [0,0,w]	0,1/2, \bar{z} [0,0,w]
4 e ..2	0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]
4 d .2'	0,y,0 [u,0,w]	0, \bar{y} ,0 [\bar{u} ,0,w]
4 c 2'..	x,0,0 [0,v,w]	\bar{x} ,0,0 [0, \bar{v} ,w]
2 b 2'2'2	0,1/2,0 [0,0,w]	
2 a 2'2'2	0,0,0 [0,0,w]	

Symmetry of special projections

Along [001] c2mm $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p2'm'm $a^* = b/2$ Origin at x,0,0	Along [010] p2'm'm $a^* = a/2$ Origin at 0,y,0
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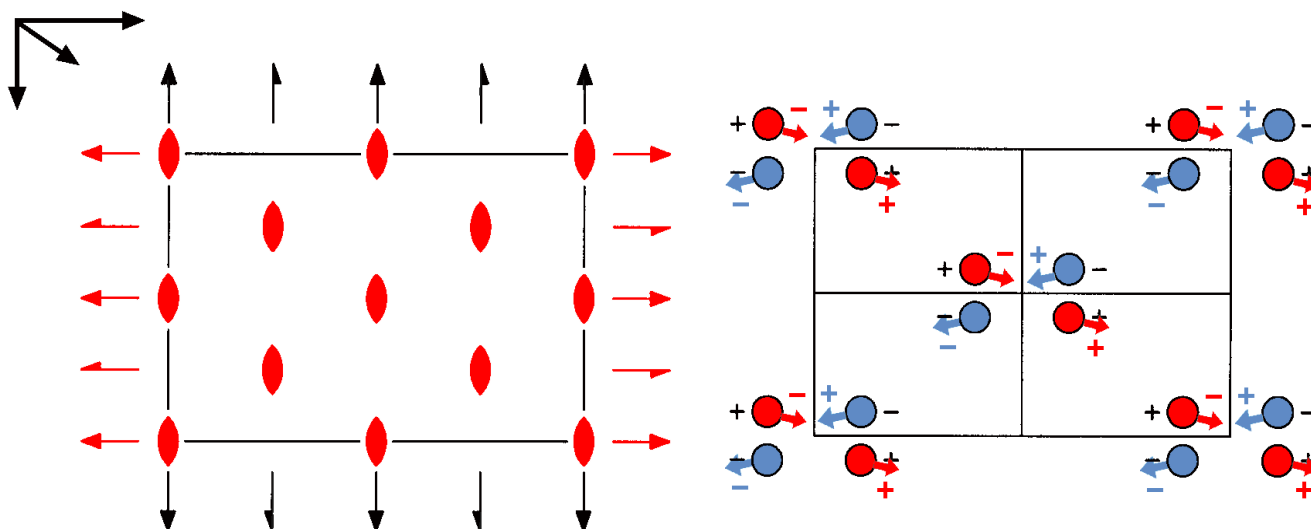
c22'2'

22'2'

Orthorhombic/Rectangular

No. 22.4.125

c22'2'



Origin at 22'2'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

For (0,0,0) + set

- | | | | |
|-----------|--------------------------|--------------------------|-------------------------|
| (1) 1 | (2) 2' 0,0,z | (3) 2' 0,y,0 | (4) 2 x,0,0 |
| (1 0,0,0) | (2 _z 0,0,0)' | (2 _y 0,0,0)' | (2 _x 0,0,0) |

For (1/2,1/2,0) + set

- | | | | |
|-------------------|------------------------------|------------------------------|-----------------------------|
| (1) t (1/2,1/2,0) | (2) 2' 1/4,1/4,z | (3) 2' (0,1/2,0) 1/4,y,0 | (4) 2 (1/2,0,0) x,1/4,0 |
| (1 1/2,1/2,0) | (2 _z 1/2,1/2,0)' | (2 _y 1/2,1/2,0)' | (2 _x 1/2,1/2,0) |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	(1/2,1/2,0) +
8 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]
	(3) \bar{x},y,\bar{z} [u, \bar{v} ,w]	(4) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]
4 g ..2'	1/4,1/4,z [u,v,0]	3/4,1/4, \bar{z} [u, \bar{v} ,0]
4 f ..2'	0,1/2,z [u,v,0]	0,1/2, \bar{z} [u, \bar{v} ,0]
4 e ..2'	0,0,z [u,v,0]	0,0, \bar{z} [u, \bar{v} ,0]
4 d .2'	0,y,0 [u,0,w]	0, \bar{y} ,0 [u,0, \bar{w}]
4 c 2..	x,0,0 [u,0,0]	\bar{x} ,0,0 [u,0,0]
2 b 22'2'	0,1/2,0 [u,0,0]	
2 a 22'2'	0,0,0 [u,0,0]	

Symmetry of special projections

Along [001] c2'mm'	Along [100] p2mm	Along [010] p2'mm'
$a^* = a$ $b^* = b$	$a^* = b/2$	$a^* = a/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

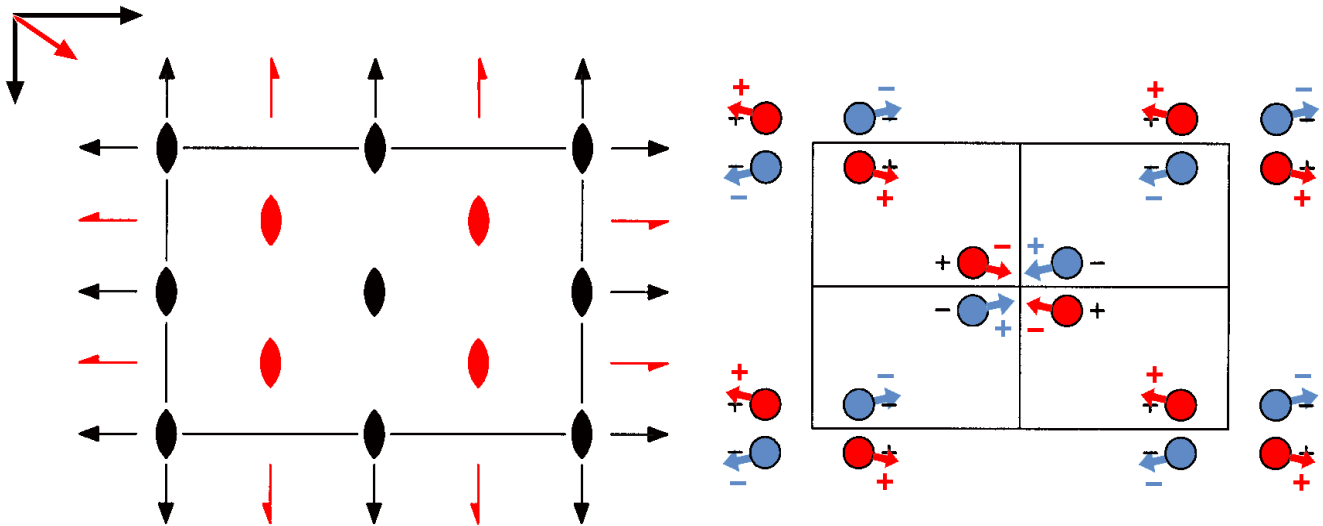
$c_p 222$

$2221'$

Orthorhombic/Rectangular

No. 22.5.126

$c_p 222$



Origin at 222

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

- For $(0,0,0)$ + set
- | | | | |
|-------------|---------------------|---------------------|---------------------|
| (1) 1 | (2) $2 \quad 0,0,z$ | (3) $2 \quad 0,y,0$ | (4) $2 \quad x,0,0$ |
| $(1 0,0,0)$ | $(2_z 0,0,0)$ | $(2_y 0,0,0)$ | $(2_x 0,0,0)$ |
- For $(1/2,1/2,0)'$ + set
- | | | | |
|----------------------------|--------------------------|--|--|
| (1) $t' \quad (1/2,1/2,0)$ | (2) $2' \quad 1/4,1/4,z$ | (3) $2' \quad (0,1/2,0) \quad 1/4,y,0$ | (4) $2' \quad (1/2,0,0) \quad x,1/4,0$ |
| $(1 1/2,1/2,0)'$ | $(2_z 1/2,1/2,0)'$ | $(2_y 1/2,1/2,0)'$ | $(2_x 1/2,1/2,0)'$ |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0)[']; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	(1/2,1/2,0) ['] +
8 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
	(3) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(4) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]
4 g ..2'	1/4,1/4,z [u,v,0]	3/4,1/4, \bar{z} [$\bar{u},v,0$]
4 f ..2	0,1/2,z [0,0,w]	0,1/2, \bar{z} [0,0, \bar{w}]
4 e ..2	0,0,z [0,0,w]	0,0, \bar{z} [0,0, \bar{w}]
4 d ..2	0,y,0 [0,v,0]	0, \bar{y} ,0 [0, \bar{v} ,0]
4 c 2..	x,0,0 [u,0,0]	\bar{x} ,0,0 [\bar{u} ,0,0]
2 b 222	0,1/2,0 [0,0,0]	
2 a 222	0,0,0 [0,0,0]	

Symmetry of special projections

Along [001] c _p 2m'm'	Along [100] p _{2a*} 2m'm'	Along [010] p _{2a*} 2m'm'
a* = a b* = b	a* = b/2	a* = a/2
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

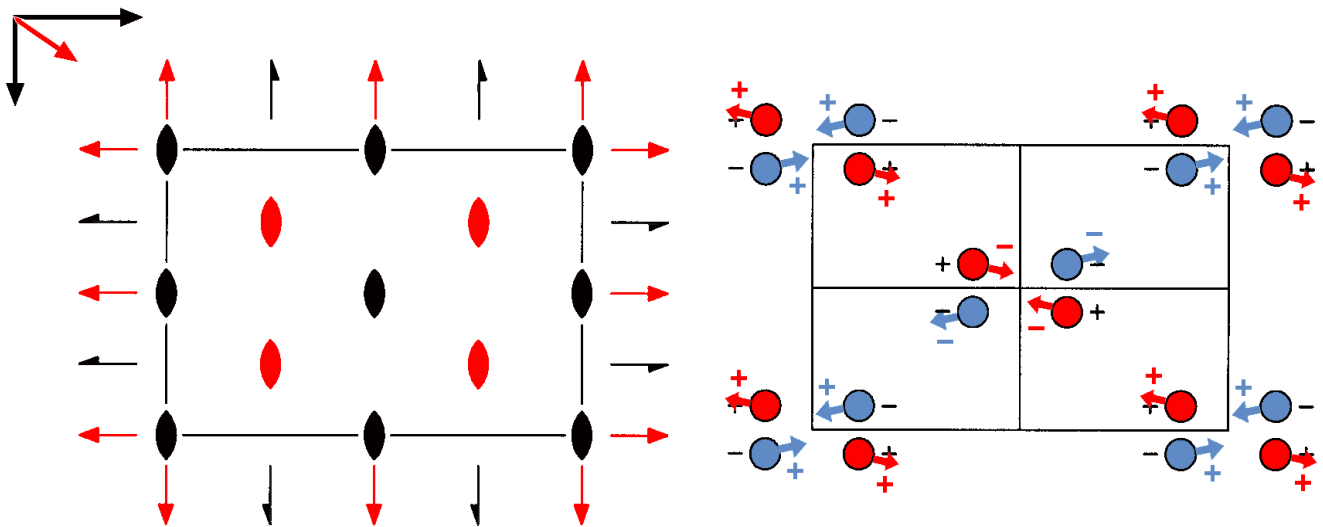
$c_p 2'2'2$

2221'

Orthorhombic/Rectangular

No. 22.6.127

$c_p 2'2'2$



Origin at $2'2'2$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

- For $(0,0,0)$ + set
- | | | | |
|-------------|---------------------|----------------------|----------------------|
| (1) 1 | (2) $2 \quad 0,0,z$ | (3) $2' \quad 0,y,0$ | (4) $2' \quad x,0,0$ |
| $(1 0,0,0)$ | $(2_z 0,0,0)$ | $(2_y 0,0,0)'$ | $(2_x 0,0,0)'$ |
- For $(1/2,1/2,0)'$ + set
- | | | | |
|----------------------------|--------------------------|---------------------------------------|---------------------------------------|
| (1) $t' \quad (1/2,1/2,0)$ | (2) $2' \quad 1/4,1/4,z$ | (3) $2 \quad (0,1/2,0) \quad 1/4,y,0$ | (4) $2 \quad (1/2,0,0) \quad x,1/4,0$ |
| $(1 1/2,1/2,0)'$ | $(2_z 1/2,1/2,0)'$ | $(2_y 1/2,1/2,0)$ | $(2_x 1/2,1/2,0)$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0) +$	$(1/2,1/2,0)' +$
8 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
	(3) $\bar{x},y,\bar{z} [u,\bar{v},w]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$
4 g ..2'	$1/4,1/4,z [u,v,0]$	$3/4,1/4,\bar{z} [u,\bar{v},0]$
4 f ..2	$0,1/2,z [0,0,w]$	$0,1/2,\bar{z} [0,0,w]$
4 e ..2	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$
4 d .2'	$0,y,0 [u,0,w]$	$0,\bar{y},0 [\bar{u},0,w]$
4 c 2'..	$x,0,0 [0,v,w]$	$\bar{x},0,0 [0,\bar{v},w]$
2 b 2'2'2	$0,1/2,0 [0,0,w]$	
2 a 2'2'2	$0,0,0 [0,0,w]$	

Symmetry of special projections

Along $[001] c_p 2mm$ $a^* = a \quad b^* = b$ Origin at $0,0,z$	Along $[100] p_{2a^*} 2mm$ $a^* = b/2$ Origin at $x,1/4,0$	Along $[010] p_{2a^*} 2mm$ $a^* = a/2$ Origin at $1/2,y,0$
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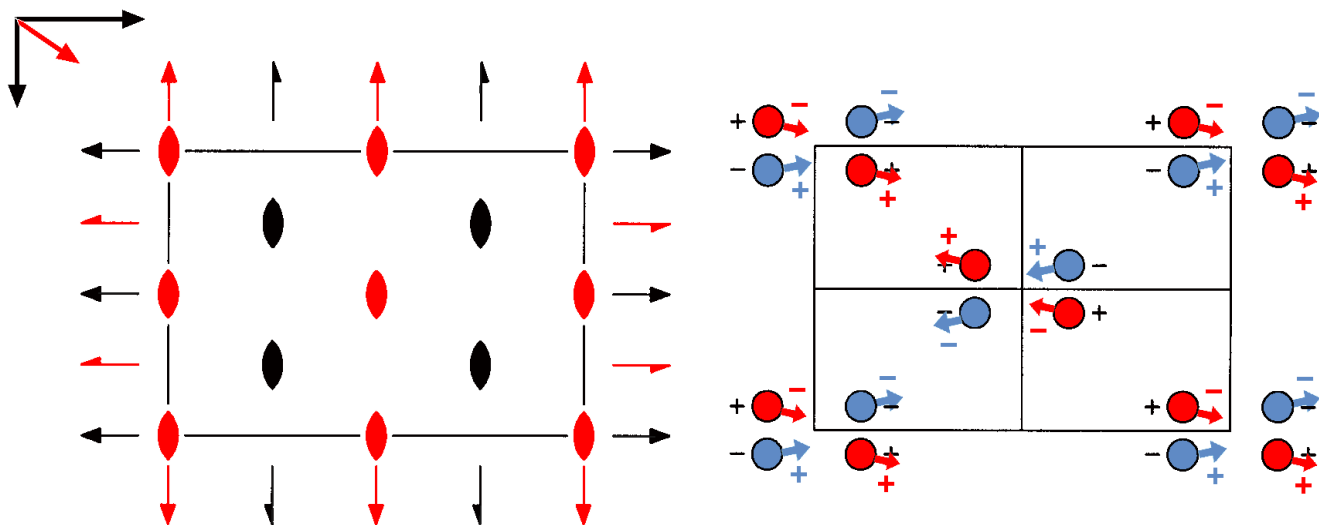
$c_p 2'22'$

$2221'$

Orthorhombic/Rectangular

No. 22.7.128

$c_p 2'22'$



Origin at $2'22'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|---------------|----------------------|---------------------|----------------------|
| (1) 1 | (2) $2' \quad 0,0,z$ | (3) $2 \quad 0,y,0$ | (4) $2' \quad x,0,0$ |
| (1 $0,0,0$) | (2_z $0,0,0$)' | (2_y $0,0,0$) | (2_x $0,0,0$)' |

For $(1/2,1/2,0)$ + set

- | | | | |
|----------------------------|-------------------------|--|---------------------------------------|
| (1) $t' \quad (1/2,1/2,0)$ | (2) $2 \quad 1/4,1/4,z$ | (3) $2' \quad (0,1/2,0) \quad 1/4,y,0$ | (4) $2 \quad (1/2,0,0) \quad x,1/4,0$ |
| (1 $1/2,1/2,0$)' | (2_z $1/2,1/2,0$) | (2_y $1/2,1/2,0$)' | (2_x $1/2,1/2,0$) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	$(1/2,1/2,0)'$ +
8 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [u,v,\bar{w}]$
	(3) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$
4 g ..2	$1/4,1/4,z [0,0,w]$	$3/4,1/4,\bar{z} [0,0,\bar{w}]$
4 f ..2'	$0,1/2,z [u,v,0]$	$0,1/2,\bar{z} [\bar{u},v,0]$
4 e ..2'	$0,0,z [u,v,0]$	$0,0,\bar{z} [\bar{u},v,0]$
4 d .2.	$0,y,0 [0,v,0]$	$0,\bar{y},0 [0,v,0]$
4 c 2'..	$x,0,0 [0,v,w]$	$\bar{x},0,0 [0,v,\bar{w}]$
2 b 2'22'	$0,1/2,0 [0,v,0]$	
2 a 2'22'	$0,0,0 [0,v,0]$	

Symmetry of special projections

Along [001] $c_p 2'mm'$ $a^* = b \quad b^* = -a$ Origin at 0,0,z	Along [100] $p_{2a^*} 2mm$ $a^* = b/2$ Origin at $x, 1/4, 0$	Along [010] $p_{2a^*} 2mm$ $a^* = a/2$ Origin at 0,y,0
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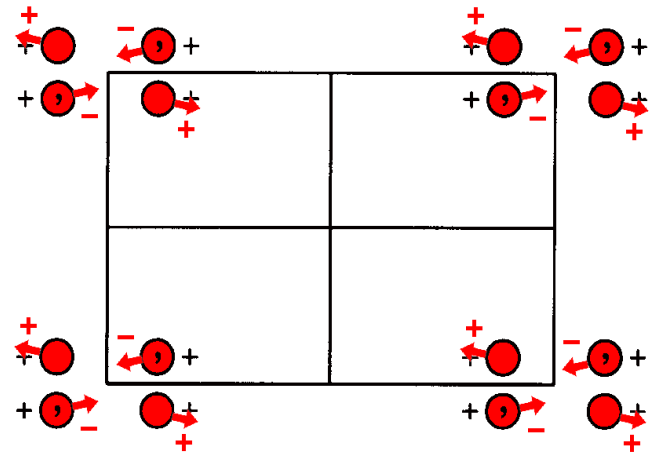
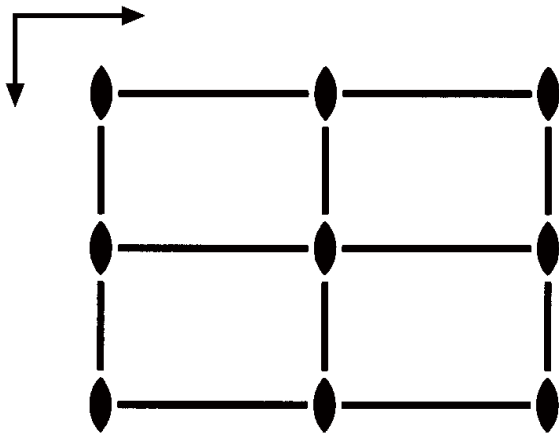
pmm2

No. 23.1.129

mm2

Orthorhombic/Rectangular

pmm2



Origin on mm2

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) m x,0,z
(m_y|0,0,0)

(4) m 0,y,z
(m_x|0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
4 i 1	(3) x,\bar{y},z [\bar{u},v,\bar{w}]	(4) \bar{x},y,z [u,\bar{v},\bar{w}]
2 h m..	$1/2,y,z$ [u,0,0]	$1/2,\bar{y},z$ [$\bar{u},0,0$]
2 g m..	$0,y,z$ [u,0,0]	$0,\bar{y},z$ [$\bar{u},0,0$]
2 f .m.	$x,1/2,z$ [0,v,0]	$\bar{x},1/2,z$ [0, \bar{v} ,0]
2 e .m.	$x,0,z$ [0,v,0]	$\bar{x},0,z$ [0, \bar{v} ,0]
1 d mm2	$1/2,1/2,z$ [0,0,0]	
1 c mm2	$1/2,0,z$ [0,0,0]	
1 b mm2	$0,1/2,z$ [0,0,0]	
1 a mm2	$0,0,z$ [0,0,0]	

Symmetry of special projections

Along [001] $p2mm$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p1m11'$
 $a^* = b$
 Origin at x,0,0

Along [010] $p1m11'$
 $a^* = a$
 Origin at 0,y,0

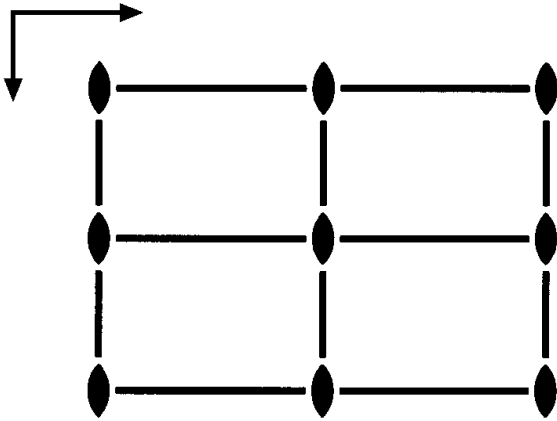
pmm21'

No. 23.2.130

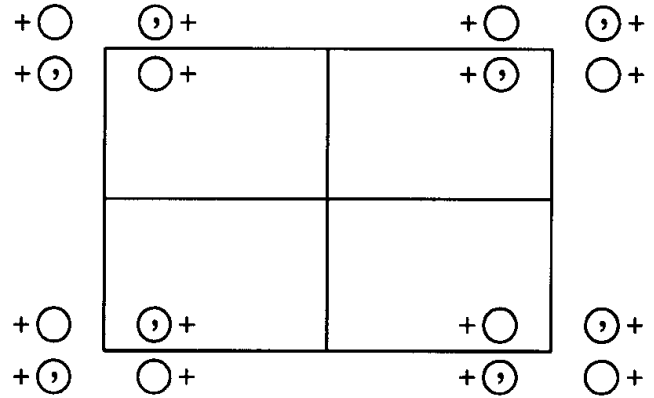
mm21'

pmm21'

Orthorhombic/Rectangular



1'



Origin on mm21'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For 1 + set

- | | | | |
|--------------------|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) m x,0,z
(m _y 0,0,0) | (4) m 0,y,z
(m _x 0,0,0) |
|--------------------|--|--|--|

For 1' + set

- | | | | |
|----------------------|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) m' x,0,z
(m _y 0,0,0)' | (4) m' 0,y,z
(m _x 0,0,0)' |
|----------------------|--|--|--|

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 i 11'	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$
	(3) $x,\bar{y},z [0,0,0]$	(4) $\bar{x},y,z [0,0,0]$
2 h m..1'	$1/2,y,z [0,0,0]$	$1/2,\bar{y},z [0,0,0]$
2 g m..1'	$0,y,z [0,0,0]$	$0,\bar{y},z [0,0,0]$
2 f .m.1'	$x,1/2,z [0,0,0]$	$\bar{x},1/2,z [0,0,0]$
2 e .m.1'	$x,0,z [0,0,0]$	$\bar{x},0,z [0,0,0]$
1 d mm21'	$1/2,1/2,z [0,0,0]$	
1 c mm21'	$1/2,0,z [0,0,0]$	
1 b mm21'	$0,1/2,z [0,0,0]$	
1 a mm21'	$0,0,z [0,0,0]$	

Symmetry of special projections

Along [001] p2mm1' $\mathbf{a}^* = \mathbf{a} \quad \mathbf{b}^* = \mathbf{b}$ Origin at 0,0,z	Along [100] p1m11' $\mathbf{a}^* = \mathbf{b}$ Origin at x,0,0	Along [010] p1m11' $\mathbf{a}^* = \mathbf{a}$ Origin at 0,y,0
--	--	--

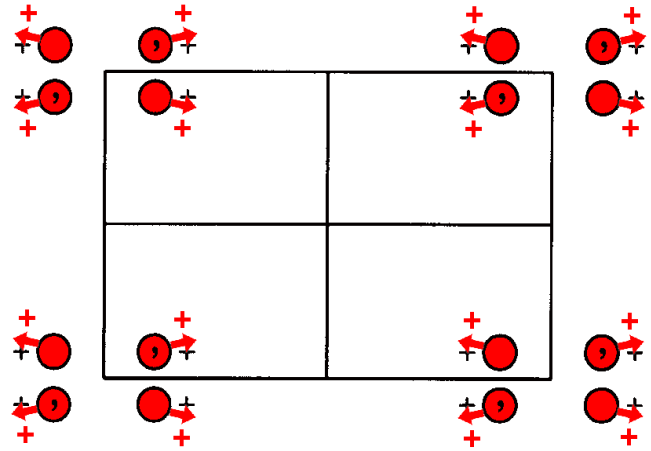
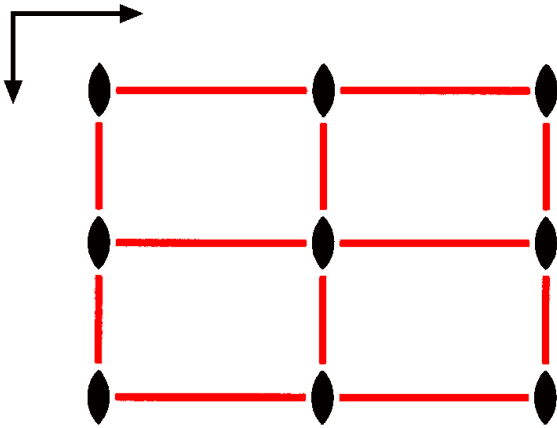
pm'm'2

No. 23.3.131

m'm'2

pm'm'2

Orthorhombic/Rectangular



Origin on m'm'2

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) m' x,0,z
(m_y|0,0,0)'

(4) m' 0,y,z
(m_x|0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
4 i 1	(3) x, \bar{y} ,z [u, \bar{v} ,w]	(4) \bar{x},y,z [\bar{u},v,w]
2 h m'..	1/2,y,z [0,v,w]	1/2, \bar{y} ,z [0, \bar{v} ,w]
2 g m'..	0,y,z [0,v,w]	0, \bar{y} ,z [0, \bar{v} ,w]
2 f .m'.	x,1/2,z [u,0,w]	$\bar{x},1/2,z$ [$\bar{u},0,w$]
2 e .m'.	x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]
1 d m'm'2	1/2,1/2,z [0,0,w]	
1 c m'm'2	1/2,0,z [0,0,w]	
1 b m'm'2	0,1/2,z [0,0,w]	
1 a m'm'2	0,0,z [0,0,w]	

Symmetry of special projections

Along [001] p2m'm'	Along [100] p1m'1	Along [010] p1m'1
$\mathbf{a}^* = \mathbf{a}$ $\mathbf{b}^* = \mathbf{b}$	$\mathbf{a}^* = \mathbf{b}$	$\mathbf{a}^* = \mathbf{a}$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

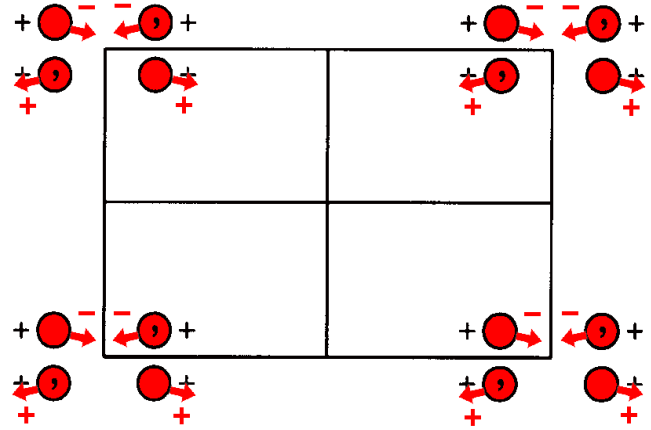
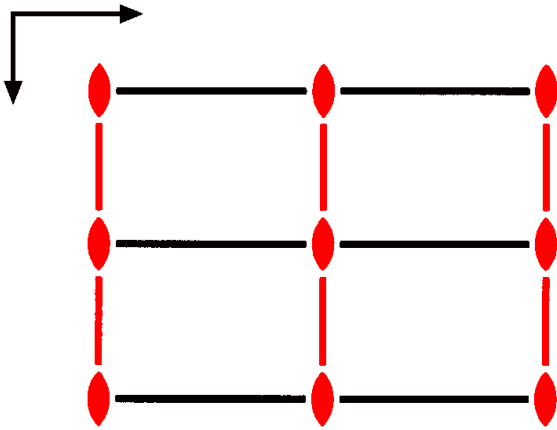
pmm'2'

No. 23.4.132

mm'2'

pmm'2'

Orthorhombic/Rectangular



Origin on mm'2'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 0,0,z
(2_z|0,0,0)'

(3) m' x,0,z
(m_y|0,0,0)'

(4) m 0,y,z
(m_x|0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
4 i 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [u,v,\bar{w}]$
	(3) $x,\bar{y},z [u,\bar{v},w]$	(4) $\bar{x},y,z [u,\bar{v},\bar{w}]$
	2 h m..	$1/2,y,z [u,0,0]$
		$1/2,\bar{y},z [u,0,0]$
2 g m..	$0,y,z [u,0,0]$	$0,\bar{y},z [u,0,0]$
2 f .m'	$x,1/2,z [u,0,w]$	$\bar{x},1/2,z [u,0,\bar{w}]$
2 e .m'	$x,0,z [u,0,w]$	$\bar{x},0,z [u,0,\bar{w}]$
1 d mm'2'	$1/2,1/2,z [u,0,0]$	
1 c mm'2'	$1/2,0,z [u,0,0]$	
1 b mm'2'	$0,1/2,z [u,0,0]$	
1 a mm'2'	$0,0,z [u,0,0]$	

Symmetry of special projections

Along [001] $p2'mm'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p1m11'$ $a^* = b$ Origin at x,0,0	Along [010] $p1m1$ $a^* = a$ Origin at 0,y,0
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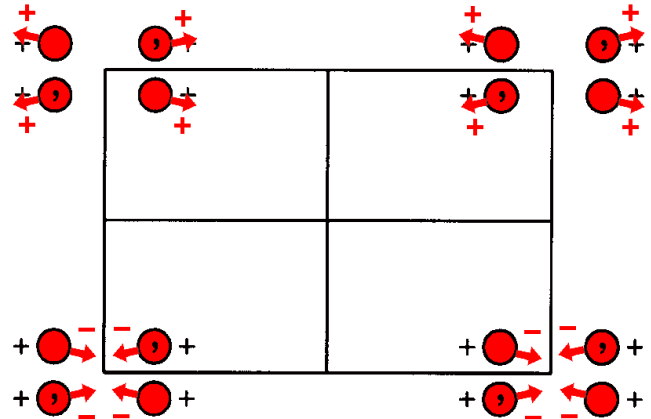
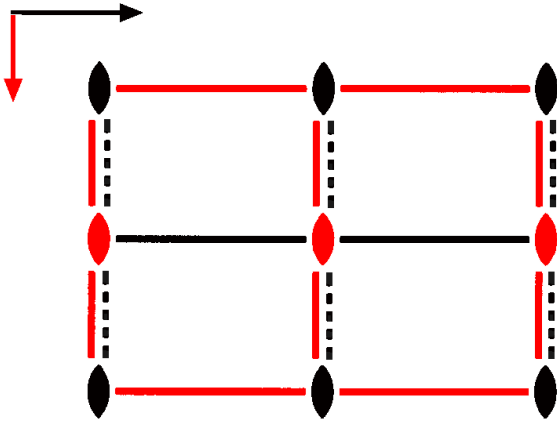
$p_{2a} m'm'2$

No. 23.5.133

$mm21'$

Orthorhombic/Rectangular

$p_{2a} m'm'2$



Origin on $m'm'2$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- (1) 1
- (2) $2 \quad 0,0,z$
- (1) $(1|0,0,0)$
- (2) $(2_z|0,0,0)$

- (3) $m' \quad x,0,z$
- (4) $m' \quad 0,y,z$
- (3) $(m_y|0,0,0)'$
- (4) $(m_x|0,0,0)'$

For $(1,0,0)'$ + set

- (1) $t' \quad (1,0,0)$
- (2) $2' \quad 1/2,0,z$
- (1) $(1|1,0,0)'$
- (2) $(2_z|1,0,0)'$

- (3) $a \quad (1,0,0) \quad x,0,z$
- (4) $m \quad 1/2,y,z$
- (3) $(m_y|1,0,0)$
- (4) $(m_x|1,0,0)$

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(1,0,0)' +
4 i 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
	(3) $x,\bar{y},z [u,\bar{v},w]$	(4) $\bar{x},y,z [\bar{u},v,w]$
2 h m..	$1/2,y,z [u,0,0]$	$1/2,\bar{y},z [u,0,0]$
2 g m'..	$0,y,z [0,v,w]$	$0,\bar{y},z [0,\bar{v},w]$
2 f .m'.	$x,1/2,z [u,0,w]$	$\bar{x},1/2,z [\bar{u},0,w]$
2 e .m'.	$x,0,z [u,0,w]$	$\bar{x},0,z [\bar{u},0,w]$
1 d mm'2'	$1/2,1/2,z [u,0,0]$	
1 c mm'2'	$1/2,0,z [u,0,0]$	
1 b m'm'2	$0,1/2,z [0,0,w]$	
1 a m'm'2	$0,0,z [0,0,w]$	

Symmetry of special projections

Along [001] $p_{2a^*}2m'm'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p1m11'$ $a^* = b$ Origin at x,0,0	Along [010] $p_{2a^*}1m1$ $a^* = a$ Origin at 1/2,y,0
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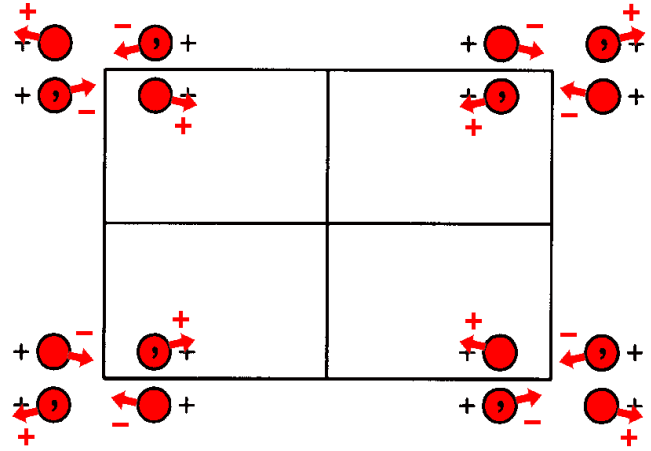
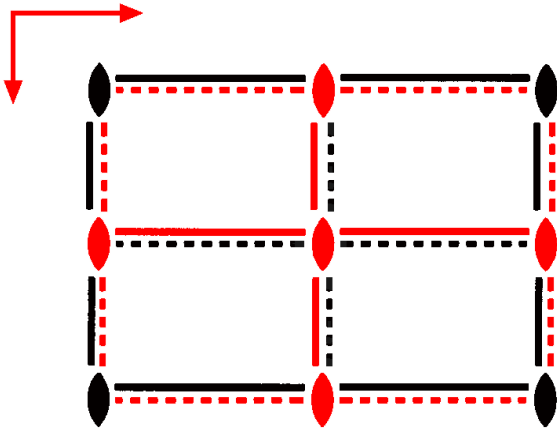
$p_c mm2$

No. 23.6.134

$mm21'$

$p_c mm2$

Orthorhombic/Rectangular



Origin on $mm2$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $2 \quad 0,0,z$
$(1 0,0,0)$	$(2_z 0,0,0)$

(3) $m \quad x,0,z$
$(m_y 0,0,0)$

(4) $m \quad 0,y,z$
$(m_x 0,0,0)$

For $(0,1,0)'$ + set

(1) $t' \quad (0,1,0)$	(2) $2' \quad 0,1/2,z$
$(1 0,1,0)'$	$(2_z 0,1,0)'$

(3) $m' \quad x,1/2,z$
$(m_y 0,1,0)'$

(4) $b' \quad (0,1,0) \quad 0,y,z$
$(m_x 0,1,0)'$

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,1,0)' +
4 i 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
	(3) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(4) $\bar{x},y,z [u,\bar{v},\bar{w}]$
2 h m'..	$1/2,y,z [0,v,w]$	$1/2,\bar{y},z [0,v,\bar{w}]$
2 g m..	$0,y,z [u,0,0]$	$0,\bar{y},z [\bar{u},0,0]$
2 f .m'.	$x,1/2,z [u,0,w]$	$\bar{x},1/2,z [u,0,\bar{w}]$
2 e .m.	$x,0,z [0,v,0]$	$\bar{x},0,z [0,\bar{v},0]$
1 d m'm'2	$1/2,1/2,z [0,0,w]$	
1 c m'm'2'	$1/2,0,z [0,v,0]$	
1 b mm'2'	$0,1/2,z [u,0,0]$	
1 a mm2	$0,0,z [0,0,0]$	

Symmetry of special projections

Along [001] p_c2mm
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p1m11'$
 $a^* = b$
 Origin at x,0,0

Along [010] $p1m11'$
 $a^* = a$
 Origin at 0,y,0

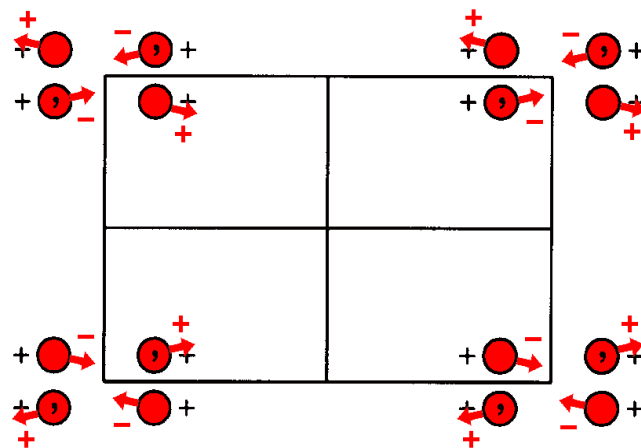
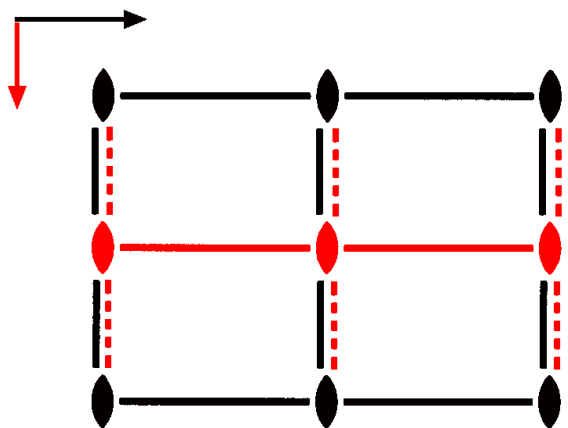
$p_{2a} mm2$

No. 23.7.135

$mm21'$

$p_{2a} mm2$

Orthorhombic/Rectangular



Origin on $mm2$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

- | | | | |
|------------------------|------------------------|------------------------------------|------------------------|
| For $(0,0,0)$ + set | | | |
| (1) 1 | (2) $2 \quad 0,0,z$ | (3) $m \quad x,0,z$ | (4) $m \quad 0,y,z$ |
| $(1 0,0,0)$ | $(2_z 0,0,0)$ | $(m_y 0,0,0)$ | $(m_x 0,0,0)$ |
| For $(1,0,0)'$ + set | | | |
| (1) $t' \quad (1,0,0)$ | (2) $2' \quad 1/2,0,z$ | (3) $a' \quad (1,0,0) \quad x,0,z$ | (4) $m' \quad 1/2,y,z$ |
| $(1 1,0,0)'$ | $(2_z 1,0,0)'$ | $(m_y 1,0,0)'$ | $(m_x 1,0,0)'$ |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)

Positions

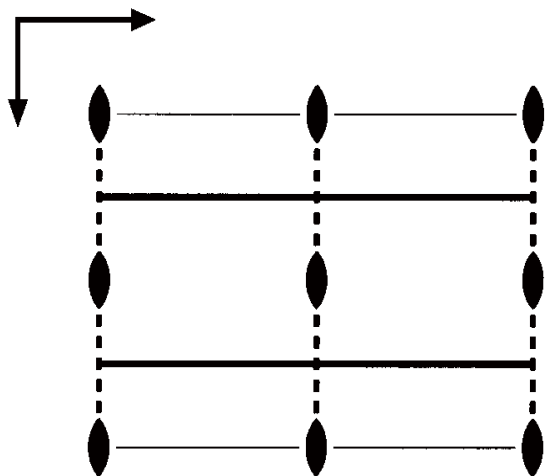
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(1,0,0)' +
4 i 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
	(3) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(4) $\bar{x},y,z [u,\bar{v},\bar{w}]$
2 h m'..	$1/2,y,z [0,v,w]$	$1/2,\bar{y},z [0,v,\bar{w}]$
2 g m..	$0,y,z [u,0,0]$	$0,\bar{y},z [\bar{u},0,0]$
2 f .m.	$x,1/2,z [0,v,0]$	$\bar{x},1/2,z [0,\bar{v},0]$
2 e .m.	$x,0,z [0,v,0]$	$\bar{x},0,z [0,\bar{v},0]$
1 d m'm2'	$1/2,1/2,z [0,v,0]$	
1 c m'm2'	$1/2,0,z [0,v,0]$	
1 b mm2	$0,1/2,z [0,0,0]$	
1 a mm2	$0,0,z [0,0,0]$	

Symmetry of special projections

Along [001] $p_{2a}2mm$ $a^* = a \quad b^* = b$ Origin at 0,0,z	Along [100] $p1m11'$ $a^* = b$ Origin at x,0,0	Along [010] $p1m11'$ $a^* = a$ Origin at 0,y,0
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pma2

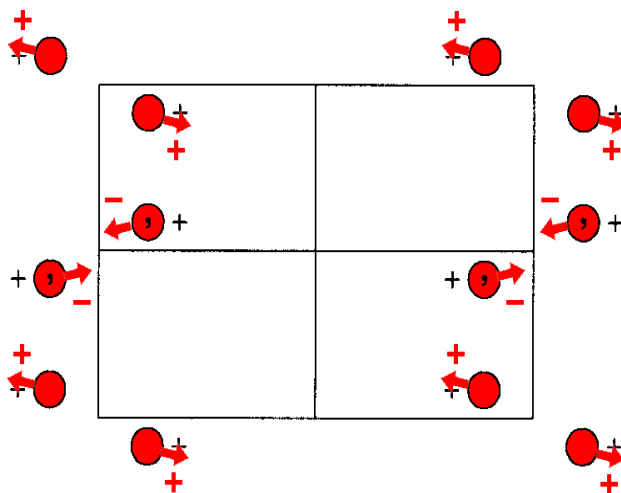
No. 24.1.136



mm2

Orthorhombic/Rectangular

pma2



Origin on 1a2

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) a (1/2,0,0) x,0,z
(m_y|1/2,0,0)

(4) m 1/4,y,z
(m_x|1/2,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
4 d 1	(3) $x+1/2,\bar{y},z$ [\bar{u},v,\bar{w}]	(4) $\bar{x}+1/2,y,z$ [u,\bar{v},\bar{w}]
2 c m..	$1/4,y,z$ [u,0,0]	$3/4,\bar{y},z$ [$\bar{u},0,0$]
2 b ..2	$0,1/2,z$ [0,0,w]	$1/2,1/2,z$ [0,0, \bar{w}]
2 a ..2	$0,0,z$ [0,0,w]	$1/2,0,z$ [0,0, \bar{w}]

Symmetry of special projections

Along [001] $p2mg$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p1m11'$ $a^* = b$ Origin at x,0,0	Along [010] $p_{2a^*}1m1$ $a^* = a/2$ Origin at $1/4,y,0$
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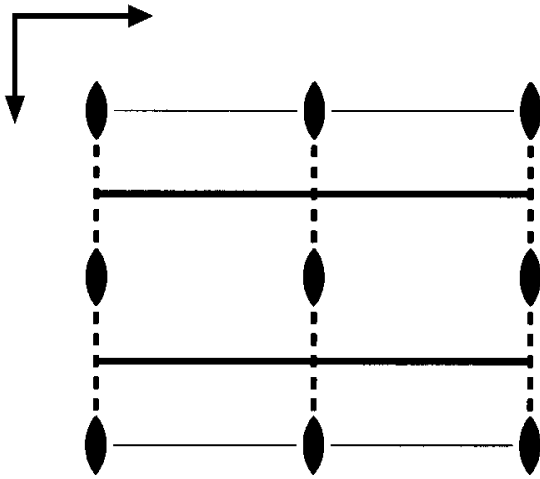
pma21'

No. 24.2.137

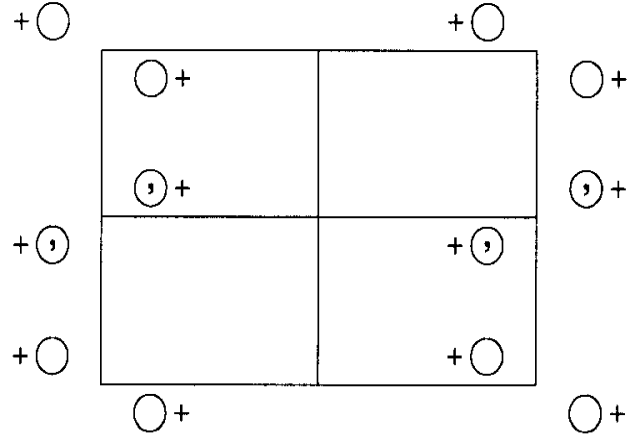
mm21'

Orthorhombic/Rectangular

pma21'



1'



Origin on 1a21'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

For 1 + set

- | | | | |
|-----------|-------------------------|---------------------------|---------------------------|
| (1) 1 | (2) 2 $0,0,z$ | (3) a $(1/2,0,0)$ $x,0,z$ | (4) m $1/4,y,z$ |
| (1 0,0,0) | (2 _z 0,0,0) | (m _y 1/2,0,0) | (m _x 1/2,0,0) |

For 1' + set

- | | | | |
|------------|--------------------------|----------------------------|----------------------------|
| (1) 1' | (2) 2' $0,0,z$ | (3) a' $(1/2,0,0)$ $x,0,z$ | (4) m' $1/4,y,z$ |
| (1 0,0,0)' | (2 _z 0,0,0)' | (m _y 1/2,0,0)' | (m _x 1/2,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); $1'$

Positions

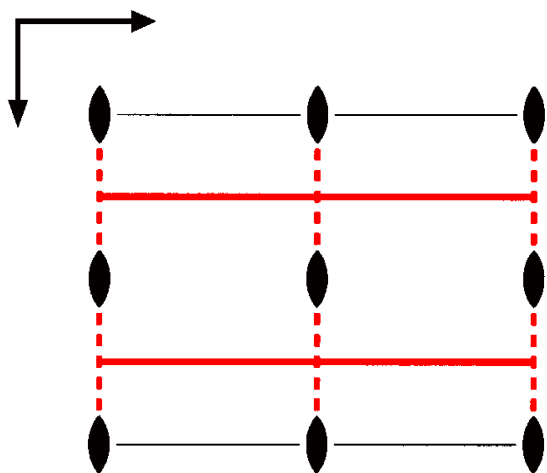
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 d 11'	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$
	(3) $x+1/2,\bar{y},z [0,0,0]$	(4) $\bar{x}+1/2,y,z [0,0,0]$
2 c m..1'	$1/4,y,z [0,0,0]$	$3/4,\bar{y},z [0,0,0]$
2 b ..21'	$0,1/2,z [0,0,0]$	$1/2,1/2,z [0,0,0]$
2 a ..21'	$0,0,z [0,0,0]$	$1/2,0,z [0,0,0]$

Symmetry of special projections

Along [001] $p2mg1'$ $a^* = a \quad b^* = b$ Origin at $0,0,z$	Along [100] $p1m11'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p1m11'$ $a^* = a/2$ Origin at $0,y,0$
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pm'a'2

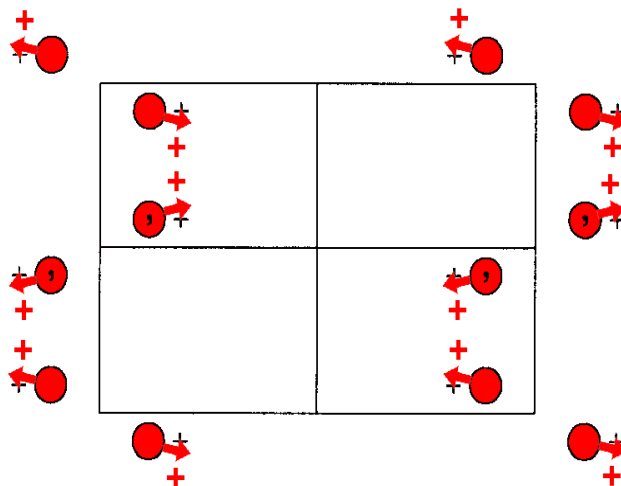
No. 24.3.138



m'm'2

Orthorhombic/Rectangular

pm'a'2



Origin on 1a'2

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2 0,0,z
(2_z|0,0,0)
- (3) a' (1/2,0,0) x,0,z
(m_y|1/2,0,0)'
- (4) m' 1/4,y,z
(m_x|1/2,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

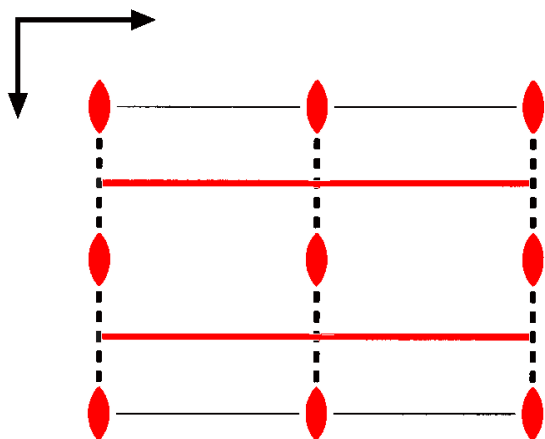
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
4 d 1	(3) $x+1/2,\bar{y},z$ [u, \bar{v} ,w]	(4) $\bar{x}+1/2,y,z$ [\bar{u},v,w]
2 c m'..	$1/4,y,z$ [u,v,0]	$3/4,\bar{y},z$ [0, \bar{v},w]
2 b ..2	$0,1/2,z$ [0,0,w]	$1/2,1/2,z$ [0,0,w]
2 a ..2	$0,0,z$ [0,0,w]	$1/2,0,z$ [0,0,w]

Symmetry of special projections

Along [001] $p2m'g'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p1m'1$ $a^* = b$ Origin at x,0,0	Along [010] $p1m'1$ $a^* = a/2$ Origin at 0,y,0
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pm'a2'

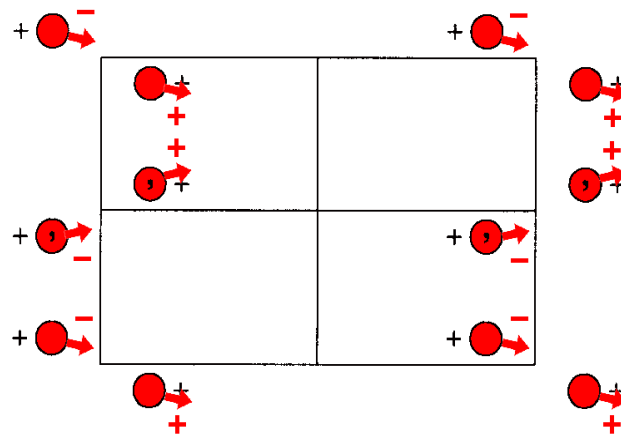
No. 24.4.139



m'm2'

Orthorhombic/Rectangular

pm'a2'



Origin on 1a2'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 0,0,z
(2_z|0,0,0)'

(3) a (1/2,0,0) x,0,z
(m_y|1/2,0,0)

(4) m' 1/4,y,z
(m_x|1/2,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

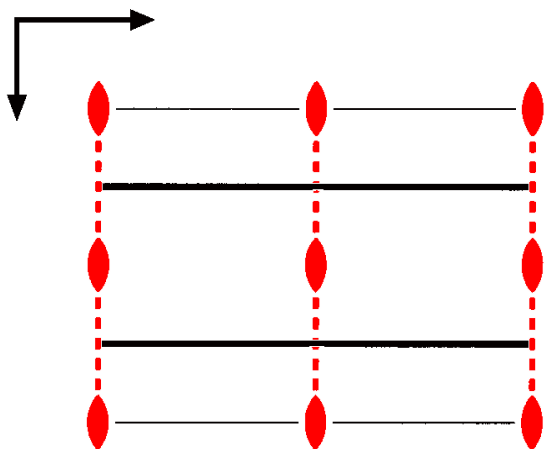
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]
4 d 1	(3) $x+1/2,\bar{y},z$ [\bar{u},v,\bar{w}]	(4) $\bar{x}+1/2,y,z$ [\bar{u},v,w]
2 c m'..	1/4,y,z [0,v,w]	3/4, \bar{y},z [0,v, \bar{w}]
2 b ..2'	0,1/2,z [u,v,0]	1/2,1/2,z [$\bar{u},v,0$]
2 a ..2'	0,0,z [u,v,0]	1/2,0,z [$\bar{u},v,0$]

Symmetry of special projections

Along [001] p2'm'g $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p1m1 $a^* = b$ Origin at x,0,0	Along [010] p _{2a*} 1m1 $a^* = a/2$ Origin at 0,y,0
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pma'2'

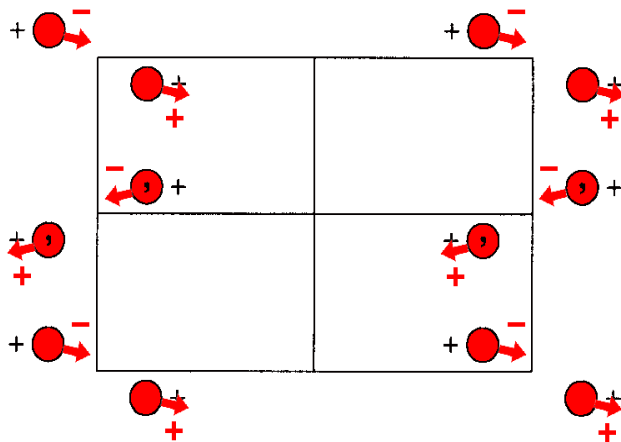
No. 24.5.140



mm'2'

Orthorhombic/Rectangular

pma'2'



Origin on 1a'2'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 0,0,z
(2_z|0,0,0)'

(3) a' (1/2,0,0) x,0,z
(m_y|1/2,0,0)'

(4) m 1/4,y,z
(m_x|1/2,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

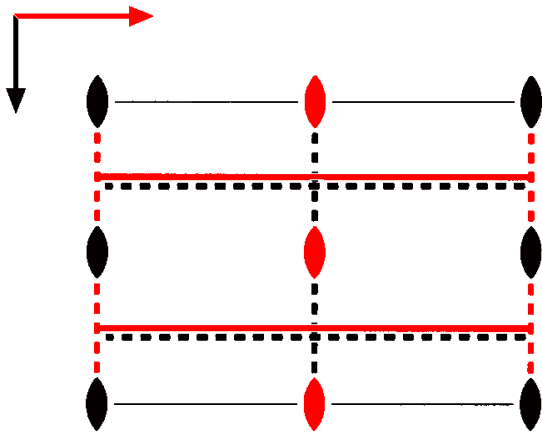
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]
4 d 1	(3) $x+1/2,\bar{y},z$ [u, \bar{v} ,w]	(4) $\bar{x}+1/2,y,z$ [u, \bar{v},\bar{w}]
2 c m..	$1/4,y,z$ [u,0,0]	$3/4,\bar{y},z$ [u,0,0]
2 b ..2'	$0,1/2,z$ [u,v,0]	$1/2,1/2,z$ [u, \bar{v} ,0]
2 a ..2'	$0,0,z$ [u,v,0]	$1/2,0,z$ [u, \bar{v} ,0]

Symmetry of special projections

Along [001] $p2'mg'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p1m11'$ $a^* = b$ Origin at x,0,0	Along [010] $p1m1$ $a^* = a/2$ Origin at 0,y,0
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$p_{2b}, m'a'2$

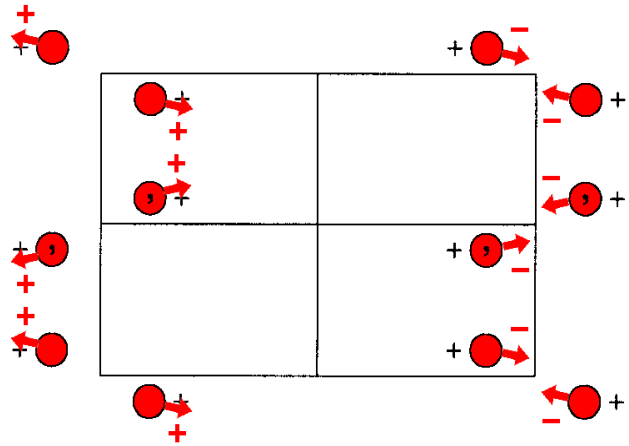
No. 24.6.141



$mm21'$

Orthorhombic/Rectangular

$p_{2b}, m'a'2$



Origin on $1a'2$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

For $(0,0,0) +$ set

(1) 1 (2) $2 \quad 0,0,z$
 $(1|0,0,0)$ $(2_z|0,0,0)$

(3) $a' \quad (1/2,0,0) \quad x,0,z$ (4) $m' \quad 1/4,y,z$
 $(m_y|1/2,0,0)'$ $(m_x|1/2,0,0)'$

For $(0,1,0)'$ + set

(1) $t' \quad (0,1,0)$ (2) $2' \quad 0,1/2,z$
 $(1|0,1,0)'$ $(2_z|0,1,0)'$

(3) $a \quad (1/2,0,0) \quad x,1/2,z$ (4) $b \quad (0,1,0) \quad 1/4,y,z$
 $(m_y|1/2,1,0)$ $(m_x|1/2,1,0)$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3)

Positions

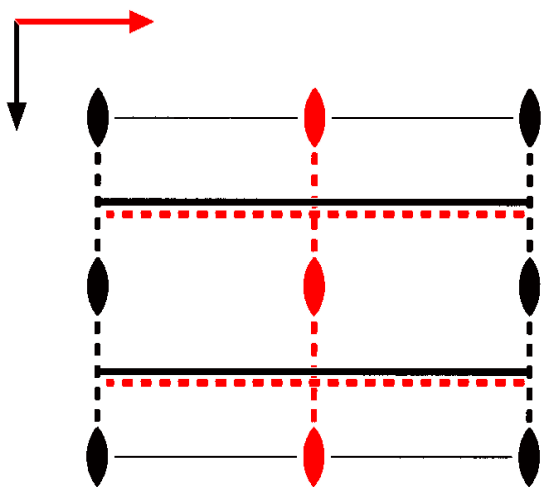
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,1,0)' +
4 d 1	(1) $x,y,z [u,v,w]$ (3) $x+1/2,\bar{y},z [u,\bar{v},w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$ (4) $\bar{x}+1/2,y,z [\bar{u},v,w]$
2 c $m'..$	$1/4,y,z [0,v,w]$	$3/4,\bar{y},z [0,\bar{v},w]$
2 b $..2'$	$0,1/2,z [u,v,0]$	$1/2,1/2,z [\bar{u},v,0]$
2 a $..2$	$0,0,z [0,0,w]$	$1/2,0,z [0,0,w]$

Symmetry of special projections

Along [001] $p_{2b} \cdot 2m'g'$ $a^* = a \quad b^* = b$ Origin at 0,0,z	Along [100] $p_{2a} \cdot 1m1$ $a^* = b$ Origin at $x, 1/2, 0$	Along [010] $p1m11'$ $a^* = a/2$ Origin at 0,y,0
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p_{2b} ma2

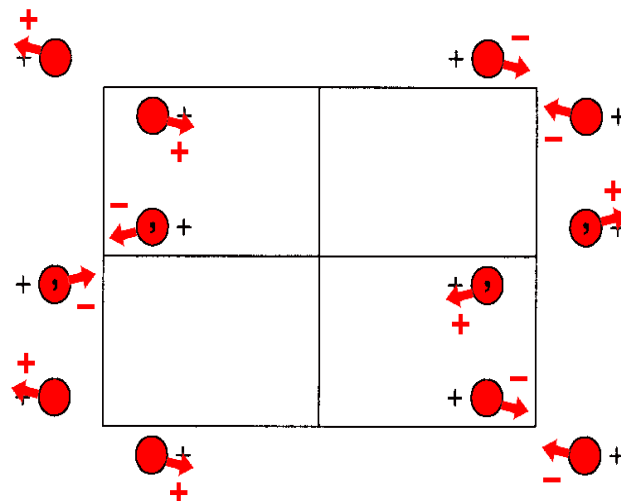
No. 24.7.142



mm21'

Orthorhombic/Rectangular

p_{2b} ma2



Origin on 1a2

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

For (0,0,0) + set

- (1) 1 (2) 2 $0,0,z$
 (1|0,0,0) (2_z|0,0,0)

- (3) a $(1/2,0,0)$ $x,0,z$ (4) m $1/4,y,z$
 (m_y|1/2,0,0) (m_x|1/2,0,0)

For (0,1,0)' + set

- (1) t' $(0,1,0)$ (2) 2' $0,1/2,z$
 (1|0,1,0)' (2_z|0,1,0)'

- (3) a' $(1/2,0,0)$ $x,1/2,z$ (4) b' $(0,1,0)$ $1/4,y,z$
 (m_y|1/2,1,0)' (m_x|1/2,1,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3)

Positions

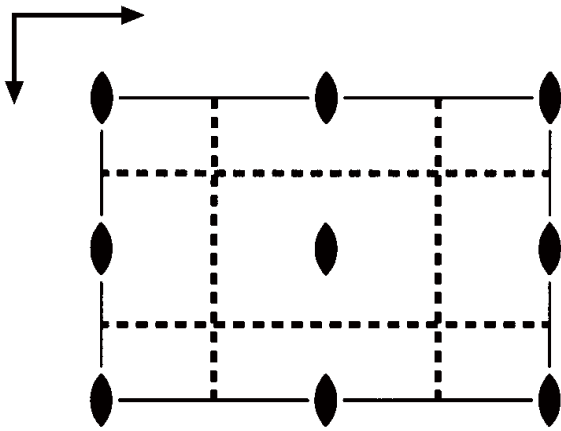
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,1,0)' +
4 d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$
	(3) $x+1/2,\bar{y},z [\bar{u},v,\bar{w}]$	(4) $\bar{x}+1/2,y,z [u,\bar{v},\bar{w}]$
2 c m..	$1/4,y,z [u,0,0]$	$3/4,\bar{y},z [\bar{u},0,0]$
2 b ..2'	$0,1/2,z [u,v,0]$	$1/2,1/2,z [u,\bar{v},0]$
2 a ..2	$0,0,z [0,0,w]$	$1/2,0,z [0,0,\bar{w}]$

Symmetry of special projections

Along [001] $p_{2b}2mg$ $a^* = a \quad b^* = b$ Origin at 0,0,z	Along [100] $p1m11'$ $a^* = b$ Origin at x,0,0	Along [010] $p1m11'$ $a^* = a/2$ Origin at 0,y,0
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pba2

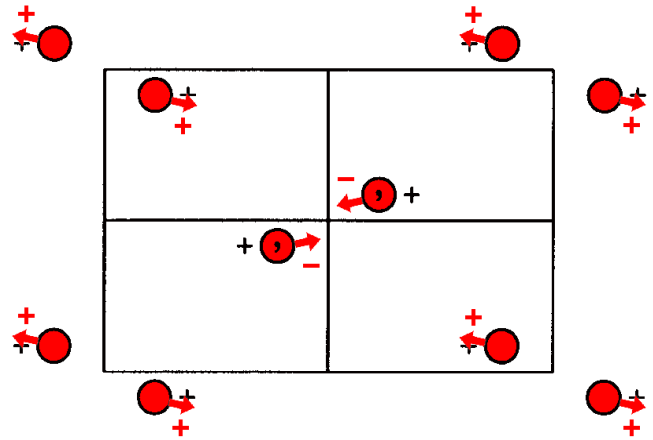
No. 25.1.143



mm2

Orthorhombic/Rectangular

pba2



Origin on 112

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) a (1/2,0,0) x,1/4,z (4) b (0,1/2,0) 1/4,y,z
(m_y|1/2,1/2,0) (m_x|1/2,1/2,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

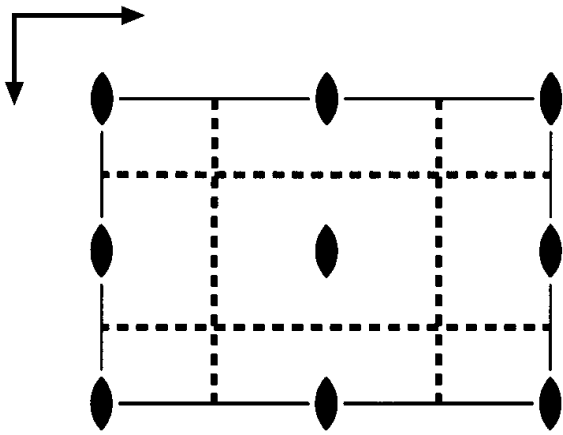
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z $[u,v,w]$	(2) \bar{x},\bar{y},z $[\bar{u},\bar{v},w]$
4 c 1	(3) $x+1/2,\bar{y}+1/2,z$ $[\bar{u},v,\bar{w}]$	(4) $\bar{x}+1/2,y+1/2,z$ $[u,\bar{v},\bar{w}]$
2 b ..2	$0,1/2,z$ $[0,0,w]$	$1/2,0,z$ $[0,0,\bar{w}]$
2 a ..2	$0,0,z$ $[0,0,w]$	$1/2,1/2,z$ $[0,0,\bar{w}]$

Symmetry of special projections

Along $[001]$ $p2gg$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along $[100]$ $p_{2a^*}1m1$ $a^* = b/2$ Origin at $x,1/4,0$	Along $[010]$ $p_{2a^*}1m1$ $a^* = a/2$ Origin at $1/4,y,0$
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pba21'

No. 25.2.144

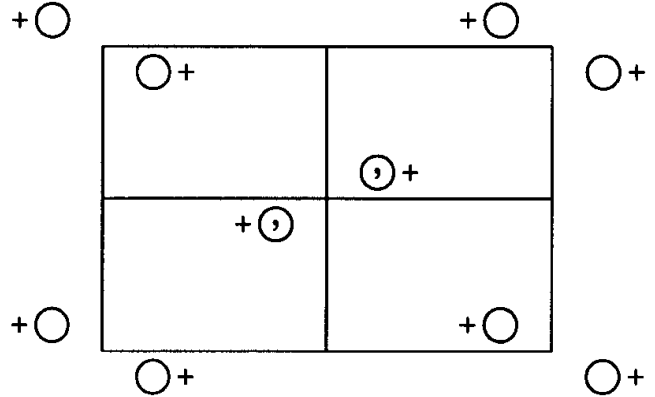


mm21'

Orthorhombic/Rectangular

pba21'

1'



Origin on 1121'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For 1 + set

- (1) 1
(1|0,0,0) (2) 2 0,0,z
(2_z|0,0,0)

- (3) a (1/2,0,0) x,1/4,z (4) b (0,1/2,0) 1/4,y,z
(m_y|1/2,1/2,0) (m_x|1/2,1/2,0)

For 1' + set

- (1) 1'
(1|0,0,0)' (2) 2' 0,0,z
(2_z|0,0,0)'

- (3) a' (1/2,0,0) x,1/4,z (4) b' (0,1/2,0) 1/4,y,z
(m_y|1/2,1/2,0)' (m_x|1/2,1/2,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); $1'$

Positions

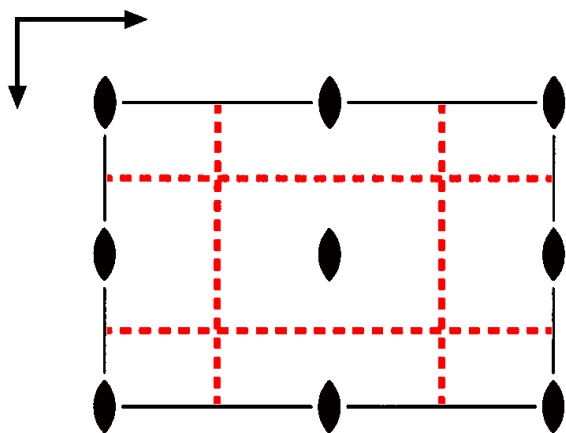
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 c 11'	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$
	(3) $x+1/2,\bar{y}+1/2,z [0,0,0]$	(4) $\bar{x}+1/2,y+1/2,z [0,0,0]$
2 b ..21'	$0,1/2,z [0,0,0]$	$1/2,0,z [0,0,0]$
2 a ..21'	$0,0,z [0,0,0]$	$1/2,1/2,z [0,0,0]$

Symmetry of special projections

Along [001] $p2gg1'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p1m11'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p1m11'$ $a^* = a/2$ Origin at $0,y,0$
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pb'a'2

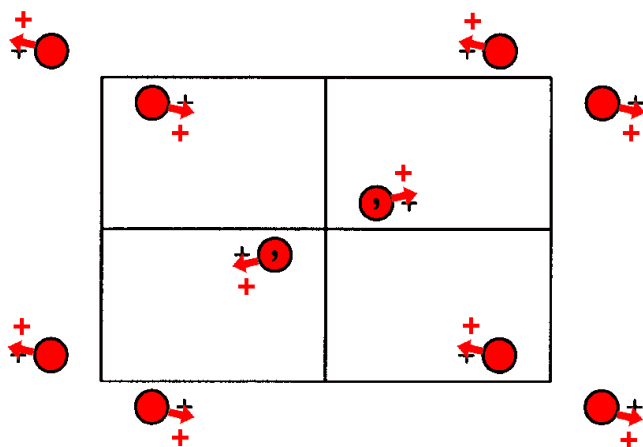
No. 25.3.145



m'm'2

Orthorhombic/Rectangular

pb'a'2



Origin on 112

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) a' (1/2,0,0) x,1/4,z (4) b' (0,1/2,0) 1/4,y,z
(m_y|1/2,1/2,0)' (m_x|1/2,1/2,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

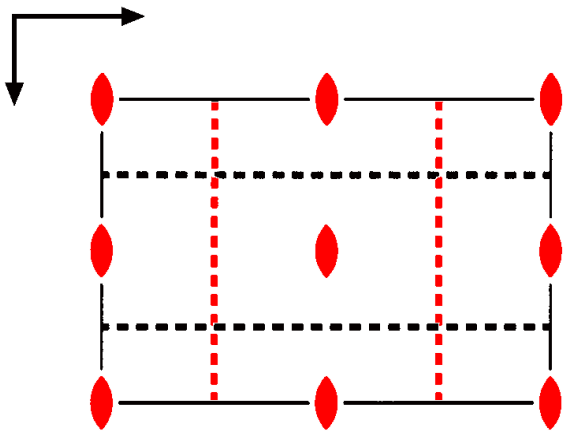
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
4 c 1	(3) $x+1/2,\bar{y}+1/2,z$ [u, \bar{v} ,w]	(4) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]
2 b ..2	0,1/2,z [0,0,w]	1/2,0,z [0,0,w]
2 a ..2	0,0,z [0,0,w]	1/2,1/2,z [0,0,w]

Symmetry of special projections

Along [001] $p2'g'g$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p1m'1$ $a^* = b/2$ Origin at x,0,0	Along [010] $p1m'1$ $a^* = a/2$ Origin at 0,y,0
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pba'2'

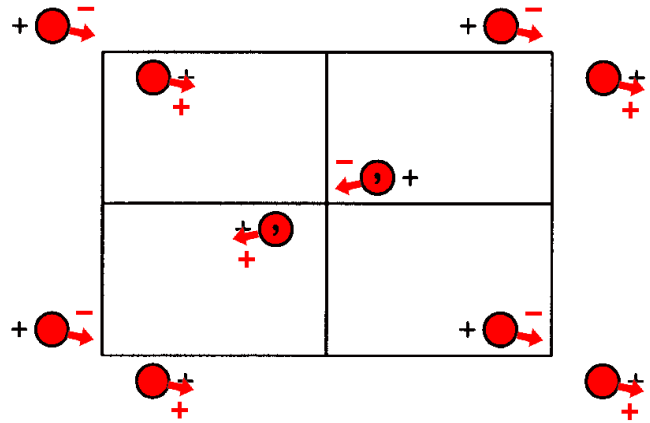
No. 25.4.146



mm'2'

Orthorhombic/Rectangular

pba'2'



Origin on 112'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 0,0,z
(2_z|0,0,0)'

(3) a' (1/2,0,0) x,1/4,z (4) b (0,1/2,0) 1/4,y,z
(m_y|1/2,1/2,0)' (m_x|1/2,1/2,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

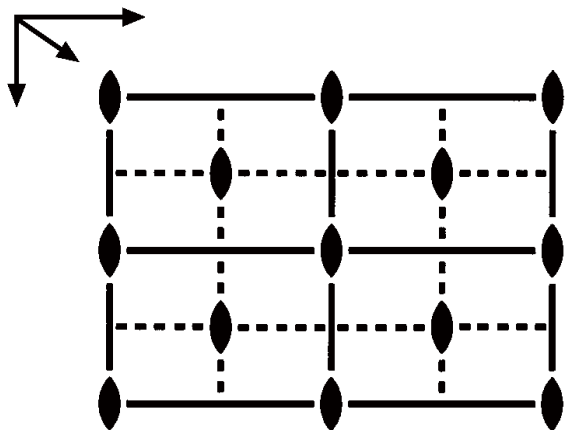
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]
4 c 1	(3) $x+1/2,\bar{y}+1/2,z$ [u, \bar{v} ,w]	(4) $\bar{x}+1/2,y+1/2,z$ [u, \bar{v},\bar{w}]
2 b ..2'	$0,1/2,z$ [u,v,0]	$1/2,0,z$ [u, \bar{v} ,0]
2 a ..2'	$0,0,z$ [u,v,0]	$1/2,1/2,z$ [u, \bar{v} ,0]

Symmetry of special projections

Along [001] $p2'gg'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p_{2a^*}1m1$ $a^* = b/2$ Origin at x,0,0	Along [010] $p1m1$ $a^* = a/2$ Origin at 0,y,0
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cmm2

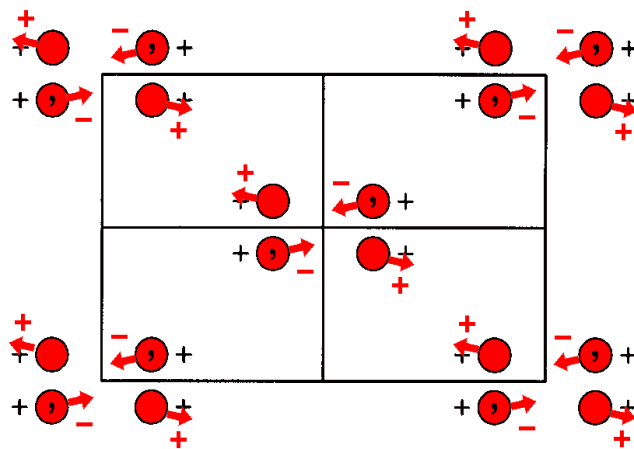
No. 26.1.147



mm2

Orthorhombic/Rectangular

cmm2



Origin on mm2

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

For (0,0,0) + set

(1) 1 (2) 2 0,0,z
 (1|0,0,0) (2_z|0,0,0)

(3) m x,0,z (4) m 0,y,z
 (m_y|0,0,0) (m_x|0,0,0)

For (1/2,1/2,0) + set

(1) t (1/2,1/2,0) (2) 2 1/4,1/4,z
 (1|1/2,1/2,0) (2_z|1/2,1/2,0)

(3) a (1/2,0,0) x,1/4,z (4) b (0,1/2,0) 1/4,y,z
 (m_y|1/2,1/2,0) (m_x|1/2,1/2,0)

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

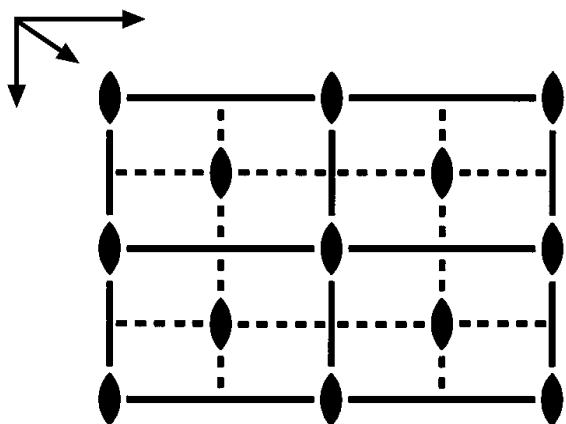
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	(1/2,1/2,0) +
8 f 1	(1) x,y,z [u,v,w] (3) x, \bar{y} ,z [\bar{u} ,v, \bar{w}]	(2) \bar{x} , \bar{y} ,z [\bar{u} , \bar{v} ,w] (4) \bar{x} ,y,z [u, \bar{v} , \bar{w}]
4 e m..	0,y,z [u,0,0]	0, \bar{y} ,z [\bar{u} ,0,0]
4 d .m.	x,0,z [0,v,0]	\bar{x} ,0,z [0,v,0]
4 c ..2	1/4,1/4,z [0,0,w]	1/4,3/4,z [0,0, \bar{w}]
2 b mm2	0,1/2,z [0,0,0]	
2 a mm2	0,0,z [0,0,0]	

Symmetry of special projections

Along [001] c2mm $\mathbf{a}^* = \mathbf{a}$ $\mathbf{b}^* = \mathbf{b}$ Origin at 0,0,z	Along [100] p1m1' $\mathbf{a}^* = \mathbf{b}/2$ Origin at x,0,0	Along [010] p1m1' $\mathbf{a}^* = \mathbf{a}/2$ Origin at 0,y,0
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cmm21'

No. 26.2.148

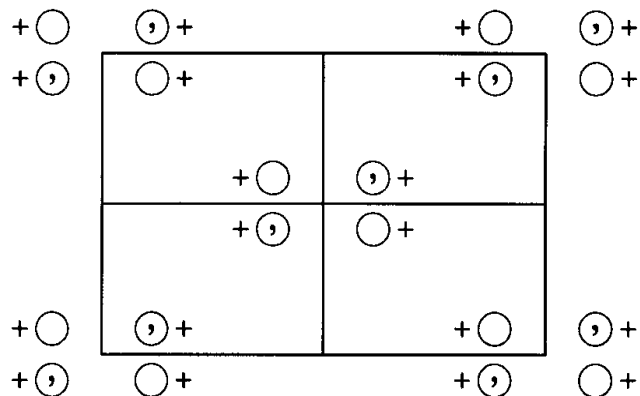


mm21'

Orthorhombic/Rectangular

cmm21'

1'



Origin on mm21'

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

For (0,0,0) + set

(1) 1 (2) 2 0,0,z
(1|0,0,0) (2_z|0,0,0)

(3) m x,0,z (4) m 0,y,z
(m_y|0,0,0) (m_x|0,0,0)

For (1/2,1/2,0) + set

(1) t (1/2,1/2,0) (2) 2 1/4,1/4,z
(1|1/2,1/2,0) (2_z|1/2,1/2,0)

(3) a (1/2,0,0) x,1/4,z (4) b (0,1/2,0) 1/4,y,z
(m_y|1/2,1/2,0) (m_x|1/2,1/2,0)

For (0,0,0)' + set

(1) 1' (2) 2' 0,0,z
(1|0,0,0)' (2_z|0,0,0)'

(3) m' x,0,z (4) m' 0,y,z
(m_y|0,0,0)' (m_x|0,0,0)'

For (1/2,1/2,0)' + set

(1) t' (1/2,1/2,0)' (2) 2' 1/4,1/4,z
(1|1/2,1/2,0)' (2_z|1/2,1/2,0)'

(3) a' (1/2,0,0)' x,1/4,z (4) b' (0,1/2,0)' 1/4,y,z
(m_y|1/2,1/2,0)' (m_x|1/2,1/2,0)'

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3); 1'

Positions

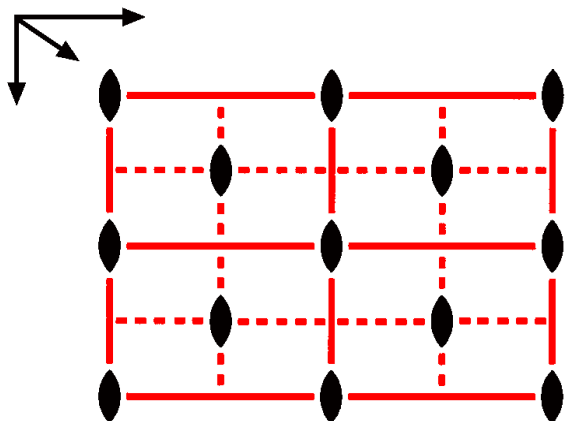
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	(1/2,1/2,0) +
	(0,0,0)' +	(1/2,1/2,0)' +
8 f 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]
	(3) x, \bar{y} ,z [0,0,0]	(4) \bar{x},y,z [0,0,0]
4 e m..1'	0,y,z [0,0,0]	0, \bar{y} ,z [0,0,0]
4 d .m.1'	x,0,z [0,0,0]	$\bar{x},0,z$ [0,0,0]
4 c ..21'	1/4,1/4,z [0,0,0]	1/4,3/4,z [0,0,0]
2 b mm21'	0,1/2,z [0,0,0]	
2 a mm21'	0,0,z [0,0,0]	

Symmetry of special projections

Along [001] c2mm1'	Along [100] p1m11'	Along [010] p1m11'
$\mathbf{a}^* = \mathbf{a}$ $\mathbf{b}^* = \mathbf{b}$	$\mathbf{a}^* = \mathbf{b}/2$	$\mathbf{a}^* = \mathbf{a}/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

cm'm'2

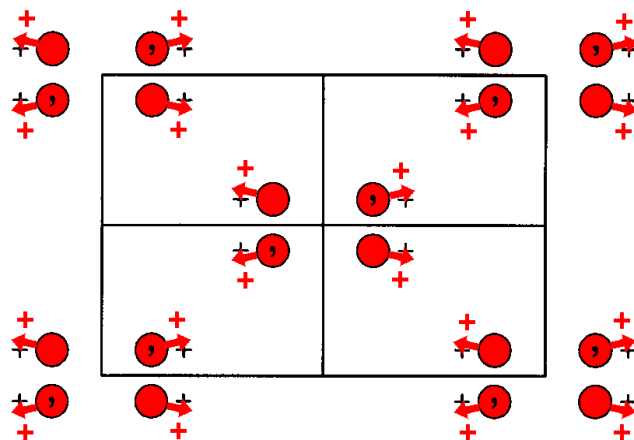
No. 26.3.149



m'm'2

Orthorhombic/Rectangular

cm'm'2



Origin on m'm'2

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

For (0,0,0) + set

- (1) 1
(1|0,0,0)
- (2) 2 $0,0,z$
(2_z|0,0,0)

- (3) m' $x,0,z$
(m_y|0,0,0)'

- (4) m' $0,y,z$
(m_x|0,0,0)'

For (1/2,1/2,0) + set

- (1) t (1/2,1/2,0)
(1|1/2,1/2,0)
- (2) 2 $1/4,1/4,z$
(2_z|1/2,1/2,0)

- (3) a' (1/2,0,0) $x,1/4,z$
(m_y|1/2,1/2,0)'
- (4) b' (0,1/2,0) $1/4,y,z$
(m_x|1/2,1/2,0)'

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

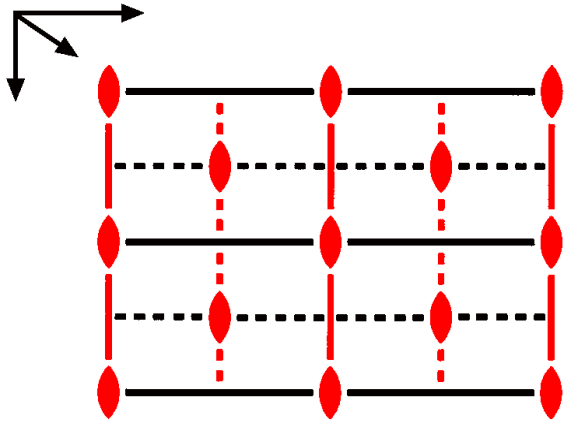
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	(1/2,1/2,0) +
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
	(3) x,\bar{y},z [u,\bar{v},w]	(4) \bar{x},y,z [\bar{u},v,w]
4 e m'..	0,y,z [0,v,w]	0, \bar{y} ,z [0, \bar{v} ,w]
4 d .m'.	x,0,z [u,0,w]	\bar{x} ,0,z [\bar{u} ,0,w]
4 c ..2	1/4,1/4,z [0,0,w]	1/4,3/4,z [0,0,w]
2 b m'm'2	0,1/2,z [0,0,w]	
2 a m'm'2	0,0,z [0,0,w]	

Symmetry of special projections

Along [001] c2m'm'	Along [100] p1m'1	Along [010] p1m'1
$a^* = a$ $b^* = b$	$a^* = b/2$	$a^* = a/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

cmm'2'

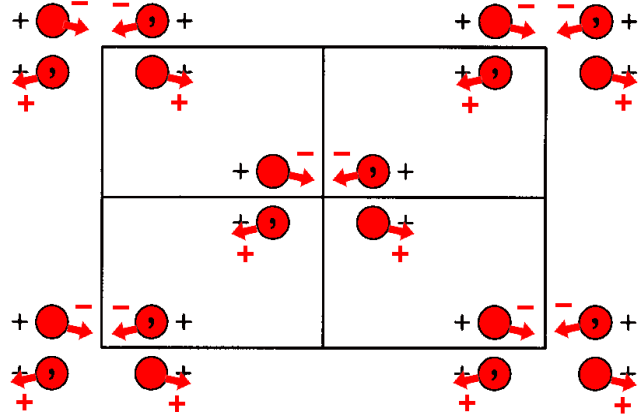
No. 26.4.150



mm'2'

Orthorhombic/Rectangular

cmm'2'



Origin on mm'2'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

For (0,0,0) + set

(1) 1
(1|0,0,0)

(2) 2' 0,0,z
(2_z|0,0,0)'

(3) m' x,0,z
(m_y|0,0,0)'

(4) m 0,y,z
(m_x|0,0,0)

For (1/2,1/2,0) + set

(1) t (1/2,1/2,0)
(1|1/2,1/2,0)

(2) 2' 1/4,1/4,z
(2_z|1/2,1/2,0)'

(3) a' (1/2,0,0) x,1/4,z
(m_y|1/2,1/2,0)'

(4) b (0,1/2,0) 1/4,y,z
(m_x|1/2,1/2,0)

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

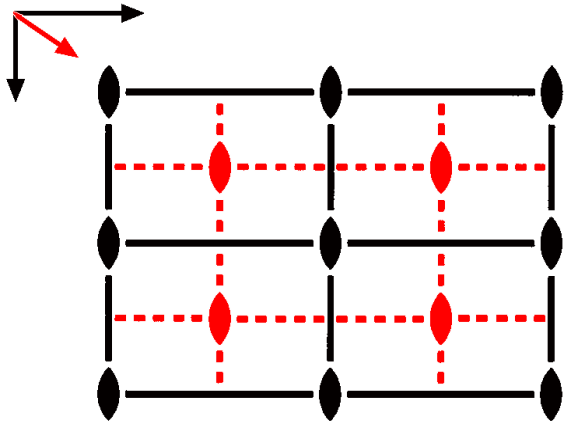
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	(1/2,1/2,0) +
8 f 1	(1) x,y,z [u,v,w] (3) x, \bar{y} ,z [u, \bar{v} ,w]	(2) \bar{x} , \bar{y} ,z [u,v, \bar{w}] (4) \bar{x} ,y,z [u, \bar{v} , \bar{w}]
4 e m..	0,y,z [u,0,0]	0, \bar{y} ,z [u,0,0]
4 d .m'	x,0,z [u,0,w]	\bar{x} ,0,z [u,0, \bar{w}]
4 c ..2'	1/4,1/4,z [u,v,0]	1/4,3/4,z [u, \bar{v} ,0]
2 b mm'2'	0,1/2,z [u,0,0]	
2 a mm'2'	0,0,z [u,0,0]	

Symmetry of special projections

Along [001] c2'mm'	Along [100] p1m1'	Along [010] p1m1
$a^* = a$ $b^* = b$	$a^* = b/2$	$a^* = a/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

$c_p, mm2$

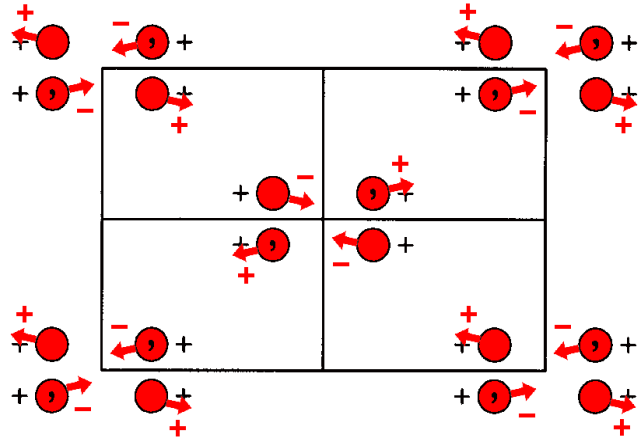
No. 26.5.151



$mm21'$

Orthorhombic/Rectangular

$c_p, mm2$



Origin on $mm2$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1
 $(1|0,0,0)$

(2) 2 $0,0,z$
 $(2_z|0,0,0)$

(3) m $x,0,z$
 $(m_y|0,0,0)$

(4) m $0,y,z$
 $(m_x|0,0,0)$

For $(1/2,1/2,0)'$ + set

(1) t' $(1/2,1/2,0)$
 $(1|1/2,1/2,0)'$

(2) $2'$ $1/4,1/4,z$
 $(2_z|1/2,1/2,0)'$

(3) a' $(1/2,0,0)$ $x,1/4,z$
 $(m_y|1/2,1/2,0)'$

(4) b' $(0,1/2,0)$ $1/4,y,z$
 $(m_x|1/2,1/2,0)'$

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0)[']; (2); (3)

Positions

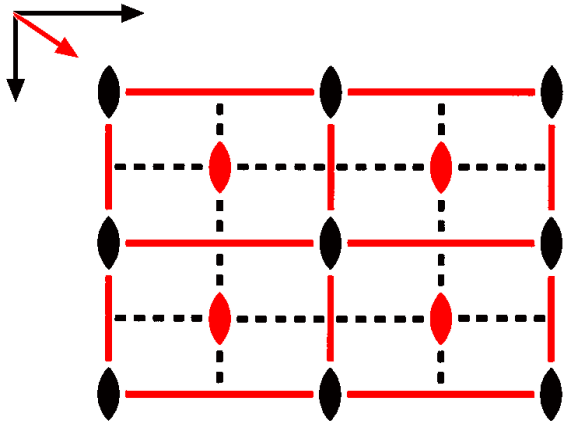
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	(1/2,1/2,0) ['] +
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]
	(3) x,\bar{y},z [\bar{u},v,\bar{w}]	(4) \bar{x},y,z [u,\bar{v},\bar{w}]
4 e m..	0,y,z [u,0,0]	0, \bar{y} ,z [$\bar{u},0,0$]
4 d .m.	x,0,z [0,v,0]	$\bar{x},0,z$ [0, $\bar{v},0$]
4 c ..2'	1/4,1/4,z [u,v,0]	1/4,3/4,z [$\bar{u},v,0$]
2 b mm2	0,1/2,z [0,0,0]	
2 a mm2	0,0,z [0,0,0]	

Symmetry of special projections

Along [001] c _p .2mm $\mathbf{a}^* = \mathbf{a}$ $\mathbf{b}^* = \mathbf{b}$ Origin at 0,0,z	Along [100] p1m1' $\mathbf{a}^* = \mathbf{b}/2$ Origin at x,0,0	Along [010] p1m1' $\mathbf{a}^* = \mathbf{a}/2$ Origin at 0,y,0
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$c_p m' m' 2$

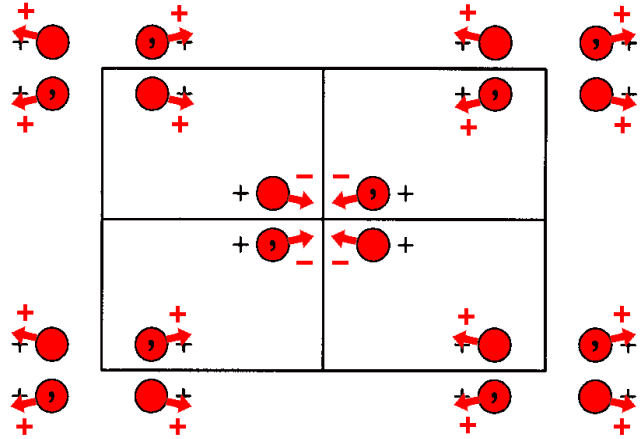
No. 26.6.152



$mm21'$

Orthorhombic/Rectangular

$c_p m' m' 2$



Origin on $m' m' 2$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

(1) 1
 $(1|0,0,0)$

(2) 2 $0,0,z$
 $(2_z|0,0,0)$

(3) m' $x,0,z$
 $(m_y|0,0,0)'$

(4) m' $0,y,z$
 $(m_x|0,0,0)'$

For $(1/2,1/2,0)'$ + set

(1) t' $(1/2,1/2,0)$
 $(1|1/2,1/2,0)'$

(2) $2'$ $1/4,1/4,z$
 $(2_z|1/2,1/2,0)'$

(3) a $(1/2,0,0)$ $x,1/4,z$
 $(m_y|1/2,1/2,0)$

(4) b $(0,1/2,0)$ $1/4,y,z$
 $(m_x|1/2,1/2,0)$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3)

Positions

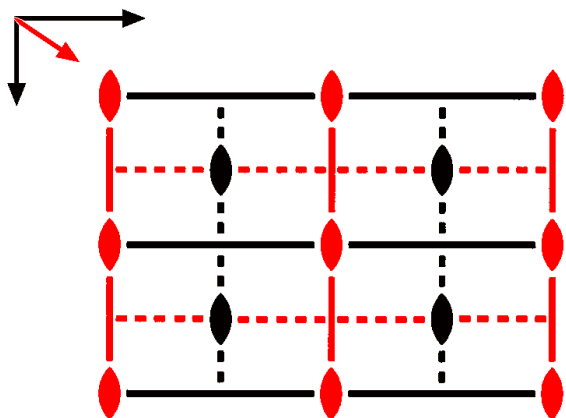
Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	(1/2,1/2,0)' +
8 f 1	(1) $x, y, z [u, v, w]$	(2) $\bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]$
	(3) $x, \bar{y}, z [u, \bar{v}, w]$	(4) $\bar{x}, y, z [\bar{u}, v, w]$
4 e $m'..$	$0, y, z [0, v, w]$	$0, \bar{y}, z [0, \bar{v}, w]$
4 d $.m'$	$x, 0, z [u, 0, w]$	$\bar{x}, 0, z [\bar{u}, 0, w]$
4 c $..2'$	$1/4, 1/4, z [u, v, 0]$	$1/4, 3/4, z [u, \bar{v}, 0]$
2 b $m' m' 2$	$0, 1/2, z [0, 0, w]$	
2 a $m' m' 2$	$0, 0, z [0, 0, w]$	

Symmetry of special projections

Along [001] $c_p .2m' m'$ $a^* = a \quad b^* = b$ Origin at 0,0,z	Along [100] $p_{2a^*} 1m1$ $a^* = b/2$ Origin at $x, 1/4, 0$	Along [010] $p_{2a^*} 1m1$ $a^* = a/2$ Origin at $1/4, y, 0$
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$c_p, mm'2'$

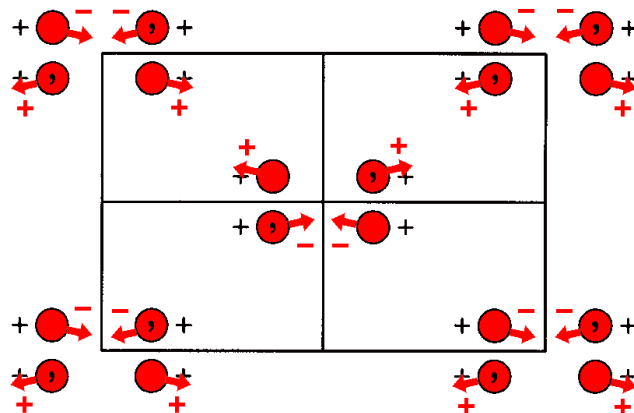
No. 26.7.153



$mm21'$

Orthorhombic/Rectangular

$c_p, mm'2'$



Origin on $mm'2'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set
 (1) 1 $(1|0,0,0)$ (2) $2' 0,0,z$ $(2_z|0,0,0)'$

(3) $m' x,0,z$ $(m_y|0,0,0)'$ (4) $m 0,y,z$ $(m_x|0,0,0)$

For $(1/2,1/2,0)'$ + set
 (1) $t' (1/2,1/2,0)$ $(1|1/2,1/2,0)'$ (2) $2 1/4,1/4,z$ $(2_z|1/2,1/2,0)$

(3) a $(1/2,0,0) x,1/4,z$ $(m_y|1/2,1/2,0)$ (4) b' $(0,1/2,0) 1/4,y,z$ $(m_x|1/2,1/2,0)'$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0) +	$(1/2,1/2,0)'$ +
8 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [u,v,\bar{w}]$
	(3) $x,\bar{y},z [u,\bar{v},w]$	(4) $\bar{x},y,z [u,\bar{v},\bar{w}]$
4 e m..	$0,y,z [u,0,0]$	$0,\bar{y},z [u,0,0]$
4 d .m'	$x,0,z [u,0,w]$	$\bar{x},0,z [u,0,\bar{w}]$
4 c ..2	$1/4,1/4,z [0,0,w]$	$1/4,3/4,z [0,0,w]$
2 b $mm'2'$	$0,1/2,z [u,0,0]$	
2 a $mm'2'$	$0,0,z [u,0,0]$	

Symmetry of special projections

Along [001] $c_p-2'mm'$ $a^* = a \quad b^* = b$ Origin at 0,0,z	Along [100] $p1m1'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p_{2a^*}1m1$ $a^* = a/2$ Origin at 0,y,0
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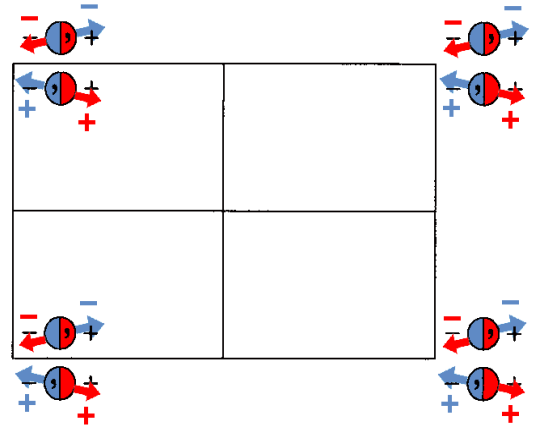
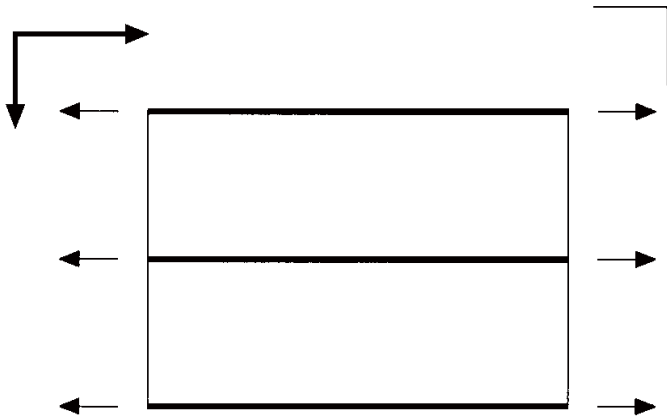
pm2m

No. 27.1.154

m2m

pm2m

Orthorhombic/Rectangular



Origin on m2m

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $0,y,0$
(2_y|0,0,0)

(3) m $0,y,z$
(m_x|0,0,0)

(4) m $x,y,0$
(m_z|0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
4 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	
	(3) $\bar{x},y,z [u,\bar{v},\bar{w}]$	(4) $x,y,\bar{z} [\bar{u},\bar{v},w]$	
	2 e ..m	$x,y,0 [0,0,w]$	$\bar{x},y,0 [0,0,\bar{w}]$
	2 d m..	$1/2,y,z [u,0,0]$	$1/2,y,\bar{z} [\bar{u},0,0]$
2 c m..	$0,y,z [u,0,0]$	$0,y,\bar{z} [\bar{u},0,0]$	
1 b m2m	$1/2,y,0 [0,0,0]$		
1 a m2m	$0,y,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p1m1'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p11m1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2mm$ $a^* = a$ Origin at $0,y,0$
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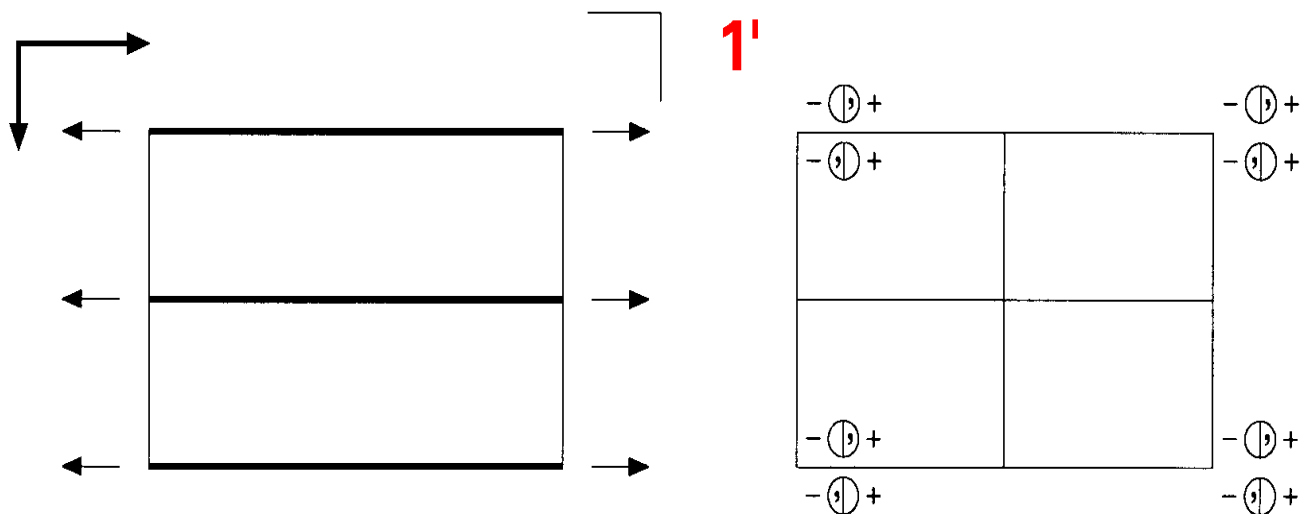
pm2m1'

m2m1'

Orthorhombic/Rectangular

No. 27.2.155

pm2m1'



Origin on m2m1'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- | | | | |
|----------------------|--|--|--|
| For 1 + set | | | |
| (1) 1
(1 0,0,0) | (2) 2 0,y,0
(2 _y 0,0,0) | (3) m 0,y,z
(m _x 0,0,0) | (4) m x,y,0
(m _z 0,0,0) |
| For 1' + set | | | |
| (1) 1'
(1 0,0,0)' | (2) 2' 0,y,0
(2 _y 0,0,0)' | (3) m' 0,y,z
(m _x 0,0,0)' | (4) m' x,y,0
(m _z 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 f 11'	(1) x,y,z [0,0,0]	(2) \bar{x},y,\bar{z} [0,0,0]
	(3) \bar{x},y,z [0,0,0]	(4) x,y, \bar{z} [0,0,0]
2 e ..m1'	x,y,0 [0,0,0]	$\bar{x},y,0$ [0,0,0]
2 d m..1'	1/2,y,z [0,0,0]	1/2,y, \bar{z} [0,0,0]
2 c m..1'	0,y,z [0,0,0]	0,y, \bar{z} [0,0,0]
1 b m2m1'	1/2,y,0 [0,0,0]	
1 a m2m1'	0,y,0 [0,0,0]	

Symmetry of special projections

Along [001] p1m11' $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p11m1' $a^* = b$ Origin at x,0,0	Along [010] p2mm1' $a^* = a$ Origin at 0,y,0
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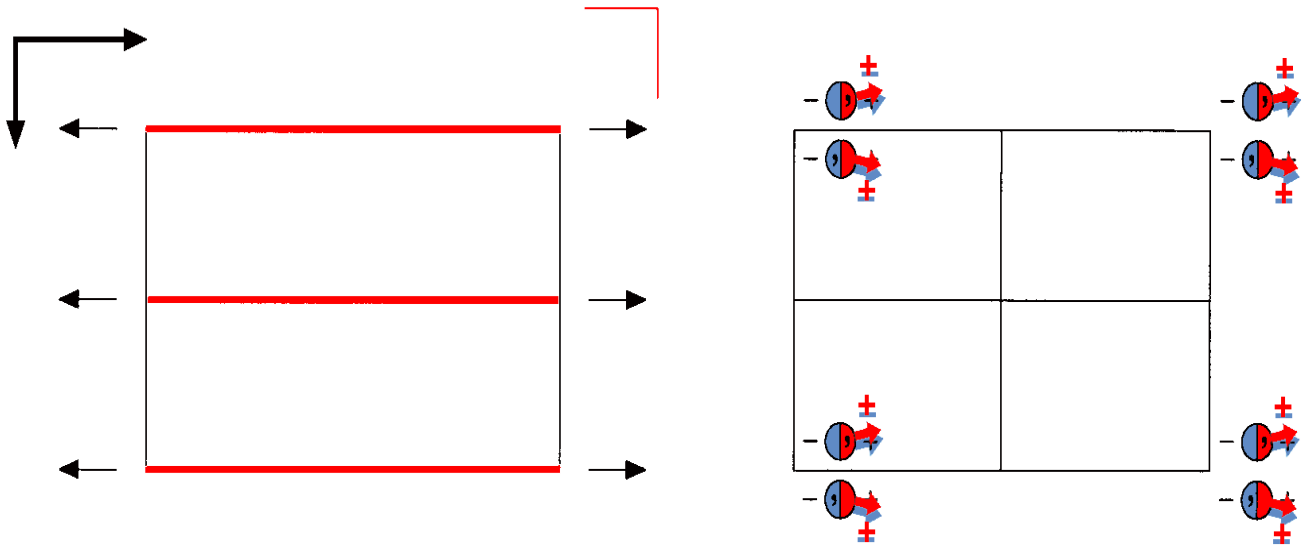
pm'2m'

No. 27.3.156

m'2m'

pm'2m'

Orthorhombic/Rectangular



Origin on m'2m'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $0,y,0$
(2_y|0,0,0)

(3) m' $0,y,z$
(m'_x|0,0,0)'

(4) m' $x,y,0$
(m'_z|0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
4 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]
	(3) \bar{x},y,z [\bar{u},v,w]	(4) x,y, \bar{z} [u,v, \bar{w}]
	x,y,0 [u,v,0]	$\bar{x},y,0$ [$\bar{u},v,0$]
	1/2,y,z [0,v,w]	1/2,y, \bar{z} [0,v, \bar{w}]
2 d m'..	0,y,z [0,v,w]	0,y, \bar{z} [0,v, \bar{w}]
2 c m'..	1/2,y,0 [0,v,0]	
1 b m'2m'	0,y,0 [0,v,0]	
1 a m'2m'		

Symmetry of special projections

Along [001] p1m'1
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] p11m'
 $a^* = b$
 Origin at x,0,0

Along [010] p2'm'm
 $a^* = a$
 Origin at 0,y,0

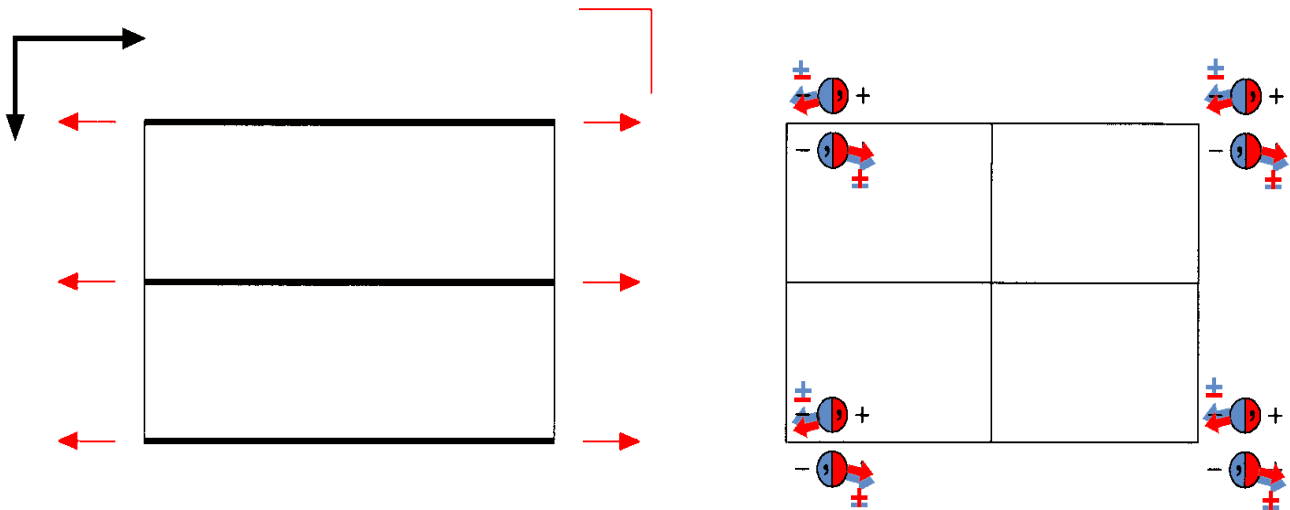
pm2'm'

No. 27.4.157

m2'm'

pm2'm'

Orthorhombic/Rectangular



Origin on m2'm'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 0,y,0
(2_y|0,0,0)'

(3) m 0,y,z
(m_x|0,0,0)

(4) m' x,y,0
(m_z|0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
4 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [u, \bar{v} ,w]
	(3) \bar{x},y,z [u, \bar{v},\bar{w}]	(4) x,y, \bar{z} [u,v, \bar{w}]
	2 e ..m'	x,y,0 [u,v,0] $\bar{x},y,0$ [u, \bar{v} ,0]
	2 d m..	1/2,y,z [u,0,0] 1/2,y, \bar{z} [u,0,0]
2 c m..	0,y,z [u,0,0] 0,y, \bar{z} [u,0,0]	
1 b m2'm'	1/2,y,0 [u,0,0]	
1 a m2'm'	0,y,0 [u,0,0]	

Symmetry of special projections

Along [001] p1m1 $\mathbf{a}^* = \mathbf{a}$ $\mathbf{b}^* = \mathbf{b}$ Origin at 0,0,z	Along [100] p11m1' $\mathbf{a}^* = \mathbf{b}$ Origin at x,0,0	Along [010] p2'mm' $\mathbf{a}^* = \mathbf{a}$ Origin at 0,y,0
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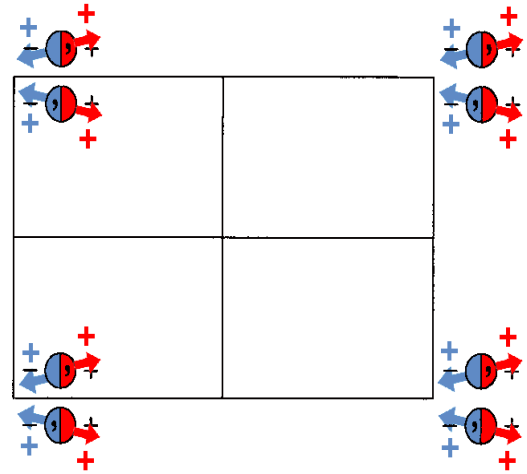
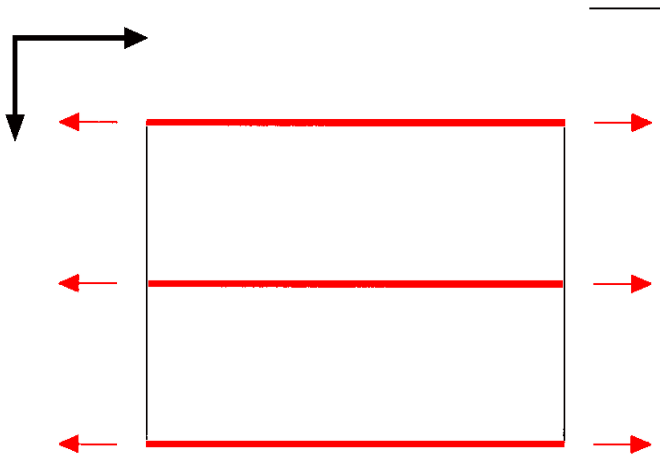
pm'2'm

No. 27.5.158

m'2'm

pm'2'm

Orthorhombic/Rectangular



Origin on m'2'm

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 0,y,0
(2_y|0,0,0)'

(3) m' 0,y,z
(m_x|0,0,0)'

(4) m x,y,0
(m_z|0,0,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x, y, z [u,v,w]	(2) \bar{x}, y, \bar{z} [u, \bar{v} ,w]
4 f 1	(3) \bar{x}, y, z [\bar{u} ,v,w]	(4) x, y, \bar{z} [\bar{u} , \bar{v} ,w]
2 e ..m	$x, y, 0$ [0,0,w]	$\bar{x}, y, 0$ [0,0,w]
2 d m'..	$1/2, y, z$ [0,v,w]	$1/2, y, \bar{z}$ [0, \bar{v} ,w]
2 c m'..	$0, y, z$ [0,v,w]	$0, y, \bar{z}$ [0, \bar{v} ,w]
1 b m'2'm	$1/2, y, 0$ [0,0,w]	
1 a m'2'm	$0, y, 0$ [0,0,w]	

Symmetry of special projections

Along [001] p1m11' $\mathbf{a}^* = \mathbf{a}$ $\mathbf{b}^* = \mathbf{b}$ Origin at 0,0,z	Along [100] p11m $\mathbf{a}^* = \mathbf{b}$ Origin at x,0,0	Along [010] p2'm'm $\mathbf{a}^* = \mathbf{a}$ Origin at 0,y,0
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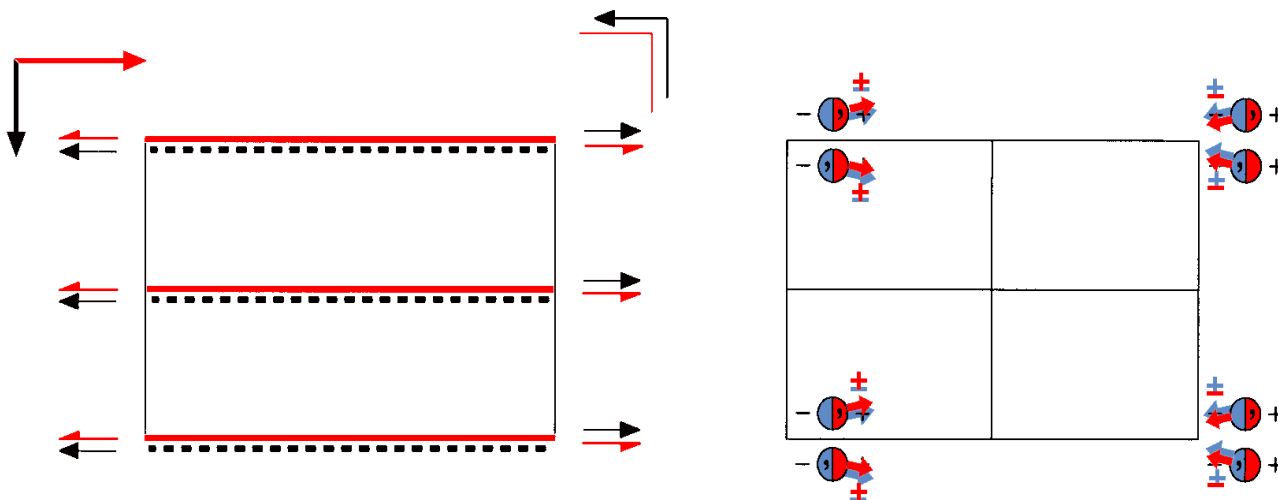
$p_{2b} m'2m'$

No. 27.6.159

$m2m1'$

$p_{2b} m'2m'$

Orthorhombic/Rectangular



Origin on $m'2m'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- For $(0,0,0) +$ set
- | | | | |
|-------------|---------------------|----------------------|----------------------|
| (1) 1 | (2) $2 \quad 0,y,0$ | (3) $m' \quad 0,y,z$ | (4) $m' \quad x,y,0$ |
| $(1 0,0,0)$ | $(2_y 0,0,0)$ | $(m_x 0,0,0)'$ | $(m_z 0,0,0)'$ |
- For $(0,1,0)'$ + set
- | | | | |
|------------------------|------------------------------------|-----------------------------------|-----------------------------------|
| (1) $t' \quad (0,1,0)$ | (2) $2' \quad (0,1,0) \quad 0,y,0$ | (3) $b \quad (0,1,0) \quad 0,y,z$ | (4) $b \quad (0,1,0) \quad x,y,0$ |
| $(1 0,1,0)'$ | $(2_y 0,1,0)'$ | $(m_x 0,1,0)$ | $(m_z 0,1,0)$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(0,1,0)'+$
4 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$
	(3) $\bar{x},y,z [\bar{u},v,w]$	(4) $x,y,\bar{z} [u,v,\bar{w}]$
2 e $..m'$	$x,y,0 [u,v,0]$	$\bar{x},y,0 [\bar{u},v,0]$
2 d $m'..$	$1/2,y,z [0,v,w]$	$1/2,y,\bar{z} [0,v,\bar{w}]$
2 c $m'..$	$0,y,z [0,v,w]$	$0,y,\bar{z} [0,v,\bar{w}]$
1 b $m'2m'$	$1/2,y,0 [0,v,0]$	
1 a $m'2m'$	$0,y,0 [0,v,0]$	

Symmetry of special projections

Along $[001] p_{2b^*}1m'1$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along $[100] p_{2a^*}11m'$ $a^* = b$ Origin at $x,0,0$	Along $[010] p2mm'1$ $a^* = a$ Origin at $0,y,0$
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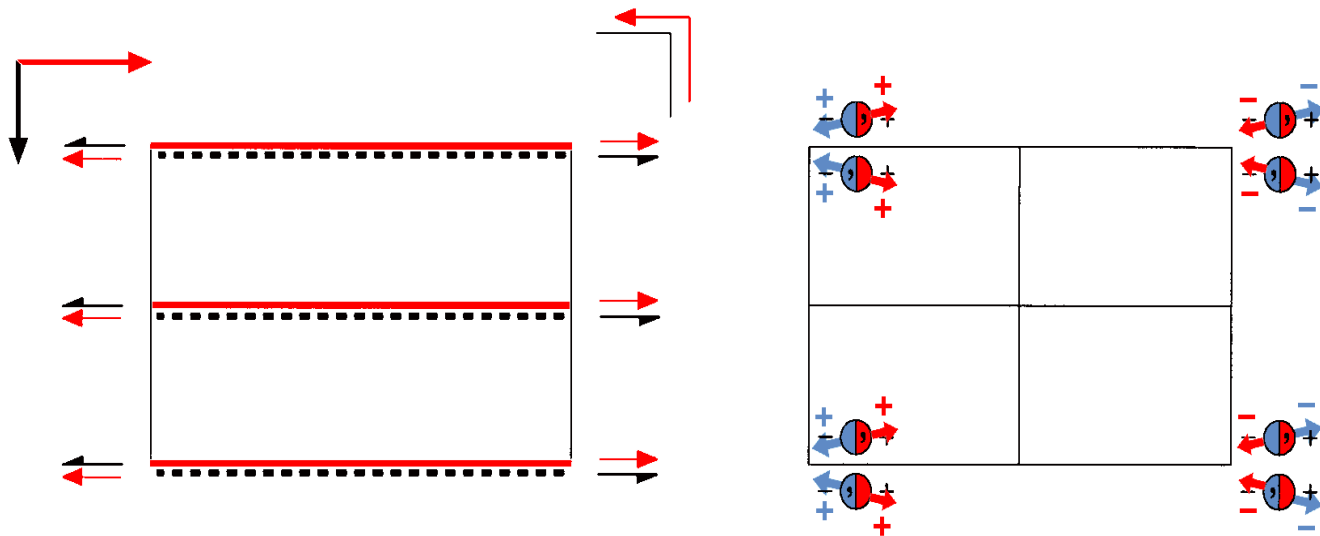
$p_{2b} m'2'm$

No. 27.7.160

$m2m1'$

$p_{2b} m'2'm$

Orthorhombic/Rectangular



Origin on $m'2'm$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- For $(0,0,0) +$ set
- | | | | |
|-------------|----------------------|----------------------|---------------------|
| (1) 1 | (2) $2' \quad 0,y,0$ | (3) $m' \quad 0,y,z$ | (4) $m \quad x,y,0$ |
| $(1 0,0,0)$ | $(2_y 0,0,0)'$ | $(m_x 0,0,0)'$ | $(m_z 0,0,0)$ |
- For $(0,1,0)' +$ set
- | | | | |
|------------------------|-----------------------------------|-----------------------------------|------------------------------------|
| (1) $t' \quad (0,1,0)$ | (2) $2 \quad (0,1,0) \quad 0,y,0$ | (3) $b \quad (0,1,0) \quad 0,y,z$ | (4) $b' \quad (0,1,0) \quad x,y,0$ |
| $(1 0,1,0)'$ | $(2_y 0,1,0)$ | $(m_x 0,1,0)$ | $(m_z 0,1,0)'$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(0,1,0)'+$
4 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [u,\bar{v},w]$
	(3) $\bar{x},y,z [\bar{u},v,w]$	(4) $x,y,\bar{z} [\bar{u},\bar{v},w]$
2 e $..m$	$x,y,0 [0,0,w]$	$\bar{x},y,0 [0,0,w]$
2 d $m'..$	$1/2,y,z [0,v,w]$	$1/2,y,\bar{z} [0,\bar{v},w]$
2 c $m'..$	$0,y,z [0,v,w]$	$0,y,\bar{z} [0,\bar{v},w]$
1 b $m'2'm$	$1/2,y,0 [0,0,w]$	
1 a $m'2'm$	$0,y,0 [0,0,w]$	

Symmetry of special projections

Along [001] $p1m11'$ $a^* = a \quad b^* = b$ Origin at $0,0,z$	Along [100] $p_{2a^*}11m$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2mm1'$ $a^* = a$ Origin at $0,y,0$
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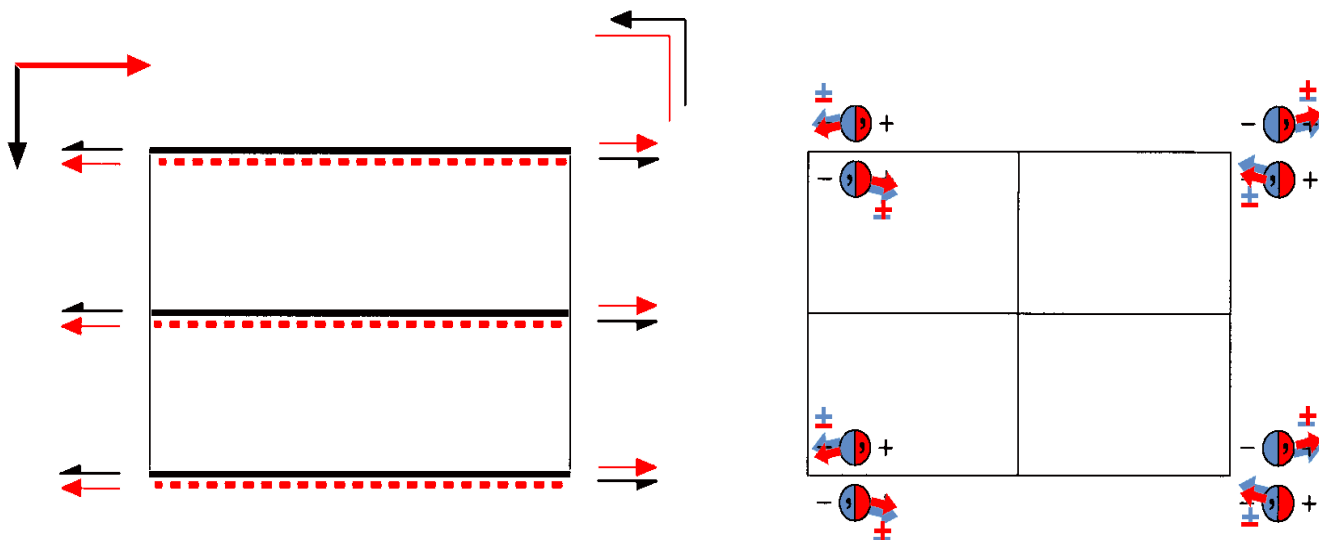
$p_{2b} m2'm'$

No. 27.8.161

$m2m1'$

$p_{2b} m2'm'$

Orthorhombic/Rectangular



Origin on $m2'm'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- For $(0,0,0) +$ set
- | | | | |
|-------------|----------------------|---------------------|----------------------|
| (1) 1 | (2) $2' \quad 0,y,0$ | (3) $m \quad 0,y,z$ | (4) $m' \quad x,y,0$ |
| $(1 0,0,0)$ | $(2_y 0,0,0)'$ | $(m_x 0,0,0)$ | $(m_z 0,0,0)'$ |
- For $(0,1,0)' +$ set
- | | | | |
|------------------------|-----------------------------------|------------------------------------|-----------------------------------|
| (1) $t' \quad (0,1,0)$ | (2) $2 \quad (0,1,0) \quad 0,y,0$ | (3) $b' \quad (0,1,0) \quad 0,y,z$ | (4) $b \quad (0,1,0) \quad x,y,0$ |
| $(1 0,1,0)'$ | $(2_y 0,1,0)$ | $(m_x 0,1,0)'$ | $(m_z 0,1,0)$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(0,1,0)'+$
4 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [u,\bar{v},w]$
	(3) $\bar{x},y,z [u,\bar{v},\bar{w}]$	(4) $x,y,\bar{z} [u,v,\bar{w}]$
2 e $..m'$	$x,y,0 [u,v,0]$	$\bar{x},y,0 [u,\bar{v},0]$
2 d $m..$	$1/2,y,z [u,0,0]$	$1/2,y,\bar{z} [u,0,0]$
2 c $m..$	$0,y,z [u,0,0]$	$0,y,\bar{z} [u,0,0]$
1 b $m2'm'$	$1/2,y,0 [u,0,0]$	
1 a $m2'm'$	$0,y,0 [u,0,0]$	

Symmetry of special projections

Along $[001]$ $p_{2b}1m1$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along $[100]$ $p11m1'$ $a^* = b$ Origin at $x,0,0$	Along $[010]$ $p2mm1'$ $a^* = a$ Origin at $0,y,0$
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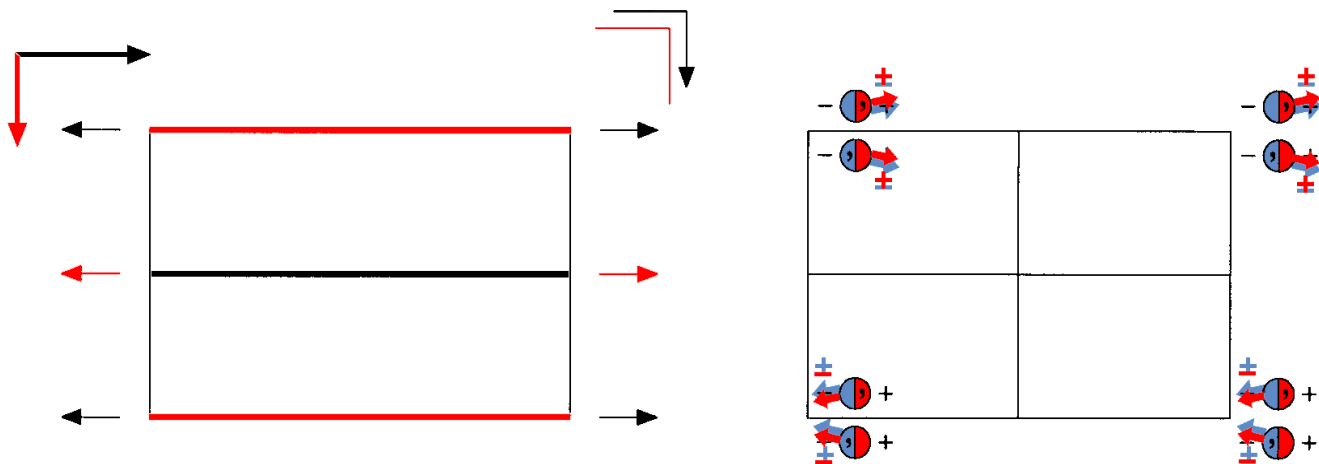
$p_{2a} m'2m'$

No. 27.9.162

$m2m1'$

$p_{2a} m'2m'$

Orthorhombic/Rectangular



Origin on $m'2m'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- | | | | |
|------------------------|------------------------|-----------------------|-----------------------------------|
| For $(0,0,0) +$ set | | | |
| (1) 1 | (2) $2 \quad 0,y,0$ | (3) $m' \quad 0,y,z$ | (4) $m' \quad x,y,0$ |
| $(1 0,0,0)$ | $(2_y 0,0,0)$ | $(m_x 0,0,0)'$ | $(m_z 0,0,0)'$ |
| For $(1,0,0)'$ + set | | | |
| (1) $t' \quad (1,0,0)$ | (2) $2' \quad 1/2,y,0$ | (3) $m \quad 1/2,y,z$ | (4) $a \quad (1,0,0) \quad x,y,0$ |
| $(1 1,0,0)'$ | $(2_y 1,0,0)'$ | $(m_x 1,0,0)$ | $(m_z 1,0,0)$ |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(1,0,0)'+$
4 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$
	(3) $\bar{x},y,z [\bar{u},v,w]$	(4) $x,y,\bar{z} [u,v,\bar{w}]$
2 e $..m'$	$x,y,0 [u,v,0]$	$\bar{x},y,0 [\bar{u},v,0]$
2 d $m..$	$1/2,y,z [u,0,0]$	$1/2,y,\bar{z} [u,0,0]$
2 c $m'..$	$0,y,z [0,v,w]$	$0,y,\bar{z} [0,v,\bar{w}]$
1 b $m'2m'$	$1/2,y,0 [u,0,0]$	
1 a $m'2m'$	$0,y,0 [u,0,0]$	

Symmetry of special projections

Along [001] $p_{2a^*}1m1$ $a^* = a$ $b^* = b$ Origin at $1/2,0,z$	Along [100] $p11m1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p_{2a^*}2m'm'$ $a^* = a$ Origin at $0,y,0$
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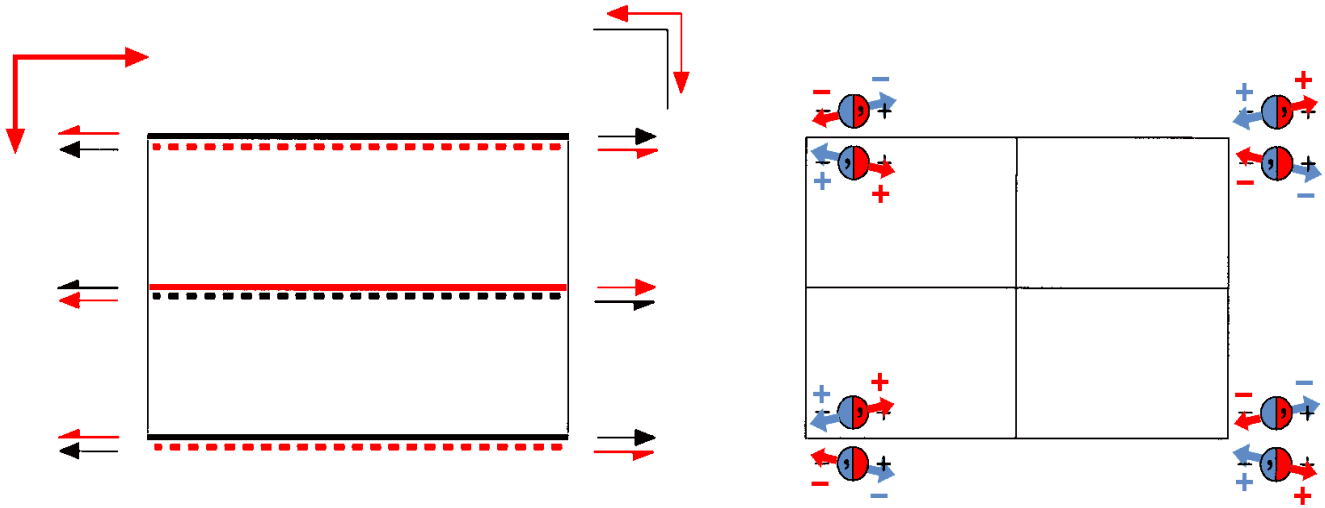
$p_c m2m$

No. 27.10.163

$m2m1'$

$p_c m2m$

Orthorhombic/Rectangular



Origin on $m2m$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- For $(0,0,0)$ + set
- | | | | |
|-------------|---------------------|---------------------|---------------------|
| (1) 1 | (2) $2 \quad 0,y,0$ | (3) $m \quad 0,y,z$ | (4) $m \quad x,y,0$ |
| $(1 0,0,0)$ | $(2_y 0,0,0)$ | $(m_x 0,0,0)$ | $(m_z 0,0,0)$ |
- For $(0,1,0)'$ + set
- | | | | |
|------------------------|------------------------------------|------------------------------------|------------------------------------|
| (1) $t' \quad (0,1,0)$ | (2) $2' \quad (0,1,0) \quad 0,y,0$ | (3) $b' \quad (0,1,0) \quad 0,y,z$ | (4) $b' \quad (0,1,0) \quad x,y,0$ |
| $(1 0,1,0)'$ | $(2_y 0,1,0)'$ | $(m_x 0,1,0)'$ | $(m_z 0,1,0)'$ |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(0,1,0)'+$
4 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$
	(3) $\bar{x},y,z [u,\bar{v},\bar{w}]$	(4) $x,y,\bar{z} [\bar{u},\bar{v},w]$
2 e ..m	$x,y,0 [0,0,w]$	$\bar{x},y,0 [0,0,\bar{w}]$
2 d m'..	$1/2,y,z [0,v,w]$	$1/2,y,\bar{z} [0,\bar{v},w]$
2 c m..	$0,y,z [u,0,0]$	$0,y,\bar{z} [\bar{u},0,0]$
1 b m'2'm	$1/2,y,0 [0,0,w]$	
1 a m2m	$0,y,0 [0,0,0]$	

Symmetry of special projections

Along [001] $p1m11'$ $a^* = a \quad b^* = b$ Origin at $0,0,z$	Along [100] $p11m1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2mm1'$ $a^* = a$ Origin at $0,y,0$
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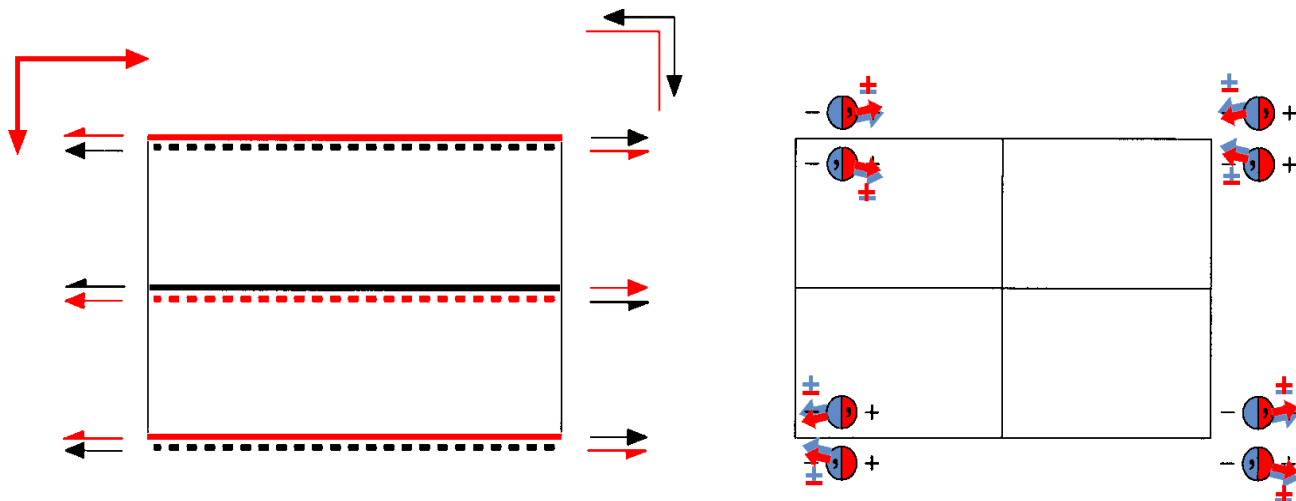
$p_c m'2m'$

No. 27.11.164

$m2m1'$

$p_c m'2m'$

Orthorhombic/Rectangular



Origin on $m'2m'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For $(0,0,0) +$ set

(1) 1	(2) $2 \quad 0,y,0$	(3) $m' \quad 0,y,z$	(4) $m' \quad x,y,0$
$(1 0,0,0)$	$(2_y 0,0,0)$	$(m_x 0,0,0)'$	$(m_z 0,0,0)'$

For $(0,1,0)'$ + set

(1) $t' \quad (0,1,0)$	(2) $2' \quad (0,1,0) \quad 0,y,0$	(3) $b \quad (0,1,0) \quad 0,y,z$	(4) $b \quad (0,1,0) \quad x,y,0$
$(1 0,1,0)'$	$(2_y 0,1,0)'$	$(m_x 0,1,0)$	$(m_z 0,1,0)$

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,1,0)' +
4 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$
	(3) $\bar{x},y,z [\bar{u},v,w]$	(4) $x,y,\bar{z} [u,v,\bar{w}]$
2 e $..m'$	$x,y,0 [u,v,0]$	$\bar{x},y,0 [\bar{u},v,0]$
2 d $m..$	$1/2,y,z [u,0,0]$	$1/2,y,\bar{z} [u,0,0]$
2 c $m'..$	$0,y,z [0,v,w]$	$0,y,\bar{z} [0,v,\bar{w}]$
1 b $m'2m'$	$1/2,y,0 [u,0,0]$	
1 a $m'2m'$	$0,y,0 [0,v,0]$	

Symmetry of special projections

Along [001] $p_c 1m1$ $a^* = a \quad b^* = b$ Origin at $1/2,0,z$	Along [100] $p11m1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2mm1'$ $a^* = a$ Origin at $0,y,0$
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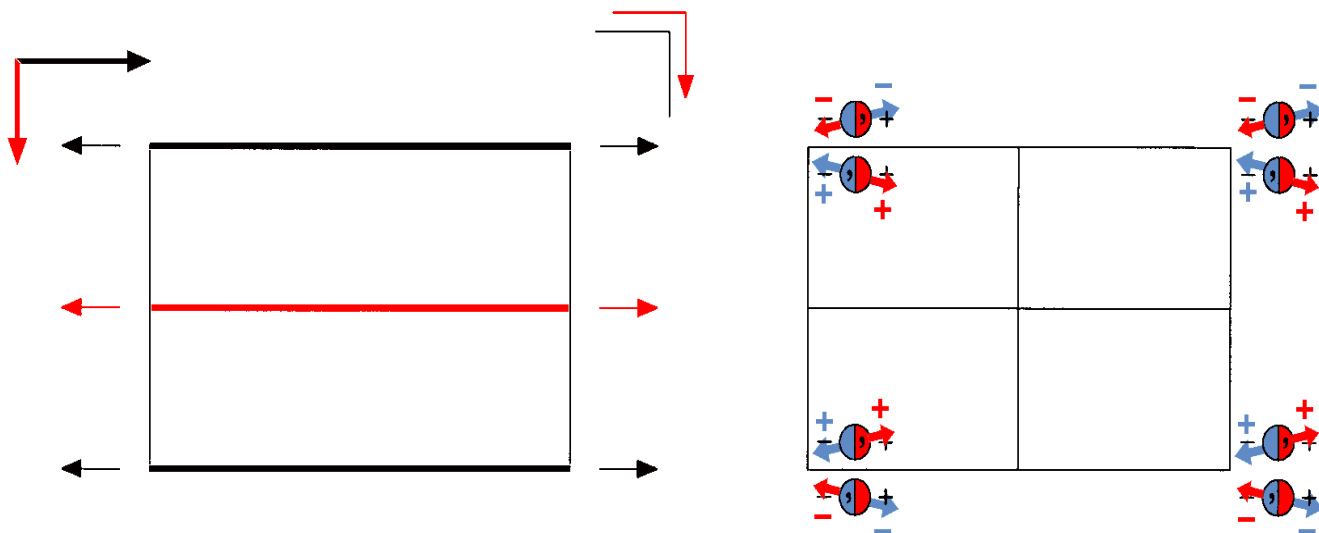
$p_{2a} m2m$

No. 27.12.165

$m2m1'$

$p_{2a} m2m$

Orthorhombic/Rectangular



Origin on $m2m$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- | | | | |
|----------------------|------------------------------|------------------------------|------------------------------|
| For $(0,0,0)$ + set | | | |
| (1) 1 | (2) 2 $0,y,0$ | (3) m $0,y,z$ | (4) m $x,y,0$ |
| (1 $0,0,0$) | (2 _y $0,0,0$) | (m _x $0,0,0$) | (m _z $0,0,0$) |
| For $(1,0,0)'$ + set | | | |
| (1) t' $(1,0,0)$ | (2) 2' $1/2,y,0$ | (3) m' $1/2,y,z$ | (4) a' $(1,0,0)$ $x,y,0$ |
| (1 $1,0,0$)' | (2 _y $1,0,0$)' | (m _x $1,0,0$)' | (m _z $1,0,0$)' |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(1,0,0)'+$
4 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$
	(3) $\bar{x},y,z [u,\bar{v},\bar{w}]$	(4) $x,y,\bar{z} [\bar{u},\bar{v},w]$
2 e ..m	$x,y,0 [0,0,w]$	$\bar{x},y,0 [0,0,\bar{w}]$
2 d m'..	$1/2,y,z [0,v,w]$	$1/2,y,\bar{z} [0,\bar{v},w]$
2 c m..	$0,y,z [u,0,0]$	$0,y,\bar{z} [\bar{u},0,0]$
1 b m'2'm	$1/2,y,0 [0,0,w]$	
1 a m2m	$0,y,0 [0,0,0]$	

Symmetry of special projections

Along [001] $p1m11'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p11m1'$ $a^* = b$ Origin at x,0,0	Along [010] $p_{2a^*}2mm$ $a^* = a$ Origin at 0,y,0
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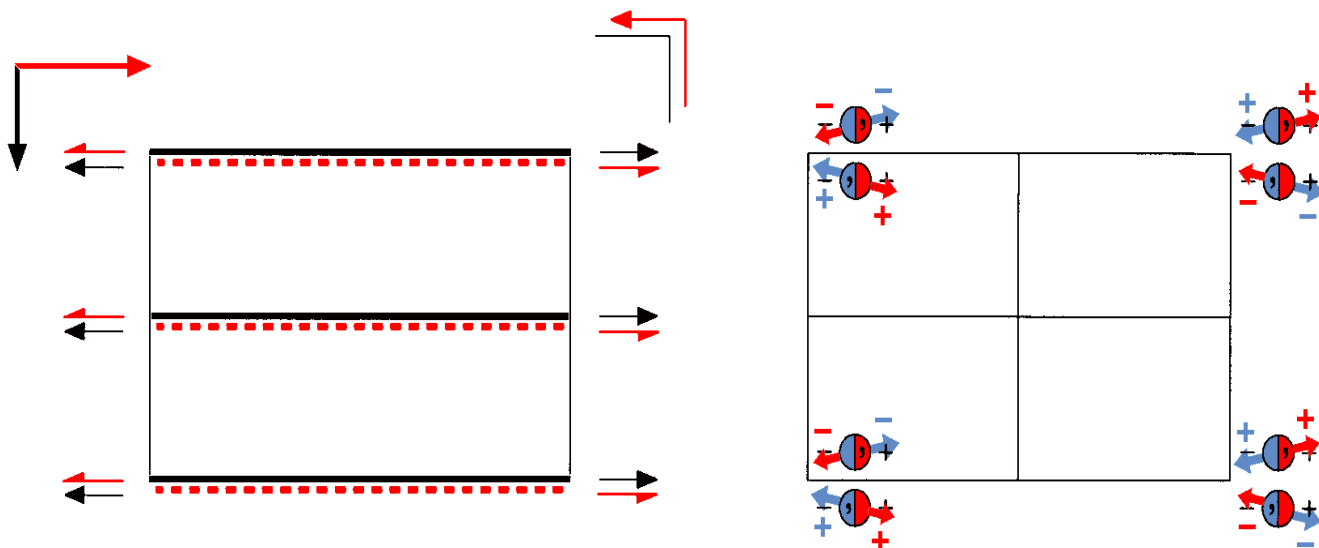
$p_{2b} m2m$

No. 27.13.166

$m2m1'$

$p_{2b} m2m$

Orthorhombic/Rectangular



Origin on $m2m$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- For $(0,0,0) +$ set
- | | | | |
|-------------|---------------------|---------------------|---------------------|
| (1) 1 | (2) $2 \quad 0,y,0$ | (3) $m \quad 0,y,z$ | (4) $m \quad x,y,0$ |
| $(1 0,0,0)$ | $(2_y 0,0,0)$ | $(m_x 0,0,0)$ | $(m_z 0,0,0)$ |
- For $(0,1,0)' +$ set
- | | | | |
|------------------------|------------------------------------|------------------------------------|------------------------------------|
| (1) $t' \quad (0,1,0)$ | (2) $2' \quad (0,1,0) \quad 0,y,0$ | (3) $b' \quad (0,1,0) \quad 0,y,z$ | (4) $b' \quad (0,1,0) \quad x,y,0$ |
| $(1 0,1,0)'$ | $(2_y 0,1,0)'$ | $(m_x 0,1,0)'$ | $(m_z 0,1,0)'$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,1,0)' +
4 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$
	(3) $\bar{x},y,z [u,\bar{v},\bar{w}]$	(4) $x,y,\bar{z} [\bar{u},\bar{v},w]$
2 e ..m	$x,y,0 [0,0,w]$	$\bar{x},y,0 [0,0,\bar{w}]$
2 d m..	$1/2,y,z [u,0,0]$	$1/2,y,\bar{z} [\bar{u},0,0]$
2 c m..	$0,y,z [u,0,0]$	$0,y,\bar{z} [\bar{u},0,0]$
1 b m2m	$1/2,y,0 [0,0,0]$	
1 a m2m	$0,y,0 [0,0,0]$	

Symmetry of special projections

Along [001] $p1m1'$ $a^* = a \quad b^* = b$ Origin at 0,0,z	Along [100] $p11m1'$ $a^* = b$ Origin at x,0,0	Along [010] $p2mm1'$ $a^* = a$ Origin at 0,y,0
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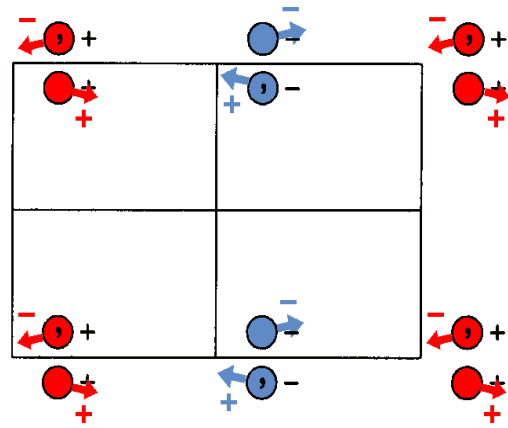
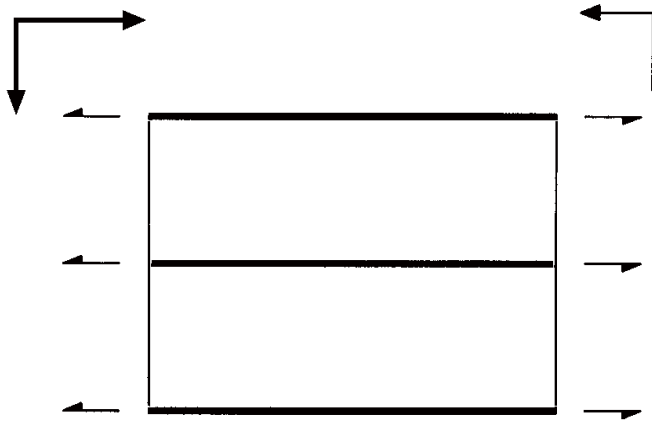
pm2₁b

No. 28.1.167

m2m

pm2₁b

Orthorhombic/Rectangular



Origin on m2₁b

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- (1) 1 (1|0,0,0) (2) 2 (0,1/2,0) 0,y,0 (2_y|0,1/2,0) (3) b (0,1/2,0) x,y,0 (m_z|0,1/2,0) (4) m 0,y,z (m_x|0,0,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $\bar{x},y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]
4 c 1	(3) x,y+1/2, \bar{z} [\bar{u},\bar{v},w]	(4) \bar{x},y,z [u,\bar{v},\bar{w}]
	2 b m..	1/2,y+1/2, \bar{z} [$\bar{u},0,0$]
2 a m..	0,y,z [u,0,0]	0,y+1/2, \bar{z} [$\bar{u},0,0$]

Symmetry of special projections

Along [001] p _{2b} *1m1 a* = a b* = b/2 Origin at 0,0,z	Along [100] p11g1' a* = b Origin at x,0,0	Along [010] p2mm a* = a Origin at 0,y,0
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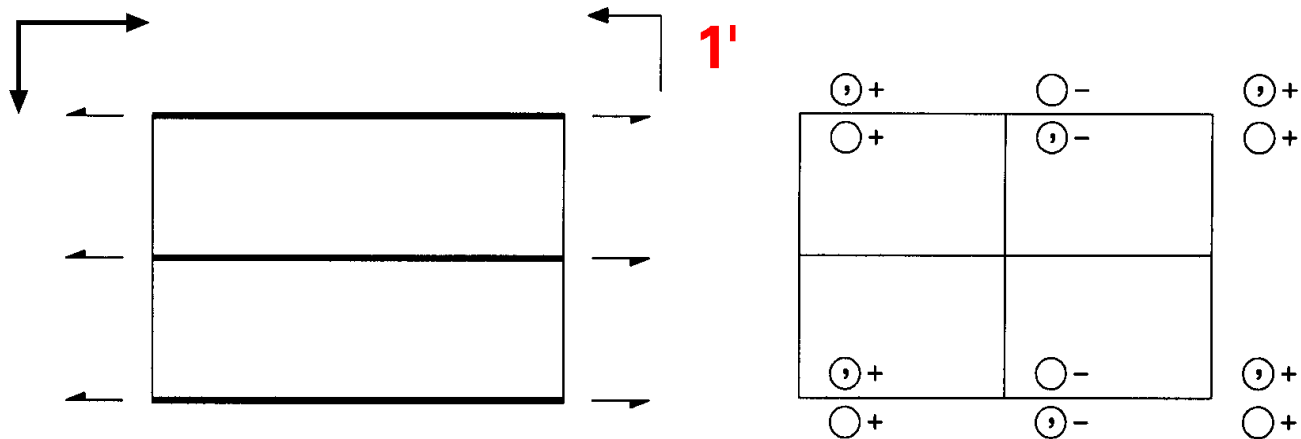
pm2₁b1'

m2m1'

Orthorhombic/Rectangular

No. 28.2.168

pm2₁b1'



Origin on m2₁b1'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For 1 + set

- (1) 1 (2) 2 (0,1/2,0) 0,y,0 (3) b (0,1/2,0) x,y,0 (4) m 0,y,z
 (1|0,0,0) (2_y|0,1/2,0) (m_z|0,1/2,0) (m_x|0,0,0)

For 1' + set

- (1) 1' (2) 2' (0,1/2,0) 0,y,0 (3) b' (0,1/2,0) x,y,0 (4) m' 0,y,z
 (1|0,0,0)' (2_y|0,1/2,0)' (m_z|0,1/2,0)' (m_x|0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 c 11'	(1) x,y,z [0,0,0]	(2) $\bar{x},y+1/2,\bar{z}$ [0,0,0]
	(3) x,y+1/2, \bar{z} [0,0,0]	(4) \bar{x},y,z [0,0,0]
2 b m..1'	1/2,y,z [0,0,0]	1/2,y+1/2, \bar{z} [0,0,0]
2 a m..1'	0,y,z [0,0,0]	0,y+1/2, \bar{z} [0,0,0]

Symmetry of special projections

Along [001] p1m11' $a^* = a$ $b^* = b/2$ Origin at 0,0,z	Along [100] p11g1' $a^* = b$ Origin at x,0,0	Along [010] p2mm1' $a^* = a$ Origin at 0,y,0
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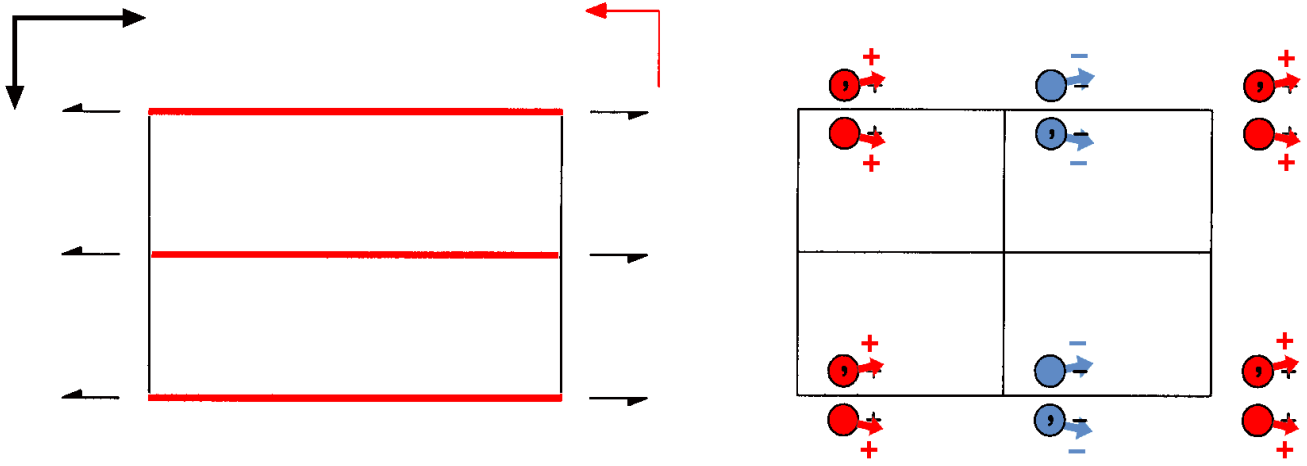
pm'2₁b'

No. 28.3.169

m'2m'

pm'2₁b'

Orthorhombic/Rectangular



Origin on m'2₁b'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- (1) 1 (1|0,0,0) (2) 2 (0,1/2,0) 0,y,0 (2_y|0,1/2,0) (3) b' (0,1/2,0) x,y,0 (m_z|0,1/2,0)' (4) m' 0,y,z (m_x|0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
4 c 1	(1) x,y,z [u,v,w]	(2) $\bar{x},y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]
	(3) x,y+1/2, \bar{z} [u,v, \bar{w}]	(4) \bar{x},y,z [\bar{u},v,w]
	2 b m'..	1/2,y,z [0,v,w] 1/2,y+1/2, \bar{z} [0,v, \bar{w}]
	2 a m'..	0,y,z [0,v,w] 0,y+1/2, \bar{z} [0,v, \bar{w}]

Symmetry of special projections

Along [001] p1m'1 a* = a b* = b/2 Origin at 0,0,z	Along [100] p11g' a* = b Origin at x,0,0	Along [010] p2m'm' a* = a Origin at 0,y,0
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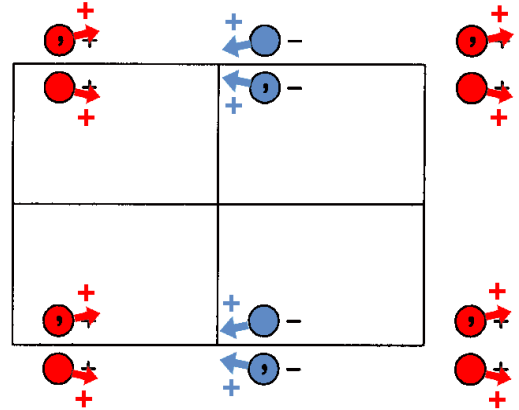
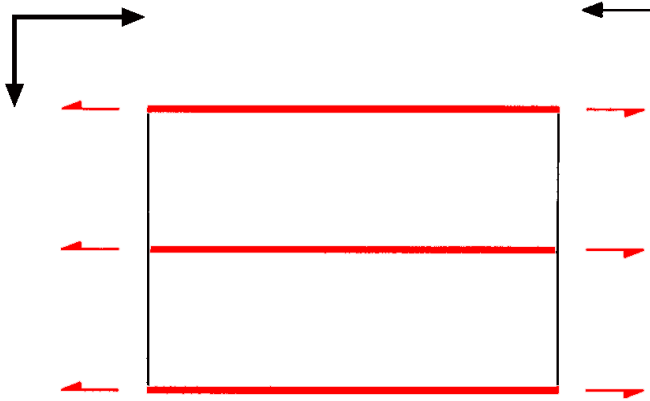
pm'2₁'b

No. 28.4.170

m'2'm

pm'2₁'b

Orthorhombic/Rectangular



Origin on m'2₁'b

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

- (1) 1 (2) 2' (0,1/2,0) 0,y,0 (3) b (0,1/2,0) x,y,0 (4) m' 0,y,z
 (1|0,0,0) (2_y|0,1/2,0)' (m_z|0,1/2,0) (m_x|0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $\bar{x},y+1/2,\bar{z}$ [u, \bar{v} ,w]
4 c 1	(3) x,y+1/2, \bar{z} [\bar{u} , \bar{v} ,w]	(4) \bar{x},y,z [\bar{u} ,v,w]
	2 b m'..	1/2,y,z [0,v,w] 1/2,y+1/2, \bar{z} [0, \bar{v} ,w]
2 a m'..	0,y,z [0,v,w] 0,y+1/2, \bar{z} [0, \bar{v} ,w]	

Symmetry of special projections

Along [001] p _{2b} '1m'1 a* = a b* = b/2 Origin at 0,0,z	Along [100] p11g a* = b Origin at x,0,0	Along [010] p2'm'm a* = a Origin at 0,y,0
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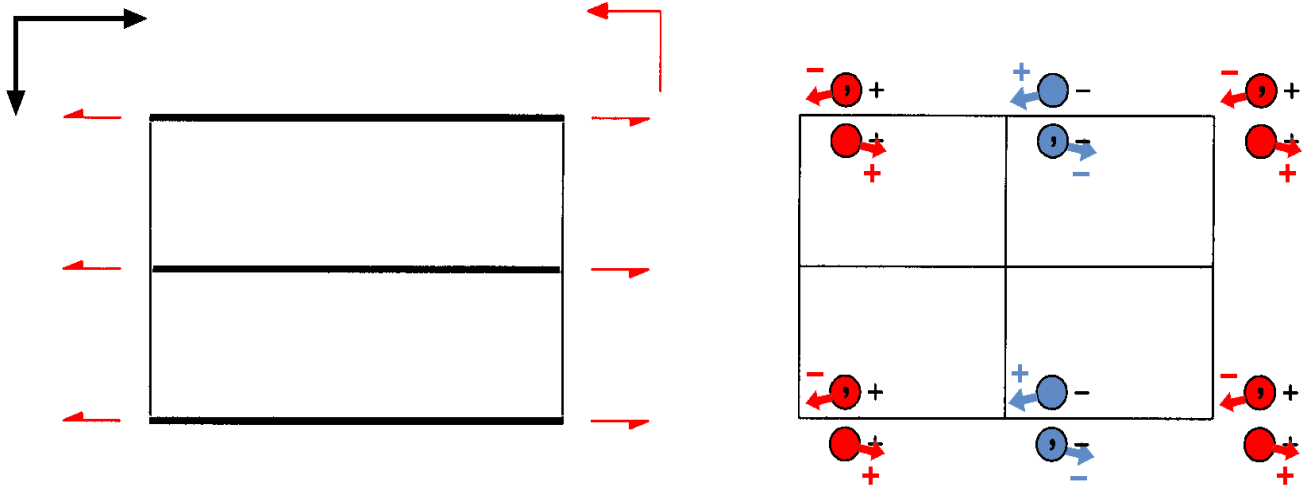
$pm2_1'b'$

No. 28.5.171

$m2'm'$

$pm2_1'b'$

Orthorhombic/Rectangular



Origin on $m2_1'b'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- (1) 1
 $(1|0,0,0)$ (2) $2'$ $(0,1/2,0)$ $0,y,0$ (3) b' $(0,1/2,0)$ $x,y,0$ (4) m $0,y,z$
 $(2_y|0,1/2,0)'$ $(m_z|0,1/2,0)'$ $(m_x|0,0,0)$

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $\bar{x},y+1/2,\bar{z}$ [u, \bar{v} ,w]
4 c 1	(3) x,y+1/2, \bar{z} [u,v, \bar{w}]	(4) \bar{x},y,z [u, \bar{v},\bar{w}]
	2 b m..	1/2,y,z [u,0,0] 1/2,y+1/2, \bar{z} [u,0,0]
2 a m..	0,y,z [u,0,0] 0,y+1/2, \bar{z} [u,0,0]	

Symmetry of special projections

Along [001] p1m1 $a^* = a$ $b^* = b/2$ Origin at 0,0,z	Along [100] p11g1' $a^* = b$ Origin at x,0,0	Along [010] p2'mm' $a^* = a$ Origin at 0,y,0
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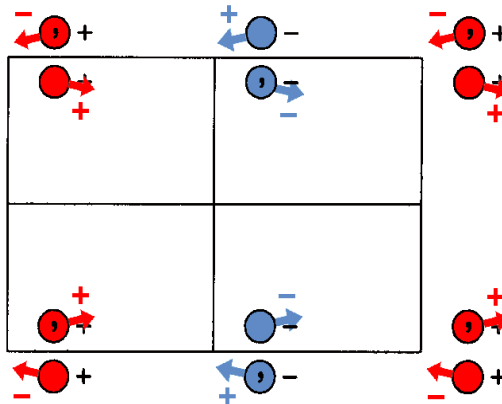
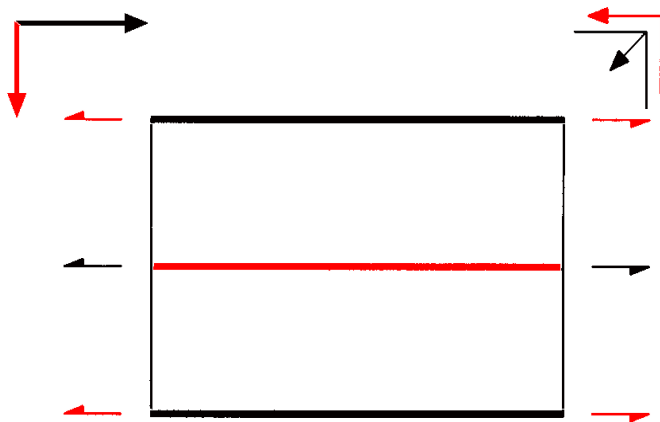
$p_{2a} m_2 'b'$

$m_2 m_1'$

Orthorhombic/Rectangular

No. 28.6.172

$p_{2a} m_2 'b'$



Origin on $m_2 'b'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | | | |
|-------------|--------------------|---------|--------------------|---------|-----------------|
| (1) 1 | (2) $2' (0,1/2,0)$ | $0,y,0$ | (3) $b' (0,1/2,0)$ | $x,y,0$ | (4) $m (0,y,z)$ |
| $(1 0,0,0)$ | $(2_y 0,1/2,0)'$ | | $(m_z 0,1/2,0)'$ | | $(m_x 0,0,0)$ |

For $(1,0,0)'$ + set

- | | | | | | |
|------------------|-------------------|-----------|-------------------|---------|--------------------|
| (1) $t' (1,0,0)$ | (2) $2 (0,1/2,0)$ | $1/2,y,0$ | (3) $n (1,1/2,0)$ | $x,y,0$ | (4) $m' (1/2,y,z)$ |
| $(1 1,0,0)'$ | $(2_y 1,1/2,0)$ | | $(m_z 1,1/2,0)$ | | $(m_x 1,0,0)'$ |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(1,0,0)'+$
4 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y+1/2,\bar{z} [u,\bar{v},w]$
	(3) $x,y+1/2,\bar{z} [u,v,\bar{w}]$	(4) $\bar{x},y,z [u,\bar{v},\bar{w}]$
2 b $m'..$	$1/2,y,z [0,v,w]$	$1/2,y+1/2,\bar{z} [0,v,\bar{w}]$
2 a $m..$	$0,y,z [u,0,0]$	$0,y+1/2,\bar{z} [u,0,0]$

Symmetry of special projections

Along [001] p_{2a}^*1m1 $a^* = a$ $b^* = b/2$ Origin at $0,0,z$	Along [100] $p11g1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p_{2a}^*2m'm'$ $a^* = a$ Origin at $1/2,y,0$
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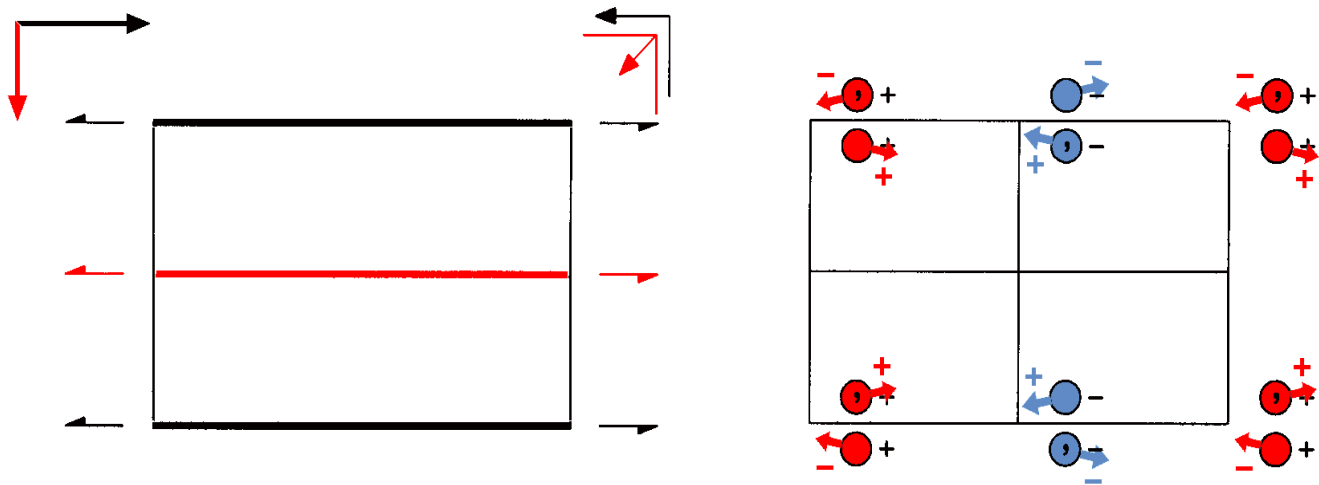
$p_{2a} m_{2,b}$

No. 28.7.173

$m_{2m} 1'$

$p_{2a} m_{2,b}$

Orthorhombic/Rectangular



Origin on $m_{2,b}$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For $(0,0,0) +$ set

- | | | | | | | | | |
|-------------|-------------------|---------------|-----------|-------------------|---------------|-----------|---------------|-----------|
| (1) 1 | (2) 2 | $(0, 1/2, 0)$ | $0, y, 0$ | (3) b | $(0, 1/2, 0)$ | $x, y, 0$ | (4) m | $0, y, z$ |
| $(1 0,0,0)$ | $(2_y 0, 1/2, 0)$ | | | $(m_z 0, 1/2, 0)$ | | | $(m_x 0,0,0)$ | |

For $(1,0,0)'$ + set

- | | | | | | | | | | |
|--------------|-----------|--------------------|---------------|-------------|--------------------|---------------|-----------|----------------|-------------|
| (1) t' | $(1,0,0)$ | (2) $2'$ | $(0, 1/2, 0)$ | $1/2, y, 0$ | (3) n' | $(1, 1/2, 0)$ | $x, y, 0$ | (4) m' | $1/2, y, z$ |
| $(1 1,0,0)'$ | | $(2_y 1, 1/2, 0)'$ | | | $(m_z 1, 1/2, 0)'$ | | | $(m_x 1,0,0)'$ | |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(1,0,0)'+$
4 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y+1/2,\bar{z} [\bar{u},v,\bar{w}]$
	(3) $x,y+1/2,\bar{z} [\bar{u},\bar{v},w]$	(4) $\bar{x},y,z [u,\bar{v},\bar{w}]$
2 b $m'..$	$1/2,y,z [0,v,w]$	$1/2,y+1/2,\bar{z} [0,\bar{v},w]$
2 a $m..$	$0,y,z [u,0,0]$	$0,y+1/2,\bar{z} [\bar{u},0,0]$

Symmetry of special projections

Along [001] $p_{c^*}1m1$ $a^* = a$ $b^* = b/2$ Origin at $0,0,z$	Along [100] $p11g1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p_{2a^*}2mm$ $a^* = a$ Origin at $0,y,0$
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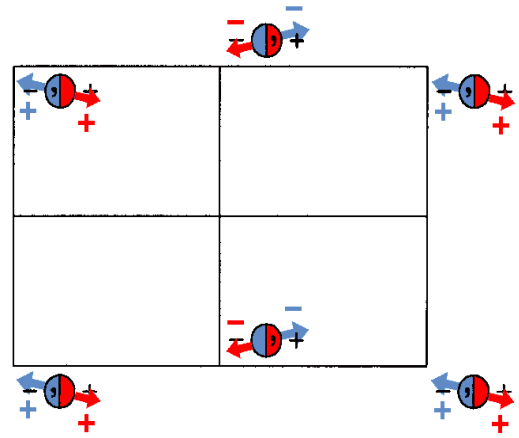
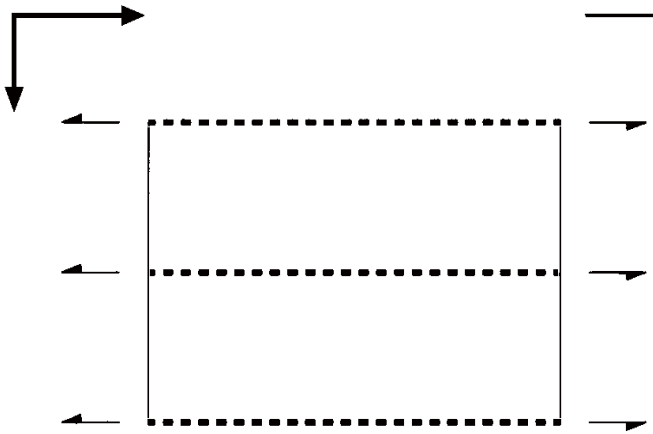
pb2₁m

m2m

Orthorhombic/Rectangular

No. 29.1.174

pb2₁m



Origin on b₂1m

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2 (0,1/2,0) 0,y,0
(2_y|0,1/2,0)
- (3) b (0,1/2/0) 0,y,z
(m_x|0,1/2,0)
- (4) m x,y,0
(m_z|0,0,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x, y, z [u, v, w]	(2) $\bar{x}, y + 1/2, \bar{z}$ [\bar{u}, v, \bar{w}]
4 b 1	(3) $\bar{x}, y + 1/2, z$ [u, \bar{v}, \bar{w}]	(4) x, y, \bar{z} [\bar{u}, \bar{v}, w]
	2 a ..m	$x, y, 0$ [0, 0, w] $\bar{x}, y + 1/2, 0$ [0, 0, \bar{w}]

Symmetry of special projections

Along [001] p1g11' $a^* = a$ $b^* = b$ Origin at 0, 0, z	Along [100] p _{2a*} 11m $a^* = b/2$ Origin at x, 0, 0	Along [010] p2mm $a^* = a$ Origin at 0, y, 0
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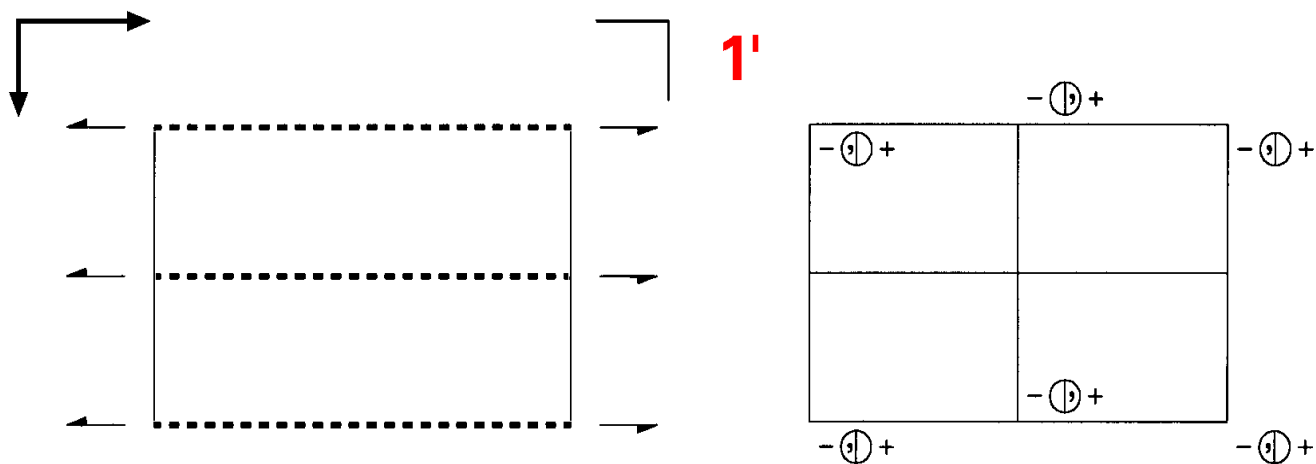
pb₂,m1'

m2m1'

Orthorhombic/Rectangular

No. 29.2.175

pb₂,m1'



Origin on b₂,m1'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- For 1 + set
- | | | | |
|-----------|---------------------------|---------------------------|-------------------------|
| (1) 1 | (2) 2 (0,1/2,0) 0,y,0 | (3) b (0,1/2/0) 0,y,z | (4) m x,y,0 |
| (1 0,0,0) | (2 _y 0,1/2,0) | (m _x 0,1/2,0) | (m _z 0,0,0) |
- For 1' + set
- | | | | |
|------------|----------------------------|----------------------------|--------------------------|
| (1) 1' | (2) 2' (0,1/2,0) 0,y,0 | (3) b' (0,1/2/0) 0,y,z | (4) m' x,y,0 |
| (1 0,0,0)' | (2 _y 0,1/2,0)' | (m _x 0,1/2,0)' | (m _z 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	1+	1' +	
4 b 11'	(1) x,y,z [0,0,0]	(2) $\bar{x},y+1/2,\bar{z}$ [0,0,0]	
	(3) $\bar{x},y+1/2,z$ [0,0,0]	(4) x,y, \bar{z} [0,0,0]	
	2 a ..m1'	x,y,0 [0,0,0]	$\bar{x},y+1/2,0$ [0,0,0]

Symmetry of special projections

Along [001] p1g11' $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p11m1' $a^* = b/2$ Origin at x,0,0	Along [010] p2mm1' $a^* = a$ Origin at 0,y,0
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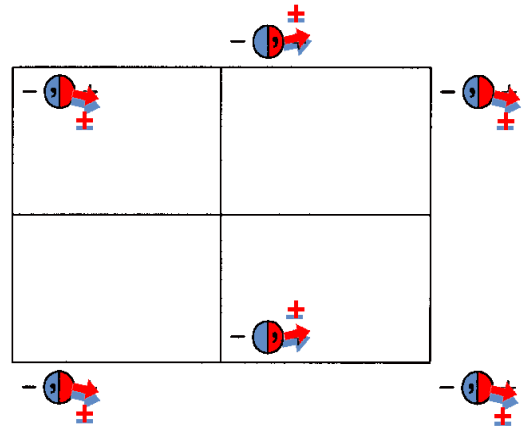
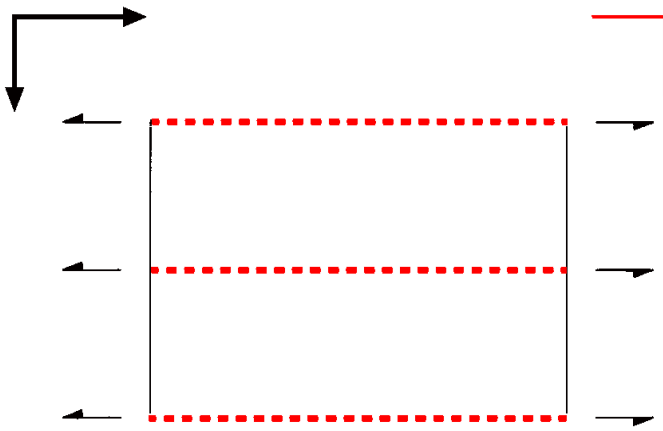
pb'2₁m'

No. 29.3.176

m'2m'

pb'2₁m'

Orthorhombic/Rectangular



Origin on b'2₁m'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- (1) 1 (1|0,0,0) (2) 2 (0,1/2,0) 0,y,0 (2_y|0,1/2,0) (3) b' (0,1/2/0) 0,y,z (m_x|0,1/2,0)' (4) m' x,y,0 (m_z|0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $\bar{x},y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]
4 b 1	(3) $\bar{x},y+1/2,z$ [\bar{u},v,w]	(4) x,y, \bar{z} [u,v, \bar{w}]
	2 a ..m'	x,y,0 [u,v,0]

Symmetry of special projections

Along [001] p1g' $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p11m $a^* = b/2$ Origin at x,0,0	Along [010] p2m'm' $a^* = a$ Origin at 0,y,0
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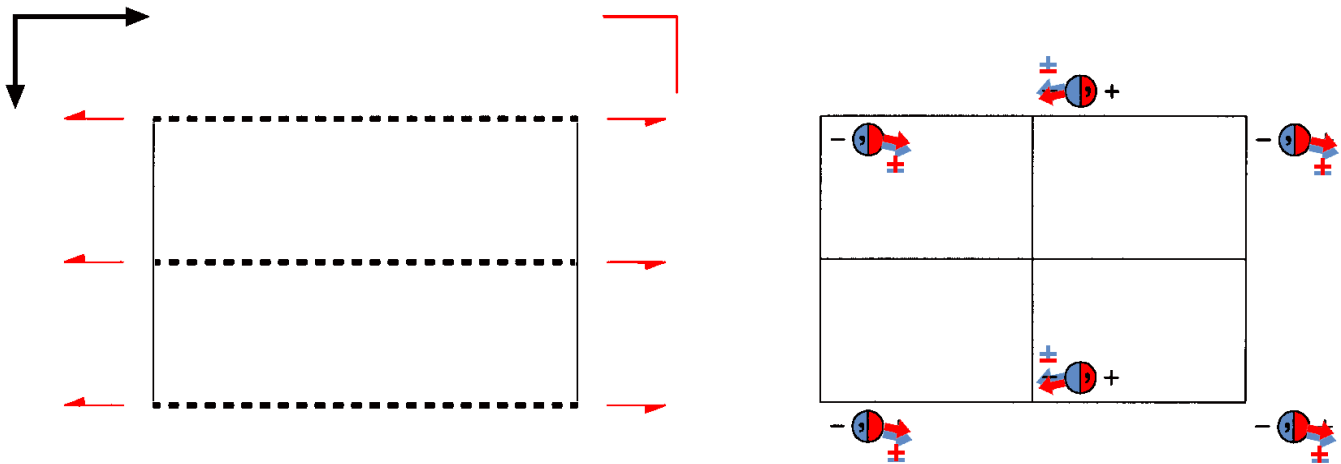
pb2₁'m'

No. 29.4.177

m2'm'

pb2₁'m'

Orthorhombic/Rectangular



Origin on b2₁'m'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2' (0,1/2,0) 0,y,0
(2_y|0,1/2,0)'
- (3) b (0,1/2/0) 0,y,z
(m_x|0,1/2,0)
- (4) m' x,y,0
(m_z|0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $\bar{x},y+1/2,\bar{z}$ [u, \bar{v} ,w]
4 b 1	(3) $\bar{x},y+1/2,z$ [u, \bar{v},\bar{w}]	(4) x,y, \bar{z} [u,v, \bar{w}]
	2 a ..m'	x,y,0 [u,v,0]

Symmetry of special projections

Along [001] p1g1 $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p_{2a^*}11m'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2'mm'$ $a^* = a$ Origin at 0,y,0
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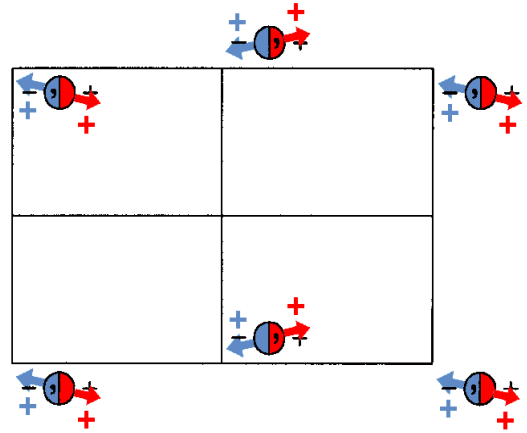
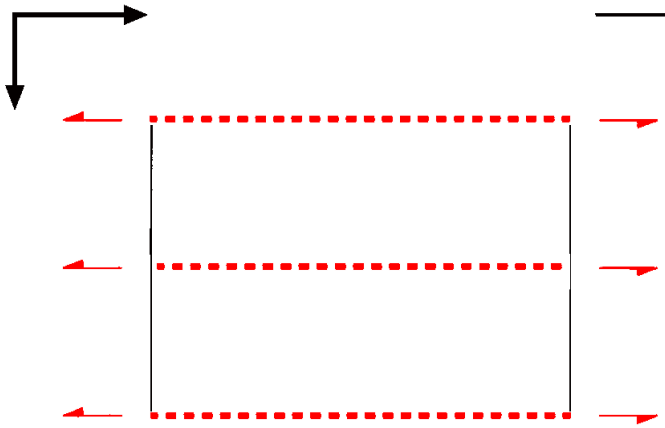
pb'2₁'m

No. 29.5.178

m'2'm

pb'2₁'m

Orthorhombic/Rectangular



Origin on b'2₁'m

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

- (1) 1 (2) 2' (0,1/2,0) 0,y,0 (3) b' (0,1/2/0) 0,y,z (4) m x,y,0
(1|0,0,0) (2_y|0,1/2,0)' (m_x|0,1/2,0)' (m_z|0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
4 b 1	(1)	x, y, z [u,v,w]	(2) $\bar{x}, y+1/2, \bar{z}$ [u, \bar{v} ,w]
	(3)	$\bar{x}, y+1/2, z$ [\bar{u} ,v,w]	(4) x, y, \bar{z} [\bar{u} , \bar{v} ,w]
2 a ..m		$x, y, 0$ [0,0,w]	$\bar{x}, y+1/2, 0$ [0,0,w]

Symmetry of special projections

Along [001] $p1g11'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p11m$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2'm'm$ $a^* = a$ Origin at 0,y,0
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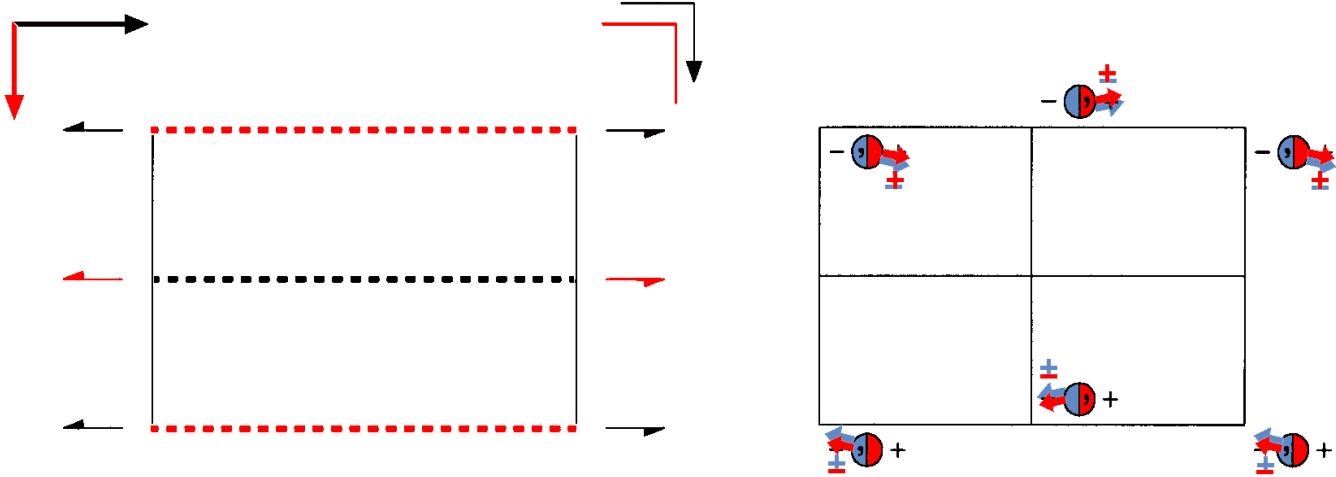
$p_{2a} b'2_1 m'$

No. 29.6.179

$m2m1'$

$p_{2a} b'2_1 m'$

Orthorhombic/Rectangular



Origin on $b'2_1 m'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For $(0,0,0) +$ set

(1) 1	(2) 2	(3) b'	(4) m'
$(1 0,0,0)$	$(2_y 0,1/2,0)$	$(m_x 0,1/2,0)'$	$(m_z 0,0,0)'$

For $(1,0,0) +$ set

(1) t'	(2) $2'$	(3) b	(4) a
$(1 1,0,0)'$	$(2_y 1,1/2,0)'$	$(m_x 1,1/2,0)$	$(m_z 1,0,0)$

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(1,0,0)'+$
4 b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y+1/2,\bar{z} [\bar{u},v,\bar{w}]$
	(3) $\bar{x},y+1/2,z [\bar{u},v,w]$	(4) $x,y,\bar{z} [u,v,\bar{w}]$
2 a $..m'$	$x,y,0 [u,v,0]$	$\bar{x},y+1/2,0 [\bar{u},v,0]$

Symmetry of special projections

Along [001] $p_{2a}1g1$ $a^* = a$ $b^* = b$ Origin at $1/2,0,z$	Along [100] $p11m1'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p_{2a}2m'm'$ $a^* = a$ Origin at $0,y,0$
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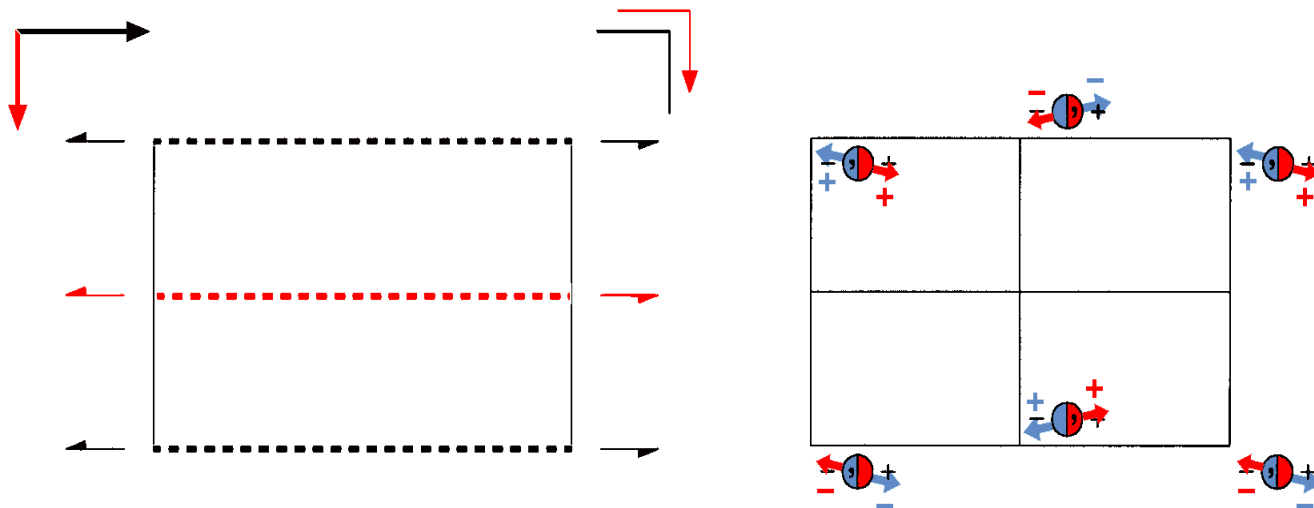
$p_{2a} b_{2_1} m$

No. 29.7.180

$m2m1'$

$p_{2a} b_{2_1} m$

Orthorhombic/Rectangular



Origin on $b_{2_1} m$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For $(0,0,0) +$ set

- | | | | |
|-------------|-----------------|-----------------|---------------|
| (1) 1 | (2) 2 | (3) b | (4) m |
| $(1 0,0,0)$ | $(2_y 0,1/2,0)$ | $(m_x 0,1/2,0)$ | $(m_z 0,0,0)$ |

For $(1,0,0)'$ + set

- | | | | |
|--------------|------------------|------------------|----------------|
| (1) t' | (2) $2'$ | (3) b' | (4) a' |
| $(1 1,0,0)'$ | $(2_y 1,1/2,0)'$ | $(m_x 1,1/2,0)'$ | $(m_z 1,0,0)'$ |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(1,0,0)'+$
4 b 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y+1/2,\bar{z} [\bar{u},v,\bar{w}]$
	(3) $\bar{x},y+1/2,z [u,\bar{v},\bar{w}]$	(4) $x,y,\bar{z} [\bar{u},\bar{v},w]$
2 a ..m	$x,y,0 [0,0,w]$	$\bar{x},y+1/2,0 [0,0,\bar{w}]$

Symmetry of special projections

Along [001] $p1g11'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p11m1'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2_{2a^*}mm$ $a^* = a$ Origin at 0,y,0
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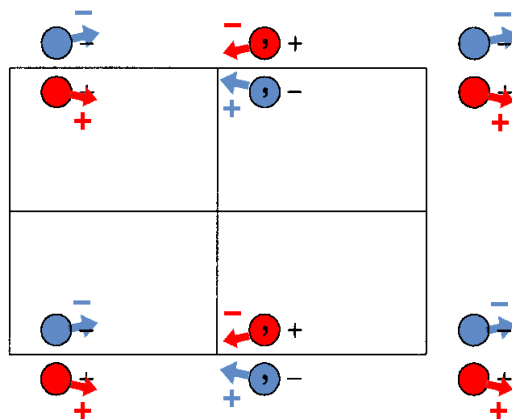
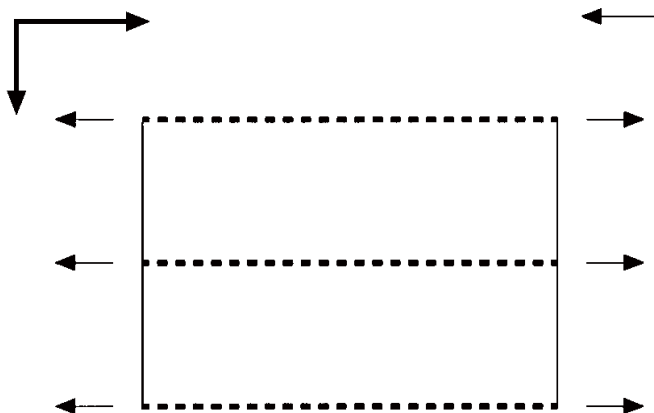
pb2b

m2m

Orthorhombic/Rectangular

No. 30.1.181

pb2b



Origin on b2b

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,y,0
(2_y|0,0,0)

(3) b (0,1/2,0) x,y,0
(m_z|0,1/2,0)

(4) b (0,1/2,0) 0,y,z
(m_x|0,1/2,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]
4 c 1	(3) $x,y+1/2,\bar{z}$ [\bar{u},\bar{v},w]	(4) $\bar{x},y+1/2,z$ [u,\bar{v},\bar{w}]
2 b .2.	$1/2,y,0$ [0,v,0]	$1/2,y+1/2,0$ [0, \bar{v} ,0]
2 a .2.	$0,y,0$ [0,v,0]	$0,y+1/2,0$ [0, \bar{v} ,0]

Symmetry of special projections

Along [001] $p_{2b^*}1m'1$ $a^* = a$ $b^* = b/2$ Origin at 0,0,z	Along [100] $p_{2a^*}11m'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2mm$ $a^* = a$ Origin at 0,y,0

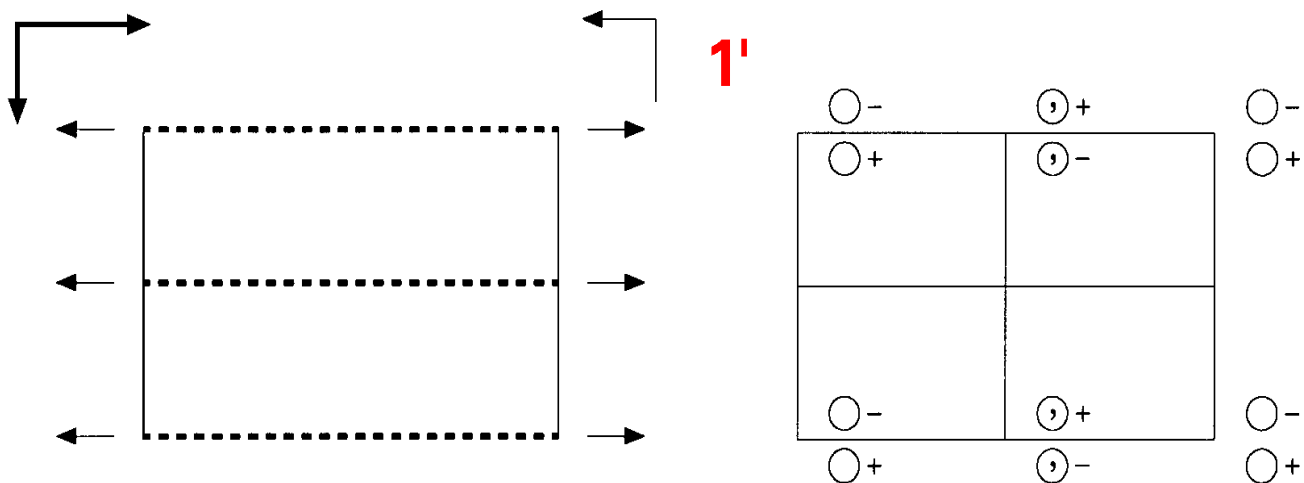
pb2b1'

m2m1'

Orthorhombic/Rectangular

No. 30.2.182

pb2b1'



Origin on b2b1'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|-----------|---------------|-----------------|-----------------|
| (1) 1 | (2) 2 | (3) b | (4) b |
| (1 0,0,0) | $(2_y 0,0,0)$ | $(m_z 0,1/2,0)$ | $(m_x 0,1/2,0)$ |

For 1' + set

- | | | | |
|------------|----------------|------------------|------------------|
| (1) 1' | (2) 2' | (3) b' | (4) b' |
| (1 0,0,0)' | $(2_y 0,0,0)'$ | $(m_z 0,1/2,0)'$ | $(m_x 0,1/2,0)'$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 c 11'	(1) x,y,z [0,0,0]	(2) \bar{x},y,\bar{z} [0,0,0]
	(3) $x,y+1/2,\bar{z}$ [0,0,0]	(4) $\bar{x},y+1/2,z$ [0,0,0]
2 b .2.1'	$1/2,y,0$ [0,0,0]	$1/2,y+1/2,0$ [0,0,0]
2 a .2.1'	$0,y,0$ [0,0,0]	$0,y+1/2,0$ [0,0,0]

Symmetry of special projections

Along [001] $p1m1'$ $a^* = a$ $b^* = b/2$ Origin at $0,0,z$	Along [100] $p11m1'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p2mm1'$ $a^* = a$ Origin at $0,y,0$
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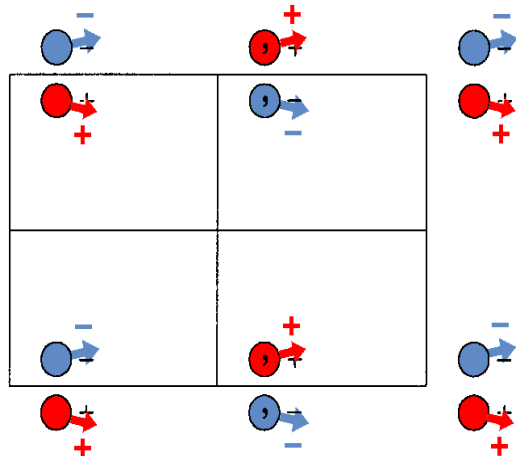
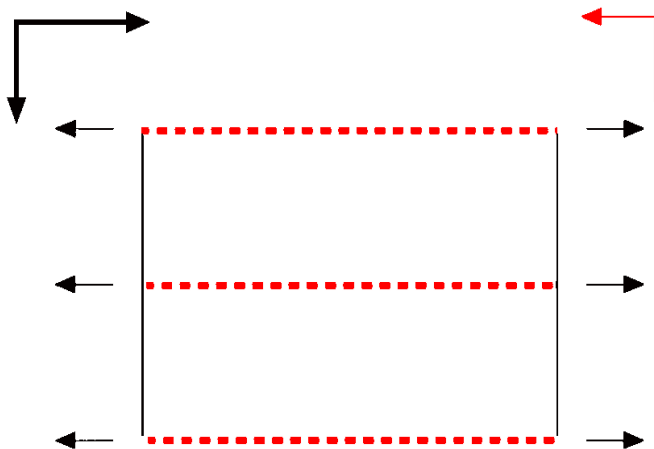
pb'2b'

m'2m'

Orthorhombic/Rectangular

No. 30.3.183

pb'2b'



Origin on b'2b'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- (1) 1 (2) 2 $0, y, 0$ (3) b' $(0, 1/2, 0)$ $x, y, 0$ (4) b' $(0, 1/2, 0)$ $0, y, z$
- $(1|0, 0, 0)$ $(2_y|0, 0, 0)$ $(m_z|0, 1/2, 0)'$ $(m_x|0, 1/2, 0)'$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
4 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$
	(3) $x,y+1/2,\bar{z} [u,v,\bar{w}]$	(4) $\bar{x},y+1/2,z [\bar{u},v,w]$
2 b .2.	$1/2,y,0 [0,v,0]$	$1/2,y+1/2,0 [0,v,0]$
2 a .2.	$0,y,0 [0,v,0]$	$0,y+1/2,0 [0,v,0]$

Symmetry of special projections

Along [001] $p1m'1$ $a^* = a \quad b^* = b/2$ Origin at $0,0,z$	Along [100] $p11m'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p2m'm'$ $a^* = a$ Origin at $0,y,0$
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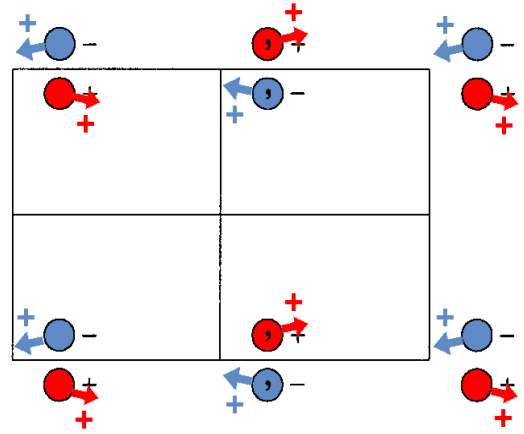
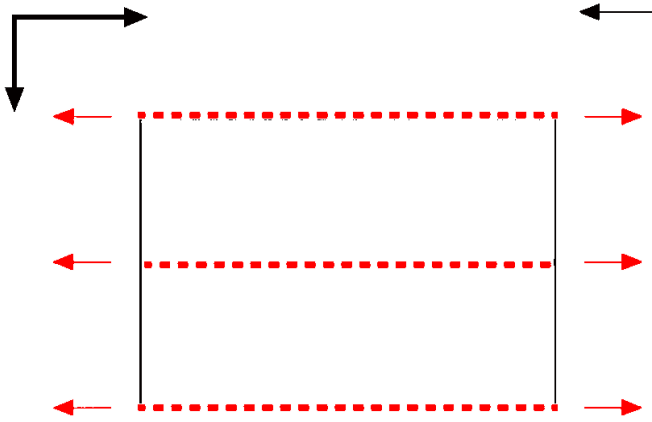
pb'2'b

No. 30.4.184

m'2'm

pb'2'b

Orthorhombic/Rectangular



Origin on b'2'b

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 0,y,0
(2_y|0,0,0)'

(3) b (0,1/2,0) x,y,0
(m_z|0,1/2,0)

(4) b' (0,1/2,0) 0,y,z
(m_x|0,1/2,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [u, \bar{v} ,w]
4 c 1	(3) $x,y+1/2,\bar{z}$ [\bar{u} , \bar{v} ,w]	(4) [\bar{u} ,v,w]z
2 b .2'	$1/2,y,0$ [u,0,w]	$1/2,y+1/2,0$ [\bar{u} ,0,w]
2 a .2'	$0,y,0$ [u,0,w]	$0,y+1/2,0$ [\bar{u} ,0,w]

Symmetry of special projections

Along [001] $p_{2b}1m1$ $a^* = a$ $b^* = b/2$ Origin at 0,0,z	Along [100] $p11m$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2'm'm$ $a^* = a$ Origin at 0,y,0
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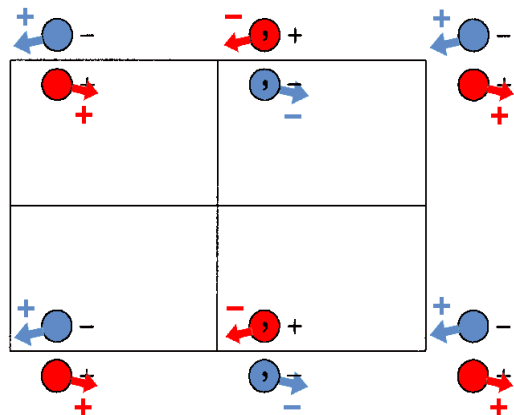
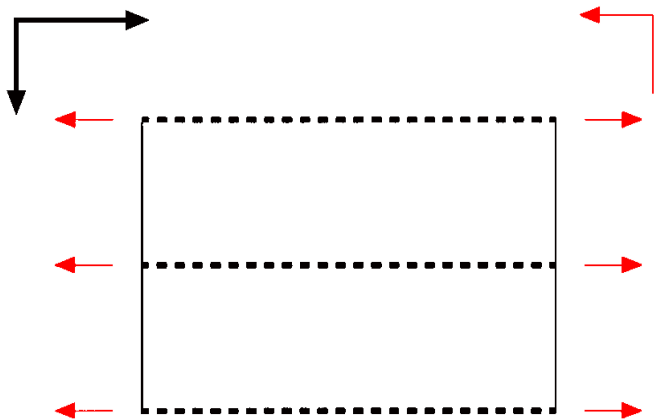
pb2'b'

m2'm'

Orthorhombic/Rectangular

No. 30.5.185

pb2'b'



Origin on b2'b'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 0,y,0
(2_y|0,0,0)'

(3) b' (0,1/2,0) x,y,0
(m_z|0,1/2,0)'

(4) b (0,1/2,0) 0,y,z
(m_x|0,1/2,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [u, \bar{v} ,w]
4 c 1	(3) $x,y+1/2,\bar{z}$ [u,v, \bar{w}]	(4) $\bar{x},y+1/2,z$ [u, \bar{v} , \bar{w}]
2 b .2'	$1/2,y,0$ [u,0,w]	$1/2,y+1/2,0$ [u,0, \bar{w}]
2 a .2'	$0,y,0$ [u,0,w]	$0,y+1/2,0$ [u,0, \bar{w}]

Symmetry of special projections

Along [001] $p1m1$ $a^* = a$ $b^* = b/2$ Origin at 0,0,z	Along [100] $p_{2a^*}11m$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2'mm'$ $a^* = a$ Origin at 0,y,0
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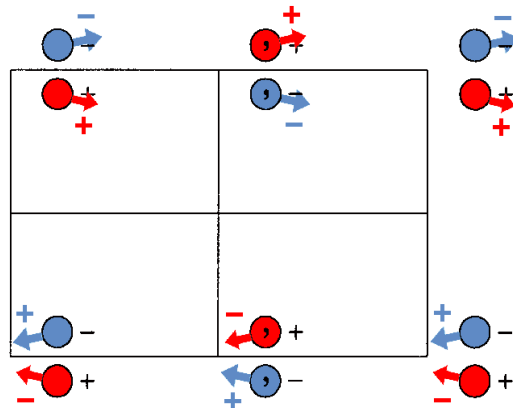
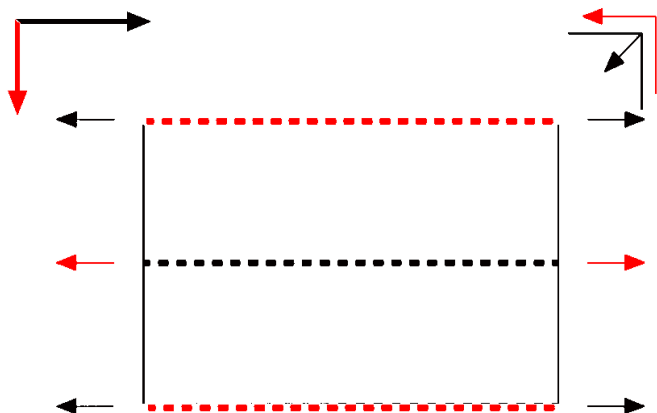
$p_{2a} b'2b'$

No. 30.6.186

$m2m1'$

$p_{2a} b'2b'$

Orthorhombic/Rectangular



Origin on $b'2b'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $2 \quad 0,y,0$	(3) $b' \quad (0,1/2,0) \quad x,y,0$	(4) $b' \quad (0,1/2,0) \quad 0,y,z$
$(1 0,0,0)$	$(2_y 0,0,0)$	$(m_z 0,1/2,0)'$	$(m_x 0,1/2,0)'$

For $(1,0,0)'$ + set

(1) $t' \quad (1,0,0)$	(2) $2' \quad 1/2,y,0$	(3) $n \quad (1,1/2,0) \quad x,y,0$	(4) $b \quad (0,1/2,0) \quad 1/2,y,z$
$(1 1,0,0)'$	$(2_y 1,0,0)'$	$(m_z 1,1/2,0)$	$(m_x 1,1/2,0)$

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(1,0,0)'+$
4 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$
	(3) $x,y+1/2,\bar{z} [u,v,\bar{w}]$	(4) $\bar{x},y+1/2,z [\bar{u},v,w]$
2 b .2'	$1/2,y,0 [u,0,w]$	$1/2,y+1/2,0 [u,0,\bar{w}]$
2 a .2.	$0,y,0 [0,v,0]$	$0,y+1/2,0 [0,v,0]$

Symmetry of special projections

Along [001] $p1m'1$ $a^* = a$ $b^* = b/2$ Origin at $0,0,z$	Along [100] $p11m'1$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p_{2a^*}2m'm'$ $a^* = a$ Origin at $0,y,0$
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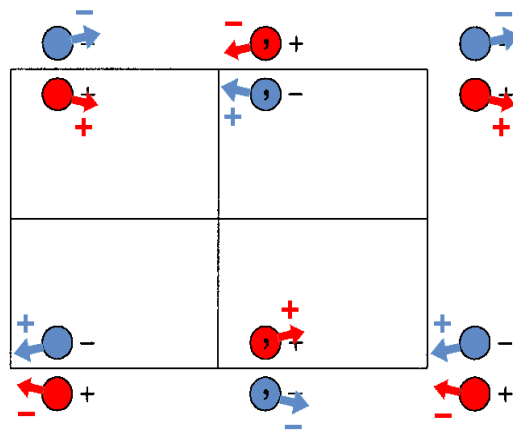
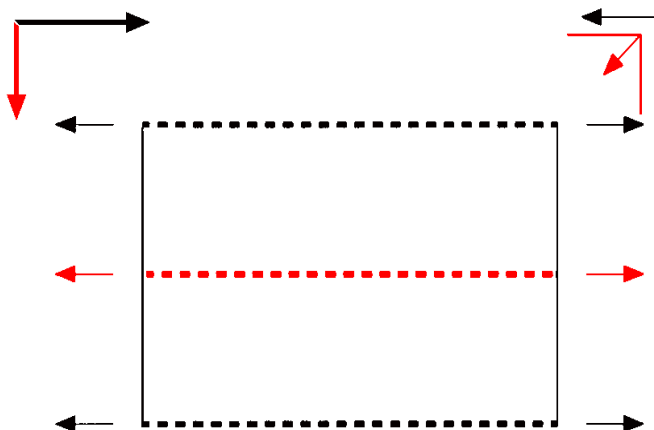
$p_{2a}b2b$

$m2m1'$

Orthorhombic/Rectangular

No. 30.7.187

$p_{2a}b2b$



Origin on $b2b$

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

(1) 1	(2) $2 \quad 0,y,0$	(3) $b \quad (0,1/2,0) \quad x,y,0$	(4) $b \quad (0,1/2,0) \quad 0,y,z$
$(1 0,0,0)$	$(2_y 0,0,0)$	$(m_z 0,1/2,0)$	$(m_x 0,1/2,0)$

For $(1,0,0)'$ + set

(1) $t' \quad (1,0,0)$	(2) $2' \quad 1/2,y,0$	(3) $n' \quad (1,1/2,0) \quad x,y,0$	(4) $b' \quad (0,1/2,0) \quad 1/2,y,z$
$(1 1,0,0)'$	$(2_y 1,0,0)'$	$(m_z 1,1/2,0)'$	$(m_x 1,1/2,0)'$

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(1,0,0)'+$
4 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$
	(3) $x,y+1/2,\bar{z} [\bar{u},\bar{v},w]$	(4) $\bar{x},y+1/2,z [u,\bar{v},\bar{w}]$
2 b .2'	$1/2,y,0 [u,0,w]$	$1/2,y+1/2,0 [\bar{u},0,w]$
2 a .2.	$0,y,0 [0,v,0]$	$0,y+1/2,0 [0,\bar{v},0]$

Symmetry of special projections

Along [001] $p_{c^*}1m1$ $a^* = a$ $b^* = b/2$ Origin at $1/2,0,z$	Along [100] $p11m1'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p_{2a^*}2mm$ $a^* = a$ Origin at $0,y,0$
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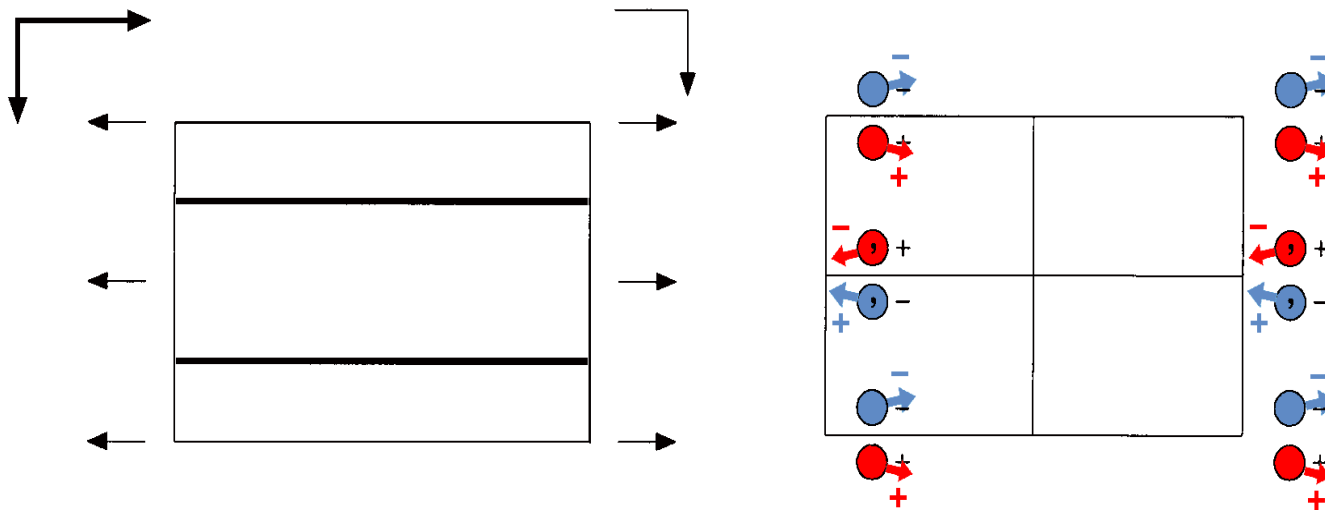
pm2a

No. 31.1.188

m2m

pm2a

Orthorhombic/Rectangular



Origin on 12a

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $0,y,0$
(2_y|0,0,0)

(3) a $(1/2,0,0)$ $x,y,0$
(m_z|1/2,0,0)

(4) m $1/4,y,z$
(m_x|1/2,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z $[u,v,w]$	(2) \bar{x},y,\bar{z} $[\bar{u},v,\bar{w}]$
4 c 1	(3) $x+1/2,y,\bar{z}$ $[\bar{u},\bar{v},w]$	(4) $\bar{x}+1/2,y,z$ $[u,\bar{v},\bar{w}]$
2 b m..	$1/4,y,z$ $[u,0,0]$	$3/4,y,\bar{z}$ $[\bar{u},0,0]$
2 a .2.	$0,y,0$ $[0,v,0]$	$1/2,y,0$ $[0,\bar{v},0]$

Symmetry of special projections

Along $[001]$ $p_{2a^*}1m1$ $a^* = a/2$ $b^* = b$ Origin at $1/4,0,z$	Along $[100]$ $p11m1'$ $a^* = b$ Origin at $x,0,0$	Along $[010]$ $p2mg$ $a^* = a$ Origin at $0,y,0$
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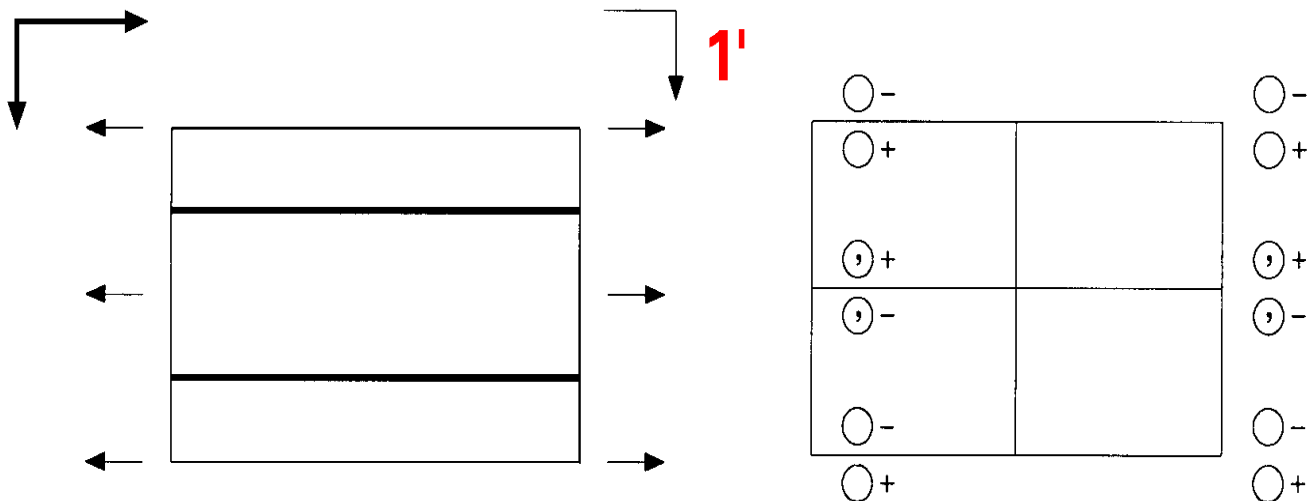
pm2a1'

No. 31.2.189

m2m1'

pm2a1'

Orthorhombic/Rectangular



Origin on 12a1'

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

- For 1 + set
- | | | | |
|--------------------|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,y,0
(2 _y 0,0,0) | (3) a (1/2,0,0) x,y,0
(m _z 1/2,0,0) | (4) m 1/4,y,z
(m _x 1/2,0,0) |
|--------------------|--|--|--|
- For 1' + set
- | | | | |
|----------------------|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,y,0
(2 _y 0,0,0)' | (3) a' (1/2,0,0) x,y,0
(m _z 1/2,0,0)' | (4) m' 1/4,y,z
(m _x 1/2,0,0)' |
|----------------------|--|--|--|

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 c 11'	(1) $x,y,z [0,0,0]$	(2) $\bar{x},y,\bar{z} [0,0,0]$
	(3) $x+1/2,y,\bar{z} [0,0,0]$	(4) $\bar{x}+1/2,y,z [0,0,0]$
2 b m..1'	$1/4,y,z [0,0,0]$	$3/4,y,\bar{z} [0,0,0]$
2 a .2.1'	$0,y,0 [0,0,0]$	$1/2,y,0 [0,0,0]$

Symmetry of special projections

Along [001] $p1m1'$ $a^* = a/2$ $b^* = b$ Origin at $0,0,z$	Along [100] $p11m1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2mg1'$ $a^* = a$ Origin at $0,y,0$
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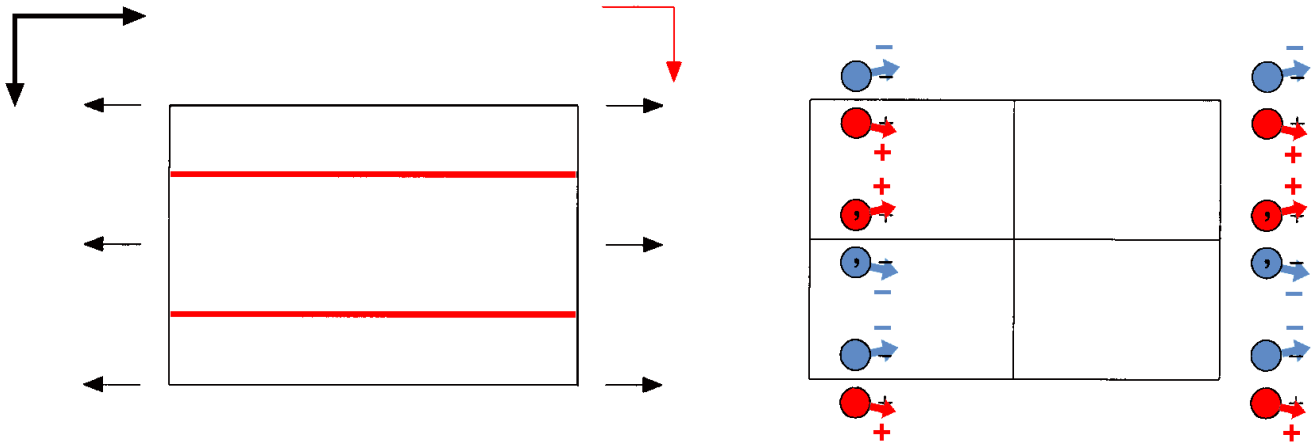
pm'2a'

No. 31.3.190

m'2m'

pm'2a'

Orthorhombic/Rectangular



Origin on 12a'

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $0,y,0$
(2_y|0,0,0)

(3) a' $(1/2,0,0)$ $x,y,0$
(m_z|1/2,0,0)'

(4) m' $1/4,y,z$
(m_x|1/2,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x} ,y, \bar{z} [u, \bar{v} ,w]
4 c 1	(3) $x+1/2$,y, \bar{z} [u,v, \bar{w}]	(4) $\bar{x}+1/2$,y,z [u, \bar{v} , \bar{w}]
2 b m..	1/4,y,z [u,0,0]	3/4,y, \bar{z} [u,0,0]
2 a .2'	0,y,0 [u,0,w]	1/2,y,0 [u,0, \bar{w}]

Symmetry of special projections

Along [001] p1m1 $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] p11m1' $a^* = b$ Origin at x,0,0	Along [010] p2'mg' $a^* = a$ Origin at 0,y,0
--	--	--

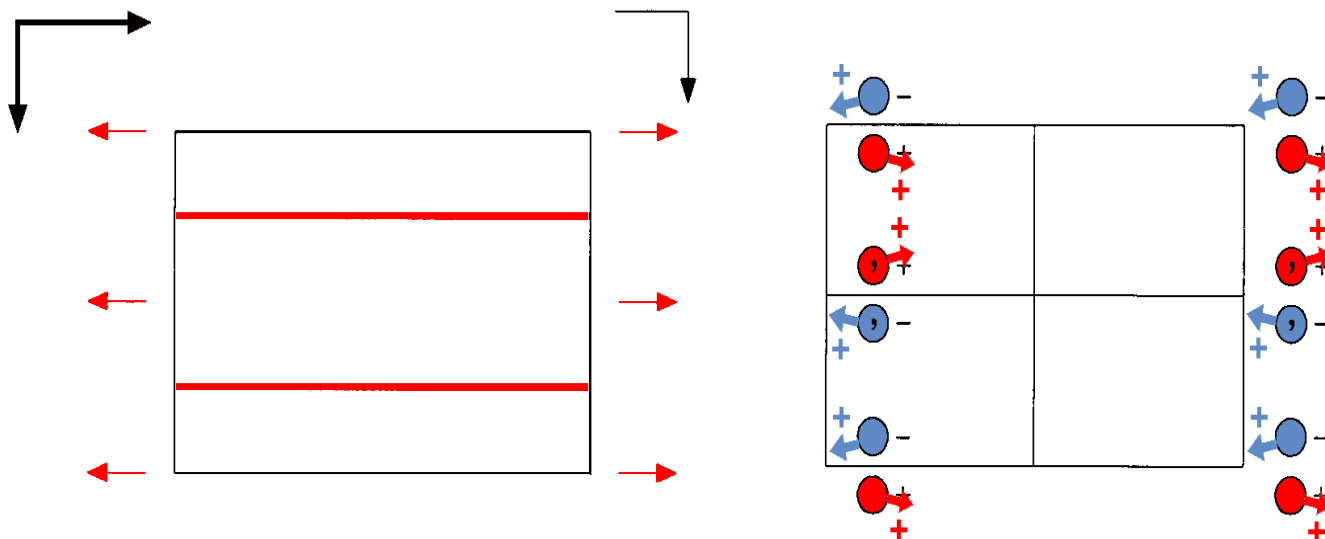
pm'2'a

No. 31.4.191

m'2'm

pm'2'a

Orthorhombic/Rectangular



Origin on 12'a

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2' 0,y,0
(2_y|0,0,0)'
- (3) a (1/2,0,0) x,y,0
(m_z|1/2,0,0)
- (4) m' 1/4,y,z
(m_x|1/2,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x, y, z [u,v,w]	(2) \bar{x}, y, \bar{z} [u, \bar{v} ,w]
4 c 1	(3) $x+1/2, y, \bar{z}$ [\bar{u} , \bar{v} ,w]	(4) $\bar{x}+1/2, y, z$ [\bar{u} ,v,w]
2 b m'..	1/4,y,z [0,v,w]	3/4,y, \bar{z} [0, \bar{v} ,w]
2 a .2'.	0,y,0 [u,0,w]	1/2,y,0 [\bar{u} ,0,w]

Symmetry of special projections

Along [001] $p_{2a^*}1m1$ $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] $p11m$ $a^* = b$ Origin at x,0,0	Along [010] $p2'm'g$ $a^* = a$ Origin at 0,y,0
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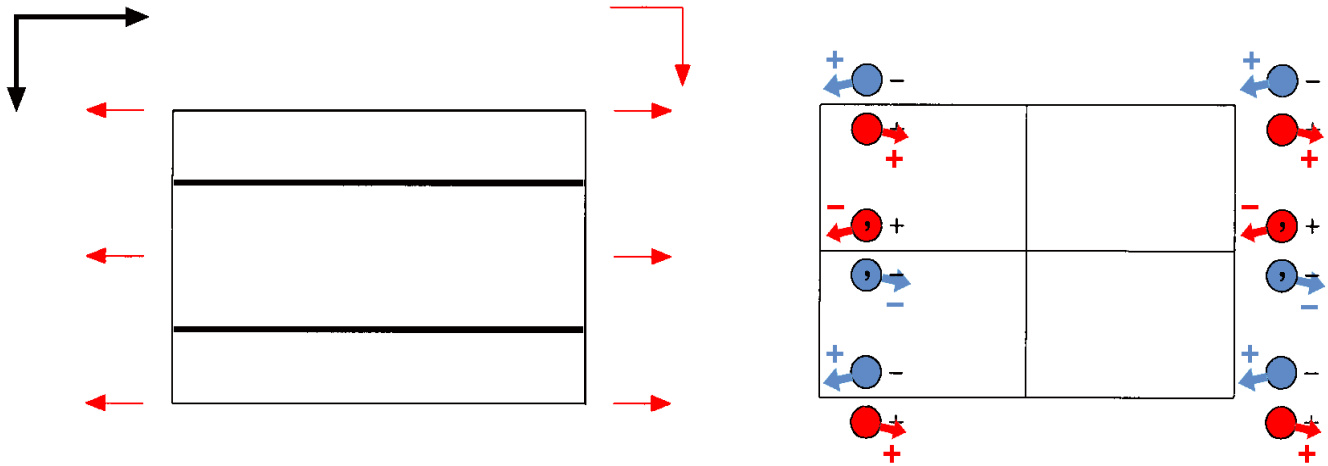
pm2'a'

No. 31.5.192

m2'm'

pm2'a'

Orthorhombic/Rectangular



Origin on 12'a'

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 0,y,0
(2_y|0,0,0)'

(3) a' (1/2,0,0) x,y,0 (4) m 1/4,y,z
(m_z|1/2,0,0) (m_x|1/2,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
4 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [u,\bar{v},w]$
	(3) $x+1/2,y,\bar{z} [u,v,\bar{w}]$	(4) $\bar{x}+1/2,y,z [u,\bar{v},\bar{w}]$
2 b m..	$1/4,y,z [u,0,0]$	$3/4,y,\bar{z} [u,0,0]$
2 a .2'	$0,y,0 [u,0,w]$	$1/2,y,0 [u,0,\bar{w}]$

Symmetry of special projections

Along [001] $p1m1$ $a^* = a/2$ $b^* = b$ Origin at $0,0,z$	Along [100] $p11m1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2'mg'$ $a^* = a$ Origin at $0,y,0$
--	--	--

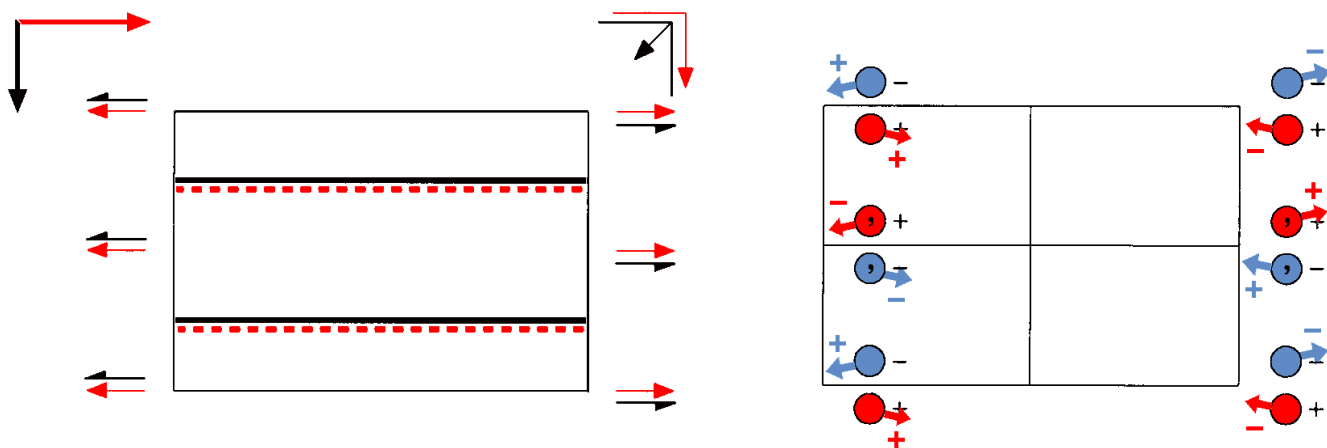
$p_{2b} m2'a'$

No. 31.6.193

$m2m1'$

$p_{2b} m2'a'$

Orthorhombic/Rectangular



Origin on $12'a'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

- For $(0,0,0) +$ set
- | | | | |
|-------------|----------------------|--------------------------------------|-----------------------|
| (1) 1 | (2) $2' \quad 0,y,0$ | (3) $a' \quad (1/2,0,0) \quad x,y,0$ | (4) $m \quad 1/4,y,z$ |
| $(1 0,0,0)$ | $(2_y 0,0,0)'$ | $(m_z 1/2,0,0)'$ | $(m_x 1/2,0,0)$ |
- For $(0,1,0) +$ set
- | | | | |
|------------------------|-----------------------------------|-------------------------------------|--------------------------------------|
| (1) $t' \quad (0,1,0)$ | (2) $2 \quad (0,1,0) \quad 0,y,0$ | (3) $n \quad (1/2,1,0) \quad x,y,0$ | (4) $b' \quad (0,1,0) \quad 1/4,y,z$ |
| $(1 0,1,0)'$ | $(2_y 0,1,0)$ | $(m_z 1/2,1,0)$ | $(m_x 1/2,1,0)'$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)+$	$(0,1,0)'+$
4 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [u,\bar{v},w]$
	(3) $x+1/2,y,\bar{z} [u,v,\bar{w}]$	(4) $\bar{x}+1/2,y,z [u,\bar{v},\bar{w}]$
2 b m..	$1/4,y,z [u,0,0]$	$3/4,y,\bar{z} [u,0,0]$
2 a .2'	$0,y,0 [u,0,w]$	$1/2,y,0 [u,0,\bar{w}]$

Symmetry of special projections

Along [001] $p_{c^*}1m1$ $a^* = a/2$ $b^* = b$ Origin at $0,0,z$	Along [100] $p11m1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2mg1'$ $a^* = a$ Origin at $0,y,0$
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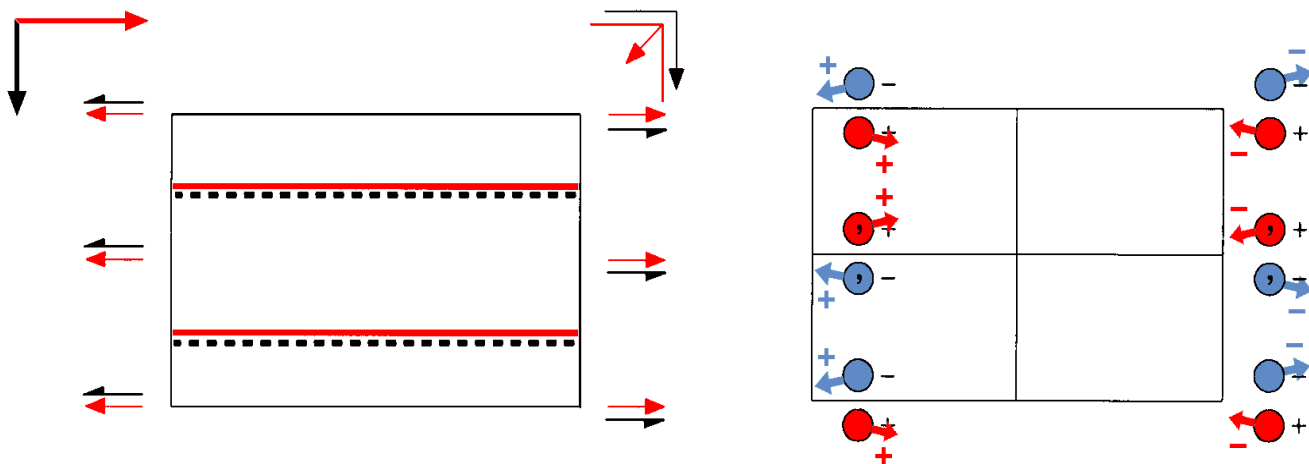
$p_{2b}, m'2'a$

No. 31.7.194

$m2m1'$

$p_{2b}, m'2'a$

Orthorhombic/Rectangular



Origin on $12'a$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

For $(0,0,0) +$ set

(1) 1	(2) $2' \quad 0,y,0$	(3) a $(1/2,0,0) \quad x,y,0$	(4) $m' \quad 1/4,y,z$
$(1 0,0,0)$	$(2_y 0,0,0)'$	$(m_z 1/2,0,0)$	$(m_x 1/2,0,0)'$

For $(0,1,0)' +$ set

(1) $t' \quad (0,1,0)$	(2) $2 \quad (0,1,0) \quad 0,y,0$	(3) $n' \quad (1/2,1,0) \quad x,y,0$	(4) b $(0,1,0) \quad 1/4,y,z$
$(1 0,1,0)'$	$(2_y 0,1,0)$	$(m_z 1/2,1,0)'$	$(m_x 1/2,1,0)$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)_+$	$(0,1,0)'$ +
4 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [u,\bar{v},w]$
	(3) $x+1/2,y,\bar{z} [\bar{u},\bar{v},w]$	(4) $\bar{x}+1/2,y,z [\bar{u},v,w]$
2 b $m'..$	$1/4,y,z [0,v,w]$	$3/4,y,\bar{z} [0,\bar{v},w]$
2 a $.2'$	$0,y,0 [u,0,w]$	$1/2,y,0 [\bar{u},0,w]$

Symmetry of special projections

Along $[001] p_{c^*}1m1$ $a^* = a/2$ $b^* = b$ Origin at $0,0,z$	Along $[100] p_{2a^*}11m$ $a^* = b$ Origin at $x,0,0$	Along $[010] p2mg1'$ $a^* = a$ Origin at $0,y,0$
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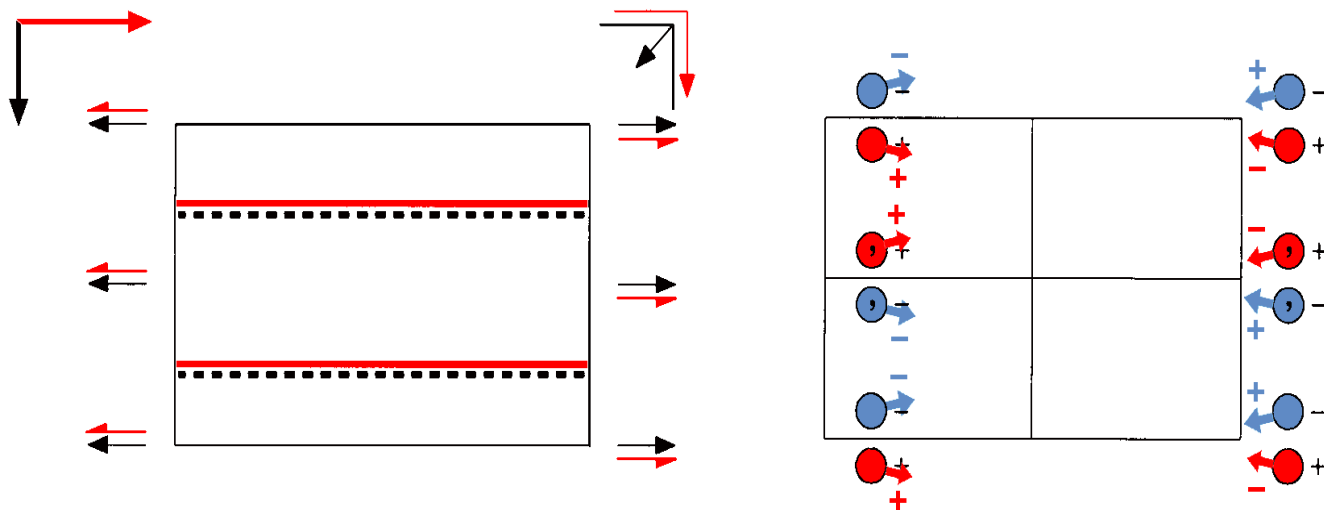
$p_{2b}, m'2a'$

No. 31.8.195

$m2m1'$

$p_{2b}, m'2a'$

Orthorhombic/Rectangular



Origin on $12a'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

For $(0,0,0) +$ set

(1) 1	(2) $2 \quad 0,y,0$	(3) $a' \quad (1/2,0,0) \quad x,y,0$	(4) $m' \quad 1/4,y,z$
$(1 0,0,0)$	$(2_y 0,0,0)$	$(m_z 1/2,0,0)'$	$(m_x 1/2,0,0)'$

For $(0,1,0)' +$ set

(1) $t' \quad (0,1,0)$	(2) $2' \quad (0,1,0) \quad 0,y,0$	(3) $n \quad (1/2,1,0) \quad x,y,0$	(4) $b \quad (0,1,0) \quad 1/4,y,z$
$(1 0,1,0)'$	$(2_y 0,1,0)'$	$(m_z 1/2,1,0)$	$(m_x 1/2,1,0)$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0)_+$	$(0,1,0)'$ +
4 c 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$
	(3) $x+1/2,y,\bar{z} [u,v,\bar{w}]$	(4) $\bar{x}+1/2,y,z [\bar{u},v,w]$
2 b $m'..$	$1/4,y,z [0,v,w]$	$3/4,y,\bar{z} [0,v,\bar{w}]$
2 a $.2.$	$0,y,0 [0,v,0]$	$1/2,y,0 [0,v,0]$

Symmetry of special projections

Along $[001]$ $p_{2b}m'1$ $a^* = a/2$ $b^* = b$ Origin at $0,0,z$	Along $[100]$ $p_{2a}m'1$ $a^* = b$ Origin at $x,0,0$	Along $[010]$ $p2mg1'$ $a^* = a$ Origin at $0,y,0$
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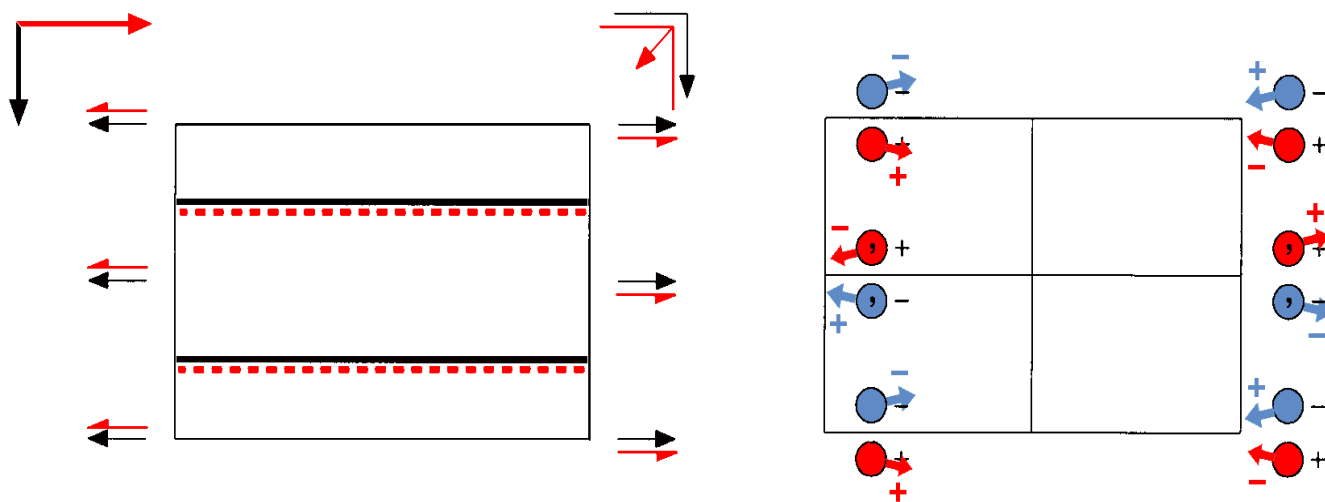
p_{2b}, m_{2a}

No. 31.9.196

$m_{2m}1'$

p_{2b}, m_{2a}

Orthorhombic/Rectangular



Origin on 12a

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

For $(0,0,0) +$ set

(1) 1	(2) $2 \quad 0,y,0$	(3) a $(1/2,0,0) \quad x,y,0$	(4) m $1/4,y,z$
$(1 0,0,0)$	$(2_y 0,0,0)$	$(m_z 1/2,0,0)$	$(m_x 1/2,0,0)$

For $(0,1,0)' +$ set

(1) $t' \quad (0,1,0)$	(2) $2' \quad (0,1,0) \quad 0,y,0$	(3) $n' \quad (1/2,1,0) \quad x,y,0$	(4) $b' \quad (0,1,0) \quad 1/4,y,z$
$(1 0,1,0)'$	$(2_y 0,1,0)'$	$(m_z 1/2,1,0)'$	$(m_x 1/2,1,0)'$

Generators selected (1); t(1,0,0); t(0,1,0)' ; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(0,0,0)+	(0,1,0)' +
4 c 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]
	(3) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]	(4) $\bar{x}+1/2,y,z$ [u, \bar{v},\bar{w}]
2 b m..	1/4,y,z [u,0,0]	3/4,y, \bar{z} [$\bar{u},0,0$]
2 a .2.	0,y,0 [0,v,0]	1/2,y,0 [0, $\bar{v},0$]

Symmetry of special projections

Along [001] p _c *1m1 a* = a/2 b* = b Origin at 1/4,0,z	Along [100] p11m1' a* = b Origin at x,0,0	Along [010] p2mg1' a* = a Origin at 0,y,0
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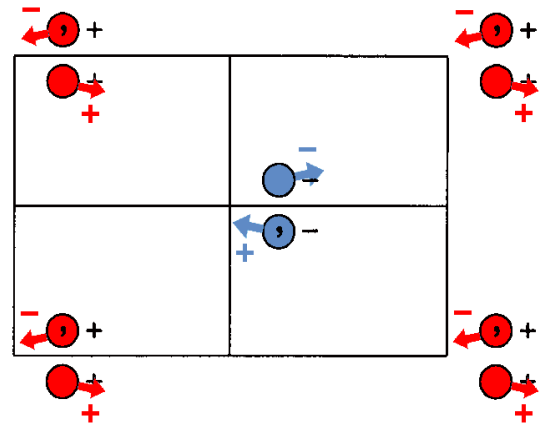
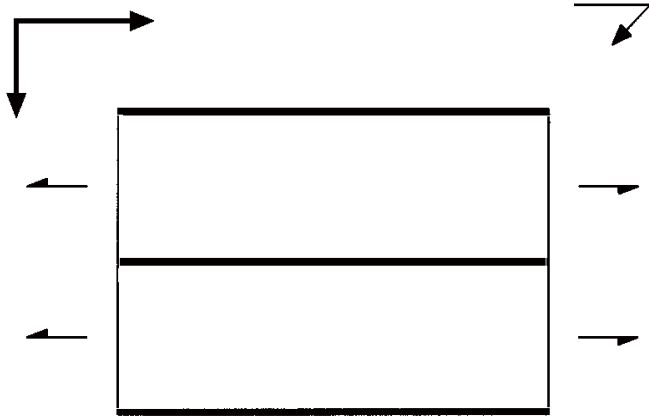
pm2₁n

No. 32.1.197

m2m

pm2₁n

Orthorhombic/Rectangular



Origin on m1n

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

(1) 1 (2) 2 (0,1/2,0) 1/4,y,0 (3) n (1/2,1/2,0) x,y,0 (4) m 0,y,z
 (1|0,0,0) (2_y|1/2,1/2,0) (m_z|1/2,1/2,0) (m_x|0,0,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
		(1) x, y, z [u,v,w]
	(3) $x + 1/2, y + 1/2, \bar{z}$ [\bar{u}, \bar{v}, w]	(4) \bar{x}, y, z [u, \bar{v}, \bar{w}]
4 b 1		
2 a m..	0,y,z [u,0,0]	1/2,y+1/2, \bar{z} [$\bar{u}, 0, 0$]

Symmetry of special projections

Along [001] $c_p 1m1$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p11g1'$ $a^* = b$ Origin at x,0,0	Along [010] $p2mg$ $a^* = a$ Origin at 1/4,y,0
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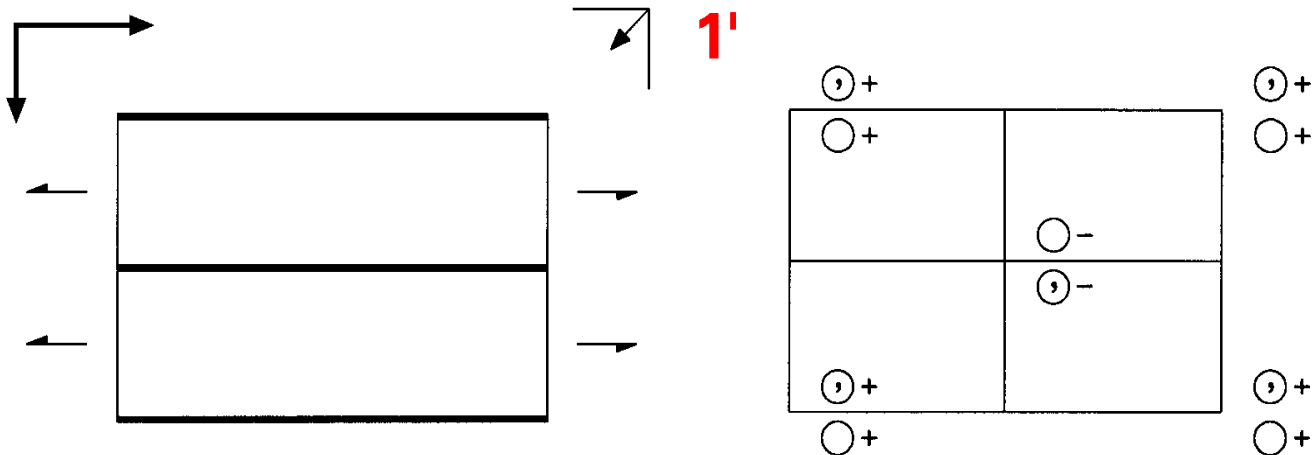
pm2₁n1'

No. 32.2.198

m2m1'

pm2₁n1'

Orthorhombic/Rectangular



Origin on m1n1'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For 1 + set

(1) 1 (2) 2 (0,1/2,0) 1/4,y,0 (3) n (1/2,1/2,0) x,y,0 (4) m 0,y,z
 (1|0,0,0) (2_y|1/2,1/2,0) (m_z|1/2,1/2,0) (m_x|0,0,0)

For 1' + set

(1) 1' (2) 2' (0,1/2,0) 1/4,y,0 (3) n' (1/2,1/2,0) x,y,0 (4) m' 0,y,z
 (1|0,0,0)' (2_y|1/2,1/2,0)' (m_z|1/2,1/2,0)' (m_x|0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 b 11'	(1) x,y,z [0,0,0]	(2) $\bar{x}+1/2,y+1/2,\bar{z}$ [0,0,0]
	(3) $x+1/2,y+1/2,\bar{z}$ [0,0,0]	(4) \bar{x},y,z [0,0,0]
2 a m..1'	0,y,z [0,0,0]	1/2,y+1/2, \bar{z} [0,0,0]

Symmetry of special projections

Along [001] c1m11'	Along [100] p11g1'	Along [010] p2mg1'
$a^* = a$ $b^* = b$	$a^* = b$	$a^* = a$
Origin at 0,0,z	Origin at x,0,0	Origin at 1/4,y,0

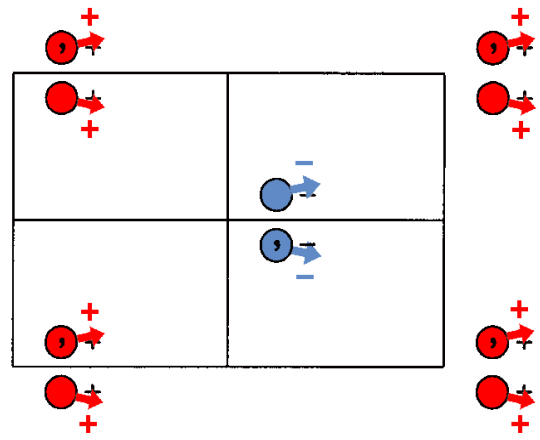
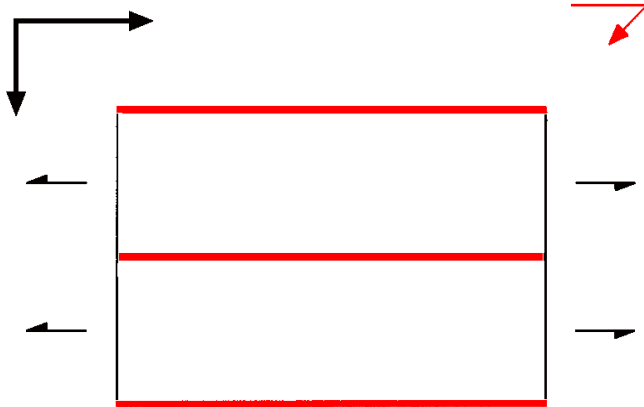
pm'2₁n'

No. 32.3.199

m'2m'

pm'2₁n'

Orthorhombic/Rectangular



Origin on m'1n'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2 (0,1/2,0) 1/4,y,0
(2_y|1/2,1/2,0)
- (3) n' (1/2,1/2,0) x,y,0
(m_z|1/2,1/2,0)'
- (4) m' 0,y,z
(m_x|0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
4 b 1	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]
	(3) $x+1/2,y+1/2,\bar{z}$ [u,v, \bar{w}]	(4) \bar{x},y,z [\bar{u},v,w]
2 a m'..	0,y,z [0,v,w]	1/2,y+1/2, \bar{z} [0,v, \bar{w}]

Symmetry of special projections

Along [001] c1m'1 $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p11g' $a^* = b$ Origin at x,0,0	Along [010] p2m'g' $a^* = a$ Origin at 1/4,y,0
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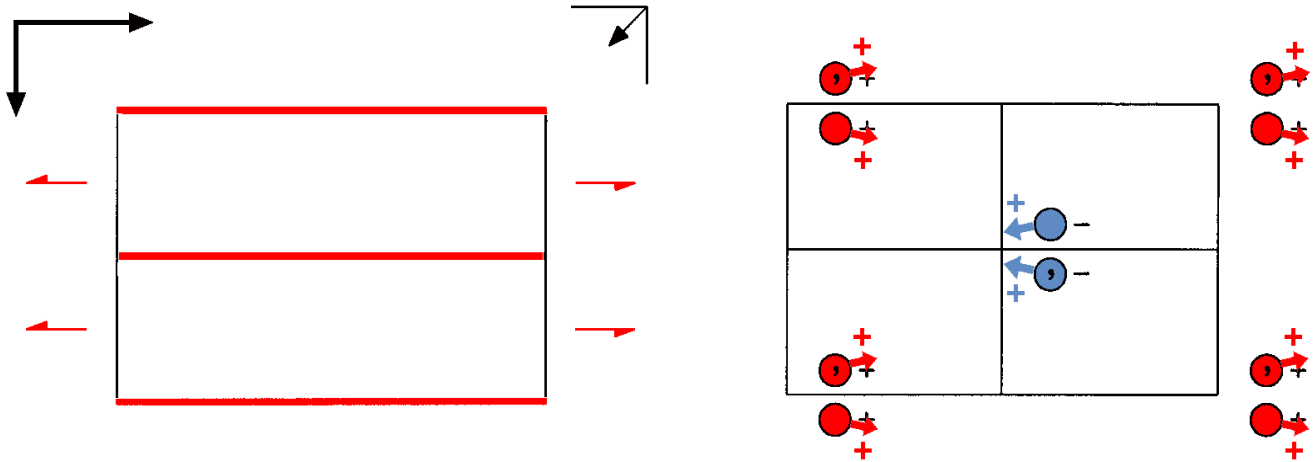
pm'2₁'n

No. 32.4.200

m'2'm

pm'2₁'n

Orthorhombic/Rectangular



Origin on m'1n

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2' (0,1/2,0) 1/4,y,0
(2_y|1/2,1/2,0)'
- (3) n (1/2,1/2,0) x,y,0
(m_z|1/2,1/2,0)
- (4) m' 0,y,z
(m_x|0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,y+1/2,\bar{z}$ [u, \bar{v} ,w]
4 b 1	(3) $x+1/2,y+1/2,\bar{z}$ [\bar{u},\bar{v} ,w]	(4) $\bar{x},y, [\bar{u},v,w]$
2 a m'..	0,y,z [0,v,w]	1/2,y+1/2, \bar{z} [0, \bar{v} ,w]

Symmetry of special projections

Along [001] $c_p 1m'1$ $a^* = a \quad b^* = b$ Origin at 0,0,z	Along [100] $p11g$ $a^* = b$ Origin at x,0,0	Along [010] $p2'm'g$ $a^* = a$ Origin at 1/4,y,0
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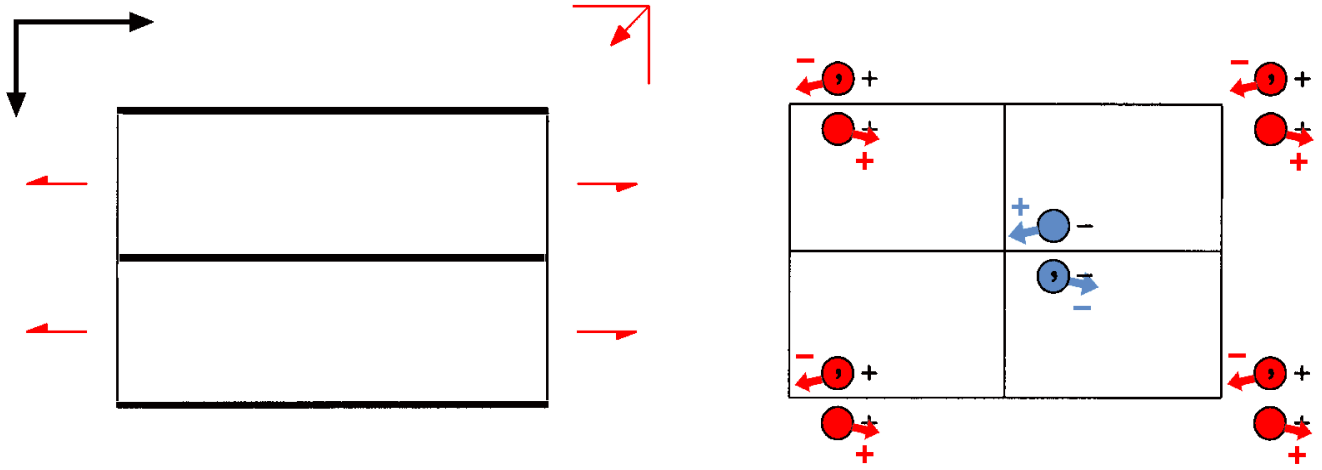
pm2₁'n'

No. 32.5.201

m2'm'

pm2₁'n'

Orthorhombic/Rectangular



Origin on m1n'

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

- (1) 1
(1|0,0,0) (2) 2' (0,1/2,0) 1/4,y,0 (3) n' (1/2,1/2,0) x,y,0 (4) m 0,y,z
(2_y|1/2,1/2,0)' (m_z|1/2,1/2,0)' (m_x|0,0,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

	Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		
4 b 1	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,y+1/2,\bar{z}$ [u, \bar{v} ,w]
	(3) $x+1/2,y+1/2,\bar{z}$ [u,v, \bar{w}]	(4) \bar{x},y,z [u, \bar{v},\bar{w}]
2 a m..	0,y,z [u,0,0]	1/2,y+1/2, \bar{z} [u,0,0]

Symmetry of special projections

Along [001] c1m1	Along [100] p11g1'	Along [010] p2'mg'
$a^* = a$ $b^* = b$	$a^* = b$	$a^* = a$
Origin at 0,0,z	Origin at x,0,0	Origin at 1/4,y,0

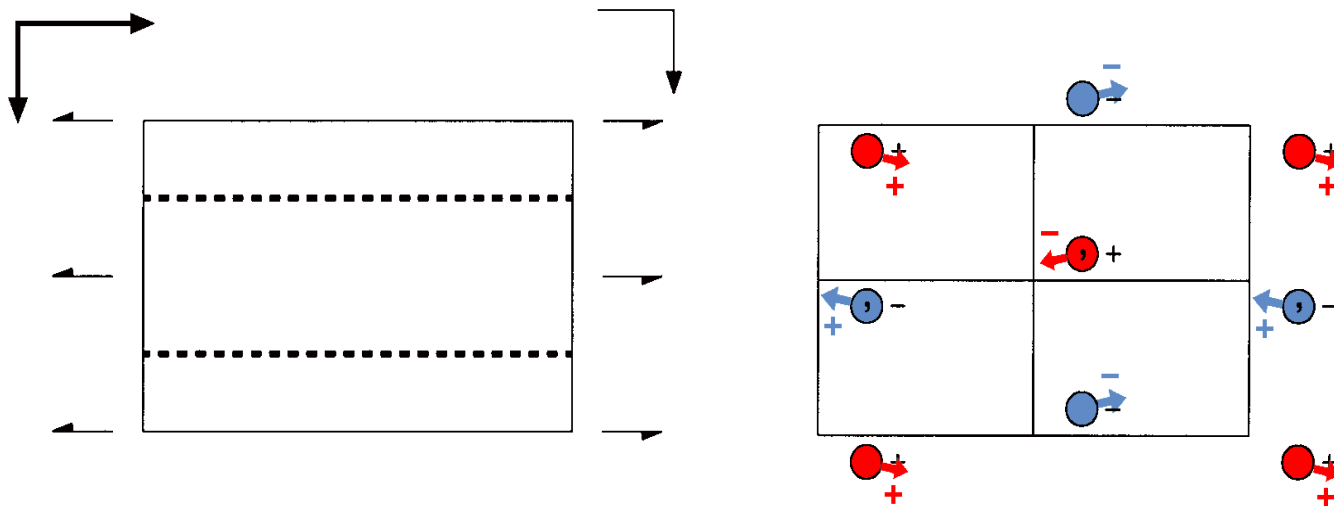
pb2₁a

No. 33.1.202

m2m

pb2₁a

Orthorhombic/Rectangular



Origin on 12₁a

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2 (0,1/2,0) 0,y,0
(2_y|0,1/2,0)
- (3) a (1/2,0,0) x,y,0
(m_z|1/2,0,0)
- (4) b (0,1/2,0) 1/4,y,z
(m_x|1/2,1/2,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

	Coordinates	
Wyckoff letter, Site symmetry		
4 a 1	(1) x,y,z [u,v,w]	(2) $\bar{x},y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]
	(3) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]	(4) $\bar{x}+1/2,y+1/2,z$ [u,\bar{v},\bar{w}]

Symmetry of special projections

Along [001] $p_{2a^*}1g1$ $a^* = a/2$ $b^* = b$ Origin at $0,0,z$	Along [100] $p_{2a^*}11m$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p2mg$ $a^* = a$ Origin at $0,y,0$
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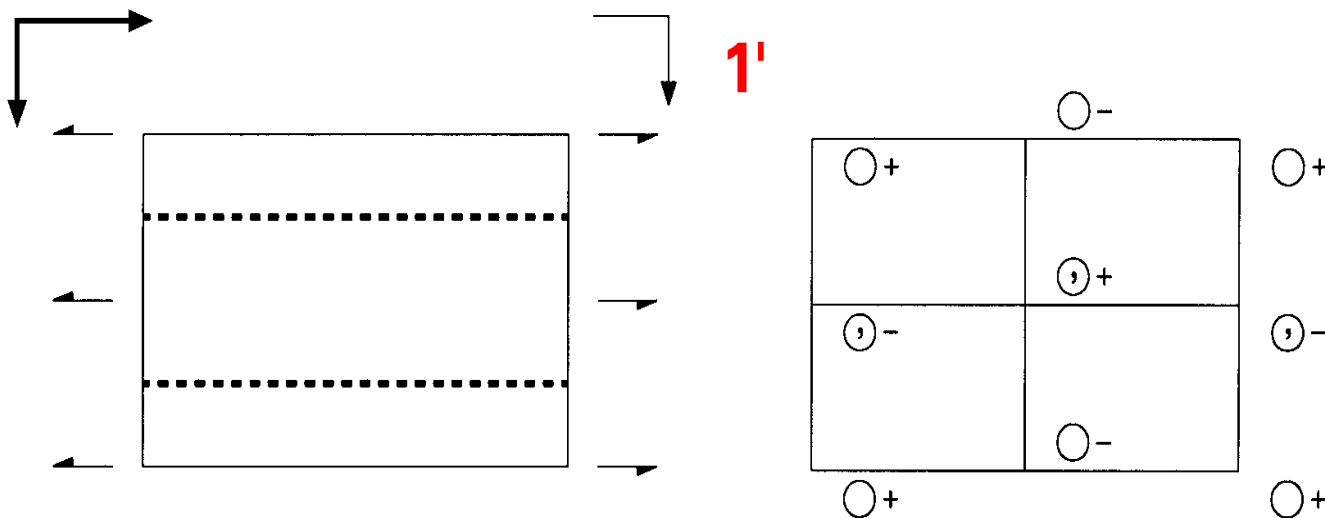
pb₂a₁'

No. 33.2.203

m2m1'

pb₂a₁'

Orthorhombic/Rectangular



Origin on 12₁a₁'

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1$

Symmetry operations

For 1 + set

(1) 1 (1 0,0,0)	(2) 2 (0,1/2,0) 0,y,0 (2 _y 0,1/2,0)	(3) a (1/2,0,0) x,y,0 (m _z 1/2,0,0)	(4) b (0,1/2,0) 1/4,y,z (m _x 1/2,1/2,0)
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For 1' + set

(1) 1' (1 0,0,0)'	(2) 2' (0,1/2,0) 0,y,0 (2 _y 0,1/2,0)'	(3) a' (1/2,0,0) x,y,0 (m _z 1/2,0,0)'	(4) b' (0,1/2,0) 1/4,y,z (m _x 1/2,1/2,0)'
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Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); 1'

Positions

Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 a 11'	(1) x,y,z [0,0,0]	(2) $\bar{x},y+1/2,\bar{z}$ [0,0,0]
	(3) $x+1/2,y,\bar{z}$ [0,0,0]	(4) $\bar{x}+1/2,y+1/2,z$ [0,0,0]

Symmetry of special projections

Along [001] p1g11' $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] p11m1' $a^* = b/2$ Origin at x,0,0	Along [010] p2mg1' $a^* = a$ Origin at 0,y,0
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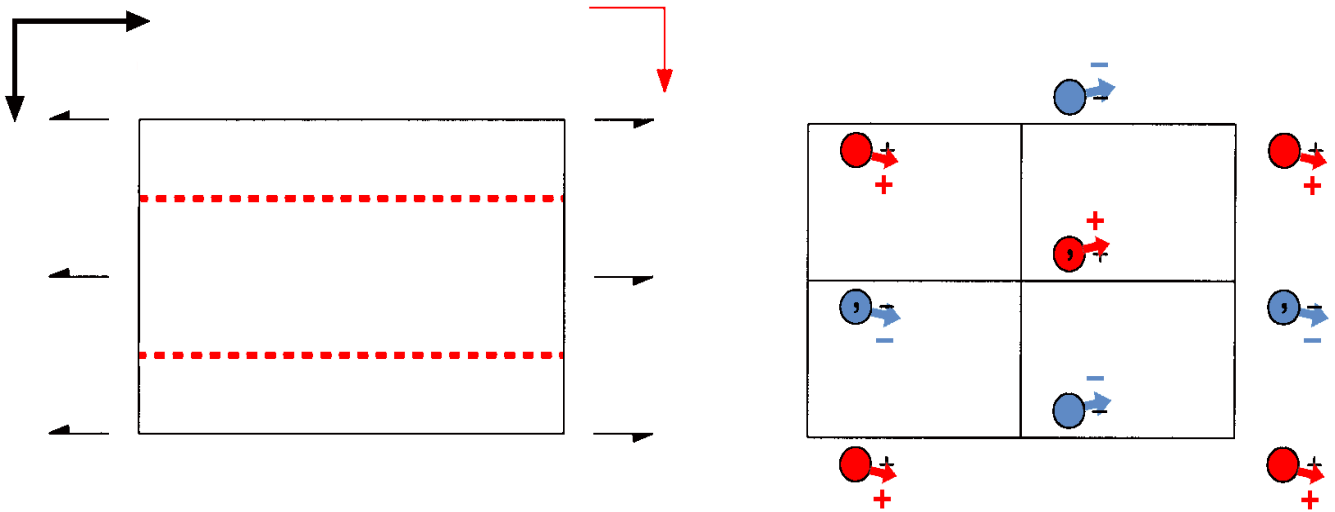
pb'2₁a'

No. 33.3.204

m'2m'

pb'2₁a'

Orthorhombic/Rectangular



Origin on 12₁a'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2 (0,1/2,0) 0,y,0
(2_y|0,1/2,0)
- (3) a' (1/2,0,0) x,y,0
(m_z|1/2,0,0)'
- (4) b' (0,1/2,0) 1/4,y,z
(m_x|1/2,1/2,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Wyckoff letter, Site symmetry	Coordinates	
	4 a 1	(1) x,y,z [u,v,w]
	(3) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]	(4) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]

Symmetry of special projections

Along [001] $p1g'1$ $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] $p11m'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2m'g'$ $a^* = a$ Origin at 0,y,0
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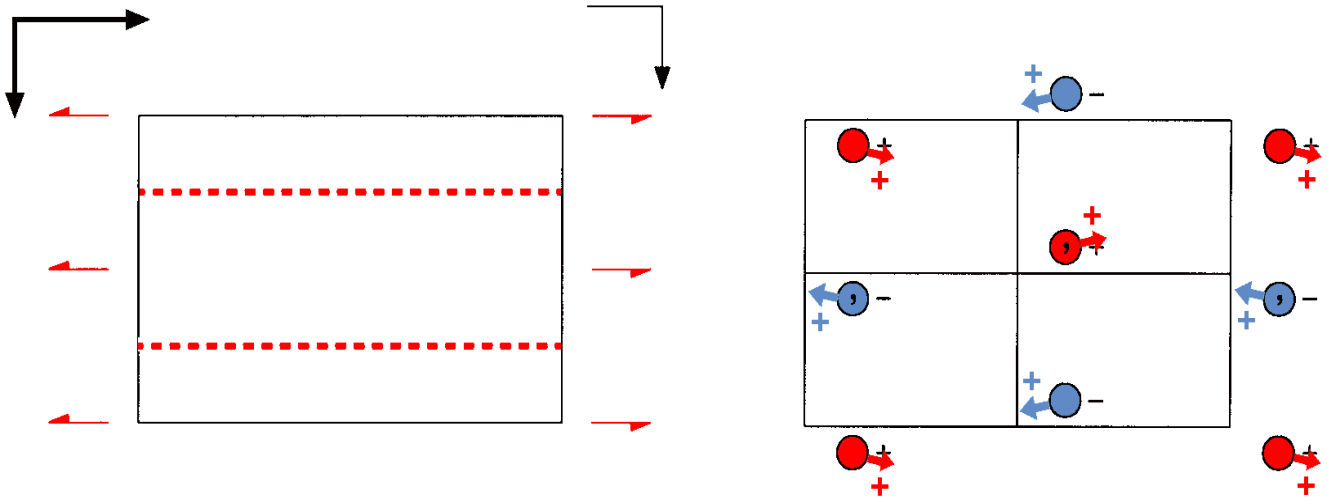
pb'2₁'a

No. 33.4.205

m'2'm

pb'2₁'a

Orthorhombic/Rectangular



Origin on 12₁'a

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2' (0,1/2,0) 0,y,0
(2_y|0,1/2,0)'
- (3) a (1/2,0,0) x,y,0
(m_z|1/2,0,0)
- (4) b' (0,1/2,0) 1/4,y,z
(m_x|1/2,1/2,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Wyckoff letter, Site symmetry	Coordinates	
	4 a 1	(1) x,y,z [u,v,w]
	(3) $x+1/2,y,\bar{z}$ [\bar{u} , \bar{v} ,w]	(4) $\bar{x}+1/2,y+1/2,z$ [\bar{u} ,v,w]

Symmetry of special projections

Along [001] $p_{2a^*}1g1$ $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] $p11m$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2'm'g$ $a^* = a$ Origin at 0,y,0
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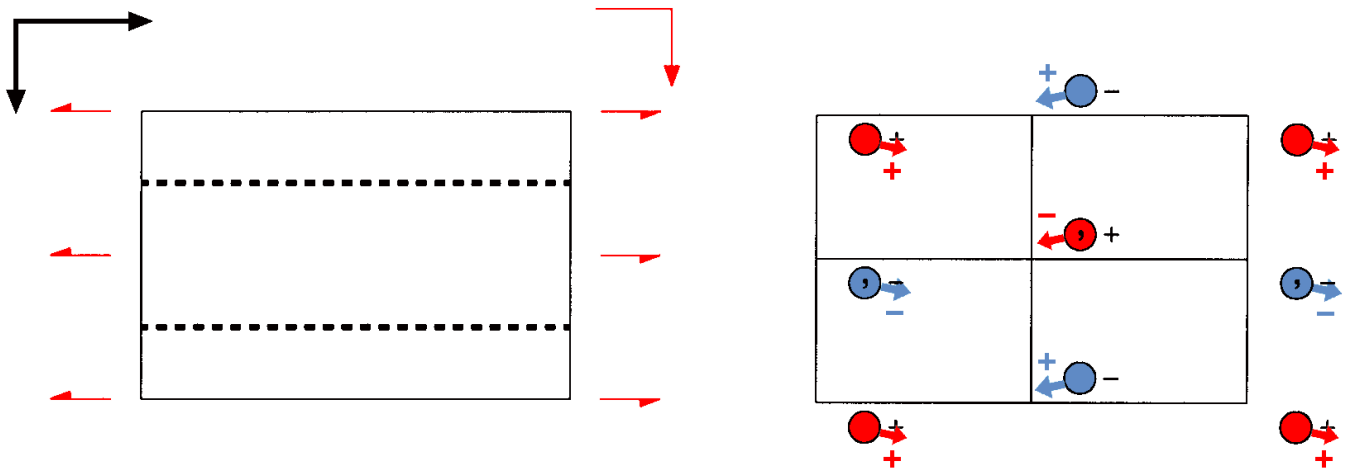
pb2₁'a'

No. 33.5.206

m2'm'

pb2₁'a'

Orthorhombic/Rectangular



Origin on 12₁'a'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2' (0,1/2,0) 0,y,0
(2_y|0,1/2,0)'
- (3) a' (1/2,0,0) x,y,0
(m_z|1/2,0,0)'
- (4) b (0,1/2,0) 1/4,y,z
(m_x|1/2,1/2,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Wyckoff letter, Site symmetry	Coordinates	
	4 a 1	(1) x,y,z [u,v,w]
	(3) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]	(4) $\bar{x}+1/2,y+1/2,z$ [u, \bar{v},\bar{w}]

Symmetry of special projections

Along [001] p1g1 $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] p _{2a*} 11m' $a^* = b/2$ Origin at x,0,0	Along [010] p2'mg' $a^* = a$ Origin at 0,y,0
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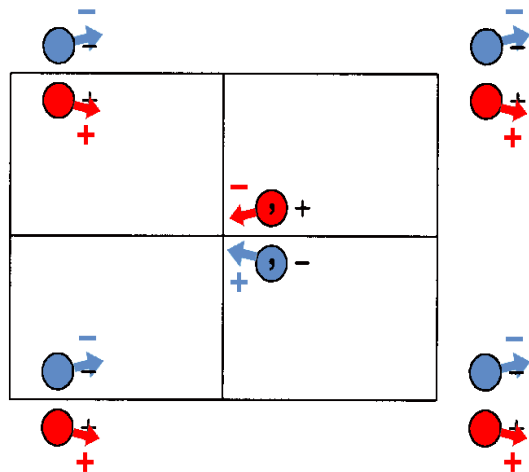
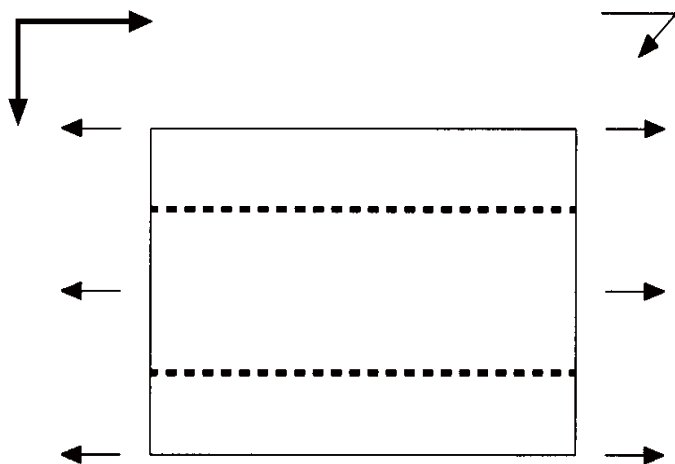
pb2n

No. 34.1.207

m2m

pb2n

Orthorhombic/Rectangular



Origin on 12n

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $0,y,0$
(2_y|0,0,0)

(3) b $(0,1/2,0)$ $1/4,y,z$
(m_x|1/2,1/2,0)

(4) n $(1/2,1/2,0)$ $x,y,0$
(m_z|1/2,1/2,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]
4 b 1	(3) $\bar{x}+1/2,y+1/2,z$ [u,\bar{v},\bar{w}]	(4) $x+1/2,y+1/2,\bar{z}$ [\bar{u},\bar{v},w]
	0, y ,0 [$0,v,0$]	$1/2,y+1/2,0$ [$0,\bar{v},0$]
2 a .2.		

Symmetry of special projections

Along [001] c_p 1m'1 $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p_{2a^*} 11m' $a^* = b/2$ Origin at x,0,0	Along [010] p_{2mg} $a^* = a$ Origin at 0,y,0
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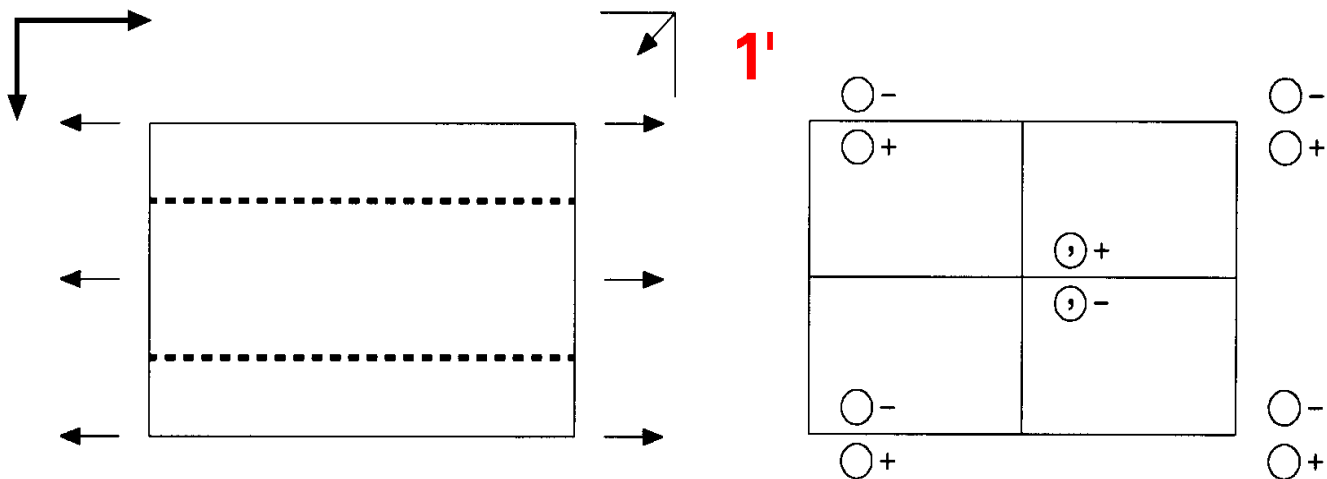
pb2n1'

m2m1'

Orthorhombic/Rectangular

No. 34.2.208

pb2n1'



Origin on 12n1'

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

- For 1 + set
- | | | | |
|--------------------|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,y,0$
(2 _y 0,0,0) | (3) b $(0,1/2,0)$ $1/4,y,z$
(m _x 1/2,1/2,0) | (4) n $(1/2,1/2,0)$ $x,y,0$
(m _z 1/2,1/2,0) |
|--------------------|--|--|--|
- For 1' + set
- | | | | |
|----------------------|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' $0,y,0$
(2 _y 0,0,0)' | (3) b' $(0,1/2,0)$ $1/4,y,z$
(m _x 1/2,1/2,0)' | (4) n' $(1/2,1/2,0)$ $x,y,0$
(m _z 1/2,1/2,0)' |
|----------------------|--|--|--|

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	1+	1' +
4 b 11'	(1) x,y,z [0,0,0]	(2) \bar{x},y,\bar{z} [0,0,0]
	(3) $\bar{x}+1/2,y+1/2,z$ [0,0,0]	(4) $x+1/2,y+1/2,\bar{z}$ [0,0,0]
2 a .2.1'	$0,y,0$ [0,0,0]	$1/2,y+1/2,0$ [0,0,0]

Symmetry of special projections

Along [001] $c1m11'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p11m1'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p2mg1'$ $a^* = a$ Origin at $0,y,0$
--	--	--

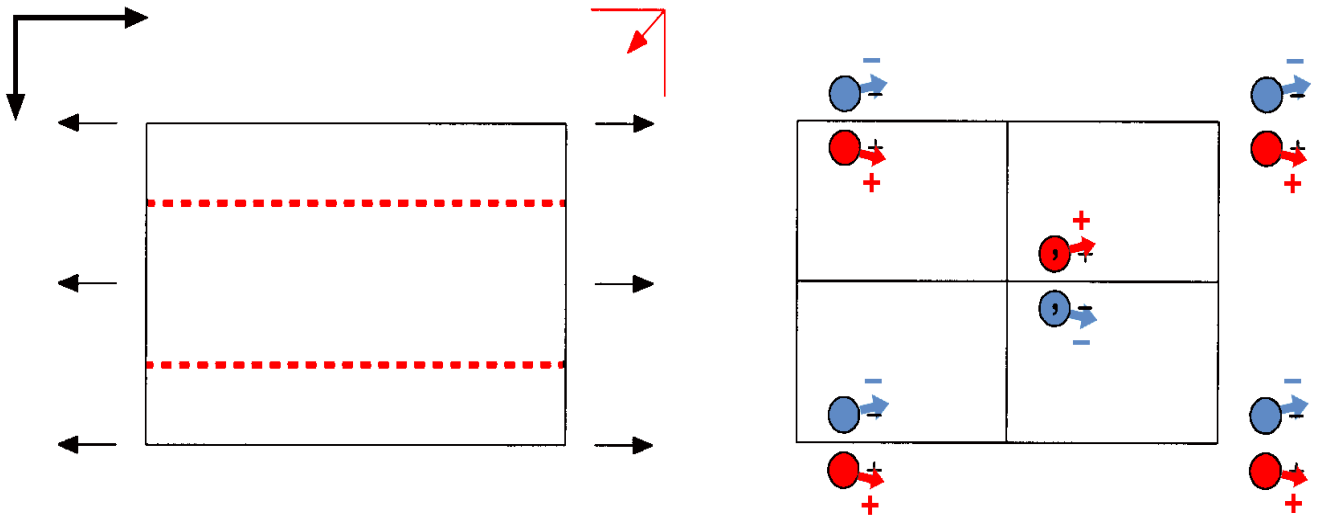
pb'2n'

No. 34.3.209

m'2m'

pb'2n'

Orthorhombic/Rectangular



Origin on 12n'

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $0,y,0$
(2_y|0,0,0)

(3) b' $(0,1/2,0)$ $1/4,y,z$
(m_x|1/2,1/2,0)'

(4) n' $(1/2,1/2,0)$ $x,y,0$
(m_z|1/2,1/2,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]
4 b 1	(3) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]	(4) $x+1/2,y+1/2,\bar{z}$ [u,v,\bar{w}]
2 a .2.	$0,y,0$ [$0,v,0$]	$1/2,y+1/2,0$ [$0,v,0$]

Symmetry of special projections

Along [001] $c1m'1$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p11m'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p2m'g'$ $a^* = a$ Origin at $0,y,0$
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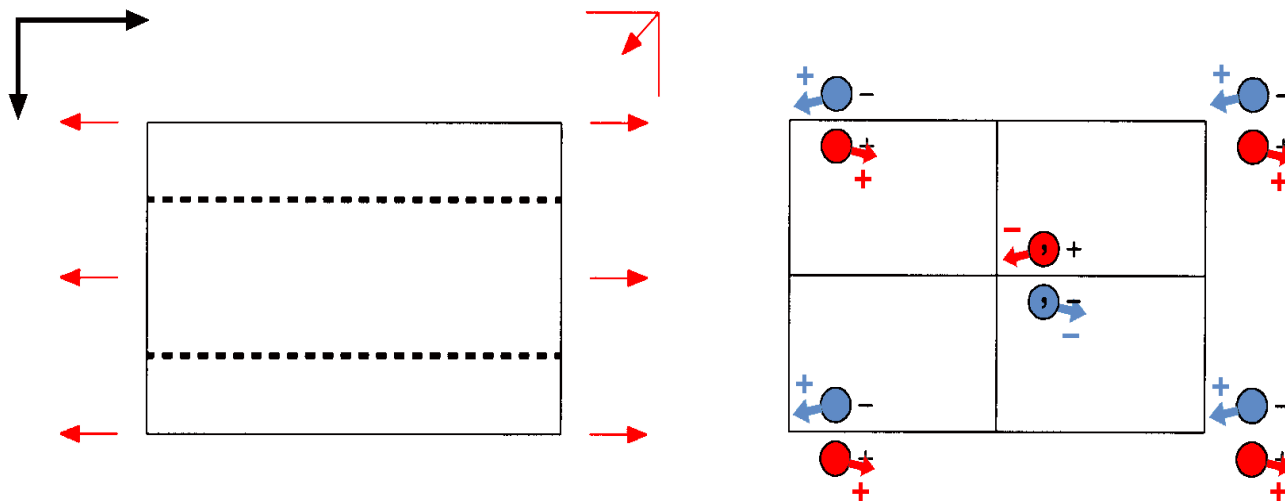
pb2'n'

m2'm'

Orthorhombic/Rectangular

No. 34.4.210

pb2'n'



Origin on 12'n'

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

- (1) 1 (2) $2'_y$ $0, y, 0$ (3) b $(0, 1/2, 0)$ $1/4, y, z$ (4) n' $(1/2, 1/2, 0)$ $x, y, 0$
- (1| $0, 0, 0$) (2_y| $0, 0, 0$)' (m_x | $1/2, 1/2, 0$) (m_z | $1/2, 1/2, 0$)'

Continued

No. 34.4.210

pb2'n'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x, y, z [u, v, w]	(2) \bar{x}, y, \bar{z} [u, \bar{v} , w]
4 b 1	(3) $\bar{x} + 1/2, y + 1/2, z$ [u, \bar{v} , \bar{w}]	(4) $x + 1/2, y + 1/2, \bar{z}$ [u, v, \bar{w}]
	2 a .2'	0, y, 0 [u, 0, w]

Symmetry of special projections

Along [001] c1m1 $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p_{2a^*}11m$ $a^* = b/2$ Origin at x,0,0	Along [010] $p_{2'}mg'$ $a^* = a$ Origin at 0,y,0
--	---	---

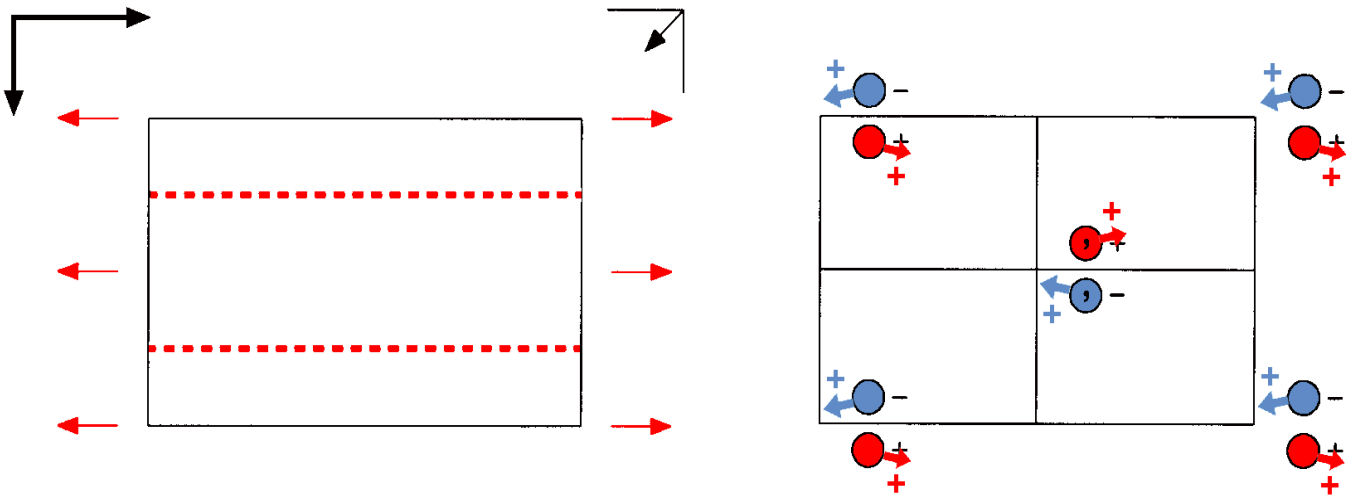
pb'2'n

No. 34.5.211

m'b'm

pb'2'n

Orthorhombic/Rectangular



Origin on 12'n

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

- (1) 1
(1|0,0,0)
- (2) 2' $0,y,0$
(2_y|0,0,0)'
- (3) b' $(0,1/2,0)$ $1/4,y,z$
(m_x|1/2,1/2,0)'
- (4) n $(1/2,1/2,0)$ $x,y,0$
(m_z|1/2,1/2,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates	
	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [u,\bar{v},w]
4 b 1	(3) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]	(4) $x+1/2,y+1/2,\bar{z}$ [\bar{u},\bar{v},w]
	2 a .2'	$0,y,0$ [$u,0,w$]

Symmetry of special projections

Along [001] $c_p 1m1$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p11m$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p2'm'g$ $a^* = a$ Origin at $0,y,0$
---	--	--

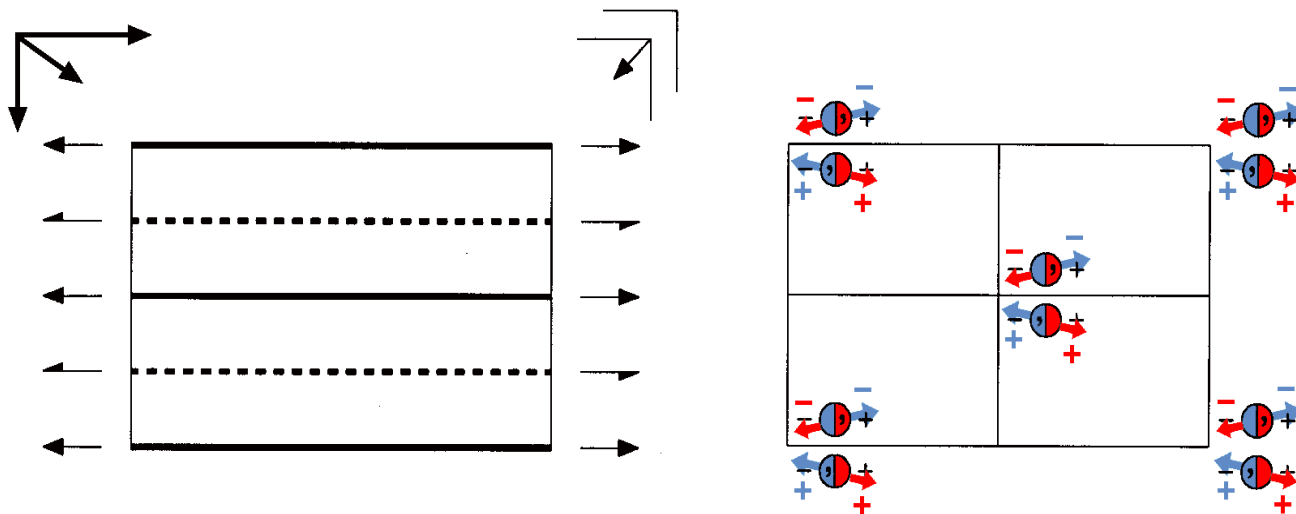
cm2m

m2m

Orthorhombic/Rectangular

No. 35.1.212

cm2m



Origin on m2m

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|-----------|---------------|---------------|---------------|
| (1) 1 | (2) 2 | (3) m | (4) m |
| (1 0,0,0) | $(2_y 0,0,0)$ | $(m_x 0,0,0)$ | $(m_z 0,0,0)$ |
- For (1/2,1/2,0) + set
- | | | | |
|-----------------|-------------------|-------------------|-------------------|
| (1) t | (2) 2 | (3) b | (4) n |
| $(1 1/2,1/2,0)$ | $(2_y 1/2,1/2,0)$ | $(m_x 1/2,1/2,0)$ | $(m_z 1/2,1/2,0)$ |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

		Coordinates	
Wyckoff letter, Site symmetry		(0,0,0) +	(1/2,1/2,0) +
8	d 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]
		(3) \bar{x},y,z [u, \bar{v},\bar{w}]	(4) x,y, \bar{z} [\bar{u},\bar{v},w]
4	c ..m	x,y,0 [0,0,w]	$\bar{x},y,0$ [0,0, \bar{w}]
4	b m..	0,y,z [u,0,0]	0,y, \bar{z} [$\bar{u},0,0$]
2	a m2m	0,y,0 [0,0,0]	

Symmetry of special projections

Along [001] c1m11'	Along [100] p11m1'	Along [010] p2mm
a* = a b* = b	a* = b/2	a* = a/2
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

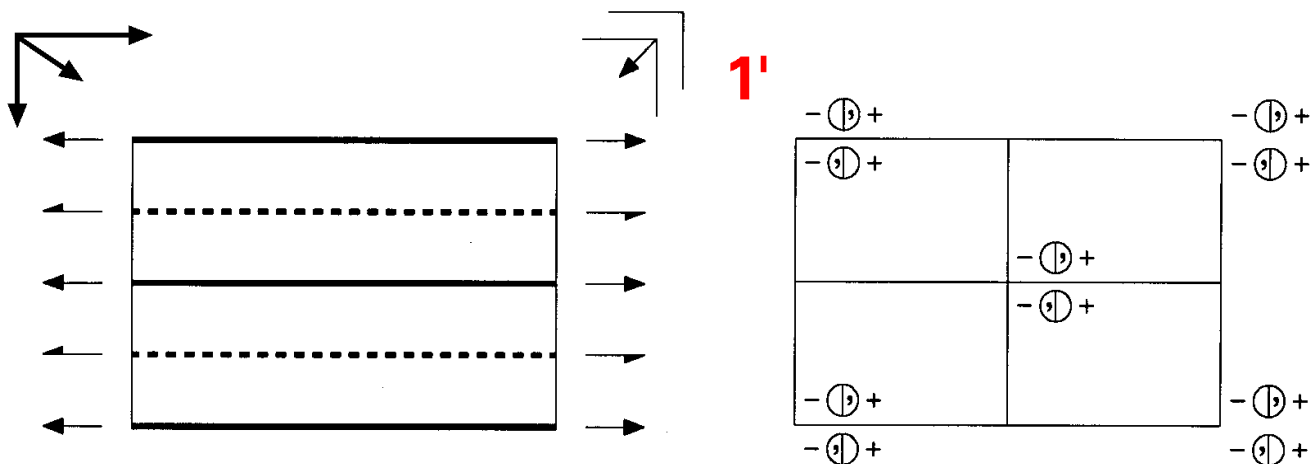
cm2m1'

m2m1'

Orthorhombic/Rectangular

No. 35.2.213

cm2m1'



Origin on m2m1'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|--------------------|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,y,0
(2 _y 0,0,0) | (3) m 0,y,z
(m _x 0,0,0) | (4) m x,y,0
(m _z 0,0,0) |
|--------------------|--|--|--|
- For (1/2,1/2,0) + set
- | | | | |
|------------------------------------|--|--|--|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (3) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (4) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) |
|------------------------------------|--|--|--|
- For (0,0,0)' + set
- | | | | |
|----------------------|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,y,0
(2 _y 0,0,0)' | (3) m' 0,y,z
(m _x 0,0,0)' | (4) m' x,y,0
(m _z 0,0,0)' |
|----------------------|--|--|--|
- For (1/2,1/2,0)' + set
- | | | | |
|--------------------------------------|--|--|--|
| (1) t' (1/2,1/2,0)
(1 1/2,1/2,0)' | (2) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (3) b' (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0)' | (4) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' |
|--------------------------------------|--|--|--|

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3); 1'

Positions

		Coordinates	
Wyckoff letter, Site symmetry		(0,0,0) + (0,0,0)' +	(1/2,1/2,0) + (1/2,1/2,0)' +
8	d 11'	(1) x,y,z [0,0,0]	(2) \bar{x},y,\bar{z} [0,0,0]
		(3) \bar{x},y,z [0,0,0]	(4) x,y, \bar{z} [0,0,0]
4	c ..m1'	x,y,0 [0,0,0]	$\bar{x},y,0$ [0,0,0]
4	b m..1'	0,y,z [0,0,0]	0,y, \bar{z} [0,0,0]
2	a m2m1'	0,y,0 [0,0,0]	

Symmetry of special projections

Along [001] c1m11'	Along [100] p11m1'	Along [010] p2mm1'
a* = a b* = b	a* = b/2	a* = a/2
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

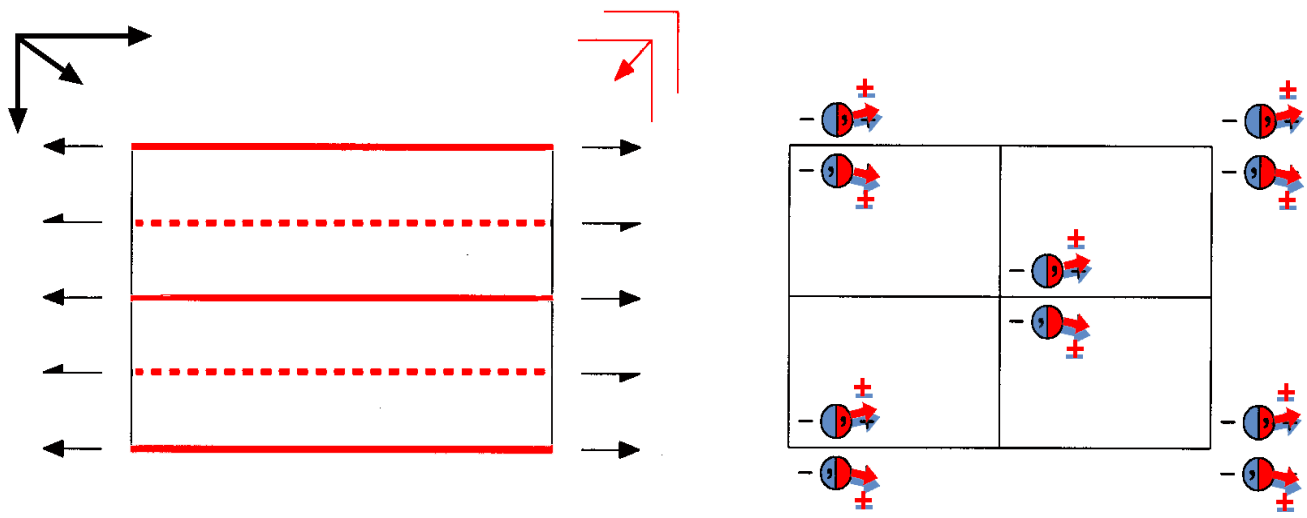
cm'2m'

m'2m'

Orthorhombic/Rectangular

No. 35.3.214

cm'2m'



Origin on m'2m'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|-----------|-------------------------|---------------------------|---------------------------|
| (1) 1 | (2) 2 $0,y,0$ | (3) m' $0,y,z$ | (4) m' $x,y,0$ |
| (1 0,0,0) | (2 _y 0,0,0) | (m' _x 0,0,0)' | (m' _z 0,0,0)' |
- For (1/2,1/2,0) + set
- | | | | |
|---------------------|-----------------------------|-------------------------------|-------------------------------|
| (1) t $(1/2,1/2,0)$ | (2) 2 $(0,1/2,0) \ 1/4,y,0$ | (3) b' $(0,1/2,0) \ 1/4,y,z$ | (4) n' $(1/2,1/2,0) \ x,y,0$ |
| (1 1/2,1/2,0) | (2 _y 1/2,1/2,0) | (m' _x 1/2,1/2,0)' | (m' _z 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

		Coordinates	
Wyckoff letter, Site symmetry		(0,0,0) +	(1/2,1/2,0) +
8	d 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]
		(3) \bar{x},y,z [\bar{u},v,w]	(4) x,y, \bar{z} [u,v, \bar{w}]
4	c ..m'	x,y,0 [u,v,0]	$\bar{x},y,0$ [$\bar{u},v,0$]
4	b m'..	0,y,z [0,v,w]	0,y, \bar{z} [0,v, \bar{w}]
2	a m'2m'	0,y,0 [0,v,0]	

Symmetry of special projections

Along [001] c1m'1	Along [100] p11m'	Along [010] p2m'm'
a* = a b* = b	a* = b/2	a* = a/2
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

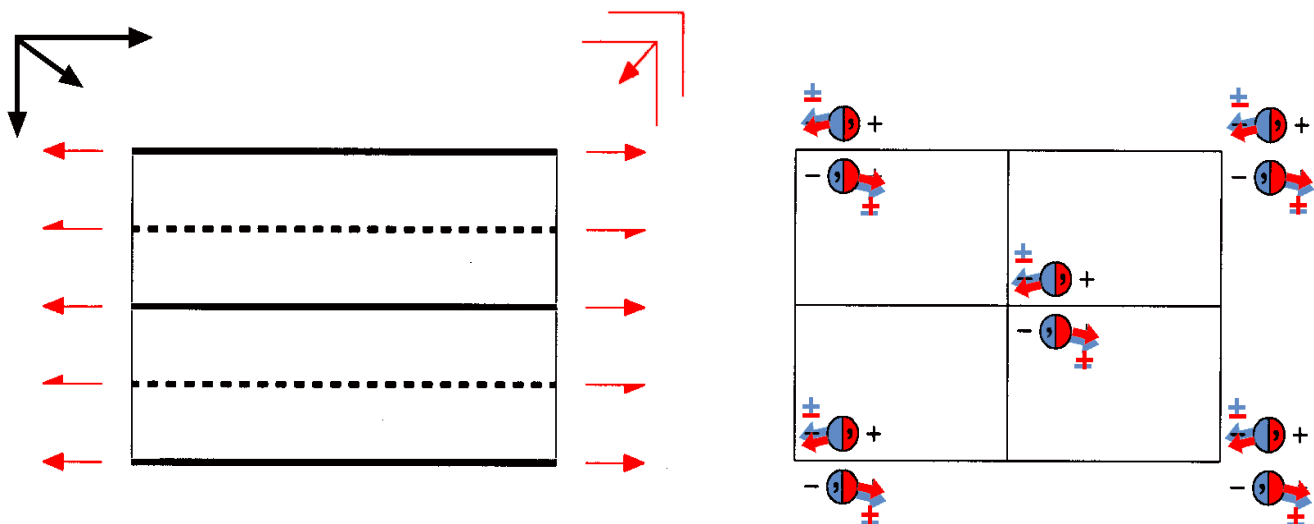
cm2'm'

m2'm'

Orthorhombic/Rectangular

No. 35.4.215

cm2'm'



Origin on m2'm'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|-----------|--------------------------|-------------------------|--------------------------|
| (1) 1 | (2) 2' $0,y,0$ | (3) m $0,y,z$ | (4) m' $x,y,0$ |
| (1 0,0,0) | (2 _y 0,0,0)' | (m _x 0,0,0) | (m _z 0,0,0)' |
- For (1/2,1/2,0) + set
- | | | | | | | |
|---------------------|------------------------------|-----------------------------|------------------------------|-----------|----------------------|---------|
| (1) t $(1/2,1/2,0)$ | (2) 2' $(0,1/2,0)$ | $1/4,y,0$ | (3) b $(0,1/2,0)$ | $1/4,y,z$ | (4) n' $(1/2,1/2,0)$ | $x,y,0$ |
| (1 1/2,1/2,0) | (2 _y 1/2,1/2,0)' | (m _x 1/2,1/2,0) | (m _z 1/2,1/2,0)' | | | |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

		Coordinates	
Wyckoff letter, Site symmetry		(0,0,0) +	(1/2,1/2,0) +
8	d 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [u, \bar{v} ,w]
		(3) \bar{x},y,z [u, \bar{v},\bar{w}]	(4) x,y, \bar{z} [u,v, \bar{w}]
4	c ..m'	x,y,0 [u,v,0]	$\bar{x},y,0$ [u, $\bar{v},0$]
4	b m..	0,y,z [u,0,0]	0,y, \bar{z} [u,0,0]
2	a m2'm'	0,y,0 [u,0,0]	

Symmetry of special projections

Along [001] c1m1	Along [100] p11m1'	Along [010] p2'mm'
a* = a b* = b	a* = b/2	a* = a/2
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

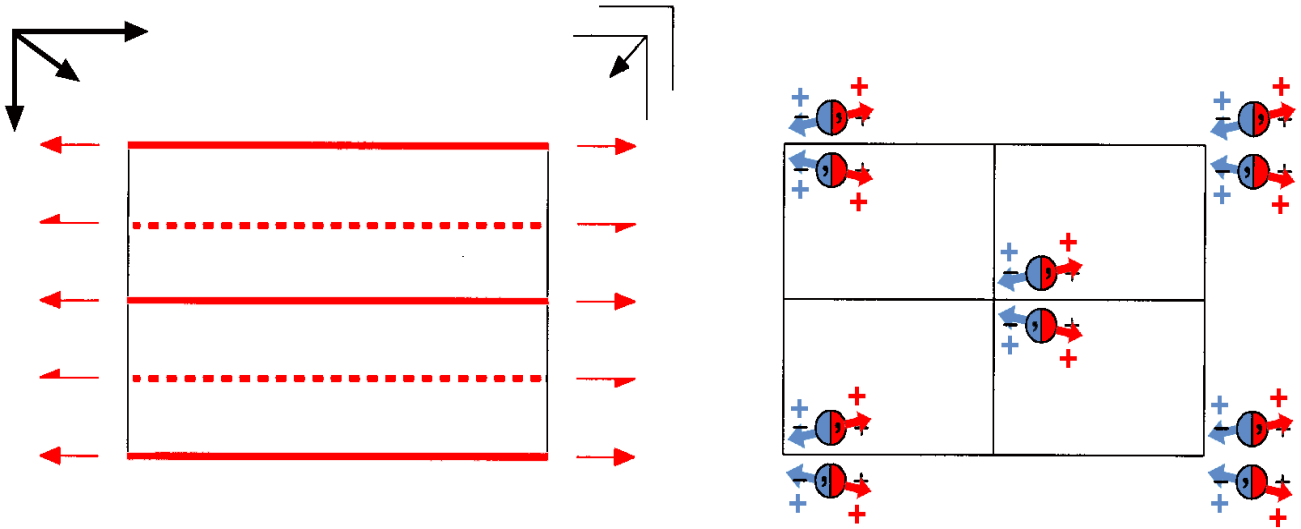
cm'2'm

No. 35.5.216

m'2'm

cm'2'm

Orthorhombic/Rectangular



Origin on m'2'm

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|-----------|--------------------------|--------------------------|-------------------------|
| (1) 1 | (2) $2'_y$ 0,y,0 | (3) m'_x 0,y,z | (4) m_z x,y,0 |
| (1 0,0,0) | (2 _y 0,0,0)' | (m _x 0,0,0)' | (m _z 0,0,0) |
- For (1/2,1/2,0) + set
- | | | | |
|-------------------|------------------------------|------------------------------|-----------------------------|
| (1) t (1/2,1/2,0) | (2) $2'_y$ (0,1/2,0) 1/4,y,0 | (3) b'_x (0,1/2,0) 1/4,y,z | (4) n (1/2,1/2,0) x,y,0 |
| (1 1/2,1/2,0) | (2 _y 1/2,1/2,0)' | (m _x 1/2,1/2,0)' | (m _z 1/2,1/2,0) |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

		Coordinates	
Wyckoff letter, Site symmetry		(0,0,0) +	(1/2,1/2,0) +
8	d 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [u, \bar{v} ,w]
		(3) \bar{x},y,z [\bar{u} ,v,w]	(4) x,y, \bar{z} [\bar{u} , \bar{v} ,w]
4	c ..m	x,y,0 [0,0,w]	$\bar{x},y,0$ [0,0,w]
4	b m'..	0,y,z [0,v,w]	0,y, \bar{z} [0, \bar{v} ,w]
2	a m'2'm	0,y,0 [0,0,w]	

Symmetry of special projections

Along [001] c1m11'	Along [100] p11m	Along [010] p2'm'm
a* = a b* = b	a* = b/2	a* = a/2
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

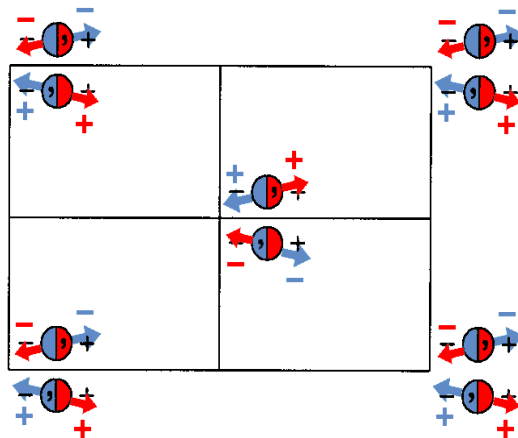
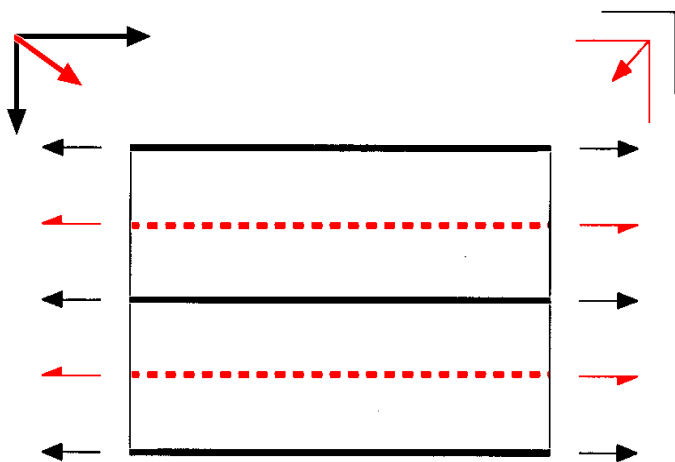
$c_p m2m$

No. 35.6.217

$m2m1'$

$c_p m2m$

Orthorhombic/Rectangular



Origin on $m2m$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- For $(0,0,0)$ + set
- | | | | |
|-------------|---------------------|---------------------|---------------------|
| (1) 1 | (2) $2 \quad 0,y,0$ | (3) $m \quad 0,y,z$ | (4) $m \quad x,y,0$ |
| $(1 0,0,0)$ | $(2_y 0,0,0)$ | $(m_x 0,0,0)$ | $(m_z 0,0,0)$ |
- For $(1/2,1/2,0)'$ + set
- | | | | |
|----------------------------|--|--|--|
| (1) $t' \quad (1/2,1/2,0)$ | (2) $2' \quad (0,1/2,0) \quad 1/4,y,0$ | (3) $b' \quad (0,1/2,0) \quad 1/4,y,z$ | (4) $n' \quad (1/2,1/2,0) \quad x,y,0$ |
| $(1 1/2,1/2,0)'$ | $(2_y 1/2,1/2,0)'$ | $(m_x 1/2,1/2,0)'$ | $(m_z 1/2,1/2,0)'$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3)

Positions

Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0) +$	$(1/2,1/2,0)' +$
8 d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$
	(3) $\bar{x},y,z [u,\bar{v},\bar{w}]$	(4) $x,y,\bar{z} [\bar{u},\bar{v},w]$
4 c ..m	$x,y,0 [0,0,w]$	$\bar{x},y,0 [0,0,\bar{w}]$
4 b m..	$0,y,z [u,0,0]$	$0,y,\bar{z} [\bar{u},0,0]$
2 a m2m	$0,y,0 [0,0,0]$	

Symmetry of special projections

Along [001] $c1m11'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p11m1'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p_{2a^*}2mm$ $a^* = a/2$ Origin at $0,y,0$
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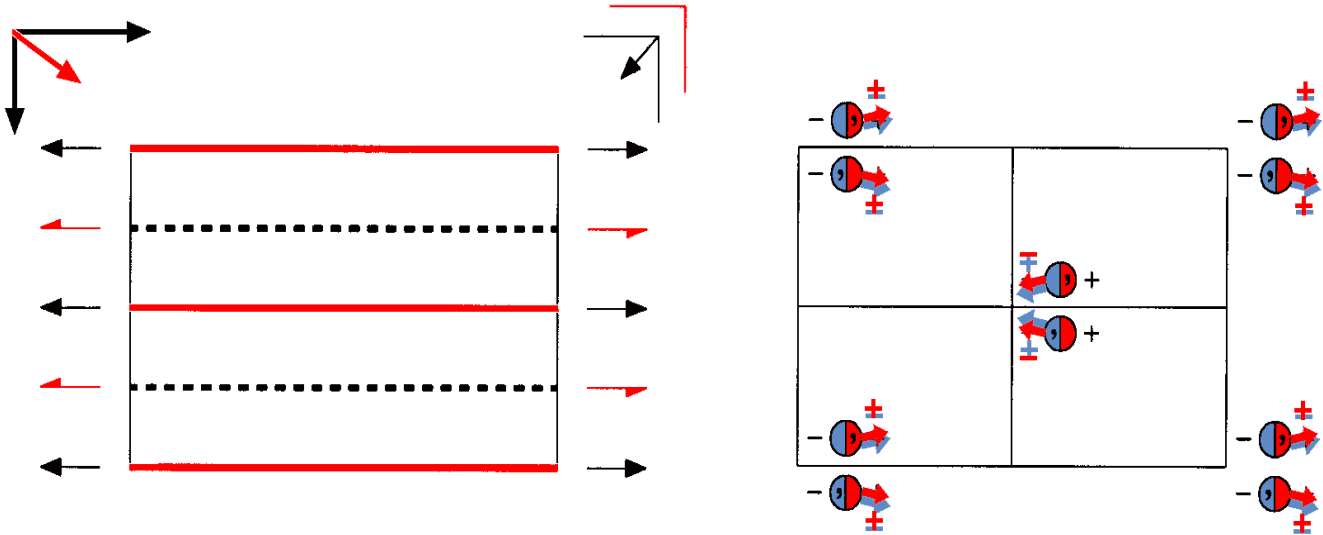
$c_p m'2m'$

No. 35.7.218

$m2m1'$

$c_p m'2m'$

Orthorhombic/Rectangular



Origin on $m'2m'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- For $(0,0,0)$ + set
- | | | | |
|-------------|---------------------|----------------------|----------------------|
| (1) 1 | (2) $2 \quad 0,y,0$ | (3) $m' \quad 0,y,z$ | (4) $m' \quad x,y,0$ |
| $(1 0,0,0)$ | $(2_y 0,0,0)$ | $(m_x 0,0,0)'$ | $(m_z 0,0,0)'$ |
- For $(1/2,1/2,0)'$ + set
- | | | | |
|----------------------------|--|---------------------------------------|---------------------------------------|
| (1) $t' \quad (1/2,1/2,0)$ | (2) $2' \quad (0,1/2,0) \quad 1/4,y,0$ | (3) $b \quad (0,1/2,0) \quad 1/4,y,z$ | (4) $n \quad (1/2,1/2,0) \quad x,y,0$ |
| $(1 1/2,1/2,0)'$ | $(2_y 1/2,1/2,0)'$ | $(m_x 1/2,1/2,0)$ | $(m_z 1/2,1/2,0)$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3)

Positions

Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0) +$	$(1/2,1/2,0)' +$
8 d 1	(1) $x,y,z [u,v,w]$ (3) $\bar{x},y,z [\bar{u},v,w]$	(2) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$ (4) $x,y,\bar{z} [u,v,\bar{w}]$
4 c $..m'$	$x,y,0 [u,v,0]$	$\bar{x},y,0 [\bar{u},v,0]$
4 b $m'..$	$0,y,z [0,v,w]$	$0,y,\bar{z} [0,v,\bar{w}]$
2 a $m'2m'$	$0,y,0 [0,v,0]$	

Symmetry of special projections

Along [001] $c_p 1m'1$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p_{2a^*} 11m'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p_{2a^*} 2m'm'$ $a^* = a/2$ Origin at $0,y,0$
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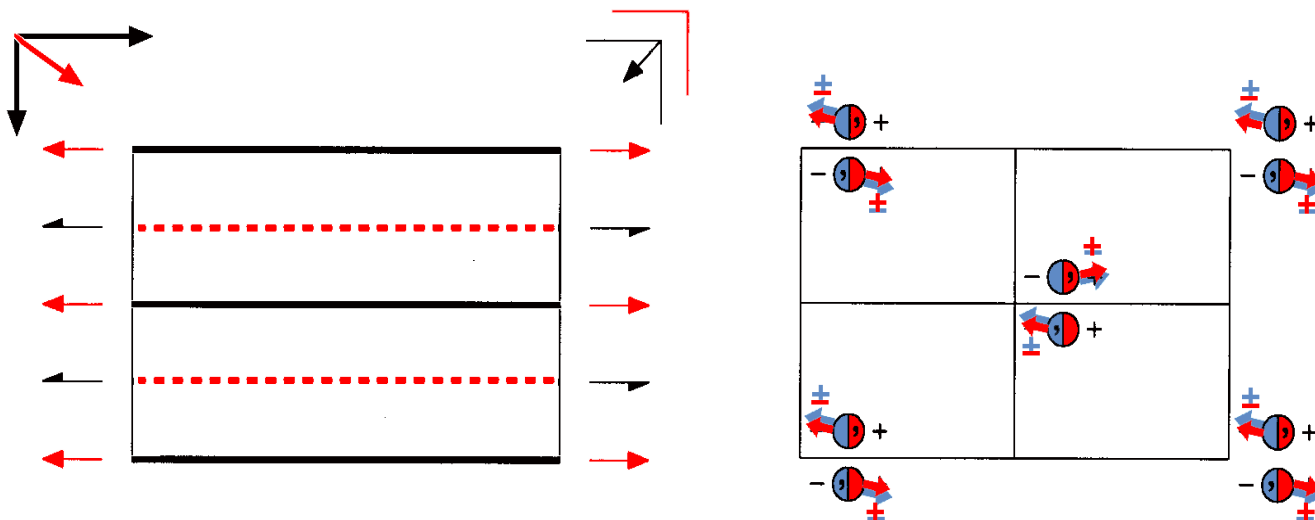
$c_p m2'm'$

No. 35.8.219

$m2m1'$

$c_p m2'm'$

Orthorhombic/Rectangular



Origin on $m2'm'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- For $(0,0,0)$ + set
- | | | | |
|-------------|------------------|-----------------|------------------|
| (1) 1 | (2) $2' \ 0,y,0$ | (3) $m \ 0,y,z$ | (4) $m' \ x,y,0$ |
| $(1 0,0,0)$ | $(2_y 0,0,0)'$ | $(m_x 0,0,0)$ | $(m_z 0,0,0)'$ |
- For $(1/2,1/2,0)'$ + set
- | | | | |
|------------------------|-------------------------------|--------------------------------|-------------------------------|
| (1) $t' \ (1/2,1/2,0)$ | (2) $2 \ (0,1/2,0) \ 1/4,y,0$ | (3) $b' \ (0,1/2,0) \ 1/4,y,z$ | (4) $n \ (1/2,1/2,0) \ x,y,0$ |
| $(1 1/2,1/2,0)'$ | $(2_y 1/2,1/2,0)$ | $(m_x 1/2,1/2,0)'$ | $(m_z 1/2,1/2,0)$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3)

Positions

		Coordinates	
Wyckoff letter, Site symmetry		$(0,0,0) +$	$(1/2,1/2,0)' +$
8	d 1	(1) $x,y,z [u,v,w]$ (3) $\bar{x},y,z [u,\bar{v},\bar{w}]$	(2) $\bar{x},y,\bar{z} [u,\bar{v},w]$ (4) $x,y,\bar{z} [u,v,\bar{w}]$
4	c ..m'	$x,y,0 [u,v,0]$	$\bar{x},y,0 [u,\bar{v},0]$
4	b m..	$0,y,z [u,0,0]$	$0,y,\bar{z} [u,0,0]$
2	a m2'm'	$0,y,0 [u,0,0]$	

Symmetry of special projections

Along [001] $c_p 1m1$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p11m1'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p_{2a^*}2m'm'$ $a^* = a/2$ Origin at $1/4,y,0$
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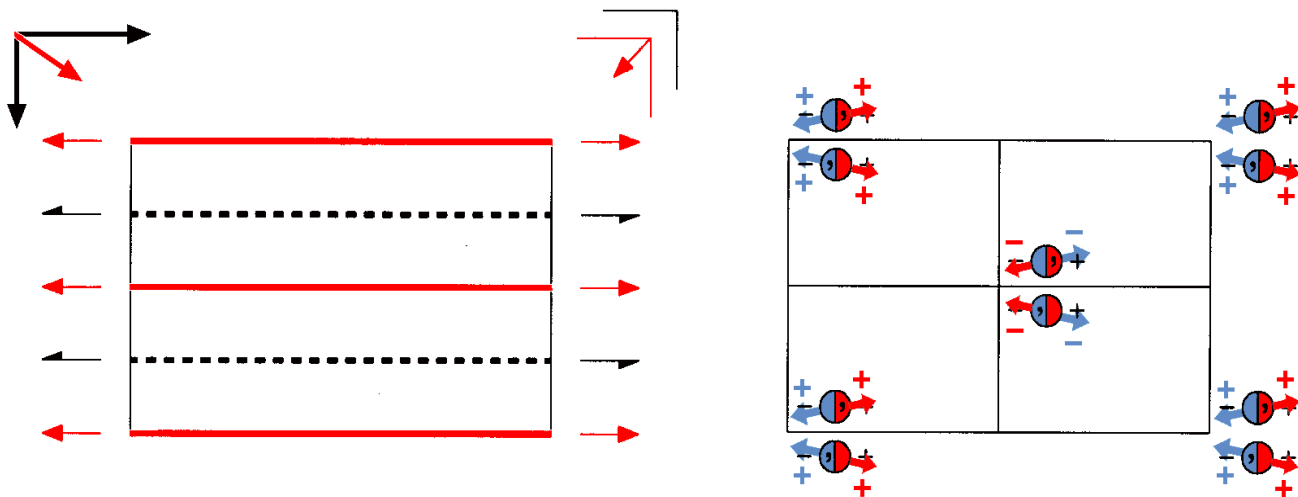
$c_p m'2'm$

No. 35.9.220

$m2m1'$

$c_p m'2'm$

Orthorhombic/Rectangular



Origin on $m'2'm$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- For $(0,0,0)$ + set
- | | | | |
|-------------|--------------------|--------------------|-------------------|
| (1) 1 | (2) $2'_y$ $0,y,0$ | (3) m'_x $0,y,z$ | (4) m_z $x,y,0$ |
| $(1 0,0,0)$ | $(2_y 0,0,0)'$ | $(m_x 0,0,0)'$ | $(m_z 0,0,0)$ |
- For $(1/2,1/2,0)'$ + set
- | | | | |
|------------------------|-------------------------------|-------------------------------|--------------------------------|
| (1) t' $(1/2,1/2,0)$ | (2) 2 $(0,1/2,0)$ $1/4,y,0$ | (3) b $(0,1/2,0)$ $1/4,y,z$ | (4) n' $(1/2,1/2,0)$ $x,y,0$ |
| $(1 1/2,1/2,0)'$ | $(2_y 1/2,1/2,0)$ | $(m_x 1/2,1/2,0)$ | $(m_z 1/2,1/2,0)'$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3)

Positions

Wyckoff letter, Site symmetry	Coordinates	
	$(0,0,0) +$	$(1/2,1/2,0)' +$
8 d 1	(1) $x,y,z [u,v,w]$ (3) $\bar{x},y,z [\bar{u},v,w]$	(2) $\bar{x},y,\bar{z} [u,\bar{v},w]$ (4) $x,y,\bar{z} [\bar{u},\bar{v},w]$
4 c ..m	$x,y,0 [0,0,w]$	$\bar{x},y,0 [0,0,w]$
4 b m'..	$0,y,z [0,v,w]$	$0,y,\bar{z} [0,\bar{v},w]$
2 a m'2'm	$0,y,0 [0,0,w]$	

Symmetry of special projections

Along [001] $c1m11'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p_{2a^*}11m$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p_{2a^*}2mm$ $a^* = a/2$ Origin at $1/4,y,0$
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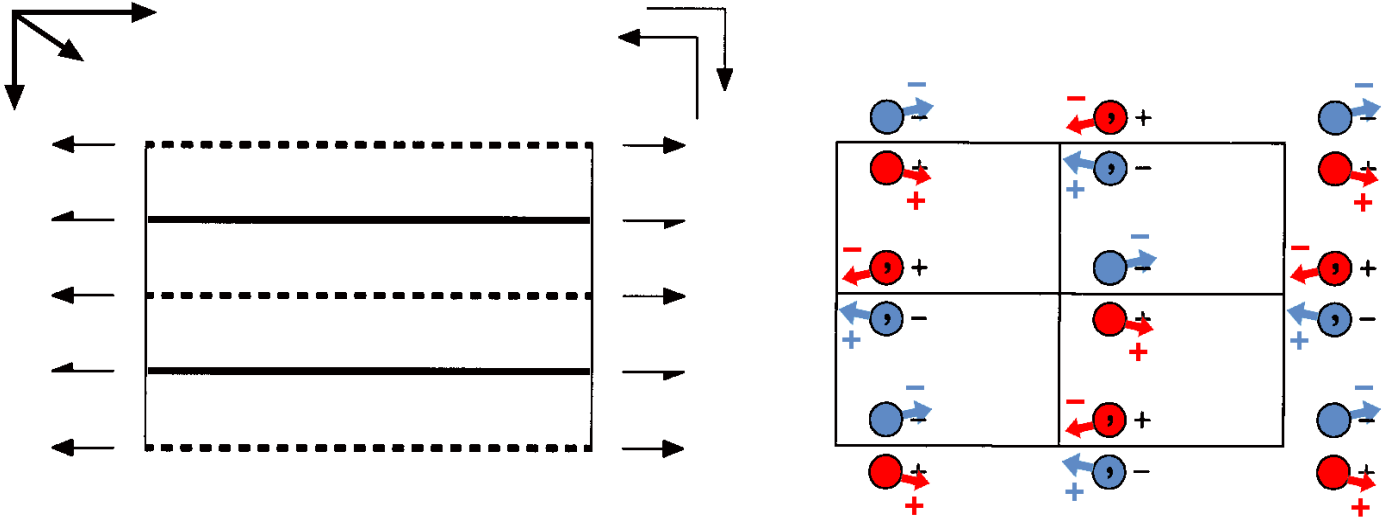
cm2a

No. 36.1.221

m2m

cm2a

Orthorhombic/Rectangular



Origin on b2a

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|-----------|-------------------------|---------------------------|---------------------------|
| (1) 1 | (2) 2 $0,y,0$ | (3) m $1/4,y,z$ | (4) a $(1/2,0,0)$ $x,y,0$ |
| (1 0,0,0) | (2 _y 0,0,0) | (m _x 1/2,0,0) | (m _z 1/2,0,0) |
- For (1/2,1/2,0) + set
- | | | | |
|---------------------|-----------------------------|---------------------------|---------------------------|
| (1) t $(1/2,1/2,0)$ | (2) 2 $(0,1/2,0)$ $1/4,y,0$ | (3) b $(0,1/2,0)$ $0,y,z$ | (4) b $(0,1/2,0)$ $x,y,0$ |
| (1 1/2,1/2,0) | (2 _y 1/2,1/2,0) | (m _x 0,1/2,0) | (m _z 0,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0) +	(1/2,1/2,0) +
8	c 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]
		(3) $\bar{x}+1/2,y,z$ [u, \bar{v},\bar{w}]	(4) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]
4	b m..	1/4,y,z [u,0,0]	3/4,y, \bar{z} [$\bar{u},0,0$]
4	a .2.	0,y,0 [0,v,0]	1/2,y,0 [0, $\bar{v},0$]

Symmetry of special projections

Along [001] $p_{c^*}1m1$ $a^* = a/2$ $b^* = b/2$ Origin at 1/4,0,z	Along [100] $p11m1'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2mm$ $a^* = a/2$ Origin at 0,y,0
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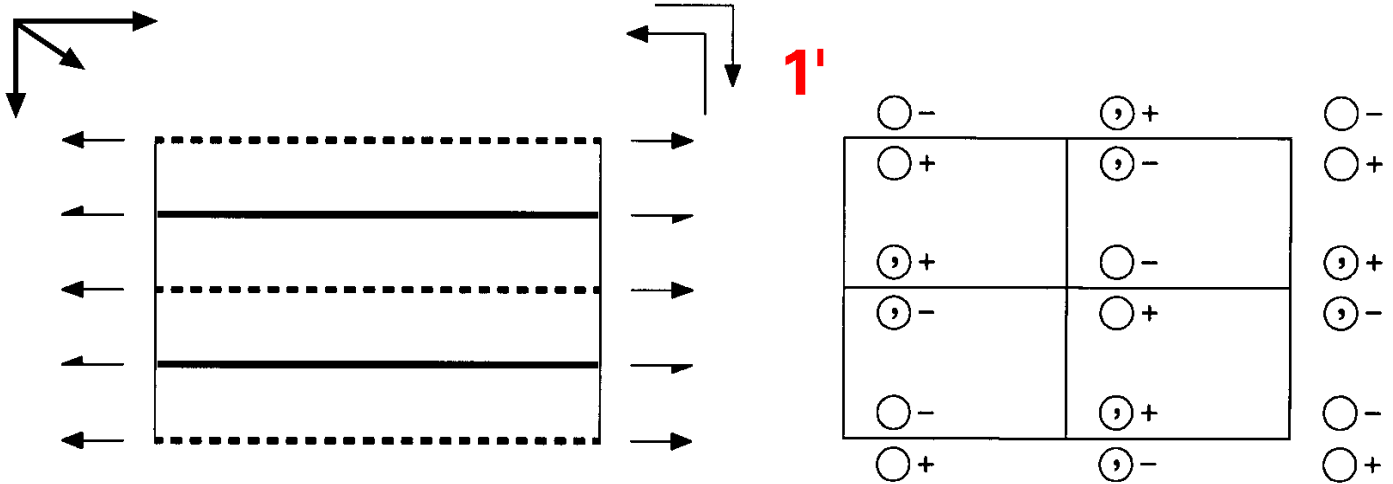
cm2a1'

No. 36.2.222

m2m1'

cm2a1'

Orthorhombic/Rectangular



Origin on b2a1'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

For (0,0,0) + set

(1) 1 (1 0,0,0)	(2) 2 0,y,0 (2 _y 0,0,0)	(3) m 1/4,y,z (m _x 1/2,0,0)	(4) a (1/2,0,0) x,y,0 (m _z 1/2,0,0)
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For (1/2,1/2,0) + set

(1) t (1/2,1/2,0) (1 1/2,1/2,0)	(2) 2 (0,1/2,0) 1/4,y,0 (2 _y 1/2,1/2,0)	(3) b (0,1/2,0) 0,y,z (m _x 0,1/2,0)	(4) b (0,1/2,0) x,y,0 (m _z 0,1/2,0)
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For (0,0,0)' + set

(1) 1' (1 0,0,0)'	(2) 2' 0,y,0 (2 _y 0,0,0)'	(3) m' 1/4,y,z (m _x 1/2,0,0)'	(4) a' (1/2,0,0) x,y,0 (m _z 1/2,0,0)'
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For (1/2,1/2,0)' + set

(1) t' (1/2,1/2,0) (1 1/2,1/2,0)'	(2) 2' (0,1/2,0) 1/4,y,0 (2 _y 1/2,1/2,0)'	(3) b' (0,1/2,0) 0,y,z (m _x 0,1/2,0)'	(4) b' (0,1/2,0) x,y,0 (m _z 0,1/2,0)'
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Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2); (3); $1'$

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0) + (0,0,0)' +	(1/2,1/2,0) + (1/2,1/2,0)' +
8	c 11'	(1) x,y,z [0,0,0]	(2) \bar{x},y,\bar{z} [0,0,0]
		(3) $\bar{x}+1/2,y,z$ [0,0,0]	(4) $x+1/2,y,\bar{z}$ [0,0,0]
4	b m..1'	$1/4,y,z$ [0,0,0]	$3/4,y,\bar{z}$ [0,0,0]
4	a .2.1'	$0,y,0$ [0,0,0]	$1/2,y,0$ [0,0,0]

Symmetry of special projections

Along [001] $p1m1'$ $a^* = a/2$ $b^* = b/2$ Origin at 0,0,z	Along [100] $p11m1'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2mm'$ $a^* = a/2$ Origin at 0,y,0
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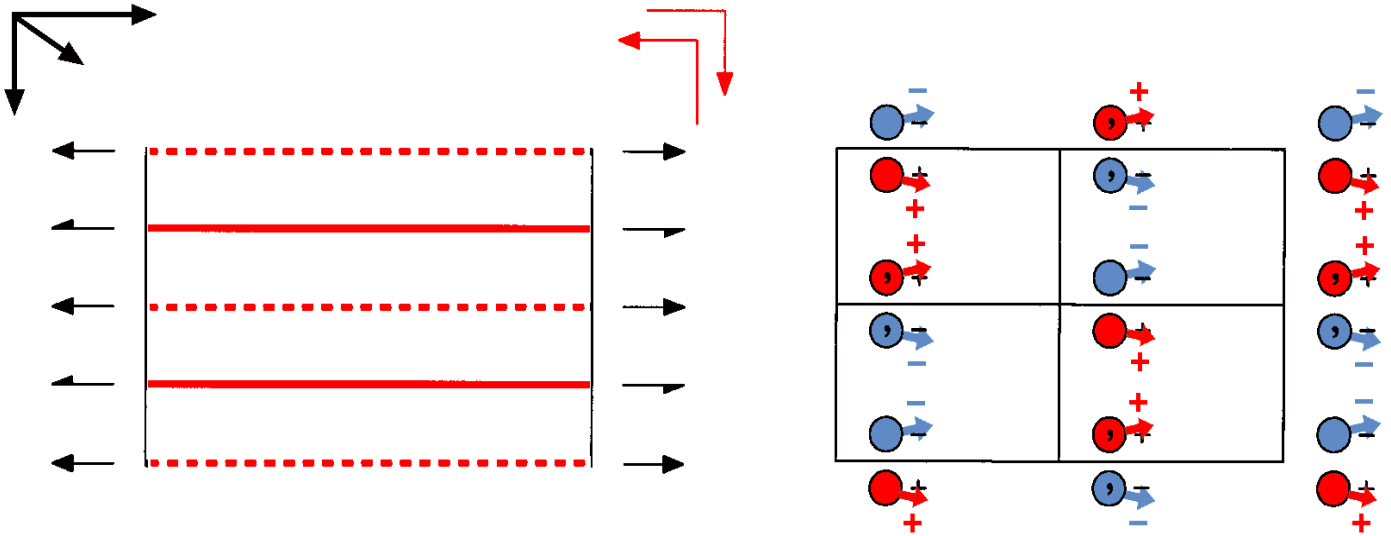
cm'2a'

No. 36.3.223

m'2m'

cm'2a'

Orthorhombic/Rectangular



Origin on b'2a'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|--------------------|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,y,0
(2 _y 0,0,0) | (3) m' 1/4,y,z
(m _x 1/2,0,0)' | (4) a' (1/2,0,0) x,y,0
(m _z 1/2,0,0)' |
|--------------------|--|--|--|
- For (1/2,1/2,0) + set
- | | | | |
|------------------------------------|--|--|--|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (3) b' (0,1/2,0) 0,y,z
(m _x 0,1/2,0)' | (4) b' (0,1/2,0) x,y,0
(m _z 0,1/2,0)' |
|------------------------------------|--|--|--|

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0) +	(1/2,1/2,0) +
8	c 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]
		(3) $\bar{x}+1/2,y,z$ [\bar{u},v,w]	(4) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]
4	b m'..	1/4,y,z [0,v,w]	3/4,y, \bar{z} [0,v, \bar{w}]
4	a .2.	0,y,0 [0,v,0]	1/2,y,0 [0,v,0]

Symmetry of special projections

Along [001] p1m'1 a* = a/2 b* = b/2 Origin at 0,0,z	Along [100] p11m' a* = b/2 Origin at x,0,0	Along [010] p2m'm' a* = a/2 Origin at 0,y,0
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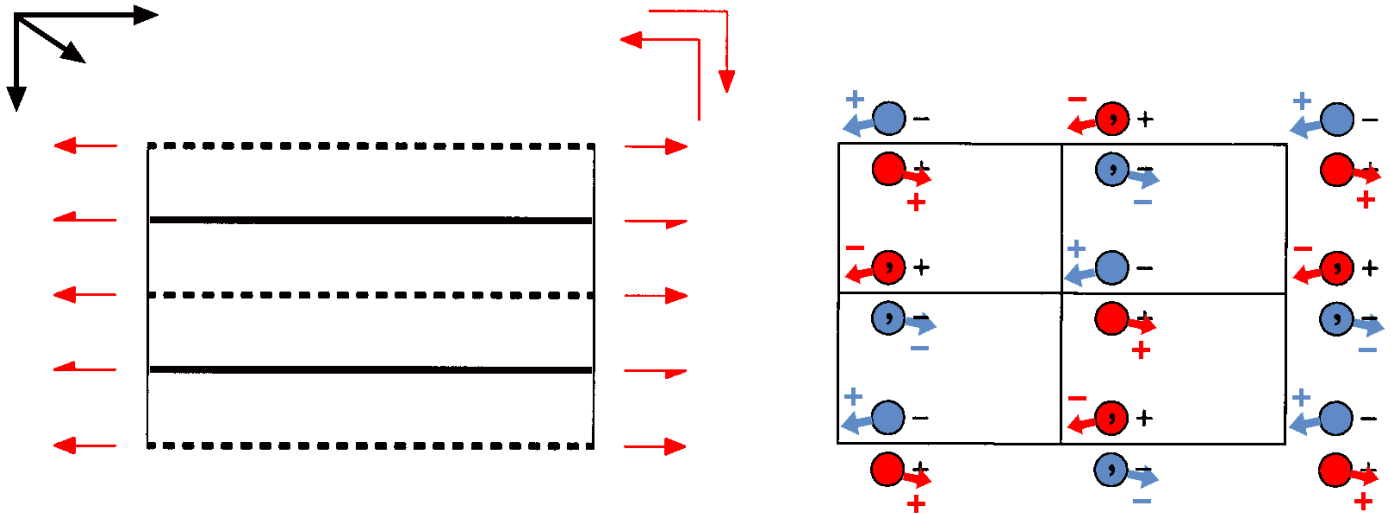
cm2'a'

No. 36.4.224

m2'm'

cm2'a'

Orthorhombic/Rectangular



Origin on b2'a'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|-----------|--------------------------|---------------------------|----------------------------|
| (1) 1 | (2) 2' 0,y,0 | (3) m 1/4,y,z | (4) a' (1/2,0,0) x,y,0 |
| (1 0,0,0) | (2 _y 0,0,0)' | (m _x 1/2,0,0) | (m _z 1/2,0,0)' |
- For (1/2,1/2,0) + set
- | | | | |
|-------------------|------------------------------|---------------------------|----------------------------|
| (1) t (1/2,1/2,0) | (2) 2' (0,1/2,0) 1/4,y,0 | (3) b (0,1/2,0) 0,y,z | (4) b' (0,1/2,0) x,y,0 |
| (1 1/2,1/2,0) | (2 _y 1/2,1/2,0)' | (m _x 0,1/2,0) | (m _z 0,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0) +	(1/2,1/2,0) +
8	c 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [u, \bar{v} ,w]
		(3) $\bar{x}+1/2,y,z$ [u, \bar{v},\bar{w}]	(4) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]
4	b m..	1/4,y,z [u,0,0]	3/4,y, \bar{z} [u,0,0]
4	a .2'	0,y,0 [u,0,w]	1/2,y,0 [u,0, \bar{w}]

Symmetry of special projections

Along [001] p1m1 a* = a/2 b* = b/2 Origin at 0,0,z	Along [100] p11m1' a* = b/2 Origin at x,0,0	Along [010] p2'mm' a* = a/2 Origin at 0,y,0
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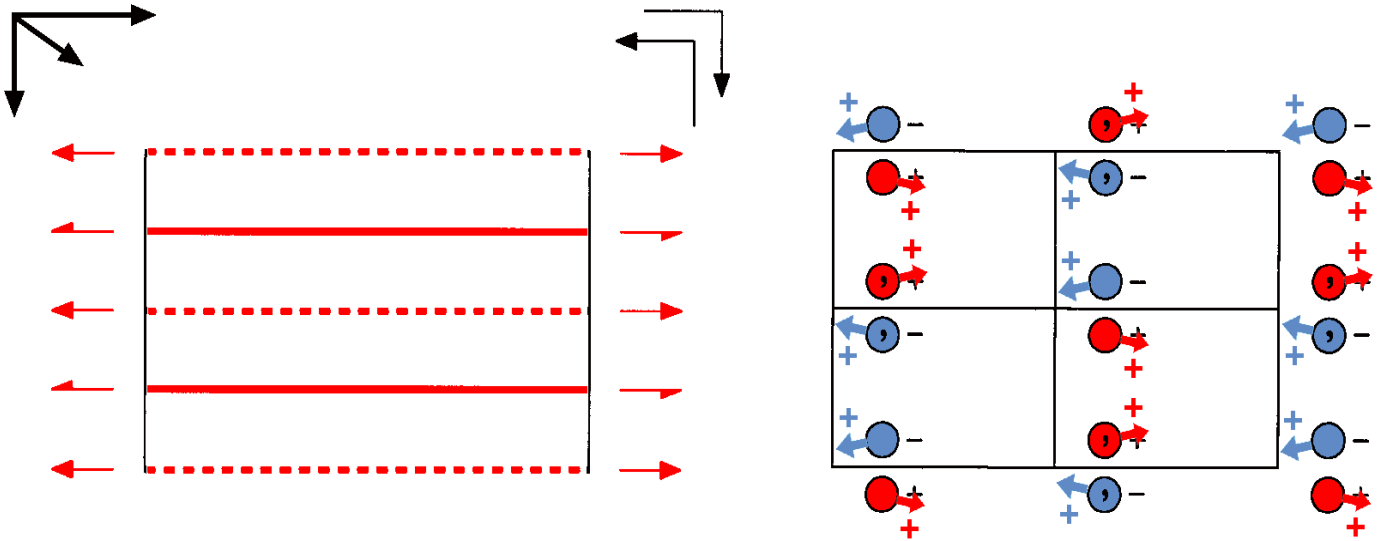
cm'2'a

No. 36.5.225

m'2'm

cm'2'a

Orthorhombic/Rectangular



Origin on b'2'a

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

- For (0,0,0) + set
- | | | | |
|-----------|--------------------------|----------------------------|---------------------------|
| (1) 1 | (2) 2' 0,y,0 | (3) m' 1/4,y,z | (4) a (1/2,0,0) x,y,0 |
| (1 0,0,0) | (2 _y 0,0,0)' | (m _x 1/2,0,0)' | (m _z 1/2,0,0) |
- For (1/2,1/2,0) + set
- | | | | |
|-------------------|------------------------------|----------------------------|---------------------------|
| (1) t (1/2,1/2,0) | (2) 2' (0,1/2,0) 1/4,y,0 | (3) b' (0,1/2,0) 0,y,z | (4) b (0,1/2,0) x,y,0 |
| (1 1/2,1/2,0) | (2 _y 1/2,1/2,0)' | (m _x 0,1/2,0)' | (m _z 0,1/2,0) |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0) +	(1/2,1/2,0) +
8	c 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [u, \bar{v} ,w]
		(3) $\bar{x}+1/2,y,z$ [\bar{u} ,v,w]	(4) $x+1/2,y,\bar{z}$ [\bar{u} , \bar{v} ,w]
4	b m'..	1/4,y,z [0,v,w]	3/4,y, \bar{z} [0, \bar{v} ,w]
4	a .2'	0,y,0 [u,0,w]	1/2,y,0 [\bar{u} ,0,w]

Symmetry of special projections

Along [001] $p_{c^*}1m1$ $a^* = a/2$ $b^* = b/2$ Origin at 0,0,z	Along [100] $p11m$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2'm'm$ $a^* = a/2$ Origin at 0,y,0
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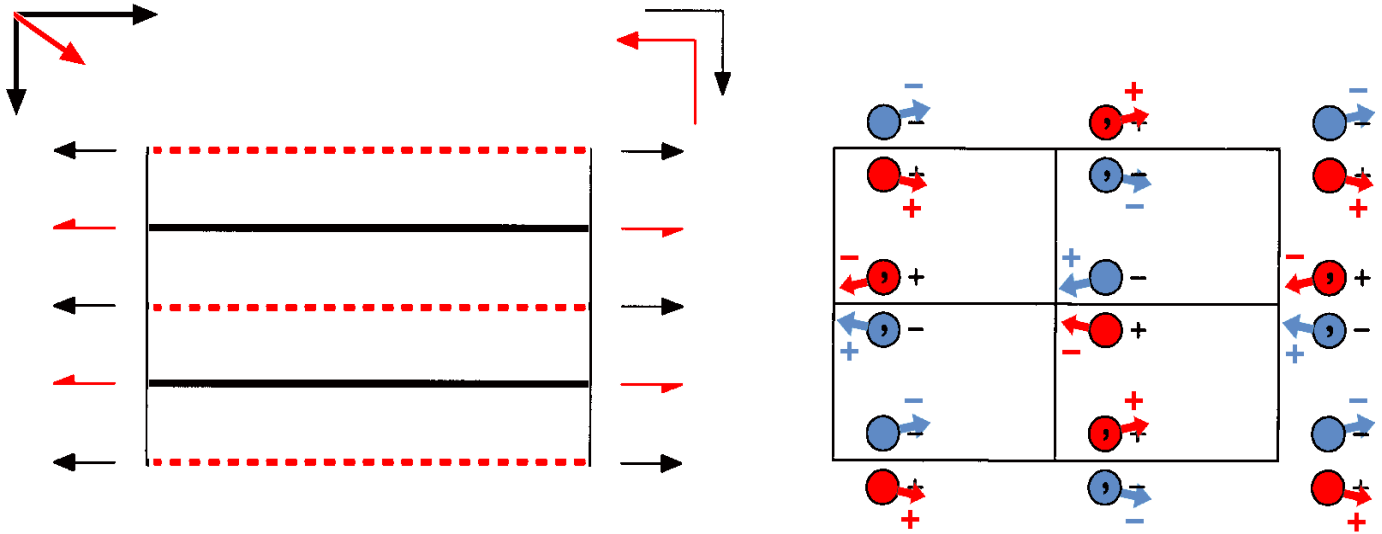
$c_p m2a$

No. 36.6.226

$m2m1'$

$c_p m2a$

Orthorhombic/Rectangular



Origin on $b2a$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

- For $(0,0,0)$ + set
- | | | | |
|-------------|---------------------|-----------------------|-------------------------------------|
| (1) 1 | (2) $2 \quad 0,y,0$ | (3) $m \quad 1/4,y,z$ | (4) $a \quad (1/2,0,0) \quad x,y,0$ |
| $(1 0,0,0)$ | $(2_y 0,0,0)$ | $(m_x 1/2,0,0)$ | $(m_z 1/2,0,0)$ |
- For $(1/2,1/2,0)'$ + set
- | | | | |
|----------------------------|--|--------------------------------------|--------------------------------------|
| (1) $t' \quad (1/2,1/2,0)$ | (2) $2' \quad (0,1/2,0) \quad 1/4,y,0$ | (3) $b' \quad (0,1/2,0) \quad 0,y,z$ | (4) $b' \quad (0,1/2,0) \quad x,y,0$ |
| $(1 1/2,1/2,0)'$ | $(2_y 1/2,1/2,0)'$ | $(m_x 0,1/2,0)'$ | $(m_z 0,1/2,0)'$ |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0) +	(1/2,1/2,0)' +
8	c 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]
		(3) $\bar{x}+1/2,y,z$ [u, \bar{v},\bar{w}]	(4) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]
4	b m..	1/4,y,z [u,0,0]	3/4,y, \bar{z} [$\bar{u},0,0$]
4	a .2.	0,y,0 [0,v,0]	1/2,y,0 [0, $\bar{v},0$]

Symmetry of special projections

Along [001] $p_{2a^*}1m1$ $a^* = a/2$ $b^* = b/2$ Origin at 0,0,z	Along [100] $p11m1'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p_{2a^*}2m'm'$ $a^* = a/2$ Origin at 0,y,0
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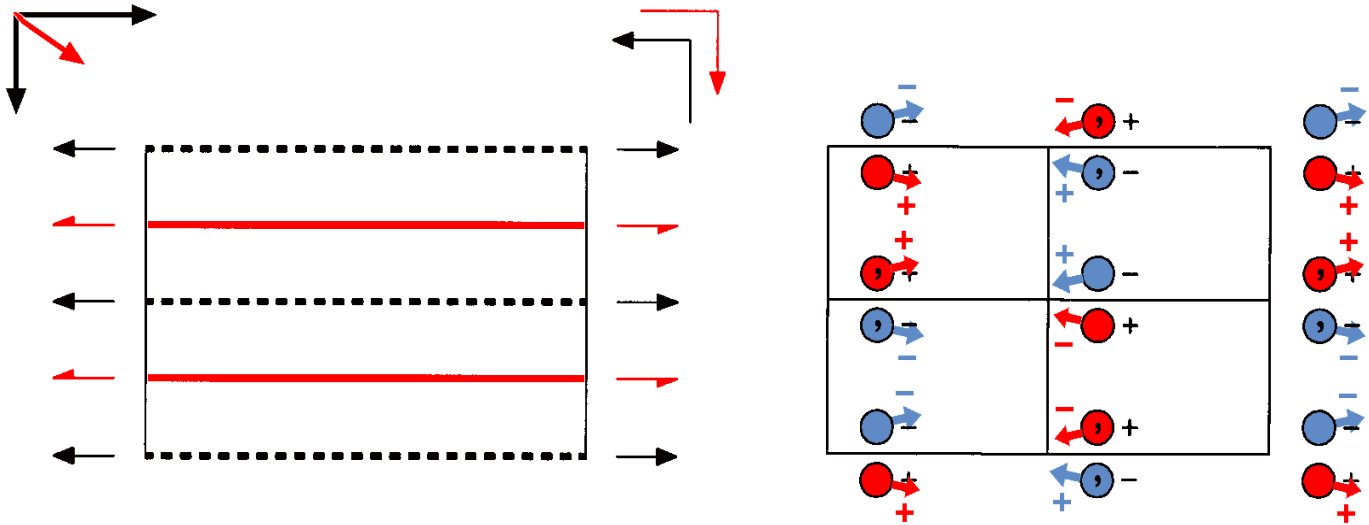
$c_p m'2a'$

No. 36.7.227

$m2m1'$

$c_p m'2a'$

Orthorhombic/Rectangular



Origin on $b2a'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- For $(0,0,0)$ + set
- | | | | |
|--------------------|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,y,0$
(2 _y 0,0,0) | (3) m' $1/4,y,z$
(m_x $1/2,0,0$)' | (4) a' $(1/2,0,0)$ $x,y,0$
(m_z $1/2,0,0$)' |
|--------------------|--|--|--|
- For $(1/2,1/2,0)'$ + set
- | | | | |
|--|--|--|--|
| (1) t' $(1/2,1/2,0)$
(1 $1/2,1/2,0$)' | (2) 2' $(0,1/2,0)$ $1/4,y,0$
(2 _y $1/2,1/2,0$)' | (3) b $(0,1/2,0)$ $0,y,z$
(m_x $0,1/2,0$) | (4) b $(0,1/2,0)$ $x,y,0$
(m_z $0,1/2,0$) |
|--|--|--|--|

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
		(0,0,0) +	(1/2,1/2,0)' +
8	c 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]
		(3) $\bar{x}+1/2,y,z$ [\bar{u},v,w]	(4) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]
4	b m'..	1/4,y,z [0,v,w]	3/4,y, \bar{z} [0,v, \bar{w}]
4	a .2.	0,y,0 [0,v,0]	1/2,y,0 [0,v,0]

Symmetry of special projections

Along [001] $p_{2b^*}1m'$ $a^* = a/2$ $b^* = b/2$ Origin at 0,0,z	Along [100] $p_{2a^*}11m'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p_{2a^*}2mm$ $a^* = a/2$ Origin at 0,y,0
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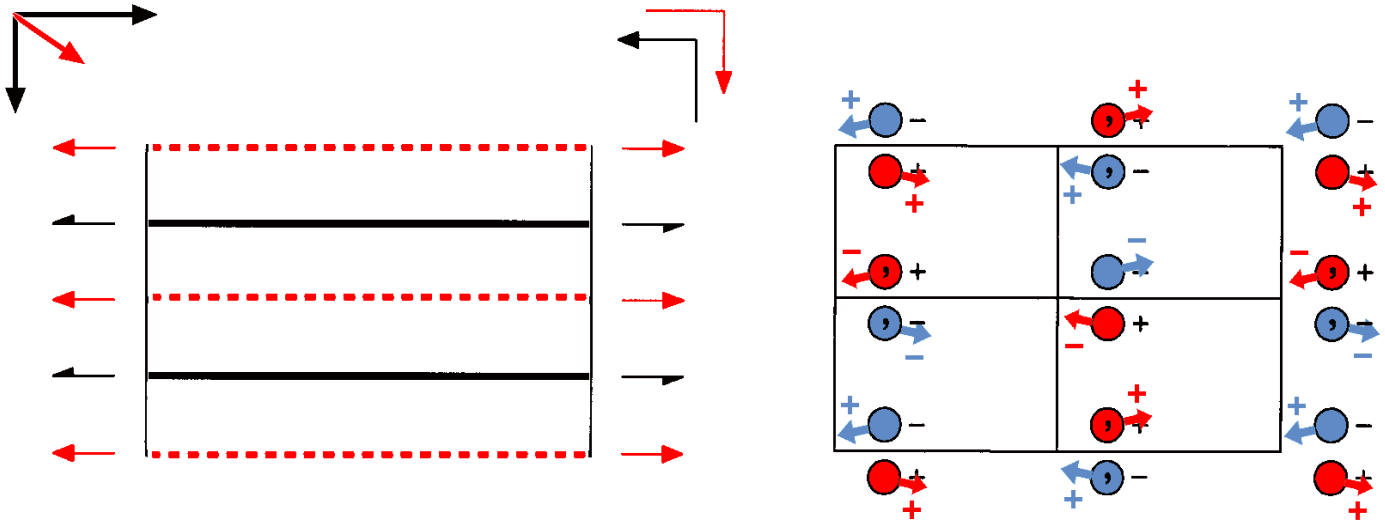
$c_p m2'a'$

No. 36.8.228

$m2m1'$

$c_p m2'a'$

Orthorhombic/Rectangular



Origin on $b'2'a'$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

- For $(0,0,0)$ + set
- | | | | |
|--------------------|--------------------------------------|--|--|
| (1) 1
(1 0,0,0) | (2) $2'$ $0,y,0$
(2_y 0,0,0)' | (3) m $1/4,y,z$
(m_x 1/2,0,0) | (4) a' $(1/2,0,0)$ $x,y,0$
(m_z 1/2,0,0)' |
|--------------------|--------------------------------------|--|--|
- For $(1/2,1/2,0)'$ + set
- | | | | |
|--|--|--|--|
| (1) t' $(1/2,1/2,0)$
(1 1/2,1/2,0)' | (2) 2 $(0,1/2,0)$ $1/4,y,0$
(2_y 1/2,1/2,0) | (3) b' $(0,1/2,0)$ $0,y,z$
(m_x 0,1/2,0)' | (4) b $(0,1/2,0)$ $x,y,0$
(m_z 0,1/2,0) |
|--|--|--|--|

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
		(0,0,0) +	(1/2,1/2,0)' +
8	c 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [u, \bar{v} ,w]
		(3) $\bar{x}+1/2,y,z$ [u, \bar{v},\bar{w}]	(4) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]
4	b m..	1/4,y,z [u,0,0]	3/4,y, \bar{z} [u,0,0]
4	a .2'	0,y,0 [u,0,w]	1/2,y,0 [u,0, \bar{w}]

Symmetry of special projections

Along [001] $p_{2b^*}1m1$ $a^* = a/2$ $b^* = b/2$ Origin at 0,0,z	Along [100] $p11m1'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p_{2a^*}2mm$ $a^* = a/2$ Origin at 1/4,y,0
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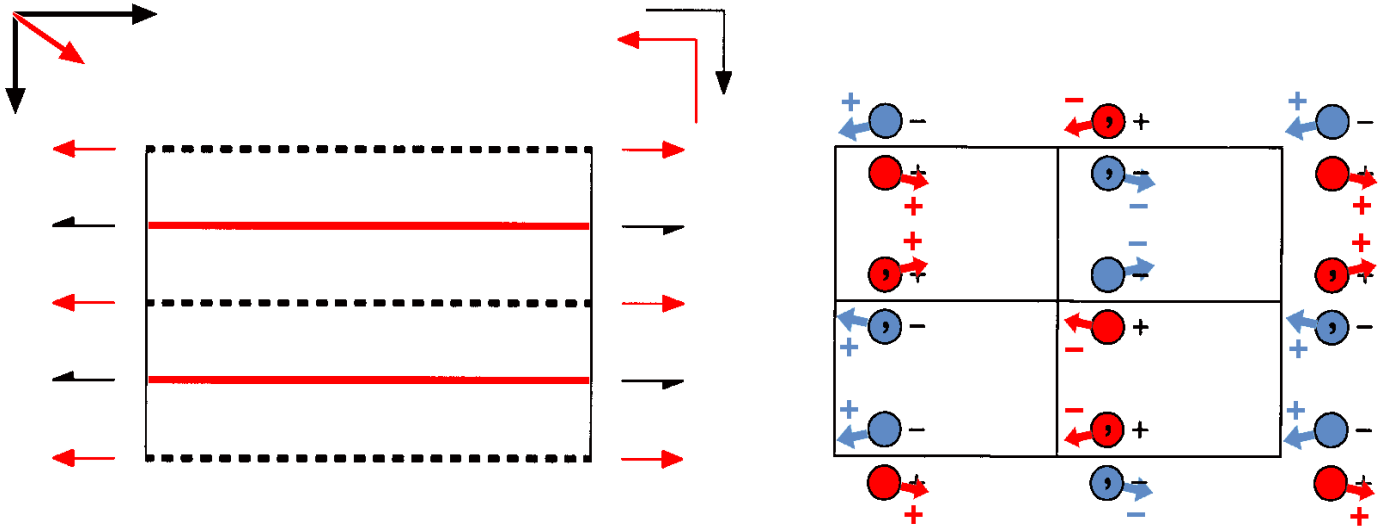
$c_p m'2'a$

No. 36.9.229

$m2m1'$

$c_p m'2'a$

Orthorhombic/Rectangular



Origin on $b2'a$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

For $(0,0,0) +$ set

- | | | | |
|---------------|----------------------|------------------------|-------------------------------|
| (1) 1 | (2) $2' \quad 0,y,0$ | (3) $m' \quad 1/4,y,z$ | (4) a $(1/2,0,0) \quad x,y,0$ |
| (1 $0,0,0$) | (2 $_y$ $0,0,0$)' | (m_x $1/2,0,0$)' | (m_z $1/2,0,0$) |

For $(1/2,1/2,0) +$ set

- | | | | |
|----------------------------|---------------------------------------|-------------------------------|--------------------------------|
| (1) $t' \quad (1/2,1/2,0)$ | (2) $2 \quad (0,1/2,0) \quad 1/4,y,0$ | (3) b $(0,1/2,0) \quad 0,y,z$ | (4) b' $(0,1/2,0) \quad x,y,0$ |
| (1 $1/2,1/2,0$)' | (2 $_y$ $1/2,1/2,0$) | (m_x $0,1/2,0$) | (m_z $0,1/2,0$)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3)

Positions

		Coordinates	
Multiplicity, Wyckoff letter, Site symmetry			
		(0,0,0) +	(1/2,1/2,0)' +
8	c 1	(1) x,y,z [u,v,w]	(2) \bar{x},y,\bar{z} [u, \bar{v} ,w]
		(3) $\bar{x}+1/2,y,z$ [\bar{u} ,v,w]	(4) $x+1/2,y,\bar{z}$ [\bar{u} , \bar{v} ,w]
4	b m'..	1/4,y,z [0,v,w]	3/4,y, \bar{z} [0, \bar{v} ,w]
4	a .2'	0,y,0 [u,0,w]	1/2,y,0 [\bar{u} ,0,w]

Symmetry of special projections

Along [001] $p_{2a^*}1m1$ $a^* = a/2$ $b^* = b/2$ Origin at 0,0,z	Along [100] $p_{2a^*}11m$ $a^* = b/2$ Origin at x,0,0	Along [010] $p_{2a^*}2m'm'$ $a^* = a/2$ Origin at 1/4,y,0
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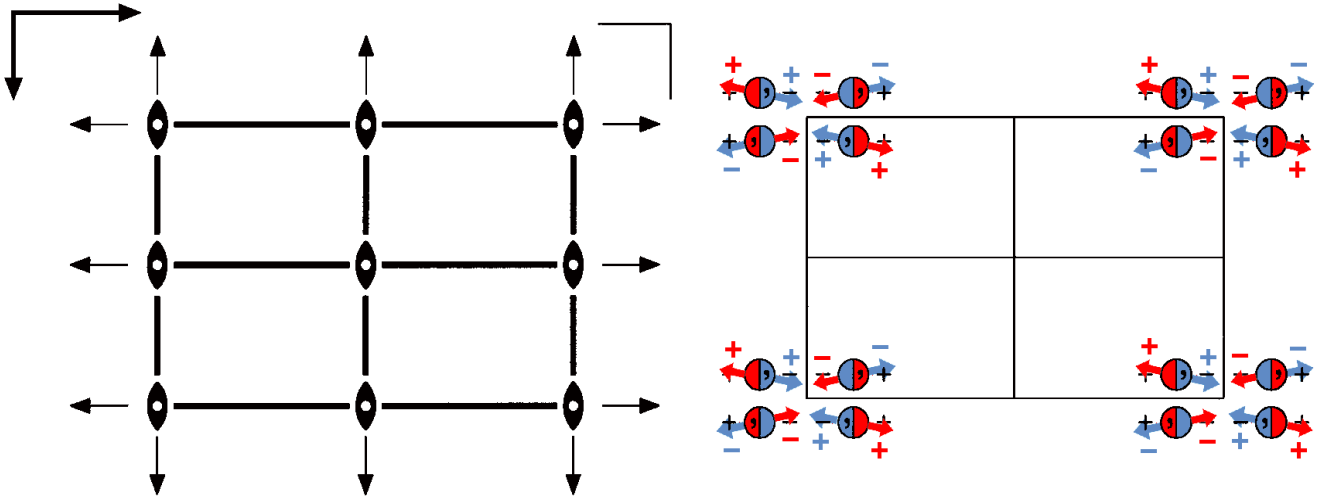
pmmm

No. 37.1.230

mmm

p2/m2/m2/m

Orthorhombic/Rectangular



Origin at center (mmm)

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2 0,y,0
(2 _y 0,0,0) | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m x,y,0
(m _z 0,0,0) | (7) m x,0,z
(m _y 0,0,0) | (8) m 0,y,z
(m _x 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 r 1		(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
		(5) $\bar{x},\bar{y},z [u,v,w]$	(6) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(7) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
4 q ..m		$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,w]$	$\bar{x},y,0 [0,0,\bar{w}]$	$x,\bar{y},0 [0,0,\bar{w}]$
4 p .m.		$x,1/2,z [0,v,0]$	$\bar{x},1/2,z [0,\bar{v},0]$	$\bar{x},1/2,\bar{z} [0,v,0]$	$x,1/2,\bar{z} [0,\bar{v},0]$
4 o .m.		$x,0,z [0,v,0]$	$\bar{x},0,z [0,\bar{v},0]$	$\bar{x},0,\bar{z} [0,v,0]$	$x,0,\bar{z} [0,\bar{v},0]$
4 n m..		$1/2,y,z [u,0,0]$	$1/2,\bar{y},z [\bar{u},0,0]$	$1/2,y,\bar{z} [\bar{u},0,0]$	$1/2,\bar{y},z [u,0,0]$
4 m m..		$0,y,z [u,0,0]$	$0,\bar{y},z [\bar{u},0,0]$	$0,y,\bar{z} [\bar{u},0,0]$	$0,\bar{y},z [u,0,0]$
2 l mm2		$1/2,1/2,z [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$		
2 k mm2		$1/2,0,z [0,0,0]$	$1/2,0,\bar{z} [0,0,0]$		
2 j mm2		$0,1/2,z [0,0,0]$	$0,1/2,\bar{z} [0,0,0]$		
2 i mm2		$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$		
2 h m2m		$1/2,y,0 [0,0,0]$	$1/2,\bar{y},0 [0,0,0]$		
2 g m2m		$0,y,0 [0,0,0]$	$0,\bar{y},0 [0,0,0]$		

Continued

No. 37.1.230

pmmm

2 f 2mm $x, 1/2, 0$ [0,0,0] $\bar{x}, 1/2, 0$ [0,0,0]

2 e 2mm $x, 0, 0$ [0,0,0] $\bar{x}, 0, 0$ [0,0,0]

1 d mmm $1/2, 1/2, 0$ [0,0,0]

1 c mmm $0, 1/2, 0$ [0,0,0]

1 b mmm $1/2, 0, 0$ [0,0,0]

1 a mmm $0, 0, 0$ [0,0,0]

Symmetry of special projections

Along [001] $p2mm1'$ $a^* = a$ $b^* = b$ Origin at $0, 0, z$	Along [100] $p2mm1'$ $a^* = b$ Origin at $x, 0, 0$	Along [010] $p2mm1'$ $a^* = a$ Origin at $0, y, 0$
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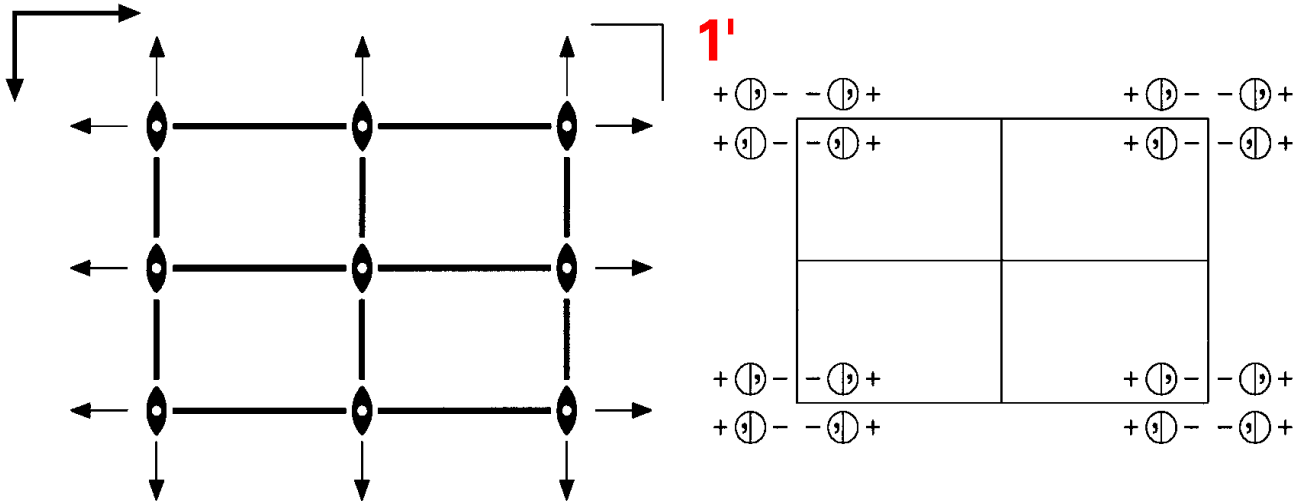
pmmm1'

No. 37.2.231

mmm1'

p2/m2/m2/m1'

Orthorhombic/Rectangular



Origin at center (mmm1')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2 0,y,0
(2 _y 0,0,0) | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m x,y,0
(m _z 0,0,0) | (7) m x,0,z
(m _y 0,0,0) | (8) m 0,y,z
(m _x 0,0,0) |

For 1' + set

- | | | | |
|---|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 2' 0,y,0
(2 _y 0,0,0)' | (4) 2' x,0,0
(2 _x 0,0,0)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ 0,0,0)' | (6) m' x,y,0
(m _z 0,0,0)' | (7) m' x,0,z
(m _y 0,0,0)' | (8) m' 0,y,z
(m _x 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	1+	1' +		
8 r 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]		
	(3) \bar{x},y,\bar{z} [0,0,0]	(4) x, \bar{y},\bar{z} [0,0,0]		
	(5) \bar{x},\bar{y},\bar{z} [0,0,0]	(6) x,y, \bar{z} [0,0,0]		
	(7) x, \bar{y},z [0,0,0]	(8) \bar{x},y,z [0,0,0]		
4 q ..m1'	x,y,0 [0,0,0]	$\bar{x},\bar{y},0$ [0,0,0]	$\bar{x},y,0$ [0,0,0]	x, $\bar{y},0$ [0,0,0]
4 p .m.1'	x,1/2,z [0,0,0]	$\bar{x},1/2,z$ [0,0,0]	$\bar{x},1/2,\bar{z}$ [0,0,0]	x,1/2, \bar{z} [0,0,0]
4 o .m.1'	x,0,z [0,0,0]	$\bar{x},0,z$ [0,0,0]	$\bar{x},0,\bar{z}$ [0,0,0]	x,0, \bar{z} [0,0,0]
4 n m..1'	1/2,y,z [0,0,0]	1/2, \bar{y},z [0,0,0]	1/2,y, \bar{z} [0,0,0]	1/2, \bar{y},\bar{z} [0,0,0]
4 m m..1'	0,y,z [0,0,0]	0, \bar{y},z [0,0,0]	0,y, \bar{z} [0,0,0]	0, \bar{y},\bar{z} [0,0,0]
2 l mm21'	1/2,1/2,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]		
2 k mm21'	1/2,0,z [0,0,0]	1/2,0, \bar{z} [0,0,0]		
2 j mm21'	0,1/2,z [0,0,0]	0,1/2, \bar{z} [0,0,0]		
2 i mm21'	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]		
2 h m2m1'	1/2,y,0 [0,0,0]	1/2, $\bar{y},0$ [0,0,0]		
2 g m2m1'	0,y,0 [0,0,0]	0, $\bar{y},0$ [0,0,0]		

Continued

No. 37.2.231

$pmmm1'$

2 f $2mm1'$ $x, 1/2, 0 [0, 0, 0]$ $\bar{x}, 1/2, 0 [0, 0, 0]$

2 e $2mm1'$ $x, 0, 0 [0, 0, 0]$ $\bar{x}, 0, 0 [0, 0, 0]$

1 d $mmm1'$ $1/2, 1/2, 0 [0, 0, 0]$

1 c $mmm1'$ $0, 1/2, 0 [0, 0, 0]$

1 b $mmm1'$ $1/2, 0, 0 [0, 0, 0]$

1 a $mmm1'$ $0, 0, 0 [0, 0, 0]$

Symmetry of special projections

Along $[001]$ $p2mm1'$ $a^* = a$ $b^* = b$ Origin at $0, 0, z$	Along $[100]$ $p2mm1'$ $a^* = b$ Origin at $x, 0, 0$	Along $[010]$ $p2mm1'$ $a^* = a$ Origin at $0, y, 0$
--	--	--

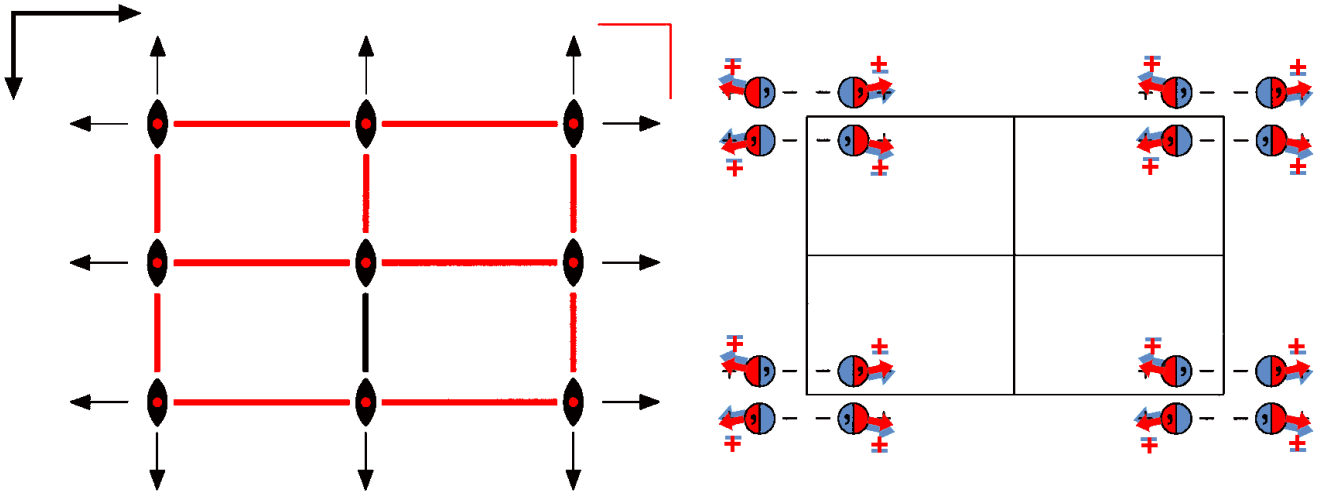
pm'm'm'

No. 37.3.232

m'm'm'

p2/m'2/m'2/m'

Orthorhombic/Rectangular



Origin at center (m'm'm')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2 0,y,0
(2 _y 0,0,0) | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ ' 0,0,0)' | (6) m' x,y,0
(m' _z 0,0,0)' | (7) m' x,0,z
(m' _y 0,0,0)' | (8) m' 0,y,z
(m' _x 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates							
8 r 1		(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(4) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y, \bar{z} [u,v, \bar{w}]	(7) x, \bar{y},z [u, \bar{v},w]	(8) \bar{x},y,z [\bar{u},v,w]
4 q ..m'		x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{x},y,0$ [$\bar{u},v,0$]	x, $\bar{y},0$ [u, $\bar{v},0$]				
4 p .m'.		x,1/2,z [u,0,w]	$\bar{x},1/2,z$ [$\bar{u},0,w$]	$\bar{x},1/2,\bar{z}$ [$\bar{u},0,\bar{w}$]	x,1/2, \bar{z} [u,0, \bar{w}]				
4 o .m'.		x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	$\bar{x},0,\bar{z}$ [$\bar{u},0,\bar{w}$]	x,0, \bar{z} [u,0, \bar{w}]				
4 n m'..		1/2,y,z [0,v,w]	1/2, \bar{y},z [0, \bar{v},w]	1/2,y, \bar{z} [0,v, \bar{w}]	1/2, \bar{y},\bar{z} [0, \bar{v},\bar{w}]				
4 m m'..		0,y,z [0,v,w]	0, \bar{y},z [0, \bar{v},w]	0,y, \bar{z} [0,v, \bar{w}]	0, \bar{y},\bar{z} [0, \bar{v},\bar{w}]				
2 l m'm'2		1/2,1/2,z [0,0,w]	1/2,1/2, \bar{z} [0,0, \bar{w}]						
2 k m'm'2		1/2,0,z [0,0,w]	1/2,0, \bar{z} [0,0, \bar{w}]						
2 j m'm'2		0,1/2,z [0,0,w]	0,1/2, \bar{z} [0,0, \bar{w}]						
2 i m'm'2		0,0,z [0,0,w]	0,0, \bar{z} [0,0, \bar{w}]						
2 h m'2m'		1/2,y,0 [0,v,0]	1/2, $\bar{y},0$ [0, $\bar{v},0$]						
2 g m'2m		0,y,0 [0,v,0]	0, $\bar{y},0$ [0, $\bar{v},0$]						

Continued

No. 37.3.232

$pm'm'm'$

2 f $2m'm'$ $x, 1/2, 0 [u, 0, 0]$ $\bar{x}, 1/2, 0 [\bar{u}, 0, 0]$

2 e $2m'm'$ $x, 0, 0 [u, 0, 0]$ $\bar{x}, 0, 0 [\bar{u}, 0, 0]$

1 d $m'm'm'$ $1/2, 1/2, 0 [0, 0, 0]$

1 c $m'm'm'$ $0, 1/2, 0 [0, 0, 0]$

1 b $m'm'm'$ $1/2, 0, 0 [0, 0, 0]$

1 a $m'm'm'$ $0, 0, 0 [0, 0, 0]$

Symmetry of special projections

Along $[001]$ $p2m'm'$
 $a^* = a$ $b^* = b$
Origin at $0, 0, z$

Along $[100]$ $p2m'm'$
 $a^* = b$
Origin at $x, 0, 0$

Along $[010]$ $p2m'm'$
 $a^* = a$
Origin at $0, y, 0$

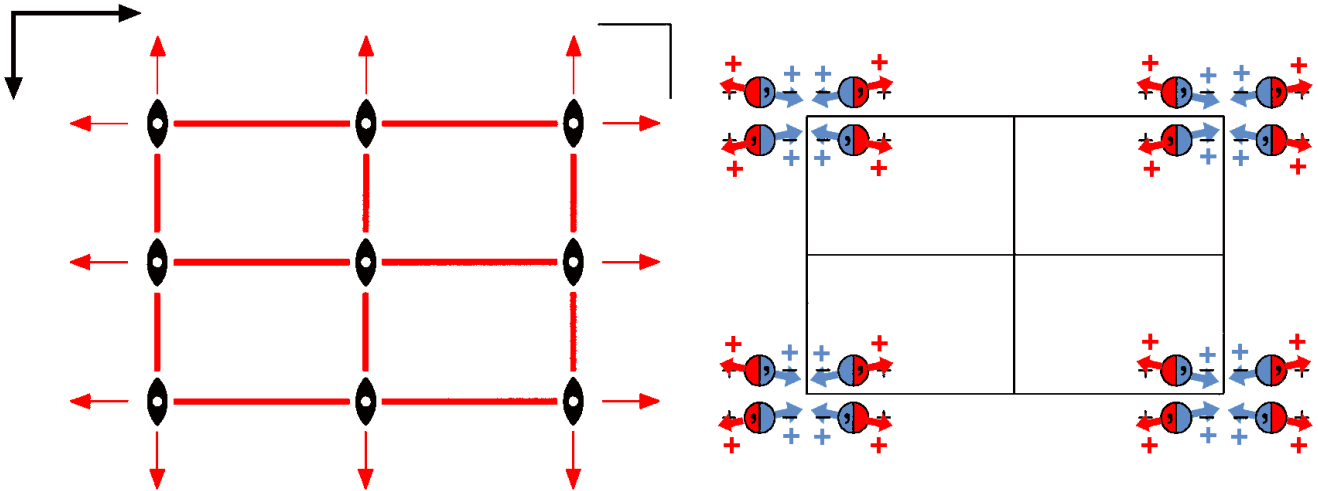
pm'm'm

No. 37.4.233

m'm'm

p2'/m'2'/m'2'/m

Orthorhombic/Rectangular



Origin at center (m'm'm)

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2' 0,y,0
(2' _y 0,0,0)' | (4) 2' x,0,0
(2' _x 0,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m x,y,0
(m _z 0,0,0) | (7) m' x,0,z
(m' _y 0,0,0)' | (8) m' 0,y,z
(m' _x 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 r 1		(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{x},y,\bar{z} [\bar{u},\bar{v},w]	(4) x,y, \bar{z} [\bar{u},\bar{v},w]
		(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y, \bar{z} [\bar{u},\bar{v},w]	(7) x, \bar{y},z [u, \bar{v},w]	(8) \bar{x},y,z [\bar{u},\bar{v},w]
4 q ..m		x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{x},y,0$ [0,0,w]	x, $\bar{y},0$ [0,0,w]
4 p .m'		x,1/2,z [u,0,w]	$\bar{x},1/2,z$ [$\bar{u},0,w$]	$\bar{x},1/2,\bar{z}$ [u,0,w]	x,1/2, \bar{z} [$\bar{u},0,w$]
4 o .m'		x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	$\bar{x},0,\bar{z}$ [u,0,w]	x,0, \bar{z} [$\bar{u},0,w$]
4 n m'..		1/2,y,z [0,v,w]	1/2, \bar{y},z [0, \bar{v},w]	1/2,y, \bar{z} [0, \bar{v},w]	1/2, \bar{y},\bar{z} [0,v,w]
4 m m'..		0,y,z [0,v,w]	0, \bar{y},z [0, \bar{v},w]	0,y, \bar{z} [0, \bar{v},w]	0, \bar{y},\bar{z} [0,v,w]
2 l m'm'2		1/2,1/2,z [0,0,w]	1/2,1/2, \bar{z} [0,0,w]		
2 k m'm'2		1/2,0,z [0,0,w]	1/2,0, \bar{z} [0,0,w]		
2 j m'm'2		0,1/2,z [0,0,w]	0,1/2, \bar{z} [0,0,w]		
2 i m'm'2		0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]		
2 h m'2'm		1/2,y,0 [0,0,w]	1/2, $\bar{y},0$ [0,0,w]		

Continued

No. 37.4.233

pm'm'm

2 g m'2'm 0,y,0 [0,0,w] 0,ȳ,0 [0,0,w]

2 f 2'm'm x,1/2,0 [0,0,w] \bar{x} ,1/2,0 [0,0,w]

2 e 2'm'm x,0,0 [0,0,w] \bar{x} ,0,0 [0,0,w]

1 d m'm'm 1/2,1/2,0 [0,0,w]

1 c m'm'm 0,1/2,0 [0,0,w]

1 b m'm'm 1/2,0,0 [0,0,w]

1 a mmm 0,0,0 [0,0,w]

Symmetry of special projections

Along [001] p2mm1'	Along [100] p2'm'm	Along [010] p2'm'm
$a^* = a$ $b^* = b$	$a^* = b$	$a^* = a$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

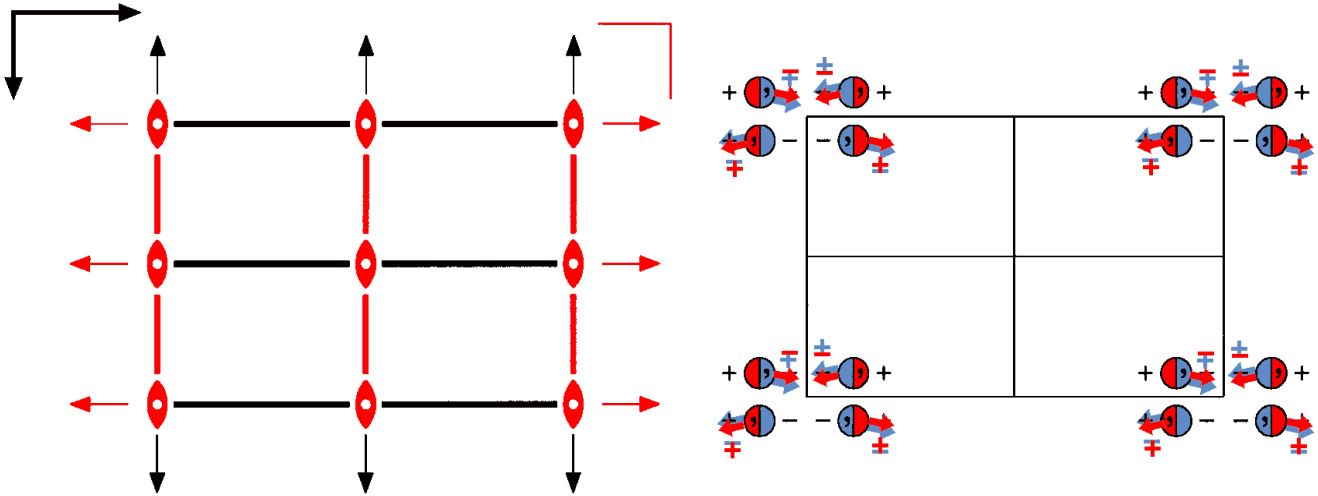
pmm'm'

No. 37.5.234

mm'm'

p2/m2'/m'2'/m'

Orthorhombic/Rectangular



Origin at center (mm'm')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 0,0,z
(2_z|0,0,0)'

(3) 2' 0,y,0
(2_y|0,0,0)'

(4) 2 x,0,0
(2_x|0,0,0)

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) m' x,y,0
(m_z|0,0,0)'

(7) m' x,0,z
(m_y|0,0,0)'

(8) m 0,y,z
(m_x|0,0,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]	(3) \bar{x},y,\bar{z} [u, \bar{v} ,w]	(4) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]
8 r 1	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y, \bar{z} [u,v, \bar{w}]	(7) x, \bar{y},z [u, \bar{v} ,w]	(8) \bar{x},y,z [u, \bar{v},\bar{w}]
4 q ..m'	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [u,v,0]	$\bar{x},y,0$ [u, \bar{v} ,0]	x, $\bar{y},0$ [u, \bar{v} ,0]
4 p .m'	x,1/2,z [u,0,w]	$\bar{x},1/2,z$ [u,0, \bar{w}]	$\bar{x},1/2,\bar{z}$ [u,0,w]	x,1/2, \bar{z} [u,0, \bar{w}]
4 o .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [u,0, \bar{w}]	$\bar{x},0,\bar{z}$ [u,0,w]	x,0, \bar{z} [u,0, \bar{w}]
4 n m..	1/2,y,z [u,0,0]	1/2, \bar{y},z [u,0,0]	1/2,y, \bar{z} [u,0,0]	1/2, \bar{y},\bar{z} [u,0,0]
4 m m..	0,y,z [u,0,0]	0, \bar{y},z [u,0,0]	0,y, \bar{z} [u,0,0]	0, \bar{y},\bar{z} [u,0,0]
2 l mm'2'	1/2,1/2,z [u,0,0]	1/2,1/2, \bar{z} [u,0,0]		
2 k mm'2'	1/2,0,z [u,0,0]	1/2,0, \bar{z} [u,0,0]		
2 j mm'2'	0,1/2,z [u,0,0]	0,1/2, \bar{z} [u,0,0]		
2 i mm'2'	0,0,z [u,0,0]	0,0, \bar{z} [u,0,0]		
2 h m2'm'	1/2,y,0 [u,0,0]	1/2, $\bar{y},0$ [u,0,0]		

Continued

No. 37.5.234

$pmm'm'$

2 g $m2'm'$ $0,y,0 [u,0,0]$ $0,\bar{y},0 [u,0,0]$

2 f $2m'm'$ $x,1/2,0 [u,0,0]$ $\bar{x},1/2,0 [u,0,0]$

2 e $2m'm'$ $x,0,0 [u,0,0]$ $\bar{x},0,0 [u,0,0]$

1 d $mm'm'$ $1/2,1/2,0 [u,0,0]$

1 c $mm'm'$ $0,1/2,0 [u,0,0]$

1 b $mm'm'$ $1/2,0,0 [u,0,0]$

1 a $mm'm'$ $0,0,0 [u,0,0]$

Symmetry of special projections

Along $[001]$ $p2'mm'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along $[100]$ $p2mm1'$ $a^* = b$ Origin at $x,0,0$	Along $[010]$ $p2'mm'$ $a^* = a$ Origin at $0,y,0$
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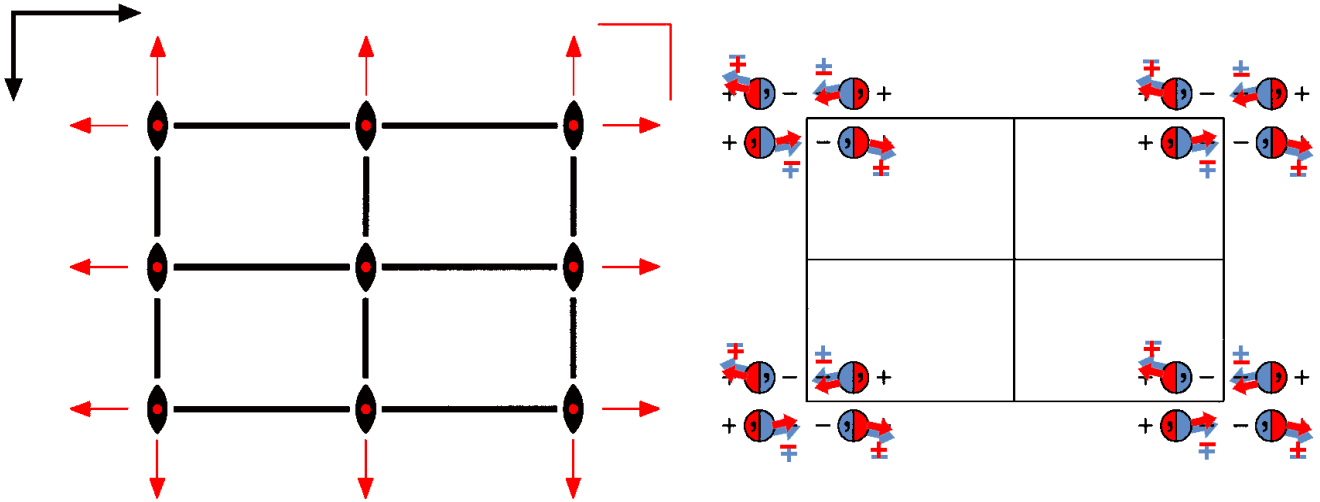
pmmm'

No. 37.6.235

mmm'

p2'/m2'/m2/m'

Orthorhombic/Rectangular



Origin at center (mmm')

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

- | | | | |
|--|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2' 0,y,0
(2 _y ' 0,0,0)' | (4) 2' x,0,0
(2 _x ' 0,0,0)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ ' 0,0,0)' | (6) m' x,y,0
(m _z ' 0,0,0)' | (7) m x,0,z
(m _y ' 0,0,0) | (8) m 0,y,z
(m _x ' 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{x},y,\bar{z} [\bar{u},v,w]	(4) x,\bar{y},\bar{z} [\bar{u},v,w]
8 r 1	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y,\bar{z} [u,v, \bar{w}]	(7) x,\bar{y},z [\bar{u},v,\bar{w}]	(8) \bar{x},y,z [u, \bar{v},\bar{w}]
4 q ..m'	$x,y,0$ [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{x},y,0$ [u, $\bar{v},0$]	$x,\bar{y},0$ [$\bar{u},v,0$]
4 p .m.	$x,1/2,z$ [0,v,0]	$\bar{x},1/2,z$ [0, $\bar{v},0$]	$\bar{x},1/2,\bar{z}$ [0, $\bar{v},0$]	$x,1/2,\bar{z}$ [0,v,0]
4 o .m.	$x,0,z$ [0,v,0]	$\bar{x},0,z$ [0, $\bar{v},0$]	$\bar{x},0,\bar{z}$ [0, $\bar{v},0$]	$x,0,\bar{z}$ [0,v,0]
4 n m..	$1/2,y,z$ [u,0,0]	$1/2,\bar{y},z$ [$\bar{u},0,0$]	$1/2,y,\bar{z}$ [u,0,0]	$1/2,\bar{y},\bar{z}$ [$\bar{u},0,0$]
4 m m..	$0,y,z$ [u,0,0]	$0,\bar{y},z$ [$\bar{u},0,0$]	$0,y,\bar{z}$ [u,0,0]	$0,\bar{y},\bar{z}$ [$\bar{u},0,0$]
2 l mm2	$1/2,1/2,z$ [0,0,0]	$1/2,1/2,\bar{z}$ [0,0,0]		
2 k mm2	$1/2,0,z$ [0,0,0]	$1/2,0,\bar{z}$ [0,0,0]		
2 j mm2	$0,1/2,z$ [0,0,0]	$0,1/2,\bar{z}$ [0,0,0]		
2 i mm2	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]		
2 h m2'm'	$1/2,y,0$ [u,0,0]	$1/2,\bar{y},0$ [$\bar{u},0,0$]		

Continued

No. 37.6.235

$pmmm'$

2 g $m2'm'$ $0,y,0 [u,0,0]$ $0,\bar{y},0 [\bar{u},0,0]$

2 f $2'mm'$ $x,1/2,0 [0,v,0]$ $\bar{x},1/2,0 [0,\bar{v},0]$

2 e $2'mm'$ $x,0,0 [0,v,0]$ $\bar{x},0,0 [0,\bar{v},0]$

1 d mmm' $1/2,1/2,0 [0,0,0]$

1 c mmm' $0,1/2,0 [0,0,0]$

1 b mmm' $1/2,0,0 [0,0,0]$

1 a mmm' $0,0,0 [0,0,0]$

Symmetry of special projections

Along $[001]$ $p2mm$
 $a^* = a$ $b^* = b$
Origin at $0,0,z$

Along $[100]$ $p2mm1'$
 $a^* = b$
Origin at $x,0,0$

Along $[010]$ $p2mm1'$
 $a^* = a$
Origin at $0,y,0$

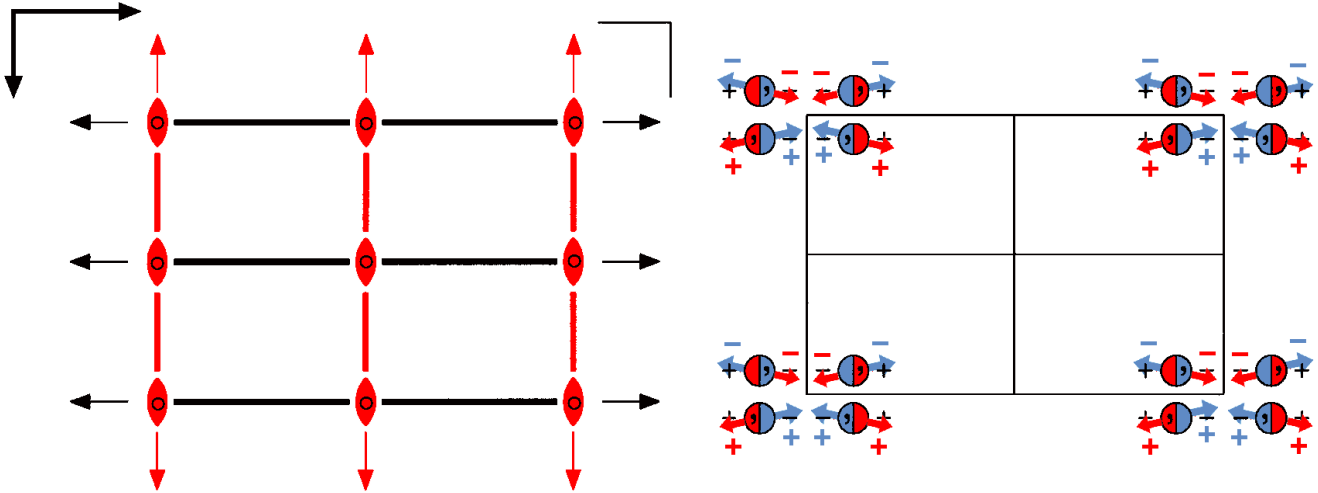
pmm'm

No. 37.7.236

mm'm

p2'/m2/m'2'/m

Orthorhombic/Rectangular



Origin at center (mm'm)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 2 0,y,0
(2 _y 0,0,0) | (4) 2' x,0,0
(2 _x 0,0,0)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ 0,0,0)' | (6) m x,y,0
(m _z 0,0,0) | (7) m' x,0,z
(m _y 0,0,0)' | (8) m 0,y,z
(m _x 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 r 1		(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z[u,v,\bar{w}]$		
		(3) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$		
		(5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(6) $x,y,\bar{z} [\bar{u},\bar{v},w]$		
		(7) $x,\bar{y},z [u,\bar{v},w]$	(8) $\bar{x},y,z [u,\bar{v},\bar{w}]$		
4 q ..m		$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,\bar{w}]$	$\bar{x},y,0 [0,0,\bar{w}]$	$x,\bar{y},0 [0,0,\bar{w}]$
4 p .m'		$x,1/2,z [u,0,w]$	$\bar{x},1/2,z [u,0,\bar{w}]$	$\bar{x},1/2,\bar{z} [\bar{u},0,\bar{w}]$	$x,1/2,\bar{z} [\bar{u},0,w]$
4 o .m'		$x,0,z [u,0,w]$	$\bar{x},0,z [u,0,\bar{w}]$	$\bar{x},0,\bar{z} [\bar{u},0,\bar{w}]$	$x,0,\bar{z} [\bar{u},0,w]$
4 n m..		$1/2,y,z [u,0,0]$	$1/2,\bar{y},z [u,0,0]$	$1/2,y,\bar{z} [\bar{u},0,0]$	$1/2,\bar{y},\bar{z} [\bar{u},0,0]$
4 m m..		$0,y,z [u,0,0]$	$0,\bar{y},z [u,0,0]$	$0,y,\bar{z} [\bar{u},0,0]$	$0,\bar{y},\bar{z} [\bar{u},0,0]$
2 l mm'2'		$1/2,1/2,z [u,0,0]$	$1/2,1/2,\bar{z} [\bar{u},0,0]$		
2 k mm'2'		$1/2,0,z [u,0,0]$	$1/2,0,\bar{z} [\bar{u},0,0]$		
2 j mm'2'		$0,1/2,z [u,0,0]$	$0,1/2,\bar{z} [\bar{u},0,0]$		
2 i mm'2'		$0,0,z [u,0,0]$	$0,0,\bar{z} [\bar{u},0,0]$		
2 h m2m		$1/2,y,0 [0,0,0]$	$1/2,\bar{y},0 [0,0,0]$		

Continued

No. 37.7.236

pmm'm

2	g	m2m	0,y,0 [0,0,0]	0,ȳ,0 [0,0,0]
2	f	2'm'm	x,1/2,0 [0,0,w]	\bar{x} ,1/2,0 [0,0, \bar{w}]
2	e	2'm'm	x,0,0 [0,0,w]	\bar{x} ,0,0 [0,0, \bar{w}]
1	d	mm'm	1/2,1/2,0 [0,0,0]	
1	c	mm'm	0,1/2,0 [0,0,0]	
1	b	mm'm	1/2,0,0 [0,0,0]	
1	a	mm'm	0,0,0 [0,0,0]	

Symmetry of special projections

Along [001] p2mm1'	Along [100] p2mm1'	Along [010] p2mm
$a^* = a$ $b^* = b$	$a^* = b$	$a^* = a$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

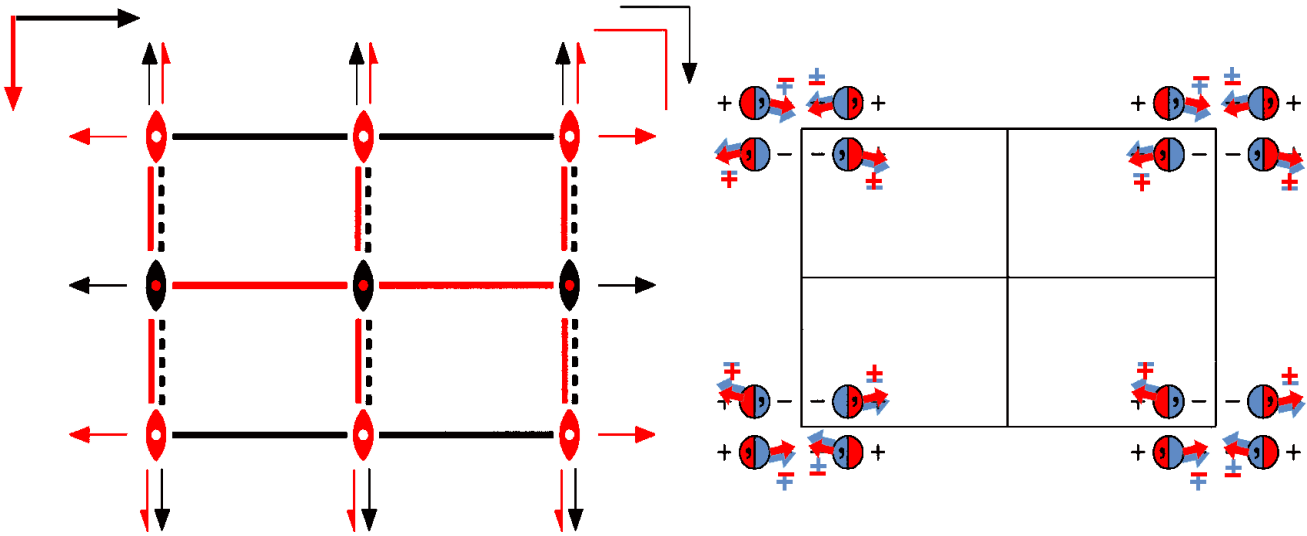
$p_{2a} mm'm'$

No. 37.8.237

$mmm1'$

$p_{2a} 2/m2'/m'2'/m'$

Orthorhombic/Rectangular



Origin at center ($mm'm'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--------------------------------------|--------------------------------------|-------------------------------------|
| (1) 1
(1 0,0,0) | (2) $2'_z$ 0,0,z
(2_z 0,0,0)' | (3) $2'_y$ 0,y,0
(2_y 0,0,0)' | (4) $2'_x$ x,0,0
(2_x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m'_x x,y,0
(m_x 0,0,0)' | (7) m'_y x,0,z
(m_y 0,0,0)' | (8) m'_z 0,y,z
(m_z 0,0,0) |

For $(1,0,0)$ ' + set

- | | | | |
|---|--|--|--|
| (1) t'_x (1,0,0)
(1 1,0,0)' | (2) $2'_z$ 1/2,0,z
(2_z 1,0,0) | (3) $2'_y$ 1/2,y,0
(2_y 1,0,0) | (4) $2'_x$ (1,0,0) x,0,0
(2_x 1,0,0)' |
| (5) $\bar{1}$ 1/2,0,0
($\bar{1}$ 1,0,0)' | (6) a (1,0,0) x,y,0
(m_z 1,0,0) | (7) a (1,0,0) x,0,z
(m_y 1,0,0) | (8) m'_z 1/2,y,z
(m_x 1,0,0)' |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1,0,0)' +		
8 r 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(3) $\bar{x},y,\bar{z} [u,\bar{v},w]$	(4) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x,y,\bar{z} [u,v,\bar{w}]$	(7) $x,\bar{y},z [u,\bar{v},w]$	(8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
4 q ..m'	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [u,v,0]$	$\bar{x},y,0 [u,\bar{v},0]$	$x,\bar{y},0 [u,\bar{v},0]$
4 p .m'.	$x,1/2,z [u,0,w]$	$\bar{x},1/2,z [u,0,\bar{w}]$	$\bar{x},1/2,\bar{z} [u,0,w]$	$x,1/2,\bar{z} [u,0,\bar{w}]$
4 o .m'.	$x,0,z [u,0,w]$	$\bar{x},0,z [u,0,\bar{w}]$	$\bar{x},0,\bar{z} [u,0,w]$	$x,0,\bar{z} [u,0,\bar{w}]$
4 n m'..	$1/2,y,z [0,v,w]$	$1/2,\bar{y},z [0,\bar{v},w]$	$1/2,y,\bar{z} [0,v,\bar{w}]$	$1/2,\bar{y},\bar{z} [0,\bar{v},\bar{w}]$
4 m m..	$0,y,z [u,0,0]$	$0,\bar{y},z [u,0,0]$	$0,y,\bar{z} [u,0,0]$	$0,\bar{y},\bar{z} [u,0,0]$
2 l m'm'2	$1/2,1/2,z [0,0,w]$	$1/2,1/2,\bar{z} [0,0,\bar{w}]$		
2 k m'm'2	$1/2,0,z [0,0,w]$	$1/2,0,\bar{z} [0,0,\bar{w}]$		
2 j mm'2'	$0,1/2,z [u,0,0]$	$0,1/2,\bar{z} [u,0,0]$		
2 i mm'2'	$0,0,z [u,0,0]$	$0,0,\bar{z} [u,0,0]$		
2 h m'2m'	$1/2,y,0 [0,v,0]$	$1/2,\bar{y},0 [0,\bar{v},0]$		

Continued

No. 37.8.237

p_{2a} mm'm'

2 g m2'm' 0,y,0 [u,0,0] 0,ȳ,0 [u,0,0]

2 f 2m'm' x,1/2,0 [u,0,0] \bar{x} ,1/2,0 [u,0,0]

2 e 2m'm' x,0,0 [u,0,0] \bar{x} ,0,0 [u,0,0]

1 d m'm'm' 1/2,1/2,0 [0,0,0]

1 c mm'm' 0,1/2,0 [u,0,0]

1 b m'm'm' 1/2,0,0 [0,0,0]

1 a mm'm' 0,0,0 [u,0,0]

Symmetry of special projections

Along [001] p_{2a} -2m'm'	Along [100] $p2mm1'$	Along [010] p_{2a} -2m'm'
$a^* = a$ $b^* = b$	$a^* = b$	$a^* = a$
Origin at 1/2,0,z	Origin at x,0,0	Origin at 1/2,y,0

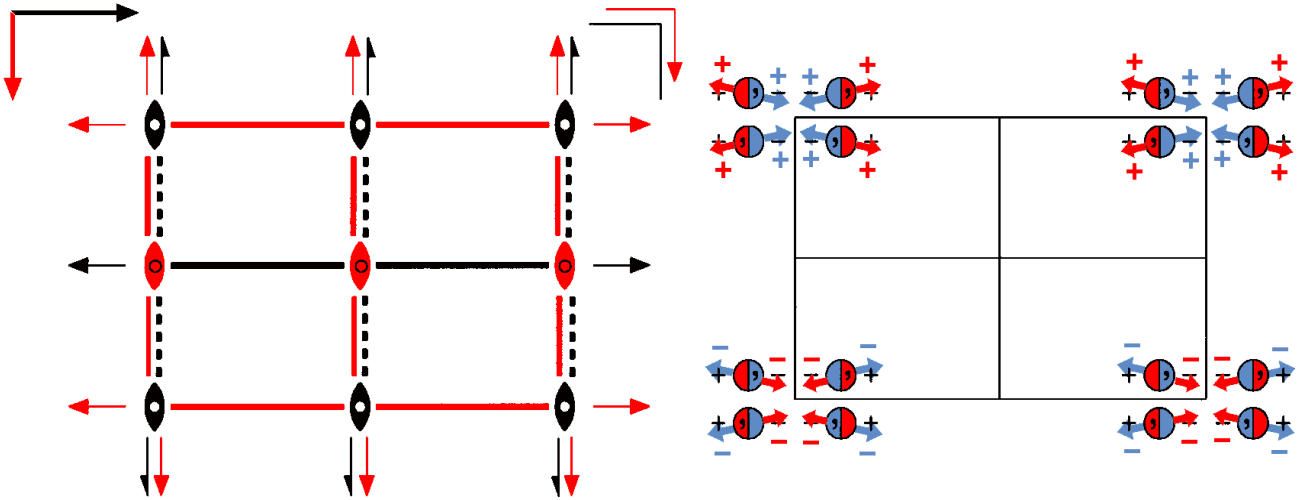
$p_{2a} m'm'm$

No. 37.9.238

$mmm1'$

$p_{2a} 2'/m'2'/m'2'/m$

Orthorhombic/Rectangular



Origin at center ($m'm'm$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)^+$ set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) 2' $0,y,0$
(2 _y 0,0,0)' | (4) 2' $x,0,0$
(2 _x 0,0,0)' |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (6) m $x,y,0$
(m _z 0,0,0) | (7) m' $x,0,z$
(m _y 0,0,0)' | (8) m' $0,y,z$
(m _x 0,0,0)' |

For $(1,0,0)'$ + set

- | | | | |
|---|--|--|--|
| (1) t' $(1,0,0)$
(1 1,0,0)' | (2) 2' $1/2,0,z$
(2 _z 1,0,0)' | (3) 2 $1/2,y,0$
(2 _y 1,0,0) | (4) 2 $(1,0,0) x,0,0$
(2 _x 1,0,0) |
| (5) $\bar{1}$ $1/2,0,0$
($\bar{1}$ 1,0,0)' | (6) a' $(1,0,0) x,y,0$
(m _z 1,0,0)' | (7) a $(1,0,0) x,0,z$
(m _y 1,0,0) | (8) m $1/2,y,z$
(m _x 1,0,0) |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		$(0,0,0)_+$	$(1,0,0)'$ +	
8 r 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{x},y,\bar{z} [u,\bar{v},w]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$
	(5) $\bar{x},\bar{y},z [u,v,w]$	(6) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(7) $x,\bar{y},z [u,\bar{v},w]$	(8) $\bar{x},y,z [\bar{u},v,w]$
4 q ..m	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [\bar{u},\bar{v},0]$	$\bar{x},y,0 [u,\bar{v},0]$	$x,\bar{y},0 [\bar{u},v,0]$
4 p .m'	$x,1/2,z [u,0,w]$	$\bar{x},1/2,z [\bar{u},0,w]$	$\bar{x},1/2,\bar{z} [u,0,w]$	$x,1/2,\bar{z} [\bar{u},0,w]$
4 o .m'	$x,0,z [u,0,w]$	$\bar{x},0,z [\bar{u},0,w]$	$\bar{x},0,\bar{z} [u,0,w]$	$x,0,\bar{z} [\bar{u},0,w]$
4 n m..	$1/2,y,z [u,0,0]$	$1/2,\bar{y},z [u,0,0]$	$1/2,y,\bar{z} [\bar{u},0,0]$	$1/2,\bar{y},\bar{z} [\bar{u},0,0]$
4 m m'..	$0,y,z [0,v,w]$	$0,\bar{y},z [0,\bar{v},w]$	$0,y,\bar{z} [0,\bar{v},w]$	$0,\bar{y},\bar{z} [0,v,w]$
2 l mm'2'	$1/2,1/2,z [u,0,0]$	$1/2,1/2,\bar{z} [\bar{u},0,0]$		
2 k mm'2'	$1/2,0,z [u,0,0]$	$1/2,0,\bar{z} [\bar{u},0,0]$		
2 j m'm'2	$0,1/2,z [0,0,w]$	$0,1/2,\bar{z} [0,0,w]$		
2 i m'm'2	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$		
2 h m2m	$1/2,y,0 [0,0,0]$	$1/2,\bar{y},0 [0,0,0]$		

Continued

No. 37.9.238

p_{2a} m'm'm

2 g m'2'm 0,y,0 [0,0,w] $0,\bar{y},0$ [0,0,w]

2 f 2'm'm x,1/2,0 [0,0,w] $\bar{x},1/2,0$ [0,0,w]

2 e 2'm'm x,0,0 [0,0,w] $\bar{x},0,0$ [0,0,w]

1 d mm'm 1/2,1/2,0 [0,0,0]

1 c m'm'm 0,1/2,0 [0,0,0]

1 b mm'm 1/2,0,0 [0,0,0]

1 a m'm'm 0,0,0 [0,0,0]

Symmetry of special projections

Along [001] $p2mm1'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p2mm1'$ $a^* = b$ Origin at x,0,0	Along [010] $p_{2a}2'm'm$ $a^* = a$ Origin at 0,y,0
--	--	---

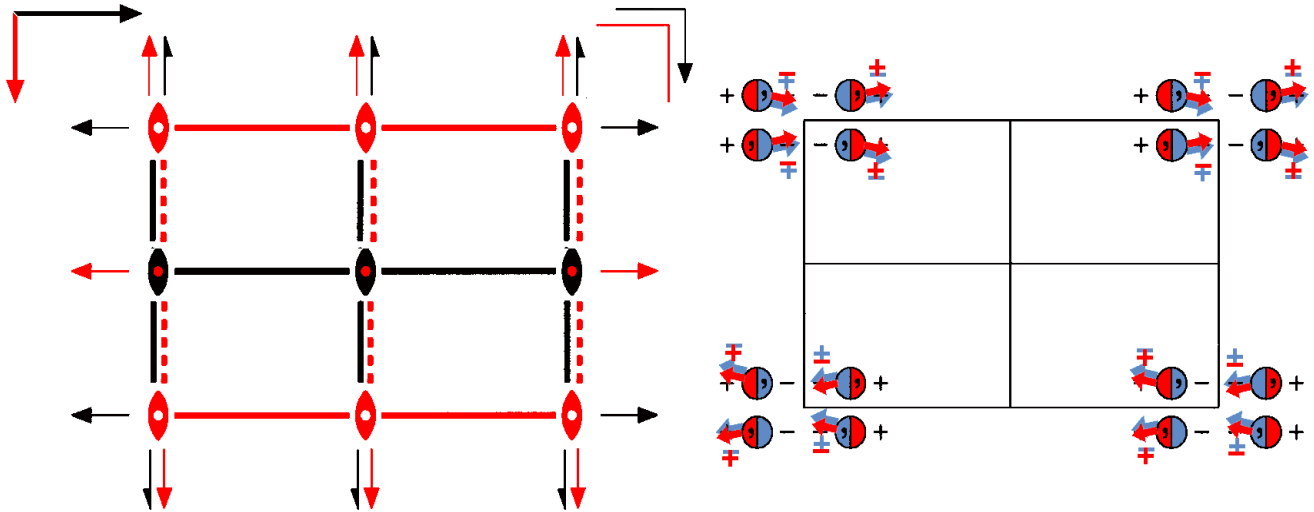
$p_{2a} m'mm'$

No. 37.10.239

$mmm1'$

$p_{2a} 2'/m'2'/m'$

Orthorhombic/Rectangular



Origin at center ($m'mm'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|---------------------------------------|--------------------------------------|---------------------------------------|
| (1) 1
(1 0,0,0) | (2) $2'_z$ 0,0,z
($2'_z$ 0,0,0)' | (3) $2'_y$ 0,y,0
($2'_y$ 0,0,0) | (4) $2'_x$ x,0,0
($2'_x$ 0,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m'_z x,y,0
(m'_z 0,0,0)' | (7) m'_y x,0,z
(m'_y 0,0,0) | (8) m'_x 0,y,z
(m'_x 0,0,0)' |

For $(1,0,0)'$ + set

- | | | | |
|---|--|---|--|
| (1) t'_z (1,0,0)
(1 1,0,0)' | (2) $2'_z$ 1/2,0,z
($2'_z$ 1,0,0) | (3) $2'_y$ 1/2,y,0
($2'_y$ 1,0,0)' | (4) $2'_x$ (1,0,0) x,0,0
($2'_x$ 1,0,0) |
| (5) $\bar{1}$ 1/2,0,0
($\bar{1}$ 1,0,0)' | (6) a'_z (1,0,0) x,y,0
(m'_z 1,0,0) | (7) a'_y (1,0,0) x,0,z
(m'_y 1,0,0)' | (8) m'_x 1/2,y,z
(m'_x 1,0,0) |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(1,0,0)'		
8 r 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(3) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$
	(5) $\bar{x},\bar{y},z [u,v,w]$	(6) $x,y,\bar{z} [u,v,\bar{w}]$	(7) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(8) $\bar{x},y,z [\bar{u},v,w]$
4 q ..m'	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [u,v,0]$	$\bar{x},y,0 [\bar{u},v,0]$	$x,\bar{y},0 [\bar{u},v,0]$
4 p .m.	$x,1/2,z [0,v,0]$	$\bar{x},1/2,z [0,v,0]$	$\bar{x},1/2,\bar{z} [0,v,0]$	$x,1/2,\bar{z} [0,v,0]$
4 o .m.	$x,0,z [0,v,0]$	$\bar{x},0,z [0,v,0]$	$\bar{x},0,\bar{z} [0,v,0]$	$x,0,\bar{z} [0,v,0]$
4 n m..	$1/2,y,z [u,0,0]$	$1/2,\bar{y},z [\bar{u},0,0]$	$1/2,y,\bar{z} [u,0,0]$	$1/2,\bar{y},\bar{z} [\bar{u},0,0]$
4 m m'..	$0,y,z [0,v,w]$	$0,\bar{y},z [0,v,\bar{w}]$	$0,y,\bar{z} [0,v,\bar{w}]$	$0,\bar{y},\bar{z} [0,v,w]$
2 l mm2	$1/2,1/2,z [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$		
2 k mm2	$1/2,0,z [0,0,0]$	$1/2,0,\bar{z} [0,0,0]$		
2 j m'm2'	$0,1/2,z [0,v,0]$	$0,1/2,\bar{z} [0,v,0]$		
2 i m'm2'	$0,0,z [0,v,0]$	$0,0,\bar{z} [0,v,0]$		
2 h m2'm'	$1/2,y,0 [u,0,0]$	$1/2,\bar{y},0 [\bar{u},0,0]$		

Continued

No. 37.10.239

p_{2a} m'mm'

2 g m'2m' 0,y,0 [0,v,0] $0,\bar{y},0$ [0,v,0]

2 f 2'mm' x,1/2,0 [0,v,0] $\bar{x},1/2,0$ [0,v,0]

2 e 2'mm' x,0,0 [0,v,0] $\bar{x},0,0$ [0,v,0]

1 d mmm' 1/2,1/2,0 [0,0,0]

1 c m'mm' 0,1/2,0 [0,v,0]

1 b mmm' 1/2,0,0 [0,0,0]

1 a m'mm' 0,0,0 [0,v,0]

Symmetry of special projections

Along [001] p_{2a} -2mm $a^* = a$ $b^* = b$ Origin at 1/2,0,z	Along [100] p 2mm1' $a^* = b$ Origin at x,0,0	Along [010] p_{2a} -2m'm' $a^* = a$ Origin at 0,y,0
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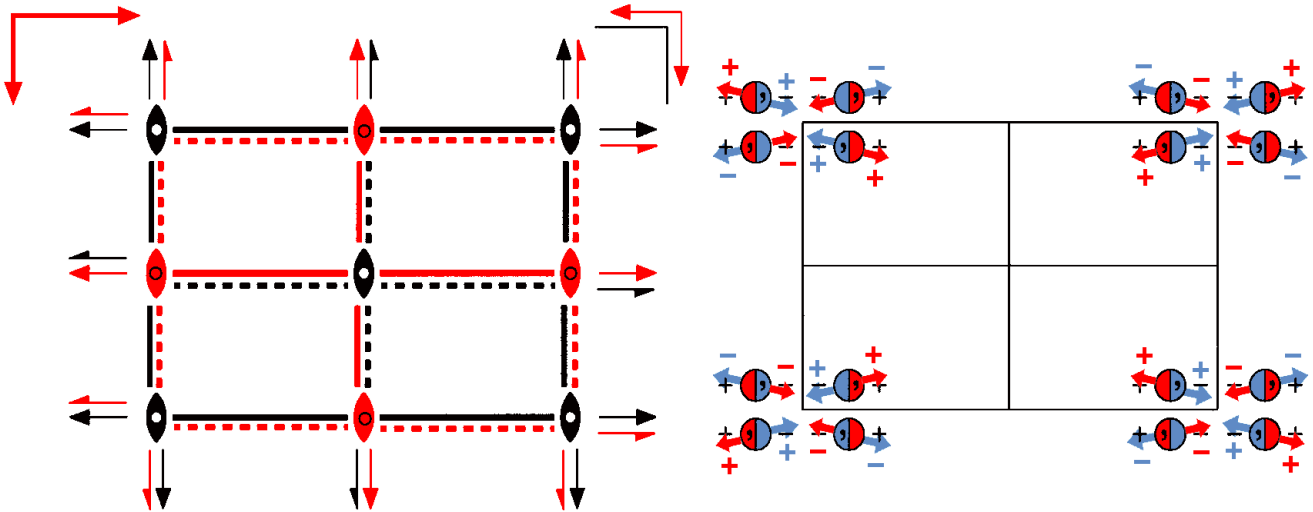
$p_c mmm$

No. 37.11.240

$mmm1'$

$p_c 2/m2/m2/m$

Orthorhombic/Rectangular



Origin at center (mmm)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) 2 $0,y,0$
(2 _y 0,0,0) | (4) 2 $x,0,0$
(2 _x 0,0,0) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (6) m $x,y,0$
(m_z 0,0,0) | (7) m $x,0,z$
(m_y 0,0,0) | (8) m $0,y,z$
(m_x 0,0,0) |

For $(0,1,0)'$ + set

- | | | | |
|---|--|--|--|
| (1) t' $(0,1,0)$
(1 0,1,0)' | (2) 2' $0,1/2,z$
(2 _z 0,1,0)' | (3) 2' $(0,1,0)$ $0,y,0$
(2 _y 0,1,0)' | (4) 2' $x,1/2,0$
(2 _x 0,1,0)' |
| (5) $\bar{1}'$ $0,1/2,0$
($\bar{1}'$ 0,1,0)' | (6) b' $(0,1,0)$ $x,y,0$
(m_z 0,1,0)' | (7) m' $x,1/2,z$
(m_y 0,1,0)' | (8) b' $(0,1,0)$ $0,y,z$
(m_x 0,1,0)' |

Generators selected (1); t(1,0,0)'; t(0,1,0)'; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(0,1,0)'		
8 r 1	(1) x,y,z [u,v,w] (3) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}] (5) \bar{x},\bar{y},\bar{z} [u,v,w] (7) x, \bar{y} ,z [\bar{u},v,\bar{w}]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w] (4) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}] (6) x,y, \bar{z} [\bar{u},\bar{v},w] (8) \bar{x},y,z [u, \bar{v},\bar{w}]		
4 q ..m	x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{x},y,0$ [0,0, \bar{w}]	x, $\bar{y},0$ [0,0, \bar{w}]
4 p .m'	x,1/2,z [u,0,w]	$\bar{x},1/2,z$ [u,0, \bar{w}]	$\bar{x},1/2,\bar{z}$ [$\bar{u},0,\bar{w}$]	x,1/2, \bar{z} [$\bar{u},0,w$]
4 o .m.	x,0,z [0,v,0]	$\bar{x},0,z$ [0, $\bar{v},0$]	$\bar{x},0,\bar{z}$ [0,v,0]	x,0, \bar{z} [0, $\bar{v},0$]
4 n m'..	1/2,y,z [0,v,w]	1/2, \bar{y},z [0,v, \bar{w}]	1/2,y, \bar{z} [0, \bar{v},w]	1/2, \bar{y},\bar{z} [0, \bar{v},\bar{w}]
4 m m..	0,y,z [u,0,0]	0, \bar{y},z [$\bar{u},0,0$]	0,y, \bar{z} [$\bar{u},0,0$]	0, \bar{y},\bar{z} [u,0,0]
2 l m'm'2	1/2,1/2,z [0,0,w]	1/2,1/2, \bar{z} [0,0,w]		
2 k m'm'2'	1/2,0,z [0,v,0]	1/2,0, \bar{z} [0, $\bar{v},0$]		
2 j mm'2'	0,1/2,z [u,0,0]	0,1/2, \bar{z} [$\bar{u},0,0$]		
2 i mm2	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]		
2 h m'2'm	1/2,y,0 [0,0,w]	1/2, $\bar{y},0$ [0,0, \bar{w}]		

Continued

No. 37.11.240

p_c mmm

2 g m2m 0,y,0 [0,0,0] 0, \bar{y} ,0 [0,0,0]

2 f 2'm'm x,1/2,0 [0,0,w] \bar{x} ,1/2,0 [0,0, \bar{w}]

2 e 2mm x,0,0 [0,0,0] \bar{x} ,0,0 [0,0,0]

1 d m'm'm 1/2,1/2,0 [0,0,w]

1 c mm'm 0,1/2,0 [0,0,0]

1 b m'mm 1/2,0,0 [0,0,0]

1 a mmm 0,0,0 [0,0,0]

Symmetry of special projections

Along [001] $p2mm1'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p2mm1'$ $a^* = b$ Origin at x,0,0	Along [010] $p2mm1'$ $a^* = a$ Origin at 0,y,0
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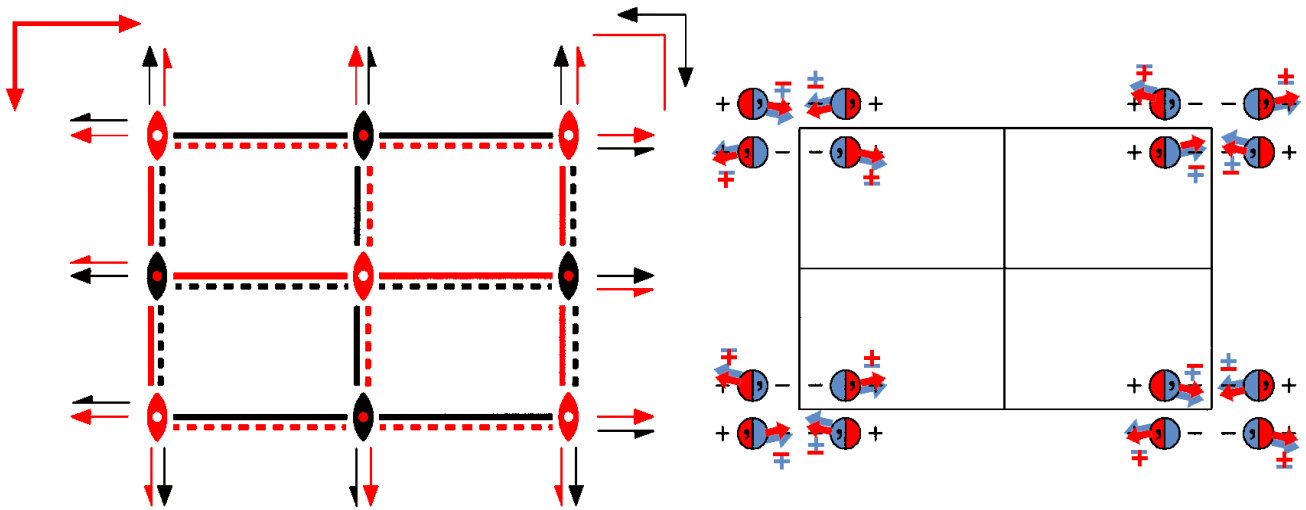
$p_c mm'm'$

No. 37.12.241

$mmm1'$

$p_c 2/m2'/m2'/m'$

Orthorhombic/Rectangular



Origin at center ($mm'm'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--------------------------------------|--------------------------------------|-------------------------------------|
| (1) 1
(1 0,0,0) | (2) $2'_z$ 0,0,z
(2_z 0,0,0)' | (3) $2'_y$ 0,y,0
(2_y 0,0,0)' | (4) $2'_x$ x,0,0
(2_x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m'_x x,y,0
(m_x 0,0,0)' | (7) m'_y x,0,z
(m_y 0,0,0)' | (8) m'_z 0,y,z
(m_z 0,0,0) |

For $(0,1,0)$ ' + set

- | | | | |
|---|---|---|--|
| (1) t'_z (0,1,0)
(1 0,1,0)' | (2) $2'_z$ 0,1/2,z
(2_z 0,1,0) | (3) $2'_y$ (0,1,0) 0,y,0
(2_y 0,1,0) | (4) $2'_x$ x,1/2,0
(2_x 0,1,0)' |
| (5) $\bar{1}$ 0,1/2,0
($\bar{1}$ 0,1,0)' | (6) b'_z (0,1,0) x,y,0
(m_z 0,1,0) | (7) m'_y x,1/2,z
(m_y 0,1,0) | (8) b'_x (0,1,0) 0,y,z
(m_x 0,1,0)' |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		(0,0,0)+	(0,1,0)'	
8 r 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v,w]	(3) \bar{x},y,\bar{z} [u,v,w]	(4) x,y, \bar{z} [u,v,w]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y,z [u,v,w]	(7) \bar{x},\bar{y},z [u,v,w]	(8) \bar{x},y,\bar{z} [u,v,w]
4 q ..m'	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [u,v,0]	$\bar{x},y,0$ [u,v,0]	x, $\bar{y},0$ [u,v,0]
4 p .m.	x,1/2,z [0,v,0]	$\bar{x},1/2,z$ [0,v,0]	$\bar{x},1/2,\bar{z}$ [0,v,0]	x,1/2, \bar{z} [0,v,0]
4 o .m'.	x,0,z [u,0,w]	$\bar{x},0,z$ [u,0,w]	$\bar{x},0,\bar{z}$ [u,0,w]	x,0, \bar{z} [u,0,w]
4 n m'..	1/2,y,z [0,v,w]	1/2, \bar{y},z [0,v,w]	1/2,y, \bar{z} [0,v,w]	1/2, \bar{y},\bar{z} [0,v,w]
4 m m..	0,y,z [u,0,0]	0, \bar{y},z [u,0,0]	0,y, \bar{z} [u,0,0]	0, \bar{y},\bar{z} [u,0,0]
2 l m'm2'	1/2,1/2,z [0,v,0]	1/2,1/2, \bar{z} [0,v,0]		
2 k m'm'2	1/2,0,z [0,0,w]	1/2,0, \bar{z} [0,0,w]		
2 j mm2	0,1/2,z [0,0,0]	0,1/2, \bar{z} [0,0,0]		
2 i mm'2'	0,0,z [u,0,0]	0,0, \bar{z} [u,0,0]		
2 h m'2m'	1/2,y,0 [0,v,0]	1/2, $\bar{y},0$ [0,v,0]		

Continued

No. 37.12.241

p_c mm'm'

2 g m2'm' 0,y,0 [u,0,0] $0,\bar{y},0$ [u,0,0]

2 f 2'mm' x,1/2,0 [0,v,0] $\bar{x},1/2,0$ [0, \bar{v} ,0]

2 e 2m'm' x,0,0 [u,0,0] $\bar{x},0,0$ [u,0,0]

1 d m'mm' 1/2,1/2,0 [0,v,0]

1 c mmm' 0,1/2,0 [0,0,0]

1 b m'm'm' 1/2,0,0 [0,0,0]

1 a mm'm' 0,0,0 [u,0,0]

Symmetry of special projections

Along [001] p_c -2mm	Along [100] p 2mm1'	Along [010] p 2mm1'
$a^* = a$ $b^* = b$	$a^* = b$	$a^* = a$
Origin at 0,1/2,z	Origin at x,0,0	Origin at 0,y,0

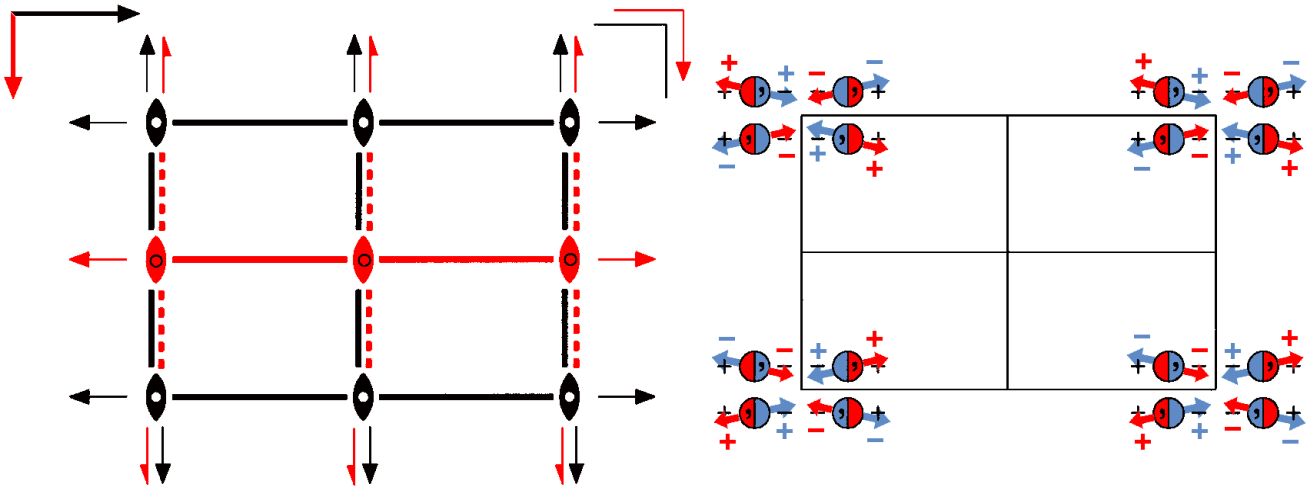
p_{2a} mmm

No. 37.13.242

mmm1'

$p_{2a} 2/m2/m2/m$

Orthorhombic/Rectangular



Origin at center (mmm)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2 0,y,0
(2 _y 0,0,0) | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m x,y,0
(m _z 0,0,0) | (7) m x,0,z
(m _y 0,0,0) | (8) m 0,y,z
(m _x 0,0,0) |

For (1,0,0)' + set

- | | | | |
|---|--|--|--|
| (1) t' (1,0,0)
(1 1,0,0)' | (2) 2' 1/2,0,z
(2 _z 1,0,0)' | (3) 2' 1/2,y,0
(2 _y 1,0,0)' | (4) 2' (1,0,0) x,0,0
(2 _x 1,0,0)' |
| (5) $\bar{1}$ ' 1/2,0,0
($\bar{1}$ 1,0,0)' | (6) a' (1,0,0) x,y,0
(m _z 1,0,0)' | (7) a' (1,0,0) x,0,z
(m _y 1,0,0)' | (8) m' 1/2,y,z
(m _x 1,0,0)' |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		(0,0,0)+	(1,0,0)' +	
8 r 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(5) $\bar{x},\bar{y},z [u,v,w]$	(6) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(7) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
4 q ..m	$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,w]$	$\bar{x},y,0 [0,0,\bar{w}]$	$x,\bar{y},0 [0,0,\bar{w}]$
4 p .m.	$x,1/2,z [0,v,0]$	$\bar{x},1/2,z [0,\bar{v},0]$	$\bar{x},1/2,\bar{z} [0,v,0]$	$x,1/2,\bar{z} [0,\bar{v},0]$
4 o .m.	$x,0,z [0,v,0]$	$\bar{x},0,z [0,\bar{v},0]$	$\bar{x},0,\bar{z} [0,v,0]$	$x,0,\bar{z} [0,\bar{v},0]$
4 n m'..	$1/2,y,z [0,v,w]$	$1/2,\bar{y},z [0,v,\bar{w}]$	$1/2,y,\bar{z} [0,\bar{v},w]$	$1/2,\bar{y},\bar{z} [0,\bar{v},\bar{w}]$
4 m m..	$0,y,z [u,0,0]$	$0,\bar{y},z [\bar{u},0,0]$	$0,y,\bar{z} [\bar{u},0,0]$	$0,\bar{y},\bar{z} [u,0,0]$
2 l m'm2'	$1/2,1/2,z [0,v,0]$	$1/2,1/2,\bar{z} [0,\bar{v},0]$		
2 k m'm2'	$1/2,0,z [0,v,0]$	$1/2,0,\bar{z} [0,\bar{v},0]$		
2 j mm2	$0,1/2,z [0,0,0]$	$0,1/2,\bar{z} [0,0,0]$		
2 i mm2	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$		
2 h m'2'm	$1/2,y,0 [0,0,w]$	$1/2,\bar{y},0 [0,0,\bar{w}]$		

Continued

No. 37.13.242

p_{2a} mmm

2 g m2m 0,y,0 [0,0,0] 0, \bar{y} ,0 [0,0,0]

2 f 2mm x,1/2,0 [0,0,0] \bar{x} ,1/2,0 [0,0,0]

2 e 2mm x,0,0 [0,0,0] \bar{x} ,0,0 [0,0,0]

1 d m'mm 1/2,1/2,0 [0,0,0]

1 c mmm 0,1/2,0 [0,0,0]

1 b m'mm 1/2,0,0 [0,0,0]

1 a mmm 0,0,0 [0,0,0]

Symmetry of special projections

Along [001] $p2mm1'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p2mm1'$ $a^* = b$ Origin at x,0,0	Along [010] $p2mm1'$ $a^* = a$ Origin at 0,y,0
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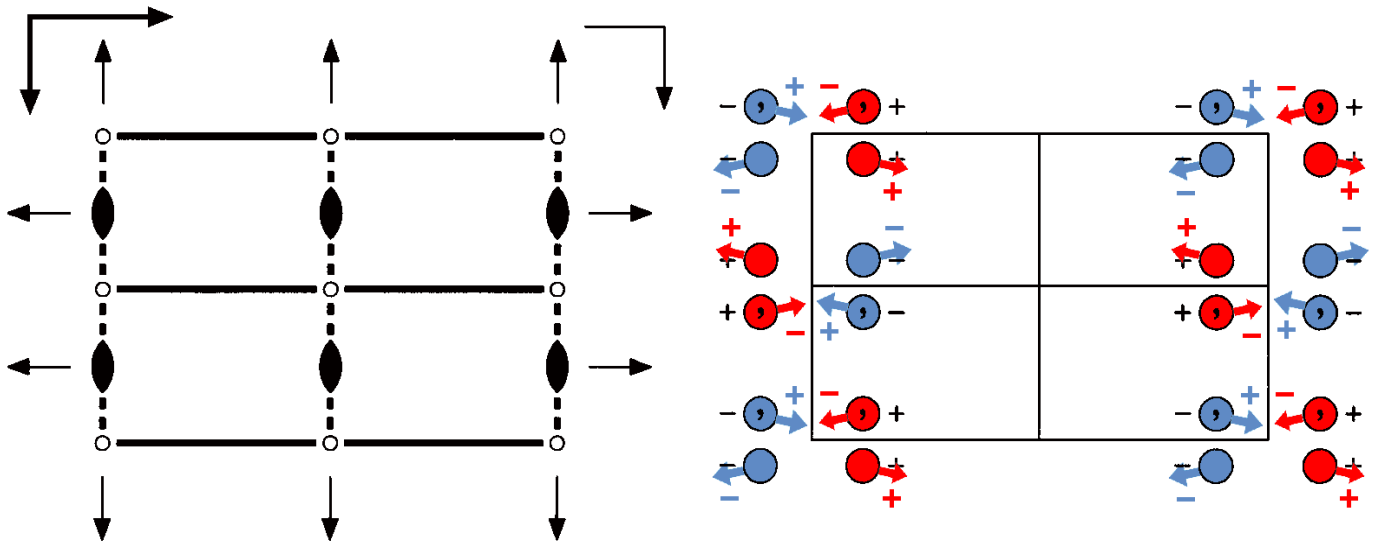
pmaa

No. 38.1.243

mmm

p2/m2/a2/a

Orthorhombic/Rectangular



Origin at center (2/m) at 2/maa

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2_x x,0,0
(2_x|0,0,0)

(3) 2_z 1/4,0,z
(2_z|1/2,0,0)

(4) 2_y 1/4,y,0
(2_y|1/2,0,0)

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) m_x 0,y,z
(m_x|0,0,0)

(7) a_x (1/2,0,0) x,y,0
(m_z|1/2,0,0)

(8) a_y (1/2,0,0) x,0,z
(m_y|1/2,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

		Coordinates			
Multiplicity, Wyckoff letter, Site symmetry					
8 k 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]	(3) $\bar{x}+1/2,\bar{y},z$ [\bar{u} , \bar{v} ,w]	(4) $\bar{x}+1/2,y,\bar{z}$ [\bar{u} ,v, \bar{w}]	
	(5) \bar{x},\bar{y},\bar{z}	(6) \bar{x},y,z [u, \bar{v} , \bar{w}]	(7) $x+1/2,y,\bar{z}$ [\bar{u} , \bar{v} ,w]	(8) $x+1/2,\bar{y},z$ [\bar{u} ,v, \bar{w}]	
4 j m..	$0,y,z$ [u,0,0]	$0,\bar{y},\bar{z}$ [u,0,0]	$1/2,\bar{y},z$ [\bar{u} ,0,0]	$1/2,y,\bar{z}$ [\bar{u} ,0,0]	
4 i 2..	$x,1/2,0$ [u,0,0]	$\bar{x}+1/2,1/2,0$ [\bar{u} ,0,0]	$\bar{x},1/2,0$ [u,0,0]	$x+1/2,1/2,0$ [\bar{u} ,0,0]	
4 h 2..	$x,0,0$ [u,0,0]	$\bar{x}+1/2,0,0$ [\bar{u} ,0,0]	$\bar{x},0,0$ [u,0,0]	$x+1/2,0,0$ [\bar{u} ,0,0]	
4 g ..2	$1/4,1/2,z$ [0,0,w]	$1/4,1/2,\bar{z}$ [0,0, \bar{w}]	$3/4,1/2,\bar{z}$ [0,0,w]	$3/4,1/2,z$ [0,0, \bar{w}]	
4 f ..2	$1/4,0,z$ [0,0,w]	$1/4,0,\bar{z}$ [0,0, \bar{w}]	$3/4,0,\bar{z}$ [0,0,w]	$3/4,0,z$ [0,0, \bar{w}]	
4 e .2.	$1/4,y,0$ [0,v,0]	$1/4,\bar{y},0$ [0, \bar{v} ,0]	$3/4,\bar{y},0$ [0,v,0]	$3/4,y,0$ [0, \bar{v} ,0]	
2 d 222	$1/4,1/2,0$ [0,0,0]	$3/4,1/2,0$ [0,0,0]			
2 c 222	$1/4,0,0$ [0,0,0]	$3/4,0,0$ [0,0,0]			
2 b 2/m..	$0,1/2,0$ [u,0,0]	$1/2,1/2,0$ [\bar{u} ,0,0]			
2 a 2/m..	$0,0,0$ [u,0,0]	$1/2,0,0$ [\bar{u} ,0,0]			

Symmetry of special projections

Along [001] $p_{2a^*}2m'm'$	Along [100] $p2mm1'$	Along [010] $p_{2a^*}2mm'$
$a^* = a/2$ $b^* = b$	$a^* = b$	$a^* = a/2$
Origin at $1/4,0,z$	Origin at $x,0,0$	Origin at $1/4,y,0$

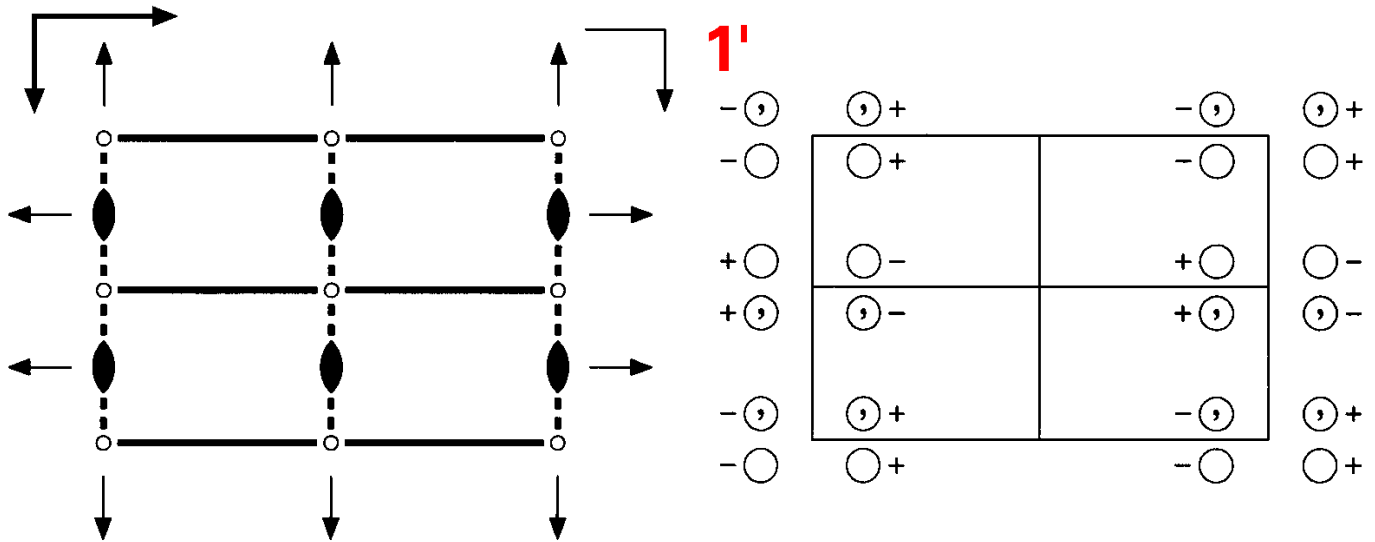
pmaa1'

No. 38.2.244

mmm1'

p2/m2/a2/a1'

Orthorhombic/Rectangular



Origin at center ($2/m1'$) at $2/maa1'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|--|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 _x x,0,0
(2 _x 0,0,0) | (3) 2 _z 1/4,0,z
(2 _z 1/2,0,0) | (4) 2 _y 1/4,y,0
(2 _y 1/2,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m _x 0,y,z
(m _x 0,0,0) | (7) a _z (1/2,0,0) x,y,0
(m _z 1/2,0,0) | (8) a _y (1/2,0,0) x,0,z
(m _y 1/2,0,0) |

For 1' + set

- | | | | |
|---|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' _x x,0,0
(2' _x 0,0,0)' | (3) 2' _z 1/4,0,z
(2' _z 1/2,0,0)' | (4) 2' _y 1/4,y,0
(2' _y 1/2,0,0)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ 0,0,0)' | (6) m' _x 0,y,z
(m' _x 0,0,0)' | (7) a' _z (1/2,0,0) x,y,0
(m' _z 1/2,0,0)' | (8) a' _y (1/2,0,0) x,0,z
(m' _y 1/2,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	$1+$	$1'+$		
8 k $11'$	(1) $x,y,z [0,0,0]$ (5) $\bar{x},\bar{y},\bar{z} [0,0,0]$	(2) $x,\bar{y},\bar{z} [0,0,0]$ (6) $\bar{x},y,z [0,0,0]$	(3) $\bar{x}+1/2,\bar{y},z [0,0,0]$ (7) $x+1/2,y,\bar{z} [0,0,0]$	(4) $\bar{x}+1/2,y,\bar{z} [0,0,0]$ (8) $x+1/2,\bar{y},z [0,0,0]$
4 j $m..1'$	$0,y,z [0,0,0]$	$0,\bar{y},\bar{z} [0,0,0]$	$1/2,\bar{y},z [0,0,0]$	$1/2,y,\bar{z} [0,0,0]$
4 i $2..1'$	$x,1/2,0 [0,0,0]$	$\bar{x}+1/2,1/2,0 [0,0,0]$	$\bar{x},1/2,0 [0,0,0]$	$x+1/2,1/2,0 [0,0,0]$
4 h $2..1'$	$x,0,0 [0,0,0]$	$\bar{x}+1/2,0,0 [0,0,0]$	$\bar{x},0,0 [0,0,0]$	$x+1/2,0,0 [0,0,0]$
4 g $..21'$	$1/4,1/2,z [0,0,0]$	$1/4,1/2,\bar{z} [0,0,0]$	$3/4,1/2,\bar{z} [0,0,0]$	$3/4,1/2,z [0,0,0]$
4 f $..21'$	$1/4,0,z [0,0,0]$	$1/4,0,\bar{z} [0,0,0]$	$3/4,0,\bar{z} [0,0,0]$	$3/4,0,z [0,0,0]$
4 e $.2.1'$	$1/4,y,0 [0,0,0]$	$1/4,\bar{y},0 [0,0,0]$	$3/4,\bar{y},0 [0,0,0]$	$3/4,y,0 [0,0,0]$
2 d $2221'$	$1/4,1/2,0 [0,0,0]$	$1/4,1/2,0 [0,0,0]$		
2 c $2221'$	$1/4,0,0 [0,0,0]$	$3/4,0,0 [0,0,0]$		
2 b $2/m..1'$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		
2 a $2/m..1'$	$0,0,0 [0,0,0]$	$1/2,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p2mm1'$ $a^* = a/2$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2mm1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2mm1'$ $a^* = a/2$ Origin at $0,y,0$
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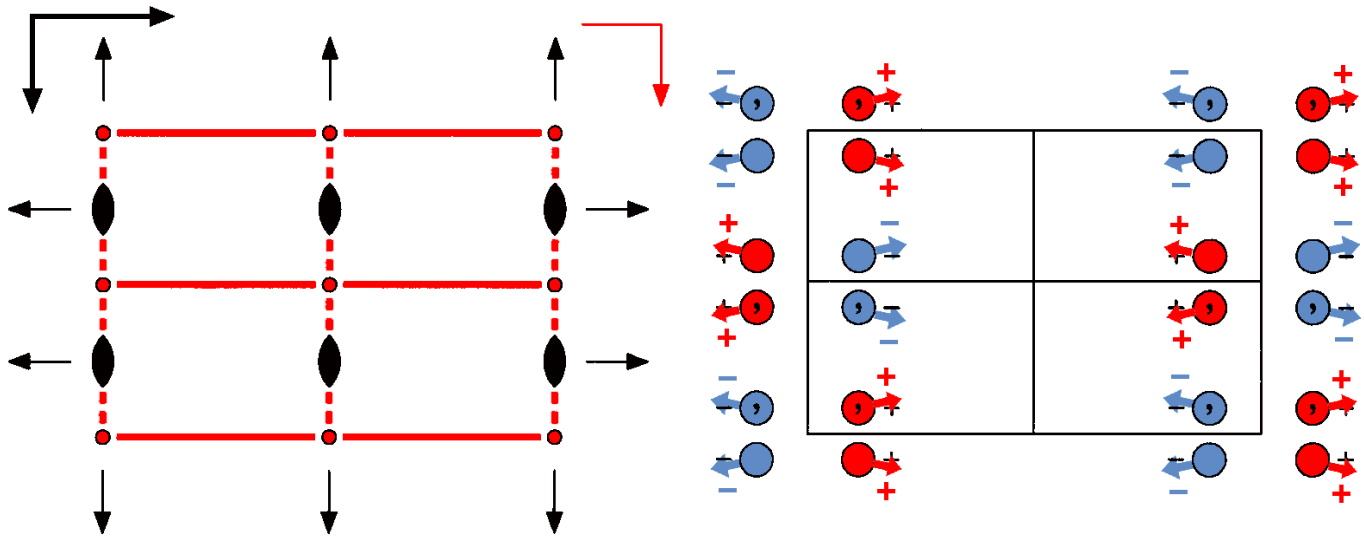
pm'a'a'

No. 38.3.245

m'm'm'

p2/m'2/a'2/a'

Orthorhombic/Rectangular



Origin at center (2/m') at 2/m'a'a'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2_x x,0,0
(2_x|0,0,0)

(3) 2_z 1/4,0,z
(2_z|1/2,0,0)

(4) 2_y 1/4,y,0
(2_y|1/2,0,0)

(5) $\bar{1}$ ' 0,0,0
($\bar{1}$ '|0,0,0)'

(6) m'_x 0,y,z
(m'_x|0,0,0)'

(7) a'_z (1/2,0,0) x,y,0
(m'_z|1/2,0,0)'

(8) a'_y (1/2,0,0) x,0,z
(m'_y|1/2,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) x,y,z̄ [ū,v,w̄]	(3) x̄+1/2,ȳ,z [ū,v,w]	(4) x̄+1/2,y,z̄ [ū,v,w̄]
8 k 1	(1) x,y,z [u,v,w]	(2) x,y,z̄ [ū,v,w̄]	(3) x̄+1/2,ȳ,z [ū,v,w]	(4) x̄+1/2,y,z̄ [ū,v,w̄]
	(5) x̄,ȳ,z̄ [ū,v,w̄]	(6) x̄,y,z [ū,v,w]	(7) x+1/2,y,z̄ [u,v,w̄]	(8) x+1/2,ȳ,z [u,v,w]
4 j m'..	0,y,z [0,v,w]	0,ȳ,z̄ [0,v̄,w̄]	1/2,ȳ,z [0,v̄,w]	1/2,y,z̄ [0,v,w̄]
4 i 2..	x,1/2,0 [u,0,0]	x̄+1/2,1/2,0 [ū,0,0]	x̄,1/2,0 [ū,0,0]	x+1/2,1/2,0 [u,0,0]
4 h 2..	x,0,0 [u,0,0]	x̄+1/2,0,0 [ū,0,0]	x̄,0,0 [ū,0,0]	x+1/2,0,0 [u,0,0]
4 g ..2	1/4,1/2,z [0,0,w]	1/4,1/2,z̄ [0,0,w̄]	3/4,1/2,z̄ [0,0,w̄]	3/4,1/2,z [0,0,w]
4 f ..2	1/4,0,z [0,0,w]	1/4,0,z̄ [0,0,w̄]	3/4,0,z̄ [0,0,w̄]	3/4,0,z [0,0,w]
4 e .2.	1/4,y,0 [0,v,0]	1/4,ȳ,0 [0,v̄,0]	3/4,ȳ,0 [0,v̄,0]	3/4,y,0 [0,v,0]
2 d 222	1/4,1/2,0 [0,0,0]	3/4,1/2,0 [0,0,0]		
2 c 222	1/4,0,0 [0,0,0]	3/4,0,0 [0,0,0]		
2 b 2/m'..	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]		
2 a 2/m'..	0,0,0 [0,0,0]	1/2,0,0 [0,0,0]		

Symmetry of special projections

Along [001] p2m'm'
a* = a/2 b* = b
Origin at 0,0,z

Along [100] p2m'm'
a* = b
Origin at x,0,0

Along [010] p2m'm'
a* = a/2
Origin at 0,y,0

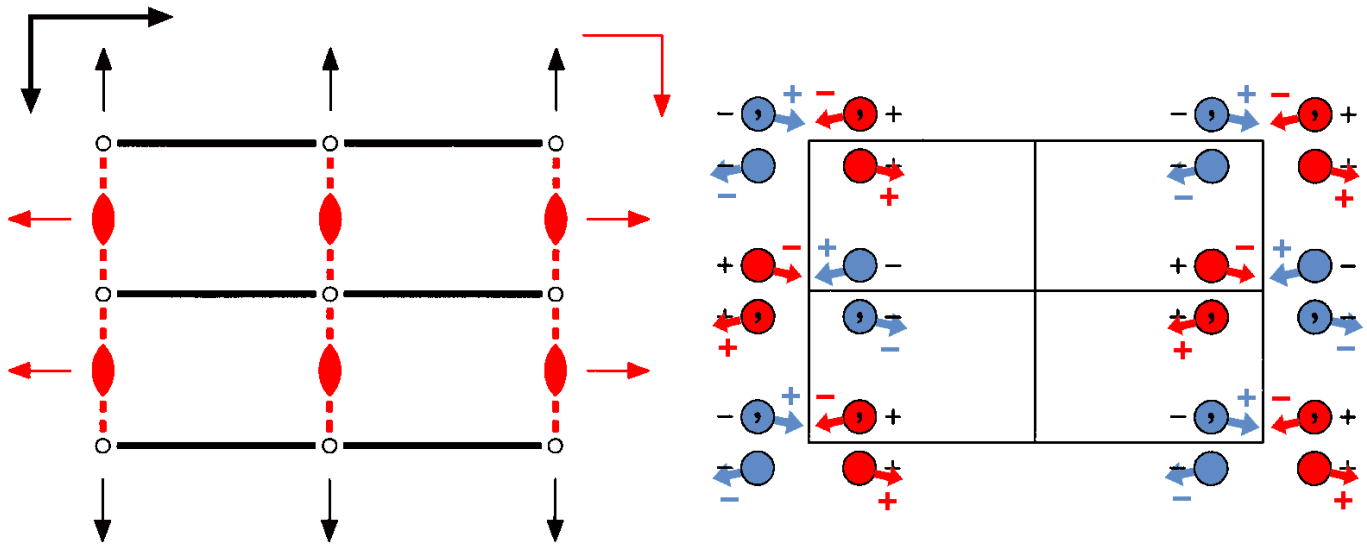
pma'a'

No. 38.4.246

mm'm'

p2/m2'/a2'/a'

Orthorhombic/Rectangular



Origin at center (2/m) at 2/ma'a'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2_x x,0,0
(2_x|0,0,0)

(3) 2'_z 1/4,0,z
(2'_z|1/2,0,0)'

(4) 2'_y 1/4,y,0
(2'_y|1/2,0,0)'

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) m 0,y,z
(m_x|0,0,0)

(7) a'_z (1/2,0,0) x,y,0
(m_z|1/2,0,0)'

(8) a'_y (1/2,0,0) x,0,z
(m_y|1/2,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

		Coordinates			
Multiplicity, Wyckoff letter, Site symmetry					
8 k 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]	(3) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]	(4) $\bar{x}+1/2,y,\bar{z}$ [u, \bar{v} ,w]	
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) \bar{x},y,z [u, \bar{v} , \bar{w}]	(7) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]	(8) $x+1/2,\bar{y},z$ [u, \bar{v} ,w]	
4 j m..	$0,y,z$ [u,0,0]	$0,\bar{y},\bar{z}$ [u,0,0]	$1/2,\bar{y},z$ [u,0,0]	$1/2,y,\bar{z}$ [u,0,0]	
4 i 2..	$x,1/2,0$ [u,0,0]	$\bar{x}+1/2,1/2,0$ [u,0,0]	$\bar{x},1/2,0$ [u,0,0]	$x+1/2,1/2,0$ [u,0,0]	
4 h 2..	$x,0,0$ [u,0,0]	$\bar{x}+1/2,0,0$ [u,0,0]	$\bar{x},0,0$ [u,0,0]	$x+1/2,0,0$ [u,0,0]	
4 g ..2'	$1/4,1/2,z$ [u,v,0]	$1/4,1/2,\bar{z}$ [u, \bar{v} ,0]	$3/4,1/2,\bar{z}$ [u,v,0]	$3/4,1/2,z$ [u, \bar{v} ,0]	
4 f ..2'	$1/4,0,z$ [u,v,0]	$1/4,0,\bar{z}$ [u, \bar{v} ,0]	$3/4,0,\bar{z}$ [u,v,0]	$3/4,0,z$ [u, \bar{v} ,0]	
4 e .2'	$1/4,y,0$ [u,0,w]	$1/4,\bar{y},0$ [u,0, \bar{w}]	$3/4,\bar{y},0$ [u,0,w]	$3/4,y,0$ [u,0, \bar{w}]	
2 d 22'2'	$1/4,1/2,0$ [u,0,0]	$3/4,1/2,0$ [u,0,0]			
2 c 22'2'	$1/4,0,0$ [u,0,0]	$3/4,0,0$ [u,0,0]			
2 b 2/m..	$0,1/2,0$ [u,0,0]	$1/2,1/2,0$ [u,0,0]			
2 a 2/m..	$0,0,0$ [u,0,0]	$1/2,0,0$ [u,0,0]			

Symmetry of special projections

Along [001] $p2'mm'$
 $a^* = a/2$ $b^* = b$
 Origin at 0,0,z

Along [100] $p2mm1'$
 $a^* = b$
 Origin at x,0,0

Along [010] $p2'mm'$
 $a^* = a/2$
 Origin at 0,y,0

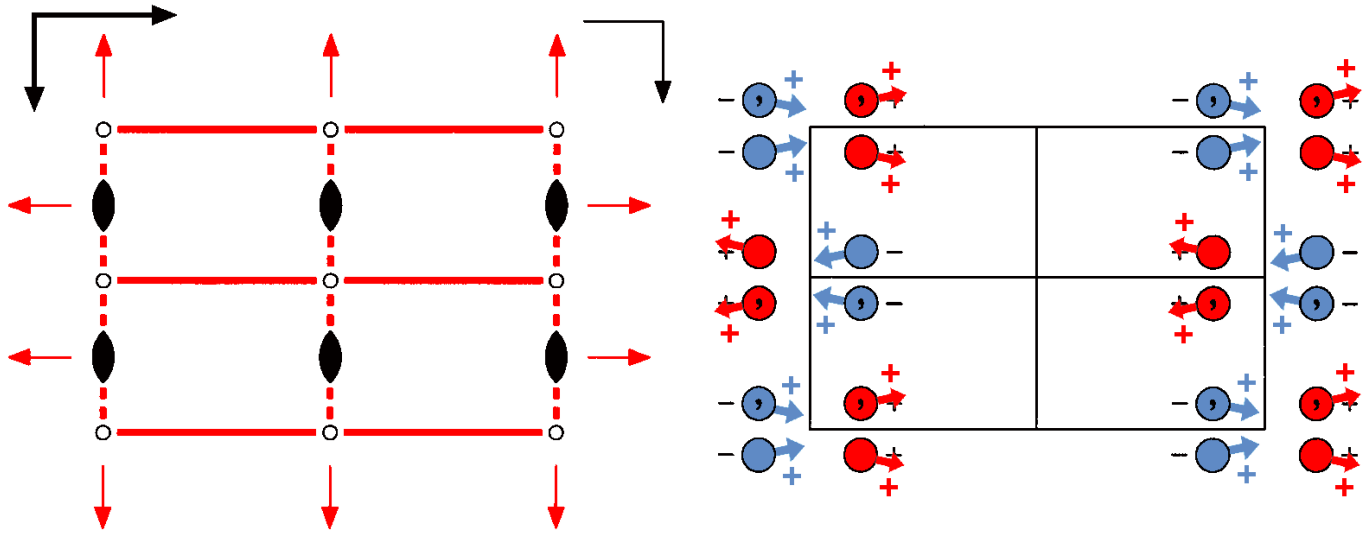
pm'a'a

No. 38.5.247

m'm'm

p2'/m'2'/a'2/a

Orthorhombic/Rectangular



Origin at center ($2'/m'$) at $2'/m'a'a$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'_x$ x,0,0
(2_x |0,0,0)'

(3) $2'_z$ 1/4,0,z
(2_z |1/2,0,0)

(4) $2'_y$ 1/4,y,0
(2_y |1/2,0,0)'

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) m'_x 0,y,z
(m_x |0,0,0)'

(7) a'_x (1/2,0,0) x,y,0
(m_z |1/2,0,0)

(8) a'_y (1/2,0,0) x,0,z
(m_y |1/2,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u},v,w]	(3) $\bar{x}+1/2,\bar{y},z$ [\bar{u},\bar{v},w]	(4) $\bar{x}+1/2,y,\bar{z}$ [u, \bar{v},w]
8 k 1	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) \bar{x},y,z [\bar{u},v,w]	(7) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]	(8) $x+1/2,\bar{y},z$ [u, \bar{v},w]
4 j m'..	0,y,z [0,v,w]	0, \bar{y},\bar{z} [0,v,w]	1/2, \bar{y},z [0, \bar{v},w]	1/2,y, \bar{z} [0, \bar{v},w]
4 i 2'..	x,1/2,0 [0,v,w]	$\bar{x}+1/2,1/2,0$ [0, \bar{v},w]	$\bar{x},1/2,0$ [0,v,w]	$x+1/2,1/2,0$ [0, \bar{v},w]
4 h 2'..	x,0,0 [0,v,w]	$\bar{x}+1/2,0,0$ [0, \bar{v},w]	$\bar{x},0,0$ [0,v,w]	$x+1/2,0,0$ [0, \bar{v},w]
4 g ..2	1/4,1/2,z [0,0,w]	1/4,1/2, \bar{z} [0,0,w]	3/4,1/2, \bar{z} [0,0,w]	3/4,1/2,z [0,0,w]
4 f ..2	1/4,0,z [0,0,w]	1/4,0, \bar{z} [0,0,w]	3/4,0, \bar{z} [0,0,w]	3/4,0,z [0,0,w]
4 e .2'	1/4,y,0 [u,0,w]	1/4, $\bar{y},0$ [$\bar{u},0,w$]	3/4, $\bar{y},0$ [u,0,w]	3/4,y,0 [$\bar{u},0,w$]
2 d 2'2'2	1/4,1/2,0 [0,0,w]	3/4,1/2,0 [0,0,w]		
2 c 2'2'2	1/4,0,0 [0,0,w]	3/4,0,0 [0,0,w]		
2 b 2'/m'..	0,1/2,0 [0,v,w]	1/2,1/2,0 [0, \bar{v},w]		
2 a 2'/m'..	0,0,0 [0,v,w]	1/2,0,0 [0, \bar{v},w]		

Symmetry of special projections

Along [001] $p_{2a^*}2mm$ $a^* = a/2$ $b^* = b$ Origin at 1/4,0,z	Along [100] $p2'm'm$ $a^* = b$ Origin at x,0,0	Along [010] $p2'm'm$ $a^* = a/2$ Origin at 0,y,0
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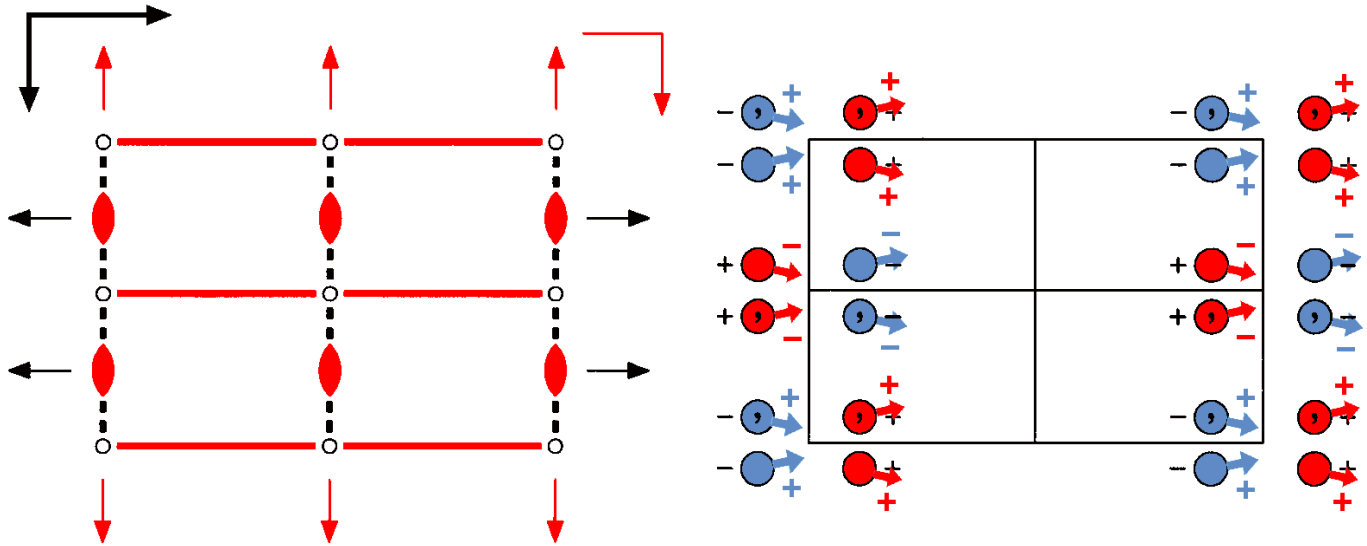
pm'aa'

No. 38.6.248

m'mm'

p2'/m'2/a2'/a'

Orthorhombic/Rectangular



Origin at center ($2'/m'$) at $2'/m'aa'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'_x$ x,0,0
(2_x |0,0,0)'

(3) $2'_z$ 1/4,0,z
(2_z |1/2,0,0)'

(4) $2'_y$ 1/4,y,0
(2_y |1/2,0,0)

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) m'_x 0,y,z
(m_x |0,0,0)'

(7) a'_x (1/2,0,0) x,y,0
(m_z |1/2,0,0)'

(8) a'_y (1/2,0,0) x,0,z
(m_y |1/2,0,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u},v,w]	(3) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]	(4) $\bar{x}+1/2,y,\bar{z}$ [\bar{u},v,\bar{w}]
8 k 1	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) \bar{x},y,z [\bar{u},v,w]	(7) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]	(8) $x+1/2,\bar{y},z$ [\bar{u},v,\bar{w}]
4 j m'..	0,y,z [0,v,w]	0, \bar{y},\bar{z} [0,v,w]	1/2, \bar{y},z [0,v, \bar{w}]	1/2,y, \bar{z} [0,v, \bar{w}]
4 i 2'..	x,1/2,0 [0,v,w]	$\bar{x}+1/2,1/2,0$ [0,v, \bar{w}]	$\bar{x},1/2,0$ [0,v,w]	$x+1/2,1/2,0$ [0,v, \bar{w}]
4 h 2'..	x,0,0 [0,v,w]	$\bar{x}+1/2,0,0$ [0,v, \bar{w}]	$\bar{x},0,0$ [0,v,w]	$x+1/2,0,0$ [0,v, \bar{w}]
4 g ..2'	1/4,1/2,z [u,v,0]	1/4,1/2, \bar{z} [$\bar{u},v,0$]	3/4,1/2, \bar{z} [u,v,0]	3/4,1/2,z [$\bar{u},v,0$]
4 f ..2'	1/4,0,z [u,v,0]	1/4,0, \bar{z} [$\bar{u},v,0$]	3/4,0, \bar{z} [u,v,0]	3/4,0,z [$\bar{u},v,0$]
4 e .2.	1/4,y,0 [0,v,0]	1/4, $\bar{y},0$ [0,v,0]	3/4, $\bar{y},0$ [0,v,0]	3/4,y,0 [0,v,0]
2 d 2'22'	1/4,1/2,0 [0,v,0]	3/4,1/2,0 [0,v,0]		
2 c 2'22'	1/4,0,0 [0,v,0]	3/4,0,0 [0,v,0]		
2 b 2'/m'..	0,1/2,0 [0,v,w]	1/2,1/2,0 [0,v, \bar{w}]		
2 a 2'/m'..	0,0,0 [0,v,w]	1/2,0,0 [0,v, \bar{w}]		

Symmetry of special projections

Along [001] $p_{2a^*}2m'm'$ $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] $p2mm$ $a^* = b$ Origin at x,0,0	Along [010] $p_{2a^*}2m'm'$ $a^* = a/2$ Origin at 0,y,0
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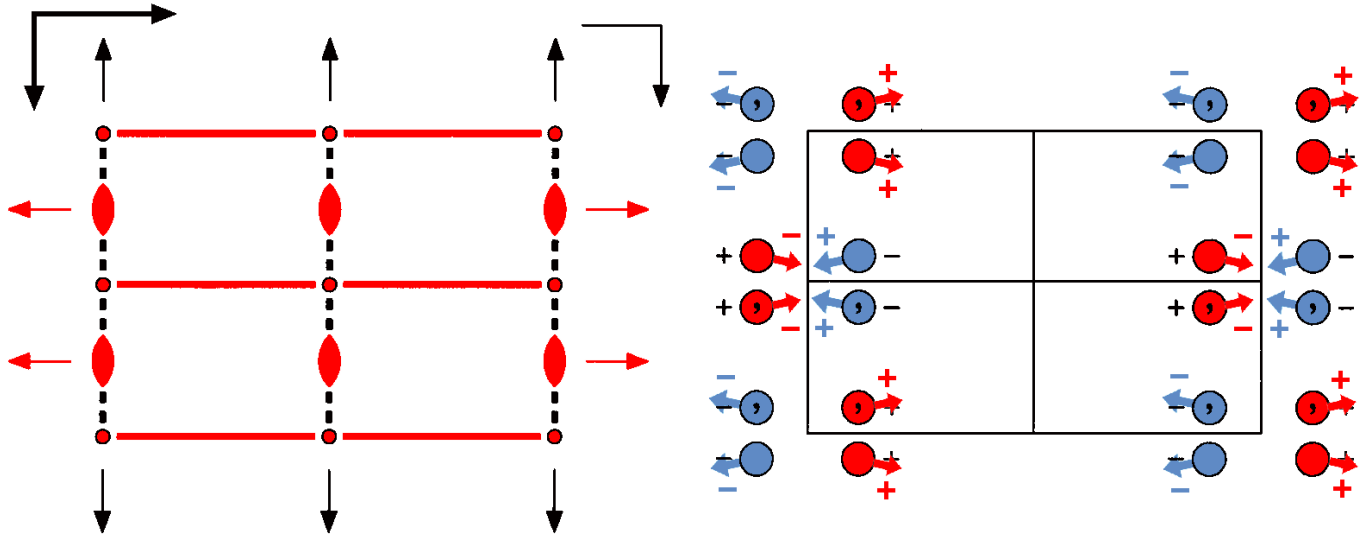
pm'aa

No. 38.7.249

m'mm

p2/m'2'/a2'/a

Orthorhombic/Rectangular



Origin at center ($2/m'$) at $2/m'aa$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $x,0,0$
($2_x|0,0,0$)

(3) 2' $1/4,0,z$
($2_z|1/2,0,0$)'

(4) 2' $1/4,y,0$
($2_y|1/2,0,0$)'

(5) $\bar{1}$ $0,0,0$
($\bar{1}|0,0,0$)'

(6) m' $0,y,z$
($m_x|0,0,0$)'

(7) a $(1/2,0,0)$ $x,y,0$
($m_z|1/2,0,0$)

(8) a $(1/2,0,0)$ $x,0,z$
($m_y|1/2,0,0$)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]	(3) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]	(4) $\bar{x}+1/2,y,\bar{z}$ [u, \bar{v} ,w]
8 k 1	(5) \bar{x},\bar{y},\bar{z} [\bar{u} , \bar{v} , \bar{w}]	(6) \bar{x},y,z [\bar{u} ,v,w]	(7) $x+1/2,y,\bar{z}$ [\bar{u} , \bar{v} ,w]	(8) $x+1/2,\bar{y},z$ [\bar{u} ,v, \bar{w}]
4 j m'..	0,y,z [0,v,w]	0, \bar{y},\bar{z} [0, \bar{v} , \bar{w}]	1/2, \bar{y},z [0,v, \bar{w}]	1/2,y, \bar{z} [0, \bar{v} ,w]
4 i 2..	x,1/2,0 [u,0,0]	$\bar{x}+1/2,1/2,0$ [u,0,0]	$\bar{x},1/2,0$ [\bar{u} ,0,0]	$x+1/2,1/2,0$ [\bar{u} ,0,0]
4 h 2..	x,0,0 [u,0,0]	$\bar{x}+1/2,0,0$ [u,0,0]	$\bar{x},0,0$ [\bar{u} ,0,0]	$x+1/2,0,0$ [\bar{u} ,0,0]
4 g ..2'	1/4,1/2,z [u,v,0]	1/4,1/2, \bar{z} [u, \bar{v} ,0]	3/4,1/2, \bar{z} [\bar{u} , \bar{v} ,0]	3/4,1/2,z [\bar{u} ,v,0]
4 f ..2'	1/4,0,z [u,v,0]	1/4,0, \bar{z} [u, \bar{v} ,0]	3/4,0, \bar{z} [\bar{u} , \bar{v} ,0]	3/4,0,z [\bar{u} ,v,0]
4 e .2'	1/4,y,0 [u,0,w]	1/4, $\bar{y},0$ [u,0, \bar{w}]	3/4, $\bar{y},0$ [\bar{u} ,0, \bar{w}]	3/4,y,0 [\bar{u} ,0,w]
2 d 22'2'	1/4,1/2,0 [u,0,0]	3/4,1/2,0 [\bar{u} ,0,0]		
2 c 22'2'	1/4,0,0 [u,0,0]	3/4,0,0 [\bar{u} ,0,0]		
2 b 2/m'..	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]		
2 a 2/m'..	0,0,0 [0,0,0]	1/2,0,0 [0,0,0]		

Symmetry of special projections

Along [001] $p_{2a^*}2m'm'$ $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] $p2mm$ $a^* = b$ Origin at x,0,0	Along [010] $p_{2a^*}2m'm'$ $a^* = a/2$ Origin at 0,y,0
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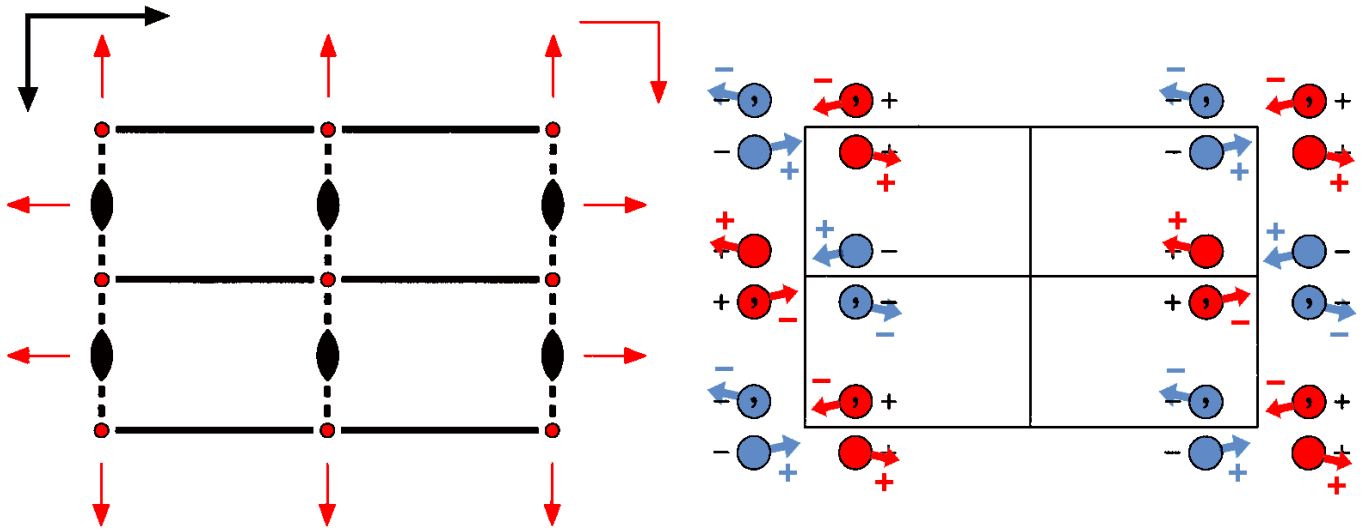
pmaa'

No. 38.8.250

mmm'

p2'/m2'/a2/a'

Orthorhombic/Rectangular



Origin at center ($2'/m$) at $2'/maa'$

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'_x$ x,0,0
(2_x |0,0,0)'

(3) $2'_z$ 1/4,0,z
(2_z |1/2,0,0)

(4) $2'_y$ 1/4,y,0
(2_y |1/2,0,0)'

(5) $\bar{1}'$ 0,0,0
($\bar{1}$ |0,0,0)'

(6) m 0,y,z
(m_x |0,0,0)

(7) a'_z (1/2,0,0) x,y,0
(m_z |1/2,0,0)'

(8) a'_y (1/2,0,0) x,0,z
(m_y |1/2,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u},v,w]	(3) $\bar{x}+1/2,\bar{y},z$ [\bar{u},\bar{v},w]	(4) $\bar{x}+1/2,y,\bar{z}$ [u,\bar{v},w]
8 k 1	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) \bar{x},y,z [u,\bar{v},\bar{w}]	(7) $x+1/2,y,\bar{z}$ [u,v,\bar{w}]	(8) $x+1/2,\bar{y},z$ [\bar{u},v,\bar{w}]
4 j m..	$0,y,z$ [$u,0,0$]	$0,\bar{y},\bar{z}$ [$\bar{u},0,0$]	$1/2,\bar{y},z$ [$\bar{u},0,0$]	$1/2,y,\bar{z}$ [$u,0,0$]
4 i 2'..	$x,1/2,0$ [$0,v,w$]	$\bar{x}+1/2,1/2,0$ [$0,\bar{v},w$]	$\bar{x},1/2,0$ [$0,\bar{v},\bar{w}$]	$x+1/2,1/2,0$ [$0,v,\bar{w}$]
4 h 2'..	$x,0,0$ [$0,v,w$]	$\bar{x}+1/2,0,0$ [$0,\bar{v},w$]	$\bar{x},0,0$ [$0,\bar{v},\bar{w}$]	$x+1/2,0,0$ [$0,v,\bar{w}$]
4 g ..2	$1/4,1/2,z$ [$0,0,w$]	$1/4,1/2,\bar{z}$ [$0,0,w$]	$3/4,1/2,\bar{z}$ [$0,0,\bar{w}$]	$3/4,1/2,z$ [$0,0,\bar{w}$]
4 f ..2	$1/4,0,z$ [$0,0,w$]	$1/4,0,\bar{z}$ [$0,0,w$]	$3/4,0,\bar{z}$ [$0,0,\bar{w}$]	$3/4,0,z$ [$0,0,\bar{w}$]
4 e .2'	$1/4,y,0$ [$u,0,w$]	$1/4,\bar{y},0$ [$\bar{u},0,w$]	$3/4,\bar{y},0$ [$\bar{u},0,\bar{w}$]	$3/4,y,0$ [$u,0,\bar{w}$]
2 d 2'2'	$1/4,1/2,0$ [$0,0,w$]	$3/4,1/2,0$ [$0,0,\bar{w}$]		
2 c 2'2'	$1/4,0,0$ [$0,0,w$]	$3/4,0,0$ [$0,0,\bar{w}$]		
2 b 2'/m..	$0,1/2,0$ [$0,0,0$]	$1/2,1/2,0$ [$0,0,0$]		
2 a 2'/m..	$0,0,0$ [$0,0,0$]	$1/2,0,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $p2mm$
 $a^* = a/2$ $b^* = b$
 Origin at $0,0,z$

Along [100] $p2mm1'$
 $a^* = b$
 Origin at $x,0,0$

Along [010] $p2mm1'$
 $a^* = a/2$
 Origin at $0,y,0$

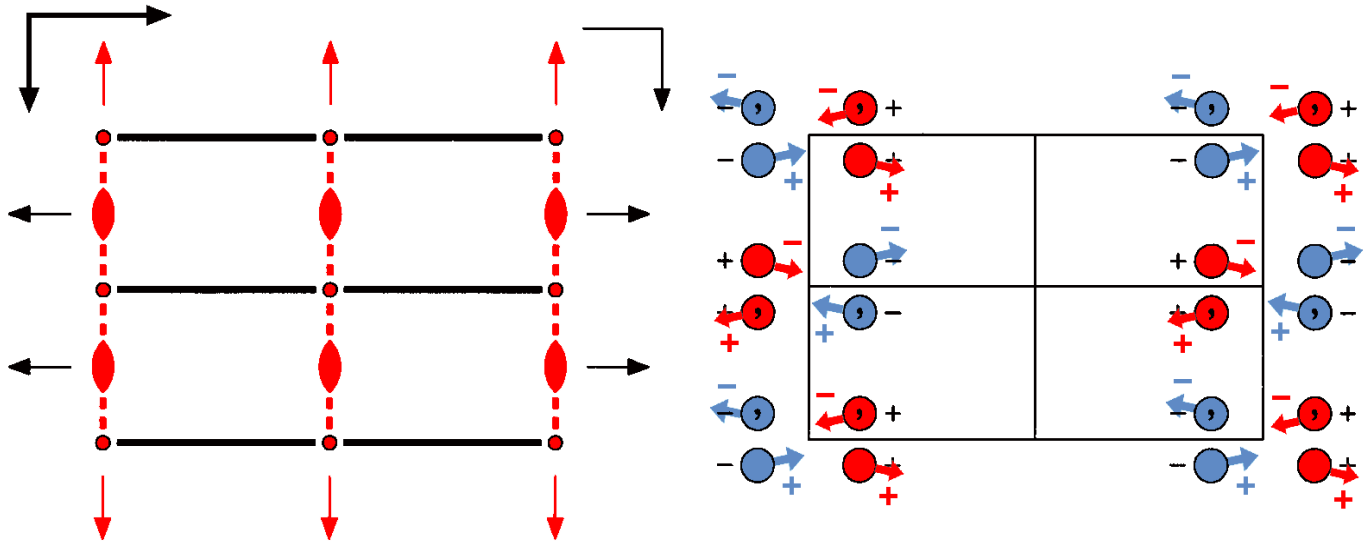
pma'a

No. 38.9.251

mm'm

p2'/m2/a'2'/a

Orthorhombic/Rectangular



Origin at center ($2'/m$) at $2'/ma'a$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'_x$ x,0,0
(2_x |0,0,0)'

(3) $2'_z$ 1/4,0,z
(2_z |1/2,0,0)'

(4) $2'_y$ 1/4,y,0
(2_y |1/2,0,0)

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)'

(6) m 0,y,z
(m_x |0,0,0)

(7) a (1/2,0,0) x,y,0
(m_z |1/2,0,0)

(8) a' (1/2,0,0) x,0,z
(m_y |1/2,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 k 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u},v,w]	(3) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]	(4) $\bar{x}+1/2,y,\bar{z}$ [\bar{u},v,\bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) \bar{x},y,z [u, \bar{v},\bar{w}]	(7) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]	(8) $x+1/2,\bar{y},z$ [u, \bar{v},w]
4 j m..	$0,y,z$ [u,0,0]	$0,\bar{y},\bar{z}$ [$\bar{u},0,0$]	$1/2,\bar{y},z$ [u,0,0]	$1/2,y,\bar{z}$ [$\bar{u},0,0$]
4 i 2'..	$x,1/2,0$ [0,v,w]	$\bar{x}+1/2,1/2,0$ [0,v, \bar{w}]	$\bar{x},1/2,0$ [0, \bar{v},\bar{w}]	$x+1/2,1/2,0$ [0, \bar{v},w]
4 h 2'..	$x,0,0$ [0,v,w]	$\bar{x}+1/2,0,0$ [0,v, \bar{w}]	$\bar{x},0,0$ [0, \bar{v},\bar{w}]	$x+1/2,0,0$ [0, \bar{v},w]
4 g ..2'	$1/4,1/2,z$ [u,v,0]	$1/4,1/2,\bar{z}$ [$\bar{u},v,0$]	$3/4,1/2,\bar{z}$ [$\bar{u},\bar{v},0$]	$3/4,1/2,z$ [u, $\bar{v},0$]
4 f ..2'	$1/4,0,z$ [u,v,0]	$1/4,0,\bar{z}$ [$\bar{u},v,0$]	$3/4,0,\bar{z}$ [$\bar{u},\bar{v},0$]	$3/4,0,z$ [u, $\bar{v},0$]
4 e .2.	$1/4,y,0$ [0,v,0]	$1/4,\bar{y},0$ [0,v,0]	$3/4,\bar{y},0$ [0, $\bar{v},0$]	$3/4,y,0$ [0, $\bar{v},0$]
2 d 2'22'	$1/4,1/2,0$ [0,v,0]	$3/4,1/2,0$ [0, $\bar{v},0$]		
2 c 2'22'	$1/4,0,0$ [0,v,0]	$3/4,0,0$ [0, $\bar{v},0$]		
2 b 2'/m..	$0,1/2,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]		
2 a 2'/m..	$0,0,0$ [0,0,0]	$1/2,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] $p_{2a^*}2mm$ $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] $p2mm1'$ $a^* = b$ Origin at x,0,0	Along [010] $p2m'm'$ $a^* = a/2$ Origin at 1/4,y,0
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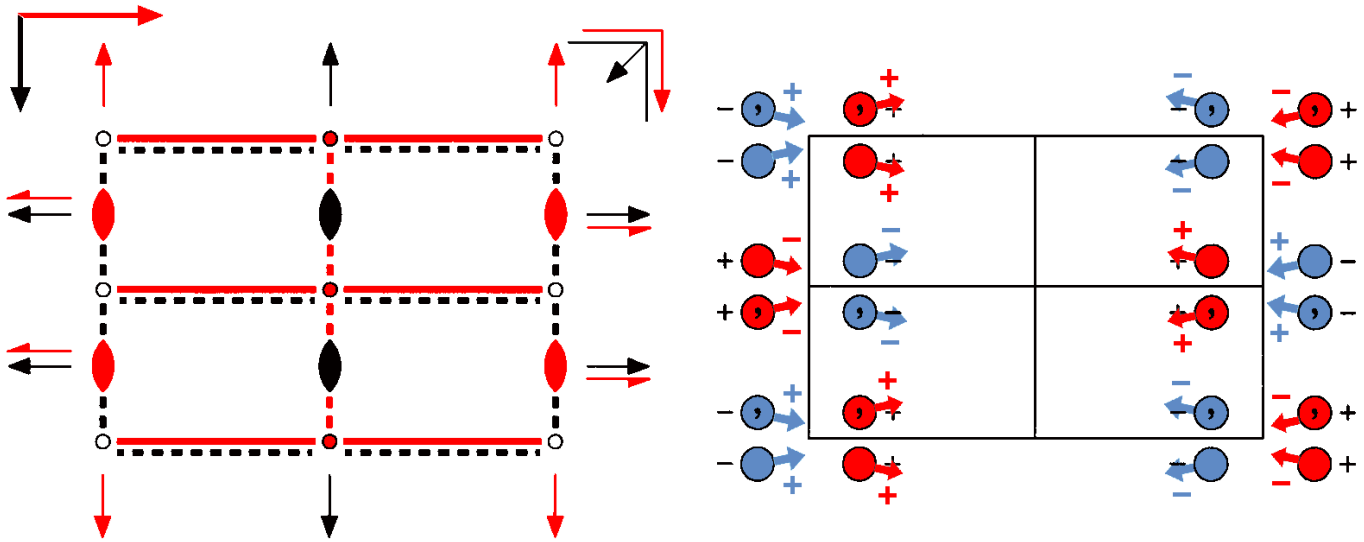
$p_{2b} m'aa'$

No. 38.10.252

$mmm1'$

$p_{2b} 2'/m'2/a2'/a'$

Orthorhombic/Rectangular



Origin at center ($2'/m'$) at $2'/m'aa'$

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1/2$; $0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) $2'_x$ $x,0,0$
(2_x 0,0,0)' | (3) $2'_z$ $1/4,0,z$
(2_z $1/2,0,0$)' | (4) $2'_y$ $1/4,y,0$
(2_y $1/2,0,0$)' |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (6) m'_x $0,y,z$
(m_x 0,0,0)' | (7) a'_z $(1/2,0,0)$ $x,y,0$
(m_z $1/2,0,0$)' | (8) a'_y $(1/2,0,0)$ $x,0,z$
(m_y $1/2,0,0$)' |

For $(0,1,0)$ ' + set

- | | | | |
|---|---|--|--|
| (1) t'_x $(0,1,0)$
(1 0,1,0)' | (2) $2'_x$ $x,1/2,0$
(2_x 0,1,0) | (3) $2'_z$ $1/4,1/2,z$
(2_z $1/2,1,0$)' | (4) $2'_y$ $(0,1,0)$ $1/4,y,0$
(2_y $1/2,1,0$)' |
| (5) $\bar{1}$ $0,1/2,0$
($\bar{1}$ 0,1,0)' | (6) b'_x $(0,1,0)$ $0,y,z$
(m_x 0,1,0) | (7) n'_z $(1/2,1,0)$ $x,y,0$
(m_z $1/2,1,0$)' | (8) a'_y $(1/2,0,0)$ $x,1/2,z$
(m_y $1/2,1,0$)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(0,1,0)'		
8 k 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u},v,w]	(3) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]	(4) $\bar{x}+1/2,y,\bar{z}$ [\bar{u},v,\bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) \bar{x},y,z [\bar{u},v,w]	(7) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]	(8) $x+1/2,\bar{y},z$ [\bar{u},v,\bar{w}]
4 j m'..	0,y,z [0,v,w]	0, \bar{y},\bar{z} [0,v,w]	1/2, \bar{y},z [0,v, \bar{w}]	1/2,y, \bar{z} [0,v, \bar{w}]
4 i 2..	x,1/2,0 [u,0,0]	$\bar{x}+1/2,1/2,0$ [$\bar{u},0,0$]	$\bar{x},1/2,0$ [$\bar{u},0,0$]	$x+1/2,1/2,0$ [u,0,0]
4 h 2'..	x,0,0 [0,v,w]	$\bar{x}+1/2,0,0$ [0,v, \bar{w}]	$\bar{x},0,0$ [0,v,w]	$x+1/2,0,0$ [0,v, \bar{w}]
4 g ..2	1/4,1/2,z [0,0,w]	1/4,1/2, \bar{z} [0,0, \bar{w}]	3/4,1/2, \bar{z} [0,0, \bar{w}]	3/4,1/2,z [0,0,w]
4 f ..2'	1/4,0,z [u,v,0]	1/4,0, \bar{z} [$\bar{u},v,0$]	3/4,0, \bar{z} [u,v,0]	3/4,0,z [$\bar{u},v,0$]
4 e .2.	1/4,y,0 [0,v,0]	1/4, $\bar{y},0$ [0,v,0]	3/4, $\bar{y},0$ [0,v,0]	3/4,y,0 [0,v,0]
2 d 222	1/4,1/2,0 [0,0,0]	3/4,1/2,0 [0,0,0]		
2 c 2'22'	1/4,0,0 [0,v,0]	3/4,0,0 [0,v,0]		
2 b 2/m'..	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]		
2 a 2'/m'..	0,0,0 [0,v,w]	1/2,0,0 [0,v, \bar{w}]		

Symmetry of special projections

Along [001] $p_{2a} \cdot 2'm'm$ Along [100] $p_{2a} \cdot 2m'm'$ Along [010] $p2mm1'$
 $a^* = b$ $b^* = -a/2$ $a^* = b$ $a^* = a/2$
Origin at 0,0,z Origin at x,1/2,0 Origin at 0,y,0

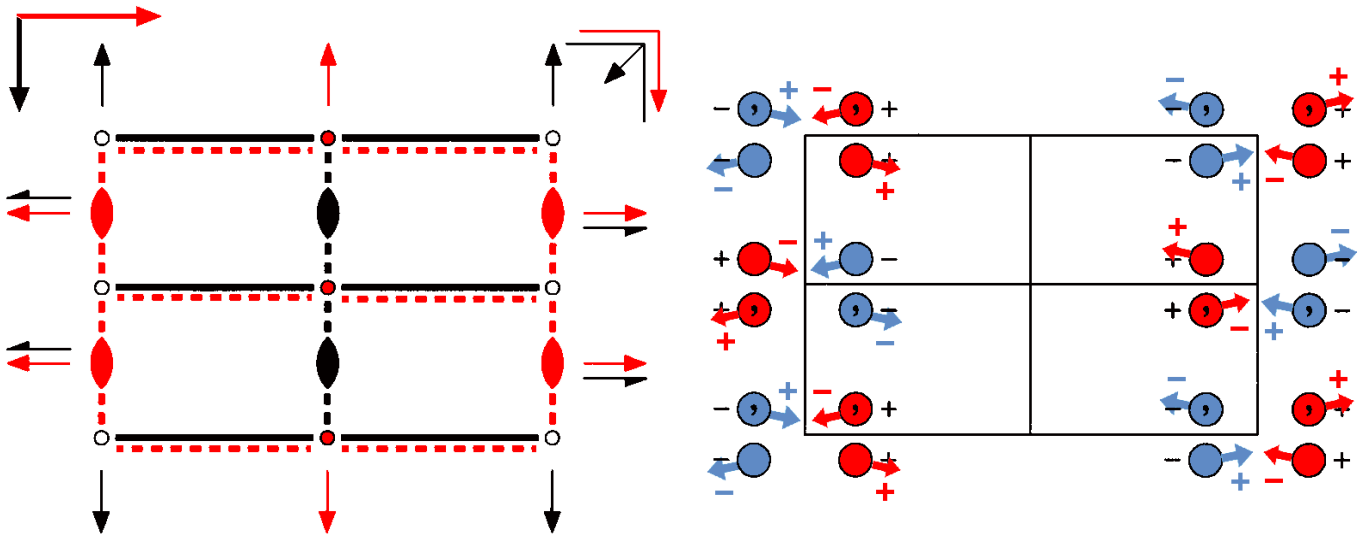
$p_{2b} ma'a'$

No. 38.11.253

$mmm1'$

$p_{2b} 2/m2'/a'2'/a'$

Orthorhombic/Rectangular



Origin at center ($2/m$) at $2/ma'a'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)^+$ set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $x,0,0$
(2 _x 0,0,0) | (3) 2' $1/4,0,z$
(2 _z 1/2,0,0)' | (4) 2' $1/4,y,0$
(2 _y 1/2,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m $0,y,z$
(m _x 0,0,0) | (7) a' $(1/2,0,0)$ $x,y,0$
(m _z 1/2,0,0)' | (8) a' $(1/2,0,0)$ $x,0,z$
(m _y 1/2,0,0)' |

For $(0,1,0)^+$ set

- | | | | |
|--|--|--|--|
| (1) t' $(0,1,0)$
(1 0,1,0)' | (2) 2' $x,1/2,0$
(2 _x 0,1,0)' | (3) 2 $1/4,1/2,z$
(2 _z 1/2,1,0) | (4) 2 $(0,1,0)$ $1/4,y,0$
(2 _y 1/2,1,0) |
| (5) $\bar{1}$ ' $0,1/2,0$
($\bar{1}$ ' 0,1,0)' | (6) b' $(0,1,0)$ $0,y,z$
(m _x 0,1,0)' | (7) n $(1/2,1,0)$ $x,y,0$
(m _z 1/2,1,0) | (8) a $(1/2,0,0)$ $x,1/2,z$
(m _y 1/2,1,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(0,1,0)'		
8 k 1	(1) x,y,z [u,v,w]	(2) x,\bar{y},\bar{z} [u, \bar{v} , \bar{w}]	(3) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]	(4) $\bar{x}+1/2,y,\bar{z}$ [u, \bar{v} ,w]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) \bar{x},y,z [u, \bar{v} , \bar{w}]	(7) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]	(8) $x+1/2,\bar{y},z$ [u, \bar{v} ,w]
4 j m..	$0,y,z$ [u,0,0]	$0,\bar{y},\bar{z}$ [u,0,0]	$1/2,\bar{y},z$ [u,0,0]	$1/2,y,\bar{z}$ [u,0,0]
4 i 2'..	$x,1/2,0$ [0,v,w]	$\bar{x}+1/2,1/2,0$ [0, \bar{v} ,w]	$\bar{x},1/2,0$ [0, \bar{v} , \bar{w}]	$x+1/2,1/2,0$ [0,v, \bar{w}]
4 h 2..	$x,0,0$ [u,0,0]	$\bar{x}+1/2,0,0$ [u,0,0]	$\bar{x},0,0$ [u,0,0]	$x+1/2,0,0$ [u,0,0]
4 g ..2	$1/4,1/2,z$ [0,0,w]	$1/4,1/2,\bar{z}$ [0,0,w]	$3/4,1/2,\bar{z}$ [0,0, \bar{w}]	$3/4,1/2,z$ [0,0, \bar{w}]
4 f ..2'	$1/4,0,z$ [u,v,0]	$1/4,0,\bar{z}$ [u, \bar{v} ,0]	$3/4,0,\bar{z}$ [u,v,0]	$3/4,0,z$ [u, \bar{v} ,0]
4 e .2'	$1/4,y,0$ [u,0,w]	$1/4,\bar{y},0$ [u,0, \bar{w}]	$3/4,\bar{y},0$ [u,0,w]	$3/4,y,0$ [u,0, \bar{w}]
2 d 2'2'	$1/4,1/2,0$ [0,0,w]	$3/4,1/2,0$ [0,0, \bar{w}]		
2 c 22'2'	$1/4,0,0$ [u,0,0]	$3/4,0,0$ [u,0,0]		
2 b 2'/m..	$0,1/2,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]		
2 a 2/m..	$0,0,0$ [u,0,0]	$1/2,0,0$ [u,0,0]		

Symmetry of special projections

Along [001] $p_{2a} \cdot 2mm$	Along [100] $p2mm1'$	Along [010] $p2mm1'$
$a^* = b$ $a^* = -a/2$	$a^* = b$	$a^* = a/2$
Origin at $0,1/2,z$	Origin at $x,0,0$	Origin at $0,y,0$

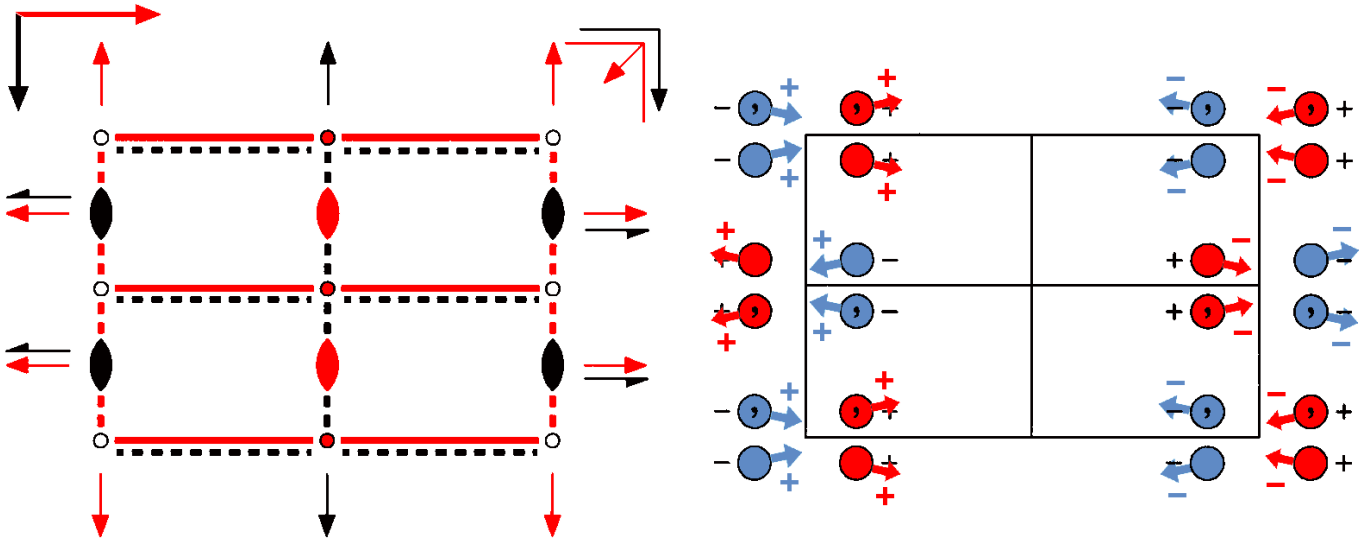
$p_{2b} m'a'a$

No. 38.12.254

$mmm1'$

$p_{2b} 2'/m'2'/a'2/a$

Orthorhombic/Rectangular



Origin at center ($2'/m'$) at $2'/m'a'a$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--------------------------------------|--|--|
| (1) 1
(1 0,0,0) | (2) $2' \ x,0,0$
($2_x 0,0,0$)' | (3) $2 \ 1/4,0,z$
($2_z 1/2,0,0$) | (4) $2' \ 1/4,y,0$
($2_y 1/2,0,0$)' |
| (5) $\bar{1} \ 0,0,0$
($\bar{1} 0,0,0$) | (6) $m' \ 0,y,z$
($m_x 0,0,0$)' | (7) $a \ (1/2,0,0) \ x,y,0$
($m_z 1/2,0,0$) | (8) $a' \ (1/2,0,0) \ x,0,z$
($m_y 1/2,0,0$)' |

For (0,1,0)' + set

- | | | | |
|---|--|--|--|
| (1) $t' \ (0,1,0)$
(1 0,1,0)' | (2) $2 \ x,1/2,0$
($2_x 0,1,0$) | (3) $2' \ 1/4,1/2,z$
($2_z 1/2,1,0$)' | (4) $2 \ (0,1,0) \ 1/4,y,0$
($2_y 1/2,1,0$) |
| (5) $\bar{1}' \ 0,1/2,0$
($\bar{1}' 0,1,0$)' | (6) $b \ (0,1,0) \ 0,y,z$
($m_x 0,1,0$) | (7) $n' \ (1/2,1,0) \ x,y,0$
($m_z 1/2,1,0$)' | (8) $a \ (1/2,0,0) \ x,1/2,z$
($m_y 1/2,1,0$) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(0,1,0)'		
8 k 1	(1) x,y,z [u,v,w] (5) \bar{x},\bar{y},\bar{z} [u,v,w]	(2) x,\bar{y},\bar{z} [\bar{u} ,v,w] (6) \bar{x},y,z [\bar{u} ,v,w]	(3) $\bar{x}+1/2,\bar{y},z$ [\bar{u} , \bar{v} ,w] (7) $x+1/2,y,\bar{z}$ [\bar{u} , \bar{v} ,w]	(4) $\bar{x}+1/2,y,\bar{z}$ [u, \bar{v} ,w] (8) $x+1/2,\bar{y},z$ [u, \bar{v} ,w]
4 j m'..	0,y,z [0,v,w]	0, \bar{y},\bar{z} [0,v,w]	1/2, \bar{y},z [0, \bar{v} ,w]	1/2,y, \bar{z} [0, \bar{v} ,w]
4 i 2..	$x,1/2,0$ [u,0,0]	$\bar{x}+1/2,1/2,0$ [u,0,0]	$\bar{x},1/2,0$ [\bar{u} ,0,0]	$x+1/2,1/2,0$ [\bar{u} ,0,0]
4 h 2'..	$x,0,0$ [0,v,w]	$\bar{x}+1/2,0,0$ [0, \bar{v} ,w]	$\bar{x},0,0$ [0,v,w]	$x+1/2,0,0$ [0, \bar{v} ,w]
4 g ..2'	1/4,1/2,z [u,v,0]	1/4,1/2, \bar{z} [u, \bar{v} ,0]	3/4,1/2, \bar{z} [\bar{u} , \bar{v} ,0]	3/4,1/2,z [\bar{u} ,v,0]
4 f ..2	1/4,0,z [0,0,w]	1/4,0, \bar{z} [0,0,w]	3/4,0, \bar{z} [0,0,w]	3/4,0,z [0,0,w]
4 e .2'	1/4,y,0 [u,0,w]	1/4, \bar{y} ,0 [\bar{u} ,0,w]	3/4, \bar{y} ,0 [u,0,w]	3/4,y,0 [\bar{u} ,0,w]
2 d 2'2'	1/4,1/2,0 [u,0,0]	3/4,1/2,0 [\bar{u} ,0,0]		
2 c 2'2'2	1/4,0,0 [0,0,w]	3/4,0,0 [0,0,w]		
2 b 2/m'..	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]		
2 a 2'/m'..	0,0,0 [0,v,w]	1/2,0,0 [0, \bar{v} ,w]		

Symmetry of special projections

Along [001] $p_{c^*}2mm$ $\mathbf{a}^* = \mathbf{a}/2$ $\mathbf{b}^* = \mathbf{b}$ Origin at 1/4,0,z	Along [100] $p_{2a^*}2'm'm$ $\mathbf{a}^* = \mathbf{b}$ Origin at x,0,0	Along [010] $p2mm1'$ $\mathbf{a}^* = \mathbf{a}/2$ Origin at 0,y,0
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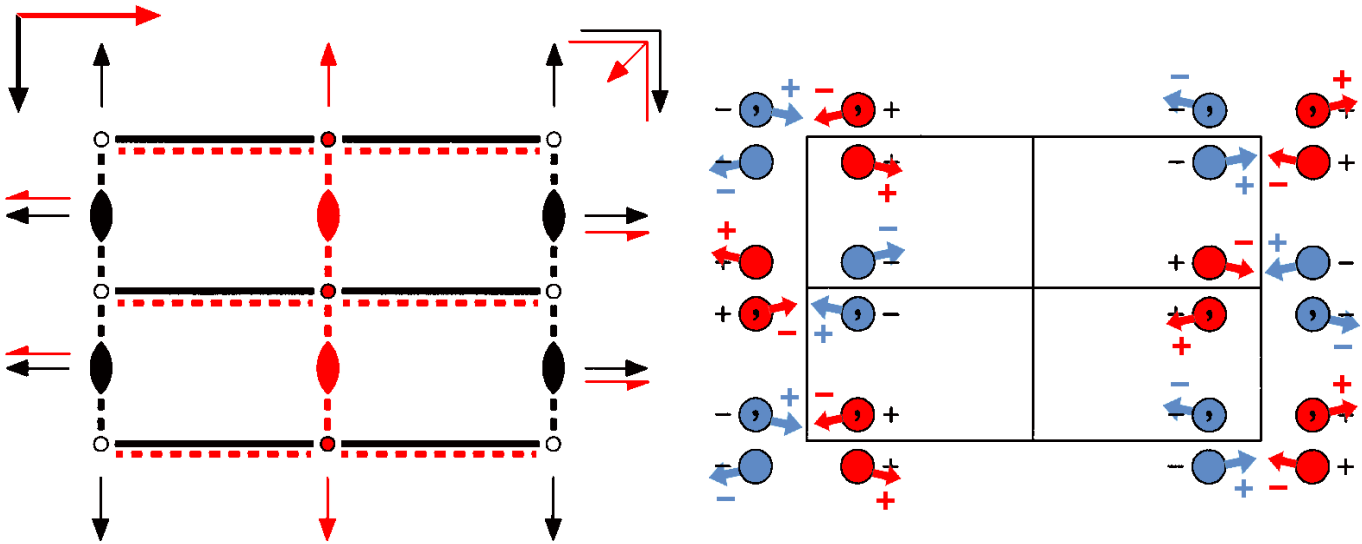
p_{2b} maa

No. 38.13.255

mmm1'

$p_{2b} 2/m2/a2/a$

Orthorhombic/Rectangular



Origin at center ($2/m$) at $2/maa$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $x,0,0$
(2 _x 0,0,0) | (3) 2 $1/4,0,z$
(2 _z 1/2,0,0) | (4) 2 $1/4,y,0$
(2 _y 1/2,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m 0,y,z
(m _x 0,0,0) | (7) a $(1/2,0,0)$ x,y,0
(m _z 1/2,0,0) | (8) a $(1/2,0,0)$ x,0,z
(m _y 1/2,0,0) |

For $(0,1,0)'$ + set

- | | | | |
|---|--|--|--|
| (1) t' $(0,1,0)$
(1 0,1,0)' | (2) 2' $x,1/2,0$
(2 _x 0,1,0)' | (3) 2' $1/4,1/2,z$
(2 _z 1/2,1,0)' | (4) 2' $(0,1,0)$ $1/4,y,0$
(2 _y 1/2,1,0)' |
| (5) $\bar{1}$ ' 0,1/2,0
($\bar{1}$ 0,1,0)' | (6) b' $(0,1,0)$ 0,y,z
(m _x 0,1,0)' | (7) n' $(1/2,1,0)$ x,y,0
(m _z 1/2,1,0)' | (8) a' $(1/2,0,0)$ x,1/2,z
(m _y 1/2,1,0)' |

Generators selected (1); t(1,0,0); t(0,1,0)'; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(0,1,0)' +		
8 k 1	(1) x,y,z [u,v,w] (5) \bar{x},\bar{y},\bar{z} [u,v,w]	(2) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}] (6) \bar{x},y,z [u, \bar{v},\bar{w}]	(3) $\bar{x}+1/2,\bar{y},z$ [\bar{u},\bar{v},w] (7) x+1/2,y, \bar{z} [\bar{u},\bar{v},w]	(4) $\bar{x}+1/2,y,\bar{z}$ [\bar{u},v,\bar{w}] (8) x+1/2, \bar{y},z [\bar{u},v,\bar{w}]
4 j m..	0,y,z [u,0,0]	0, \bar{y},\bar{z} [u,0,0]	1/2, \bar{y},z [$\bar{u},0,0$]	1/2,y, \bar{z} [$\bar{u},0,0$]
4 i 2'..	x,1/2,0 [0,v,w]	$\bar{x}+1/2,1/2,0$ [0,v, \bar{w}]	$\bar{x},1/2,0$ [0, \bar{v},\bar{w}]	x+1/2,1/2,0 [0, \bar{v},w]
4 h 2..	x,0,0 [u,0,0]	$\bar{x}+1/2,0,0$ [$\bar{u},0,0$]	$\bar{x},0,0$ [u,0,0]	x+1/2,0,0 [$\bar{u},0,0$]
4 g ..2'	1/4,1/2,z [u,v,0]	1/4,1/2, \bar{z} [$\bar{u},v,0$]	3/4,1/2, \bar{z} [$\bar{u},\bar{v},0$]	3/4,1/2,z [u, $\bar{v},0$]
4 f ..2	1/4,0,z [0,0,w]	1/4,0, \bar{z} [0,0, \bar{w}]	3/4,0, \bar{z} [0,0,w]	3/4,0,z [0,0, \bar{w}]
4 e .2.	1/4,y,0 [0,v,0]	1/4, $\bar{y},0$ [0, $\bar{v},0$]	3/4, $\bar{y},0$ [0,v,0]	3/4,y,0 [0, $\bar{v},0$]
2 d 2'22'	1/4,1/2,0 [0,v,0]	3/4,1/2,0 [0, $\bar{v},0$]		
2 c 222	1/4,0,0 [0,0,0]	3/4,0,0 [0,0,0]		
2 b 2'/m..	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]		
2 a 2/m..	0,0,0 [u,0,0]	1/2,0,0 [$\bar{u},0,0$]		

Symmetry of special projections

Along [001] p _c 2mm a* = a/2 b* = b Origin at 0,1/2,z	Along [100] p2mm1' a* = b Origin at x,0,0	Along [010] p2mm1' a* = a/2 Origin at 0,y,0
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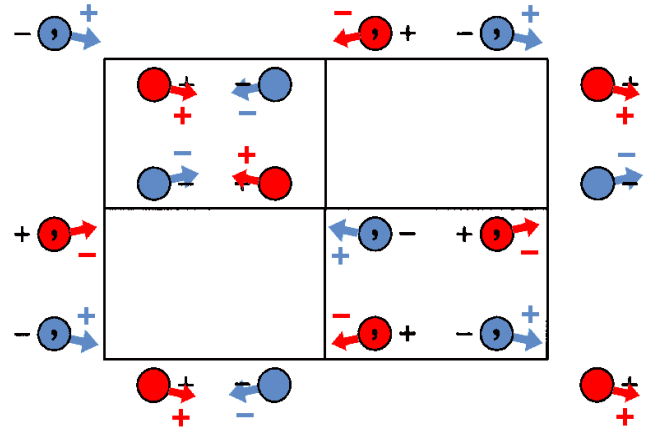
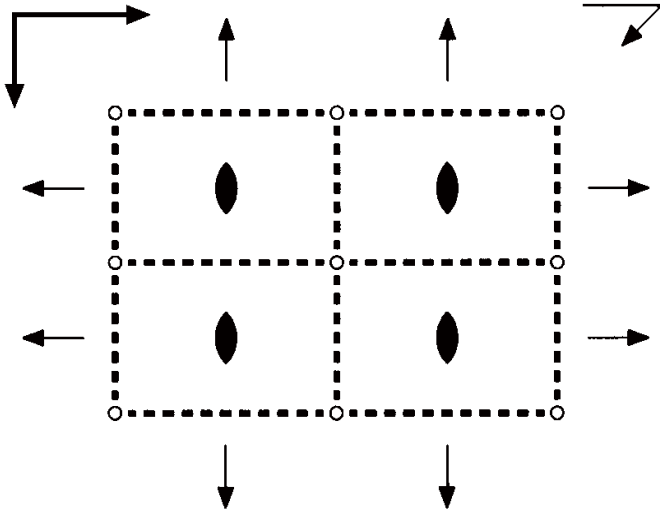
pban

No. 39.1.256

mmm

p2/b2/a2/n

Orthorhombic/Rectangular



Origin at $\bar{1}$ at ban, at $-1/4, -1/4, 0$ from 222

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4, 1/4, z$
(2 _z 1/2, 1/2, 0) | (3) 2 $1/4, y, 0$
(2 _y 1/2, 0, 0) | (4) 2 $x, 1/4, 0$
(2 _x 0, 1/2, 0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) n $(1/2, 1/2, 0)$ x,y,0
(m _z 1/2, 1/2, 0) | (7) a $(1/2, 0, 0)$ x,0,z
(m _y 1/2, 0, 0) | (8) b $(0, 1/2, 0)$ 0,y,z
(m _x 0, 1/2, 0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

		Coordinates						
Multiplicity, Wyckoff letter, Site symmetry								
8 h 1	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y}+1/2,z$ [\bar{u},\bar{v},w]	(3) $\bar{x}+1/2,y,\bar{z}$ [\bar{u},v,\bar{w}]	(4) $x,\bar{y}+1/2,\bar{z}$ [u,\bar{v},\bar{w}]	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x+1/2,y+1/2,\bar{z}$ [\bar{u},\bar{v},w]	(7) $x+1/2,\bar{y},z$ [\bar{u},v,\bar{w}]	(8) $\bar{x},y+1/2,z$ [u,\bar{v},\bar{w}]
4 g ..2	$1/4,3/4,z$ [0,0,w]	$1/4,3/4,\bar{z}$ [0,0, \bar{w}]	$3/4,1/4,\bar{z}$ [0,0,w]	$3/4,1/4,z$ [0,0, \bar{w}]				
4 f ..2	$1/4,1/4,z$ [0,0,w]	$1/4,1/4,\bar{z}$ [0,0, \bar{w}]	$3/4,3/4,\bar{z}$ [0,0,w]	$3/4,3/4,z$ [0,0, \bar{w}]				
4 e .2.	$1/4,y,0$ [0,v,0]	$1/4,\bar{y}+1/2,0$ [0, \bar{v} ,0]	$3/4,\bar{y},0$ [0,v,0]	$3/4,y+1/2,0$ [0, \bar{v} ,0]				
4 d 2..	$x,1/4,0$ [u,0,0]	$\bar{x}+1/2,1/4,0$ [$\bar{u},0,0$]	$\bar{x},3/4,0$ [u,0,0]	$x+1/2,3/4,0$ [$\bar{u},0,0$]				
4 c $\bar{1}$	0,0,0 [u,v,w]	$1/2,1/2,0$ [\bar{u},\bar{v},w]	$1/2,0,0$ [\bar{u},v,\bar{w}]	$[u,\bar{v},\bar{w}]0,1/2,0$				
2 b 222	$3/4,1/4,0$ [0,0,0]	$1/4,3/4,0$ [0,0,0]						
2 a 222	$1/4,1/4,0$ [0,0,0]	$3/4,3/4,0$ [0,0,0]						

Symmetry of special projections

Along [001] $c_p, 2m'm'$ $a^* = a$ $b^* = b$ Origin at $1/4, 1/4, z$	Along [100] $p_{2a^*}, 2mm'$ $a^* = b/2$ Origin at $x, 0, 1/4, 0$	Along [010] $p_{2a^*}, 2m'm'$ $a^* = a/2$ Origin at $1/4, y, 0$
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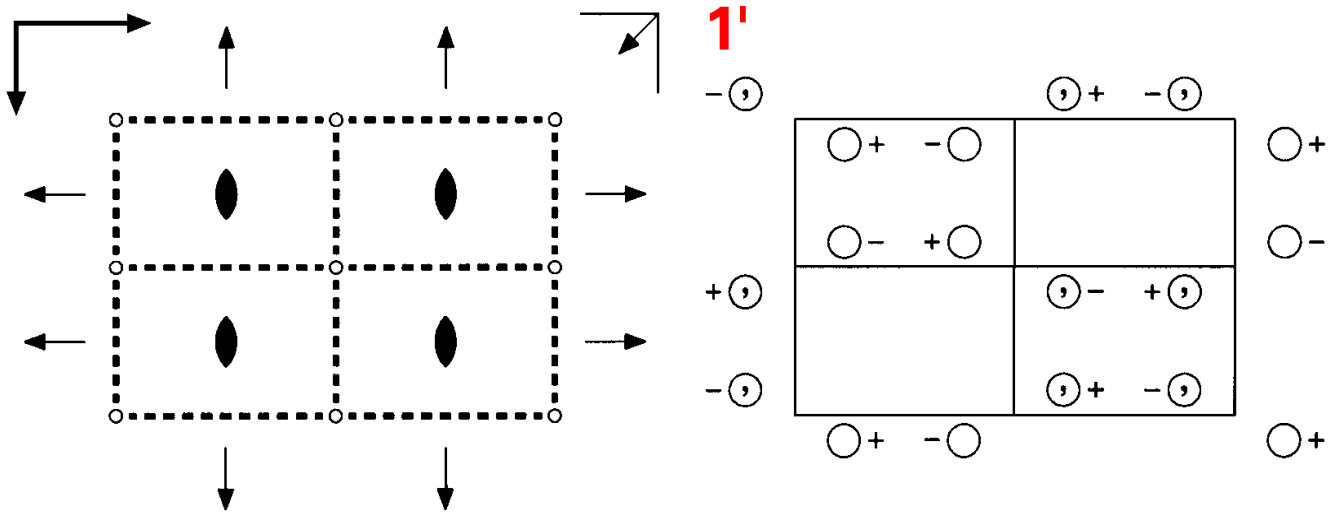
pban1'

No. 39.2.257

mmm1'

p2/b2/a2/n1'

Orthorhombic/Rectangular



Origin at $\bar{1}1'$ at ban1', at $-1/4, -1/4, 0$ from 2221'

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4, 1/4, z$
(2 _z 1/2, 1/2, 0) | (3) 2 $1/4, y, 0$
(2 _y 1/2, 0, 0) | (4) 2 $x, 1/4, 0$
(2 _x 0, 1/2, 0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) n (1/2, 1/2, 0) $x, y, 0$
(m _z 1/2, 1/2, 0) | (7) a (1/2, 0, 0) $x, 0, z$
(m _y 1/2, 0, 0) | (8) b (0, 1/2, 0) $0, y, z$
(m _x 0, 1/2, 0) |

For 1' + set

- | | | | |
|---|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' $1/4, 1/4, z$
(2 _z 1/2, 1/2, 0)' | (3) 2' $1/4, y, 0$
(2 _y 1/2, 0, 0)' | (4) 2' $x, 1/4, 0$
(2 _x 0, 1/2, 0)' |
| (5) $\bar{1}'$ 0,0,0
($\bar{1}'$ 0,0,0)' | (6) n' (1/2, 1/2, 0) $x, y, 0$
(m _z 1/2, 1/2, 0)' | (7) a' (1/2, 0, 0) $x, 0, z$
(m _y 1/2, 0, 0)' | (8) b' (0, 1/2, 0) $0, y, z$
(m _x 0, 1/2, 0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	1+	1'		
8 h 11'	(1) x,y,z [0,0,0] (5) \bar{x},\bar{y},\bar{z} [0,0,0]	(2) $\bar{x}+1/2,\bar{y}+1/2,z$ [0,0,0] (6) $x+1/2,y+1/2,\bar{z}$ [0,0,0]	(3) $\bar{x}+1/2,y,\bar{z}$ [0,0,0] (7) $x+1/2,\bar{y},z$ [0,0,0]	(4) $x,\bar{y}+1/2,\bar{z}$ [0,0,0] (8) $\bar{x},y+1/2,z$ [0,0,0]
4 g ..21'	$1/4,3/4,z$ [0,0,0]	$1/4,3/4,\bar{z}$ [0,0,0]	$3/4,1/4,\bar{z}$ [0,0,0]	$3/4,1/4,z$ [0,0,0]
4 f ..21'	$1/4,1/4,z$ [0,0,0]	$1/4,1/4,\bar{z}$ [0,0,0]	$3/4,3/4,\bar{z}$ [0,0,0]	$3/4,3/4,z$ [0,0,0]
4 e .2.1'	$1/4,y,0$ [0,0,0]	$1/4,\bar{y}+1/2,0$ [0,0,0]	$3/4,\bar{y},0$ [0,0,0]	$3/4,y+1/2,0$ [0,0,0]
4 d 2..1'	$x,1/4,0$ [0,0,0]	$\bar{x}+1/2,1/4,0$ [0,0,0]	$\bar{x},3/4,0$ [0,0,0]	$x+1/2,3/4,0$ [0,0,0]
4 c $\bar{1}1'$	$0,0,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]	$1/2,0,0$ [0,0,0]	$0,1/2,0$ [0,0,0]
2 b 2221'	$3/4,1/4,0$ [0,0,0]	$1/4,3/4,0$ [0,0,0]		
2 a 2221'	$1/4,1/4,0$ [0,0,0]	$3/4,3/4,0$ [0,0,0]		

Symmetry of special projections

Along [001] $c2mm1'$ $a^* = a$ $b^* = b$ Origin at $1/4,1/4,z$	Along [100] $p2mm1'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p2mm1'$ $a^* = a/2$ Origin at $0,y,0$
--	--	--

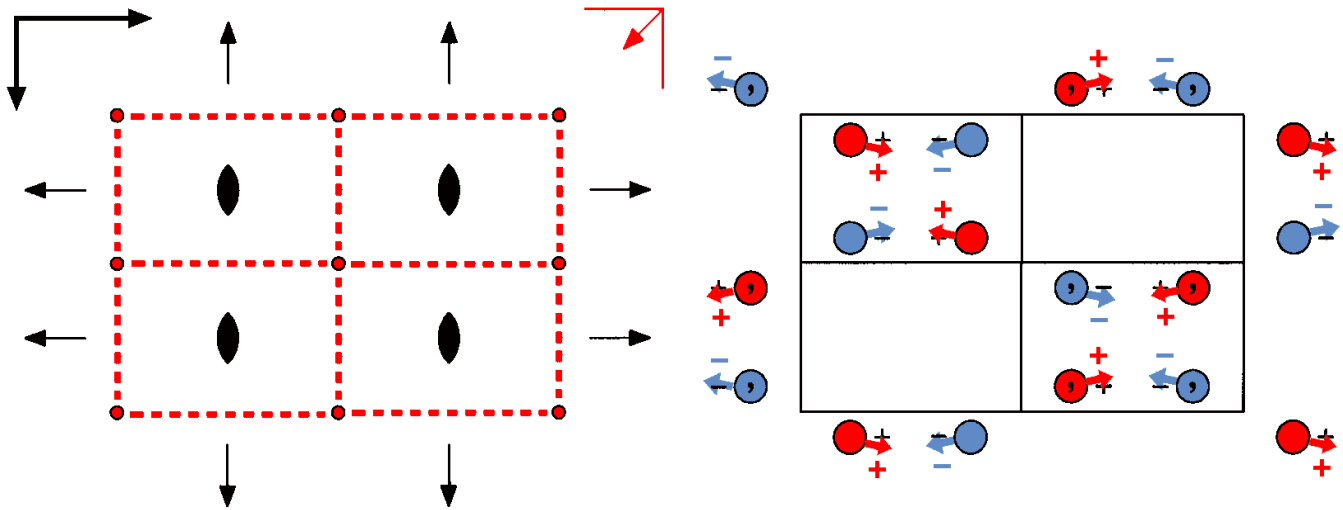
pb'a'n'

No. 39.3.258

m'm'm'

p2/b'2/a'2/n'

Orthorhombic/Rectangular



Origin at $\bar{1}$ at b'a'n', at $-1/4, -1/4, 0$ from 222

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4, 1/4, z$
(2 _z 1/2, 1/2, 0) | (3) 2 $1/4, y, 0$
(2 _y 1/2, 0, 0) | (4) 2 $x, 1/4, 0$
(2 _x 0, 1/2, 0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) n' (1/2, 1/2, 0) $x, y, 0$
(m _z 1/2, 1/2, 0)' | (7) a' (1/2, 0, 0) $x, 0, z$
(m _y 1/2, 0, 0)' | (8) b' (0, 1/2, 0) $0, y, z$
(m _x 0, 1/2, 0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y}+1/2,z$ [\bar{u},\bar{v},w]	(3) $\bar{x}+1/2,y,\bar{z}$ [\bar{u},v,\bar{w}]	(4) $x,\bar{y}+1/2,\bar{z}$ [u,\bar{v},\bar{w}]
8 h 1	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) $x+1/2,y+1/2,\bar{z}$ [u,v,\bar{w}]	(7) $x+1/2,\bar{y},z$ [u,\bar{v},w]	(8) $\bar{x},y+1/2,z$ [\bar{u},v,w]
4 g ..2	$1/4,3/4,z$ [0,0,w]	$1/4,3/4,\bar{z}$ [0,0, \bar{w}]	$3/4,1/4,\bar{z}$ [0,0, \bar{w}]	$3/4,1/4,z$ [0,0,w]
4 f ..2	$1/4,1/4,z$ [0,0,w]	$1/4,1/4,\bar{z}$ [0,0, \bar{w}]	$3/4,3/4,\bar{z}$ [0,0, \bar{w}]	$3/4,3/4,z$ [0,0,w]
4 e .2.	$1/4,y,0$ [0,v,0]	$1/4,\bar{y}+1/2,0$ [0, \bar{v} ,0]	$3/4,\bar{y},0$ [0, \bar{v} ,0]	$3/4,y+1/2,0$ [0,v,0]
4 d 2..	$x,1/4,0$ [u,0,0]	$\bar{x}+1/2,1/4,0$ [$\bar{u},0,0$]	$\bar{x},3/4,0$ [$\bar{u},0,0$]	$x+1/2,3/4,0$ [u,0,0]
4 c $\bar{1}$ '	0,0,0 [0,0,0]	$1/2,1/2,0$ [0,0,0]	$1/2,0,0$ [0,0,0]	$0,1/2,0$ [0,0,0]
2 b 222	$3/4,1/4,0$ [0,0,0]	$1/4,3/4,0$ [0,0,0]		
2 a 222	$1/4,1/4,0$ [0,0,0]	$3/4,3/4,0$ [0,0,0]		

Symmetry of special projections

Along [001] $c2m'm'$
 $a^* = a$ $b^* = b$
 Origin at $1/4,1/4,z$

Along [100] $p2m'm'$
 $a^* = b/2$
 Origin at $x,0,0$

Along [010] $p2m'm'$
 $a^* = a/2$
 Origin at $0,y,0$

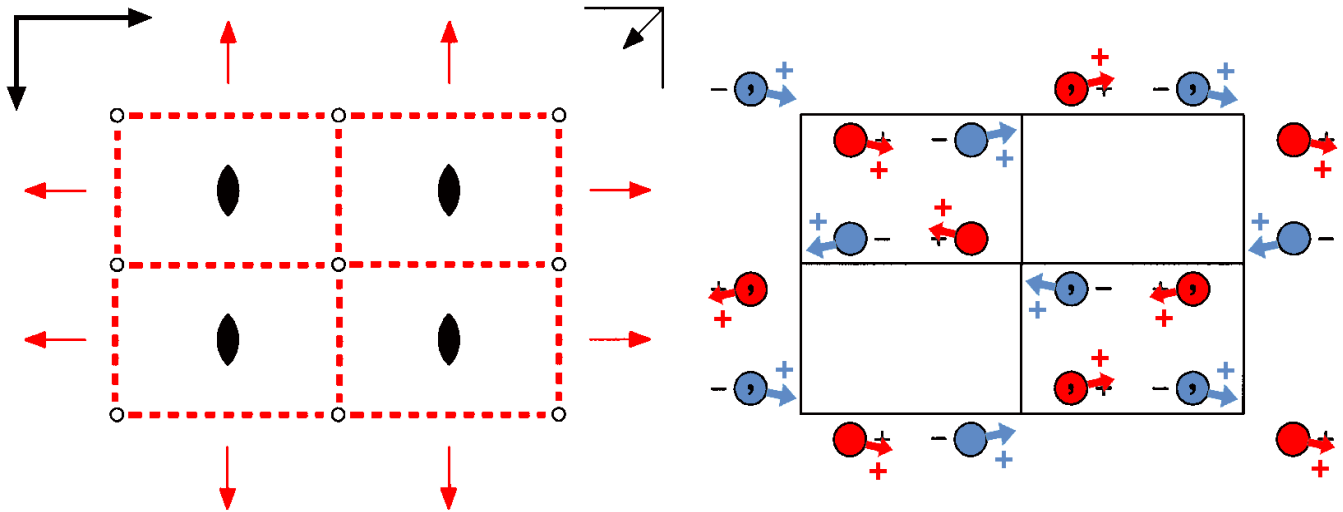
pb'a'n

No. 39.4.259

m'm'm

p2'/b'2'/a'2'/n

Orthorhombic/Rectangular



Origin at $\bar{1}$ at b'a'h, at $-1/4, -1/4, 0$ from $2'2'2$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4, 1/4, z$
(2 _z 1/2, 1/2, 0) | (3) 2' $1/4, y, 0$
(2 _y 1/2, 0, 0)' | (4) 2' $x, 1/4, 0$
(2 _x 0, 1/2, 0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) n (1/2, 1/2, 0) $x, y, 0$
(m _z 1/2, 1/2, 0) | (7) a' (1/2, 0, 0) $x, 0, z$
(m _y 1/2, 0, 0)' | (8) b' (0, 1/2, 0) $0, y, z$
(m _x 0, 1/2, 0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 h 1		(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,\bar{y}+1/2,z [\bar{u},\bar{v},w]$	(3) $\bar{x}+1/2,y,\bar{z} [u,\bar{v},w]$	(4) $x,\bar{y}+1/2,\bar{z} [\bar{u},\bar{v},w]$
		(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x+1/2,y+1/2,\bar{z} [\bar{u},\bar{v},w]$	(7) $x+1/2,\bar{y},z [u,\bar{v},w]$	(8) $\bar{x},y+1/2,z [\bar{u},\bar{v},w]$
4 g ..2		$1/4,3/4,z [0,0,w]$	$1/4,3/4,\bar{z} [0,0,w]$	$3/4,1/4,\bar{z} [0,0,w]$	$3/4,1/4,z [0,0,w]$
4 f ..2		$1/4,1/4,z [0,0,w]$	$1/4,1/4,\bar{z} [0,0,w]$	$3/4,3/4,\bar{z} [0,0,w]$	$3/4,3/4,z [0,0,w]$
4 e .2'		$1/4,y,0 [u,0,w]$	$1/4,\bar{y}+1/2,0 [\bar{u},0,w]$	$3/4,\bar{y},0 [u,0,w]$	$3/4,y+1/2,0 [\bar{u},0,w]$
4 d 2'..		$x,1/4,0 [0,v,w]$	$\bar{x}+1/2,1/4,0 [0,\bar{v},w]$	$\bar{x},3/4,0 [0,v,w]$	$x+1/2,3/4,0 [0,\bar{v},w]$
4 c $\bar{1}$		$0,0,0 [u,v,w]$	$1/2,1/2,0 [\bar{u},\bar{v},w]$	$1/2,0,0 [u,\bar{v},w]$	$0,1/2,0 [\bar{u},v,w]$
2 b 2'2'		$3/4,1/4,0 [0,0,w]$	$1/4,3/4,0 [0,0,w]$		
2 a 2'2'		$1/4,1/4,0 [0,0,w]$	$3/4,3/4,0 [0,0,w]$		

Symmetry of special projections

Along [001] c_p -2mm	Along [100] $p2m'm'$	Along [010] $p2'm'm$
$a^* = a$ $b^* = b$	$a^* = b/2$	$a^* = a/2$
Origin at $1/4,1/4,z$	Origin at $x,0,0$	Origin at $0,y,0$

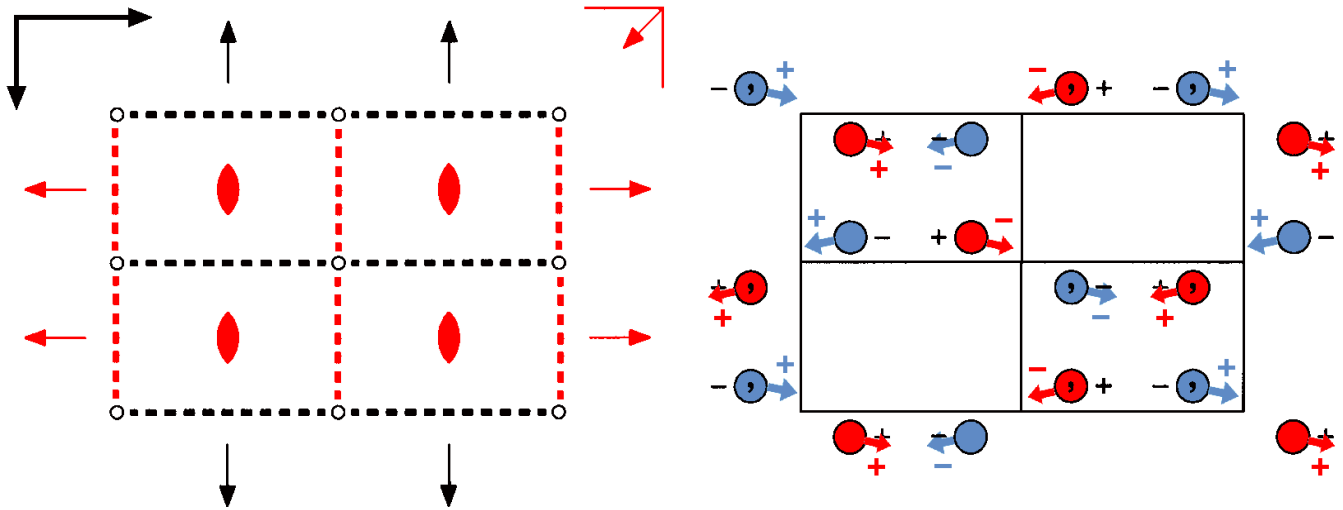
pba'n'

No. 39.5.260

mm'm'

p2/b2'/a'2'/n'

Orthorhombic/Rectangular



Origin at $\bar{1}$ at ba'n', at $-1/4, -1/4, 0$ from $22'2'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|---|
| (1) 1
(1 0,0,0) | (2) $2'_z$ $1/4, 1/4, z$
(2_z $1/2, 1/2, 0$)' | (3) $2'_y$ $1/4, y, 0$
(2_y $1/2, 0, 0$)' | (4) 2_{x1} $x, 1/4, 0$
(2_x $0, 1/2, 0$) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) n'_z ($1/2, 1/2, 0$) $x, y, 0$
(m_z $1/2, 1/2, 0$)' | (7) a'_y ($1/2, 0, 0$) $x, 0, z$
(m_y $1/2, 0, 0$)' | (8) b_{x1} ($0, 1/2, 0$) $0, y, z$
(m_x $0, 1/2, 0$) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 h 1		(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,\bar{y}+1/2,z [u,v,\bar{w}]$	(3) $\bar{x}+1/2,y,\bar{z} [u,\bar{v},w]$	(4) $x,\bar{y}+1/2,\bar{z} [u,\bar{v},\bar{w}]$
		(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x+1/2,y+1/2,\bar{z} [u,v,\bar{w}]$	(7) $x+1/2,\bar{y},z [u,\bar{v},w]$	(8) $\bar{x},y+1/2,z [u,\bar{v},\bar{w}]$
4 g ..2'		$1/4,3/4,z [u,v,0]$	$1/4,3/4,\bar{z} [u,\bar{v},0]$	$3/4,1/4,\bar{z} [u,v,0]$	$3/4,1/4,z [u,\bar{v},0]$
4 f ..2'		$1/4,1/4,z [u,v,0]$	$1/4,1/4,\bar{z} [u,\bar{v},0]$	$3/4,3/4,\bar{z} [u,v,0]$	$3/4,3/4,z [u,\bar{v},0]$
4 e .2'		$1/4,y,0 [u,0,w]$	$1/4,\bar{y}+1/2,0 [u,0,\bar{w}]$	$3/4,\bar{y},0 [u,0,w]$	$3/4,y+1/2,0 [u,0,\bar{w}]$
4 d 2..		$x,1/4,0 [u,0,0]$	$\bar{x}+1/2,1/4,0 [u,0,0]$	$\bar{x},3/4,0 [u,0,0]$	$x+1/2,3/4,0 [u,0,0]$
4 c $\bar{1}$		$0,0,0 [u,v,w]$	$1/2,1/2,0 [u,v,\bar{w}]$	$1/2,0,0 [u,\bar{v},w]$	$0,1/2,0 [u,\bar{v},\bar{w}]$
2 b 22'2'		$3/4,1/4,0 [u,0,0]$	$1/4,3/4,0 [u,0,0]$		
2 a 22'2'		$1/4,1/4,0 [u,0,0]$	$3/4,3/4,0 [u,0,0]$		

Symmetry of special projections

Along [001] $c2'mm'$ $a^* = a$ $b^* = b$ Origin at $1/4,1/4,z$	Along [100] $p_{2a^*}2'm'm$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p2'mm'$ $a^* = a/2$ Origin at $0,y,0$
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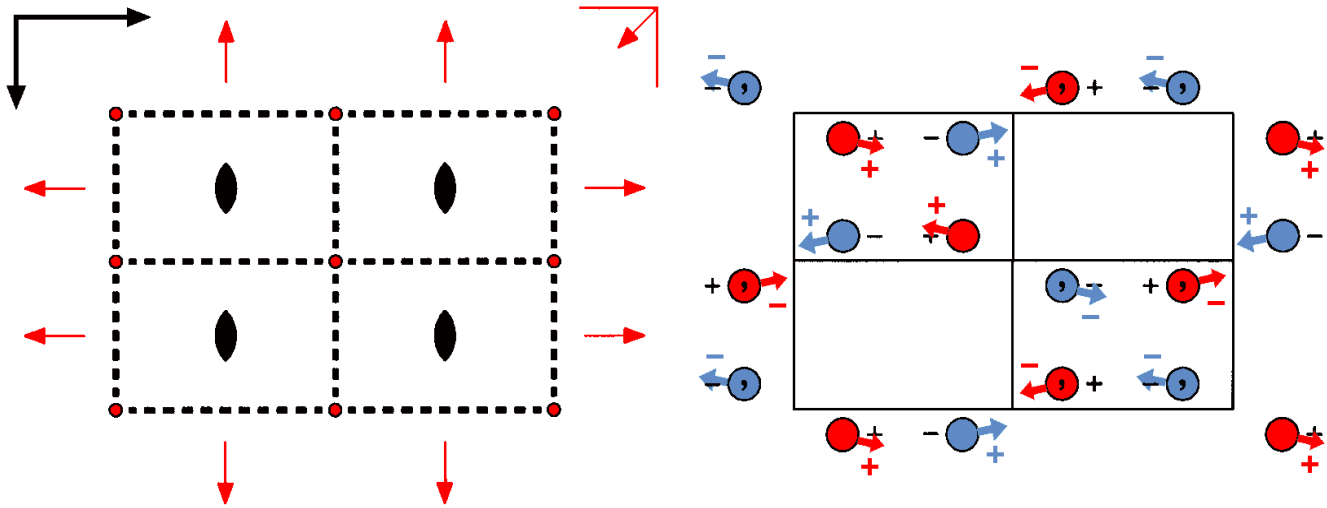
pban'

No. 39.6.261

mmm'

p2'/b2'/a2/n'

Orthorhombic/Rectangular



Origin at $\bar{1}$ at ban', at $-1/4, -1/4, 0$ from $2'2'2$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4, 1/4, z$
(2 _z 1/2, 1/2, 0) | (3) 2' $1/4, y, 0$
(2 _y 1/2, 0, 0)' | (4) 2' $x, 1/4, 0$
(2 _x 0, 1/2, 0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) n' (1/2, 1/2, 0) $x, y, 0$
(m _z 1/2, 1/2, 0)' | (7) a (1/2, 0, 0) $x, 0, z$
(m _y 1/2, 0, 0) | (8) b (0, 1/2, 0) $0, y, z$
(m _x 0, 1/2, 0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 h 1		(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y}+1/2,z$ [\bar{u},\bar{v},w]	(3) $\bar{x}+1/2,y,\bar{z}$ [u, \bar{v},w]	(4) $x,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]
		(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) $x+1/2,y+1/2,\bar{z}$ [u,v, \bar{w}]	(7) $x+1/2,\bar{y},z$ [\bar{u},v,\bar{w}]	(8) $\bar{x},y+1/2,z$ [u, \bar{v},\bar{w}]
4 g ..2		$1/4,3/4,z$ [0,0,w]	$1/4,3/4,\bar{z}$ [0,0,w]	$3/4,1/4,\bar{z}$ [0,0, \bar{w}]	$3/4,1/4,z$ [0,0, \bar{w}]
4 f ..2		$1/4,1/4,z$ [0,0,w]	$1/4,1/4,\bar{z}$ [0,0,w]	$3/4,3/4,\bar{z}$ [0,0, \bar{w}]	$3/4,3/4,z$ [0,0, \bar{w}]
4 e .2'		$1/4,y,0$ [u,0,w]	$1/4,\bar{y}+1/2,0$ [$\bar{u},0,w$]	$3/4,\bar{y},0$ [$\bar{u},0,\bar{w}$]	$3/4,y+1/2,0$ [u,0, \bar{w}]
4 d 2'..		$x,1/4,0$ [0,v,w]	$\bar{x}+1/2,1/4,0$ [0, \bar{v},w]	$\bar{x},3/4,0$ [0, \bar{v},\bar{w}]	$x+1/2,3/4,0$ [0,v, \bar{w}]
4 c $\bar{1}$ '		0,0,0 [0,0,0]	$1/2,1/2,0$ [0,0,0]	$1/2,0,0$ [0,0,0]	$0,1/2,0$ [0,0,0]
2 b 2'2'		$3/4,1/4,0$ [0,0,w]	$1/4,3/4,0$ [0,0, \bar{w}]		
2 a 2'2'		$1/4,1/4,0$ [0,0,w]	$3/4,3/4,0$ [0,0, \bar{w}]		

Symmetry of special projections

Along [001] $c2mm$
 $a^* = a$ $b^* = b$
 Origin at $1/4,1/4,z$

Along [100] $p_{2a^*}2mm$
 $a^* = b/2$
 Origin at $x,0,0$

Along [010] $p_{2a^*}2mm$
 $a^* = a/2$
 Origin at $0,y,0$

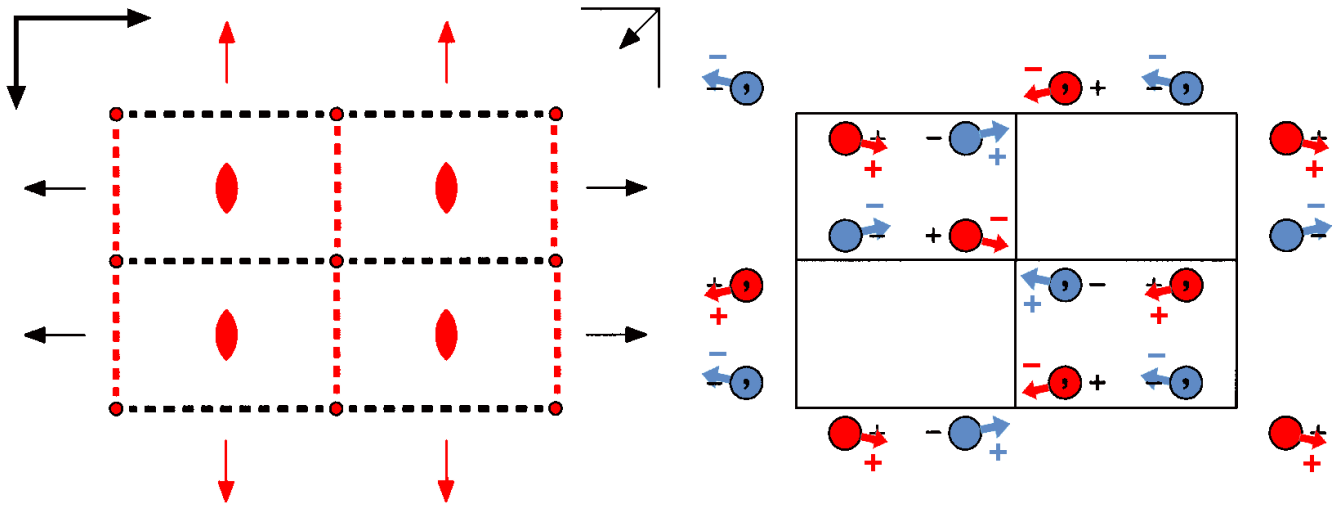
pba'n

No. 39.7.262

mm'm

p2'/b2/a'2'/n

Orthorhombic/Rectangular



Origin at $\bar{1}$ at ba'n, at $-1/4, -1/4, 0$ from $2'22'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2' $1/4, 1/4, z$
(2 _z 1/2, 1/2, 0)' | (3) 2 $1/4, y, 0$
(2 _y 1/2, 0, 0) | (4) 2' $x, 1/4, 0$
(2 _x 0, 1/2, 0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) n $(1/2, 1/2, 0)$ $x, y, 0$
(m _z 1/2, 1/2, 0) | (7) a' $(1/2, 0, 0)$ $x, 0, z$
(m _y 1/2, 0, 0)' | (8) b $(0, 1/2, 0)$ $0, y, z$
(m _x 0, 1/2, 0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 h 1		(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,\bar{y}+1/2,z [u,v,\bar{w}]$	(3) $\bar{x}+1/2,y,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x,\bar{y}+1/2,\bar{z} [\bar{u},v,w]$
		(5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(6) $x+1/2,y+1/2,\bar{z} [\bar{u},\bar{v},w]$	(7) $x+1/2,\bar{y},z [u,\bar{v},w]$	(8) $\bar{x},y+1/2,z [u,\bar{v},\bar{w}]$
4 g ..2'		$1/4,3/4,z [u,v,0]$	$1/4,3/4,\bar{z} [\bar{u},v,0]$	$3/4,1/4,\bar{z} [\bar{u},\bar{v},0]$	$3/4,1/4,z [u,\bar{v},0]$
4 f ..2'		$1/4,1/4,z [u,v,0]$	$1/4,1/4,\bar{z} [\bar{u},v,0]$	$3/4,3/4,\bar{z} [\bar{u},\bar{v},0]$	$3/4,3/4,z [u,\bar{v},0]$
4 e .2.		$1/4,y,0 [0,v,0]$	$1/4,\bar{y}+1/2,0 [0,v,0]$	$3/4,\bar{y},0 [0,\bar{v},0]$	$3/4,y+1/2,0 [0,\bar{v},0]$
4 d 2'..		$x,1/4,0 [0,v,w]$	$\bar{x}+1/2,1/4,0 [0,v,\bar{w}]$	$\bar{x},3/4,0 [0,\bar{v},\bar{w}]$	$x+1/2,3/4,0 [0,\bar{v},w]$
4 c $\bar{1}$ '		$0,0,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$
2 b 2'22'		$3/4,1/4,0 [0,v,0]$	$1/4,3/4,0 [0,\bar{v},0]$		
2 a 2'22'		$1/4,1/4,0 [0,v,0]$	$3/4,3/4,0 [0,\bar{v},0]$		

Symmetry of special projections

Along [001] $c_p, 2'mm'$	Along [100] $p_{2a}, 2m'm'$	Along [010] $p2mm$
$a^* = b$ $b^* = -a$	$a^* = b/2$	$a^* = a/2$
Origin at $1/4, 1/4, z$	Origin at $x, 0, 0$	Origin at $0, y, 0$

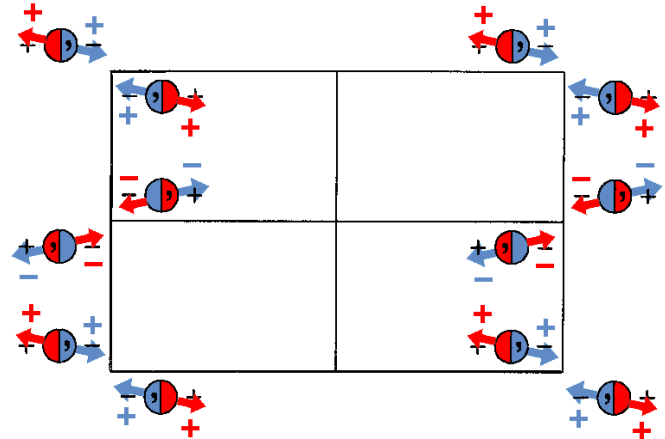
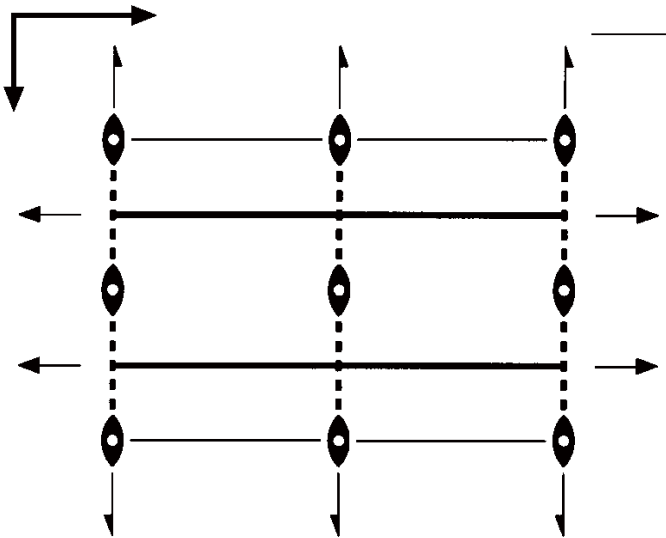
pmam

No. 40.1.263

mmm

$p2_1/m2/a2/m$

Orthorhombic/Rectangular



Origin at center ($2/m$) at $2_1a2/m$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4,y,0$
(2 _y 1/2,0,0) | (3) 2 $0,0,z$
(2 _z 0,0,0) | (4) 2 $(1/2,0,0)$ $x,0,0$
(2 _x 1/2,0,0) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (6) a $(1/2,0,0)$ $x,0,z$
(m _y 1/2,0,0) | (7) m $x,y,0$
(m _z 0,0,0) | (8) m $1/4,y,z$
(m _x 1/2,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,y,\bar{z} [\bar{u},v,\bar{w}]$	(3) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(4) $x+1/2,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x+1/2,\bar{y},z [\bar{u},v,\bar{w}]$	(7) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(8) $\bar{x}+1/2,y,z [u,\bar{v},\bar{w}]$
4 g m..	$1/4,y,z [u,0,0]$	$1/4,y,\bar{z} [\bar{u},0,0]$	$3/4,\bar{y},z [\bar{u},0,0]$	$3/4,\bar{y},\bar{z} [u,0,0]$
4 f ..m	$x,y,0 [0,0,w]$	$\bar{x}+1/2,y,0 [0,0,\bar{w}]$	$\bar{x},\bar{y},0 [0,0,w]$	$x+1/2,\bar{y},0 [0,0,\bar{w}]$
4 e ..2	$0,1/2,z [0,0,w]$	$1/2,1/2,\bar{z} [0,0,\bar{w}]$	$0,1/2,\bar{z} [0,0,w]$	$1/2,1/2,z [0,0,\bar{w}]$
4 d ..2	$0,0,z [0,0,w]$	$1/2,0,\bar{z} [0,0,\bar{w}]$	$0,0,\bar{z} [0,0,w]$	$1/2,0,z [0,0,\bar{w}]$
2 c m2m	$1/4,y,0 [0,0,0]$	$3/4,\bar{y},0 [0,0,0]$		
2 b ..2/m	$0,1/2,0 [0,0,w]$	$1/2,1/2,0 [0,0,\bar{w}]$		
2 a ..2/m	$0,0,0 [0,0,w]$	$1/2,0,0 [0,0,\bar{w}]$		

Symmetry of special projections

Along [001] $p2mg1'$ $a^* = a \quad b^* = b$ Origin at $0,0,z$	Along [100] $p2mm1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p_{2a^*}2mm$ $a^* = a/2$ Origin at $1/4,y,0$
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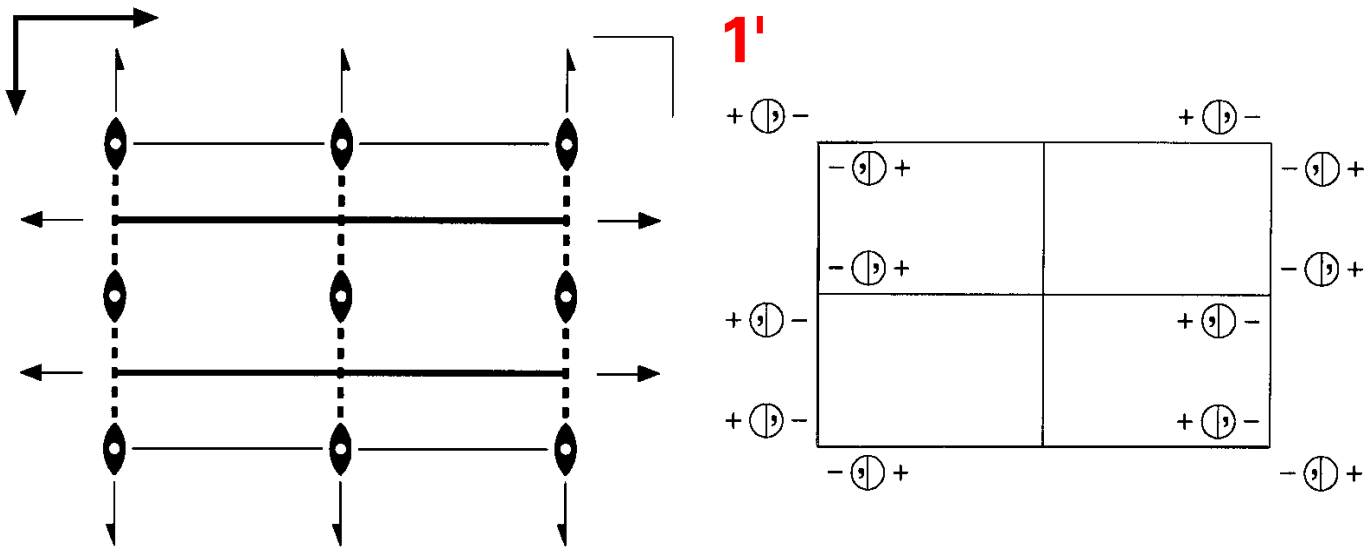
pmam1'

No. 40.2.264

mmm1'

p2₁/m2/a2/m1'

Orthorhombic/Rectangular



Origin at center (2/m1') at 2₁a2/m1'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 1/4,y,0
(2 _y 1/2,0,0) | (3) 2 0,0,z
(2 _z 0,0,0) | (4) 2 (1/2,0,0) x,0,0
(2 _x 1/2,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) a (1/2,0,0) x,0,z
(m _y 1/2,0,0) | (7) m x,y,0
(m _z 0,0,0) | (8) m 1/4,y,z
(m _x 1/2,0,0) |

For 1' + set

- | | | | |
|---|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 1/4,y,0
(2 _y 1/2,0,0)' | (3) 2' 0,0,z
(2 _z 0,0,0)' | (4) 2' (1/2,0,0) x,0,0
(2 _x 1/2,0,0)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ 0,0,0)' | (6) a' (1/2,0,0) x,0,z
(m _y 1/2,0,0)' | (7) m' x,y,0
(m _z 0,0,0)' | (8) m' 1/4,y,z
(m _x 1/2,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	1+	1' +		
8 h 11'	(1) x,y,z [0,0,0] (5) \bar{x},\bar{y},\bar{z} [0,0,0]	(2) $\bar{x}+1/2,y,\bar{z}$ [0,0,0] (6) $x+1/2,\bar{y},z$ [0,0,0]	(3) \bar{x},\bar{y},z [0,0,0] (7) x,y,\bar{z} [0,0,0]	(4) $x+1/2,\bar{y},\bar{z}$ [0,0,0] (8) $\bar{x}+1/2,y,z$ [0,0,0]
4 g m..1'	1/4,y,z [0,0,0]	1/4,y, \bar{z} [0,0,0]	3/4, \bar{y},z [0,0,0]	3/4, \bar{y},\bar{z} [0,0,0]
4 f ..m1'	x,y,0 [0,0,0]	$\bar{x}+1/2,y,0$ [0,0,0]	$\bar{x},\bar{y},0$ [0,0,0]	$x+1/2,\bar{y},0$ [0,0,0]
4 e ..21'	0,1/2,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]	0,1/2, \bar{z} [0,0,0]	1/2,1/2,z [0,0,0]
4 d ..21'	0,0,z [0,0,0]	1/2,0, \bar{z} [0,0,0]	0,0, \bar{z} [0,0,0]	1/2,0,z [0,0,0]
2 c m2m1'	1/4,y,0 [0,0,0]	3/4, $\bar{y},0$ [0,0,0]		
2 b ..2/m1'	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]		
2 a ..2/m1'	0,0,0 [0,0,0]	1/2,0,0 [0,0,0]		

Symmetry of special projections

Along [001] p2mg1' $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p2mm1' $a^* = b$ Origin at x,0,0	Along [010] p2mm1' $a^* = a/2$ Origin at 0,y,0
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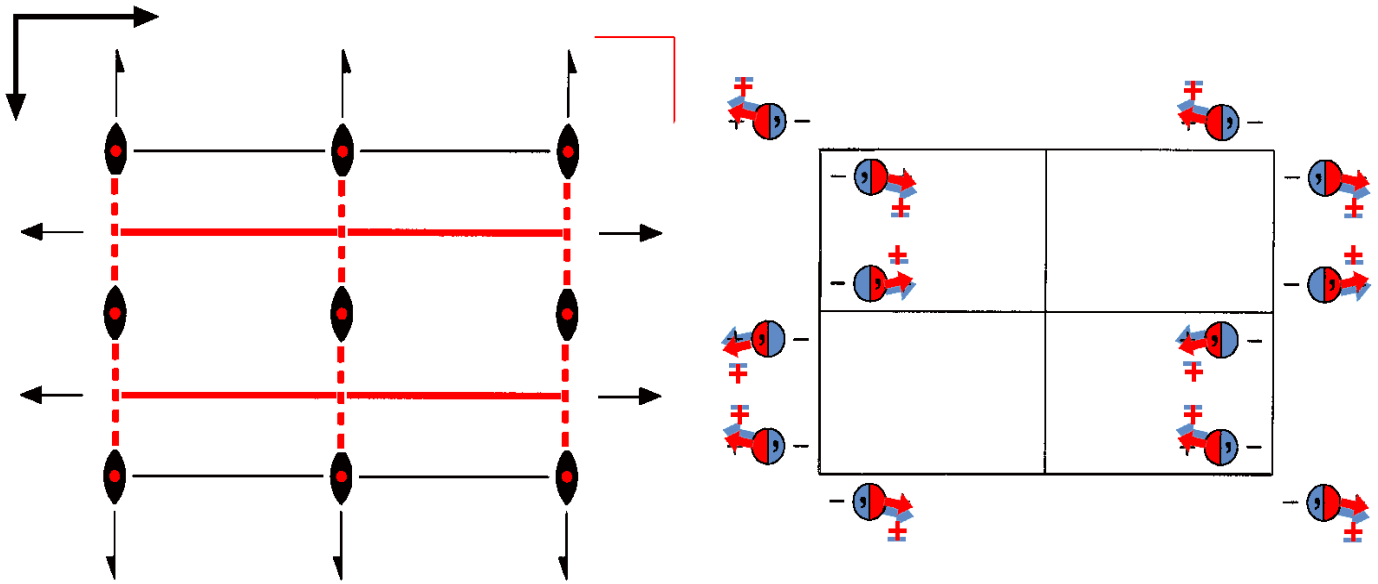
pm'a'm'

No. 40.3.265

m'm'm'

p2₁/m₂/a₂/m'

Orthorhombic/Rectangular



Origin at center (2/m') at 2, a'₂/m'

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 1/4,y,0
(2_y|1/2,0,0)

(3) 2 0,0,z
(2_z|0,0,0)

(4) 2 (1/2,0,0) x,0,0
(2_x|1/2,0,0)

(5) $\bar{1}$ ' 0,0,0
($\bar{1}$ '|0,0,0)'

(6) a' (1/2,0,0) x,0,z
(m_y|1/2,0,0)'

(7) m' x,y,0
(m_z|0,0,0)'

(8) m' 1/4,y,z
(m_x|1/2,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,y,\bar{z}$ [\bar{u},v,\bar{w}]	(3) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(4) $x+1/2,\bar{y},\bar{z}$ [u,\bar{v},\bar{w}]
8 h 1	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) $x+1/2,\bar{y},z$ [u,\bar{v},w]	(7) x,y,\bar{z} [u,v,\bar{w}]	(8) $\bar{x}+1/2,y,z$ [\bar{u},v,w]
4 g m'..	1/4,y,z [0,v,w]	1/4,y, \bar{z} [0,v, \bar{w}]	3/4, \bar{y},z [0, \bar{v},w]	3/4, \bar{y},\bar{z} [0, \bar{v},\bar{w}]
4 f ..m'	x,y,0 [u,v,0]	$\bar{x}+1/2,y,0$ [$\bar{u},v,0$]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$x+1/2,\bar{y},0$ [$u,\bar{v},0$]
4 e ..2	0,1/2,z [0,0,w]	1/2,1/2, \bar{z} [0,0, \bar{w}]	0,1/2, \bar{z} [0,0, \bar{w}]	1/2,1/2,z [0,0,w]
4 d ..2	0,0,z [0,0,w]	1/2,0, \bar{z} [0,0, \bar{w}]	0,0, \bar{z} [0,0, \bar{w}]	1/2,0,z [0,0,w]
2 c m'2m'	1/4,y,0 [0,v,0]	3/4, $\bar{y},0$ [0, $\bar{v},0$]		
2 b ..2/m'	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]		
2 a ..2/m'	0,0,0 [0,0,0]	1/2,0,0 [0,0,0]		

Symmetry of special projections

Along [001] p2m'g'
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] p2m'm'
 $a^* = b$
 Origin at x,0,0

Along [010] p2m'm'
 $a^* = a/2$
 Origin at 0,y,0

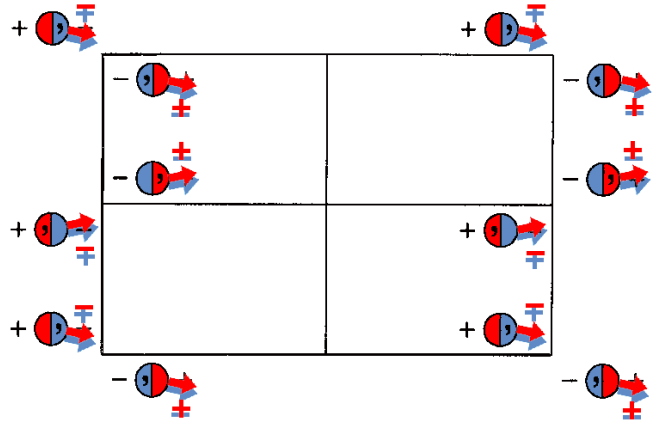
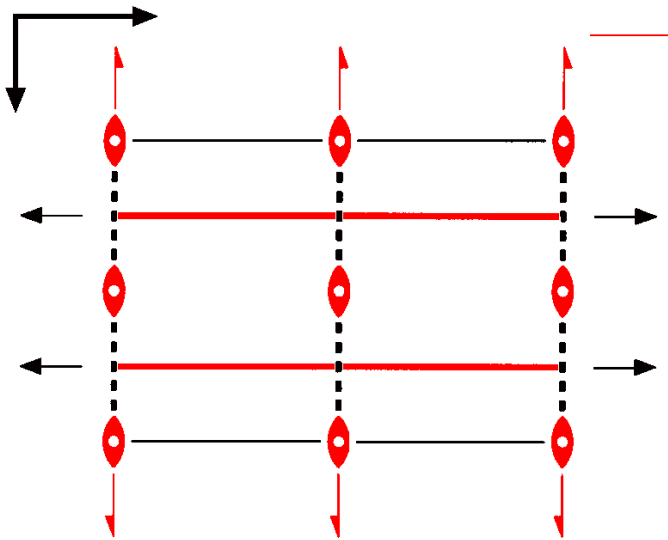
pm'am'

No. 40.4.266

m'mm'

$p2_1'/m'2/a2'/m'$

Orthorhombic/Rectangular



Origin at center ($2'/m'$) at $2_1'a2'/m'$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) $2_{1/4}$ $1/4,y,0$
($2_y 1/2,0,0$) | (3) $2'_z$ $0,0,z$
($2_z 0,0,0'$) | (4) $2'_x$ $(1/2,0,0)$ $x,0,0$
($2_x 1/2,0,0'$) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$) | (6) a $(1/2,0,0)$ $x,0,z$
($m_y 1/2,0,0$) | (7) m'_x $x,y,0$
($m_z 0,0,0'$) | (8) m'_y $1/4,y,z$
($m_x 1/2,0,0'$) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,y,\bar{z}$ [\bar{u},v,\bar{w}]	(3) \bar{x},\bar{y},z [u,v, \bar{w}]	(4) $x+1/2,\bar{y},\bar{z}$ [\bar{u},v,w]
8 h 1	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x+1/2,\bar{y},z$ [\bar{u},v,\bar{w}]	(7) x,y, \bar{z} [u,v, \bar{w}]	(8) $\bar{x}+1/2,y,z$ [\bar{u},v,w]
4 g m'..	1/4,y,z [0,v,w]	1/4,y, \bar{z} [0,v, \bar{w}]	3/4, \bar{y},z [0,v, \bar{w}]	3/4, \bar{y},\bar{z} [0,v,w]
4 f ..m'	x,y,0 [u,v,0]	$\bar{x}+1/2,y,0$ [$\bar{u},v,0$]	$\bar{x},\bar{y},0$ [u,v,0]	$x+1/2,\bar{y},0$ [$\bar{u},v,0$]
4 e ..2'	0,1/2,z [u,v,0]	1/2,1/2, \bar{z} [$\bar{u},v,0$]	0,1/2, \bar{z} [u,v,0]	1/2,1/2,z [$\bar{u},v,0$]
4 d ..2'	0,0,z [u,v,0]	1/2,0, \bar{z} [$\bar{u},v,0$]	0,0, \bar{z} [u,v,0]	1/2,0,z [$\bar{u},v,0$]
2 c m'2m'	1/4,y,0 [0,v,0]	3/4, $\bar{y},0$ [0,v,0]		
2 b ..2'/m'	0,1/2,0 [u,v,0]	1/2,1/2,0 [$\bar{u},v,0$]		
2 a ..2'/m'	0,0,0 [u,v,0]	1/2,0,0 [$\bar{u},v,0$]		

Symmetry of special projections

Along [001] p2'm'g
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] p2'mm'
 $a^* = b$
 Origin at x,0,0

Along [010] p_{2a*}2m'm'
 $a^* = a/2$
 Origin at 1/4,y,0

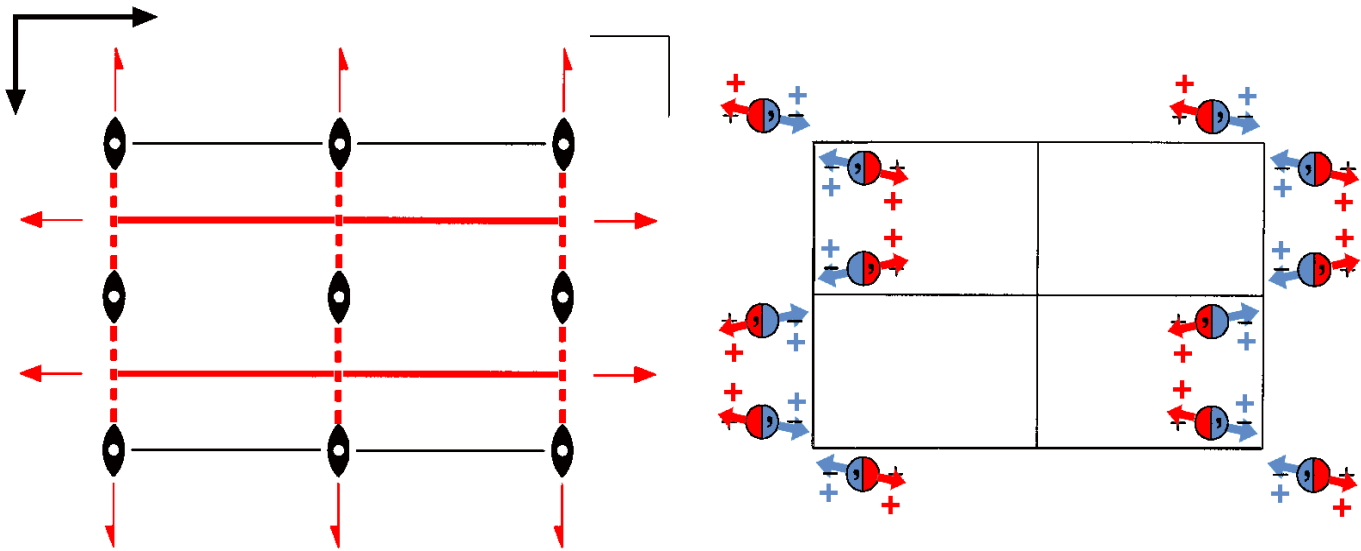
pm'a'm

No. 40.5.267

m'm'm

p2₁'/m₂'/a₂'/m

Orthorhombic/Rectangular



Origin at center (2/m) at 2₁'a₂'/m

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 1/4,y,0
(2_y|1/2,0,0)'

(3) 2 0,0,z
(2_z|0,0,0)

(4) 2' (1/2,0,0) x,0,0
(2_x|1/2,0,0)'

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) a' (1/2,0,0) x,0,z
(m_y|1/2,0,0)'

(7) m x,y,0
(m_z|0,0,0)

(8) m' 1/4,y,z
(m_x|1/2,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,y,\bar{z}$ [u, \bar{v} ,w]	(3) \bar{x},\bar{y},z [\bar{u} , \bar{v} ,w]	(4) $x+1/2,\bar{y},\bar{z}$ [\bar{u} ,v,w]
8 h 1	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x+1/2,\bar{y},z$ [u, \bar{v} ,w]	(7) x,y,\bar{z} [\bar{u} , \bar{v} ,w]	(8) $\bar{x}+1/2,y,z$ [\bar{u} ,v,w]
4 g m'..	1/4,y,z [0,v,w]	1/4,y, \bar{z} [0, \bar{v} ,w]	3/4, \bar{y},z [0, \bar{v} ,w]	3/4, \bar{y},\bar{z} [0,v,w]
4 f ..m	x,y,0 [0,0,w]	$\bar{x}+1/2,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$x+1/2,\bar{y},0$ [0,0,w]
4 e ..2	0,1/2,z [0,0,w]	1/2,1/2, \bar{z} [0,0,w]	0,1/2, \bar{z} [0,0,w]	1/2,1/2,z [0,0,w]
4 d ..2	0,0,z [0,0,w]	1/2,0, \bar{z} [0,0,w]	0,0, \bar{z} [0,0,w]	1/2,0,z [0,0,w]
2 c m'2'm	1/4,y,0 [0,0,w]	3/4, $\bar{y},0$ [0,0,w]		
2 b ..2/m	0,1/2,0 [0,0,w]	1/2,1/2,0 [0,0,w]		
2 a ..2/m	0,0,0 [0,0,w]	1/2,0,0 [0,0,w]		

Symmetry of special projections

Along [001] p2mg1'
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] p2'm'm
 $a^* = b$
 Origin at x,0,0

Along [010] p2'm'm
 $a^* = a/2$
 Origin at 0,y,0

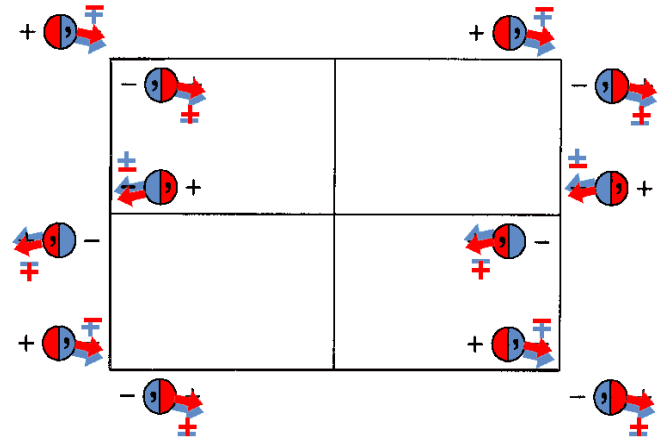
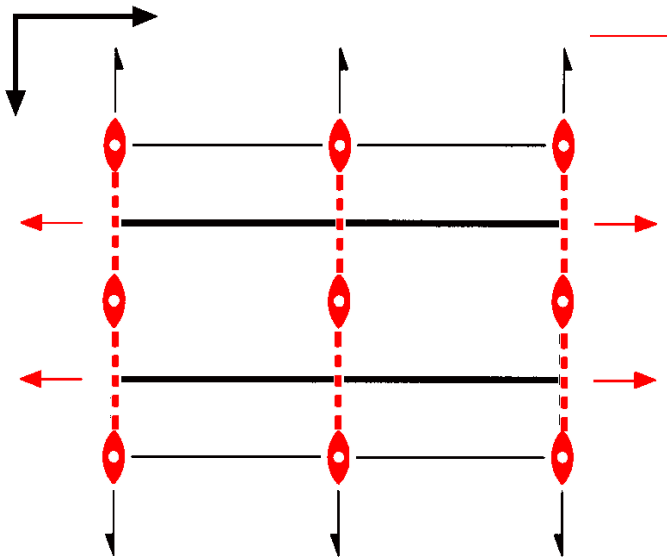
pma'm'

No. 40.6.268

mm'm'

p2₁/m2'/a'2'/m'

Orthorhombic/Rectangular



Origin at center (2'/m') at 2₁a'2'/m'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 1/4,y,0
(2_y|1/2,0,0)'

(3) 2' 0,0,z
(2_z|0,0,0)'

(4) 2 (1/2,0,0) x,0,0
(2_x|1/2,0,0)

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) a' (1/2,0,0) x,0,z
(m_y|1/2,0,0)'

(7) m' x,y,0
(m_z|0,0,0)'

(8) m 1/4,y,z
(m_x|1/2,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,y,\bar{z} [u,\bar{v},w]$	(3) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(4) $x+1/2,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x+1/2,\bar{y},z [u,\bar{v},w]$	(7) $x,y,\bar{z} [u,v,\bar{w}]$	(8) $\bar{x}+1/2,y,z [u,\bar{v},\bar{w}]$
4 g m..	$1/4,y,z [u,0,0]$	$1/4,y,\bar{z} [u,0,0]$	$3/4,\bar{y},z [u,0,0]$	$3/4,\bar{y},\bar{z} [u,0,0]$
4 f ..m'	$x,y,0 [u,v,0]$	$\bar{x}+1/2,y,0 [u,\bar{v},0]$	$\bar{x},\bar{y},0 [u,v,0]$	$x+1/2,\bar{y},0 [u,\bar{v},0]$
4 e ..2'	$0,1/2,z [u,v,0]$	$1/2,1/2,\bar{z} [u,\bar{v},0]$	$0,1/2,\bar{z} [u,v,0]$	$1/2,1/2,z [u,\bar{v},0]$
4 d ..2'	$0,0,z [u,v,0]$	$1/2,0,\bar{z} [u,\bar{v},0]$	$0,0,\bar{z} [u,v,0]$	$1/2,0,z [u,\bar{v},0]$
2 c m2'm'	$1/4,y,0 [u,0,0]$	$3/4,\bar{y},0 [u,0,0]$		
2 b ..2'/m'	$0,1/2,0 [u,v,0]$	$1/2,1/2,0 [u,\bar{v},0]$		
2 a ..2'/m'	$0,0,0 [u,v,0]$	$1/2,0,0 [u,\bar{v},0]$		

Symmetry of special projections

Along [001] $p2'mg'$
 $a^* = a \quad b^* = b$
 Origin at $0,0,z$

Along [100] $p2mm1'$
 $a^* = b$
 Origin at $x,0,0$

Along [010] $p2'mm'$
 $a^* = a/2$
 Origin at $0,y,0$

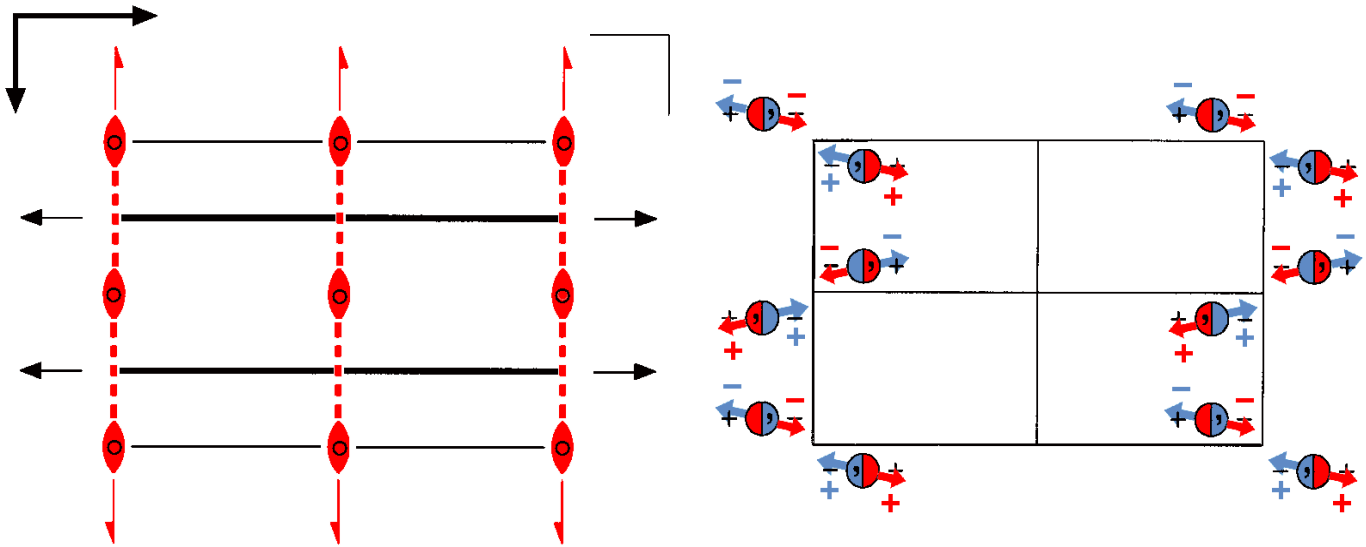
pma'm

No. 40.7.269

mm'm

p2₁'/m2/a'2'/m

Orthorhombic/Rectangular



Origin at center ($2'/m$) at $2, 'a'2'/m$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4, y, 0$
(2 _y $1/2, 0, 0$) | (3) 2' $0, 0, z$
(2 _z $0, 0, 0$)' | (4) 2' $(1/2, 0, 0)$ $x, 0, 0$
(2 _x $1/2, 0, 0$)' |
| (5) $\bar{1}$ ' $0, 0, 0$
($\bar{1}$ $0, 0, 0$)' | (6) a' $(1/2, 0, 0)$ $x, 0, z$
(m _y $1/2, 0, 0$)' | (7) m $x, y, 0$
(m _z $0, 0, 0$) | (8) m $1/4, y, z$
(m _x $1/2, 0, 0$) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,y,\bar{z} [\bar{u},v,\bar{w}]$	(3) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(4) $x+1/2,\bar{y},\bar{z} [\bar{u},v,w]$
	(5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(6) $x+1/2,\bar{y},z [u,\bar{v},w]$	(7) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(8) $\bar{x}+1/2,y,z [u,\bar{v},\bar{w}]$
4 g m..	$1/4,y,z [u,0,0]$	$1/4,y,\bar{z} [\bar{u},0,0]$	$3/4,\bar{y},z [u,0,0]$	$3/4,\bar{y},\bar{z} [\bar{u},0,0]$
4 f ..m	$x,y,0 [0,0,w]$	$\bar{x}+1/2,y,0 [0,0,\bar{w}]$	$\bar{x},\bar{y},0 [0,0,\bar{w}]$	$x+1/2,\bar{y},0 [0,0,w]$
4 e ..2'	$0,1/2,z [u,v,0]$	$1/2,1/2,\bar{z} [\bar{u},v,0]$	$0,1/2,\bar{z} [\bar{u},\bar{v},0]$	$1/2,1/2,z [u,\bar{v},0]$
4 d ..2'	$0,0,z [u,v,0]$	$1/2,0,\bar{z} [\bar{u},v,0]$	$0,0,\bar{z} [\bar{u},\bar{v},0]$	$1/2,0,z [u,\bar{v},0]$
2 c m2m	$1/4,y,0 [0,0,0]$	$3/4,\bar{y},0 [0,0,0]$		
2 b ..2'/m	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		
2 a ..2'/m	$0,0,0 [0,0,0]$	$1/2,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p2mg1'$ $a^* = a \quad b^* = b$ Origin at $0,0,z$	Along [100] $p2mm1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2mm$ $a^* = a/2$ Origin at $0,y,0$
--	--	--

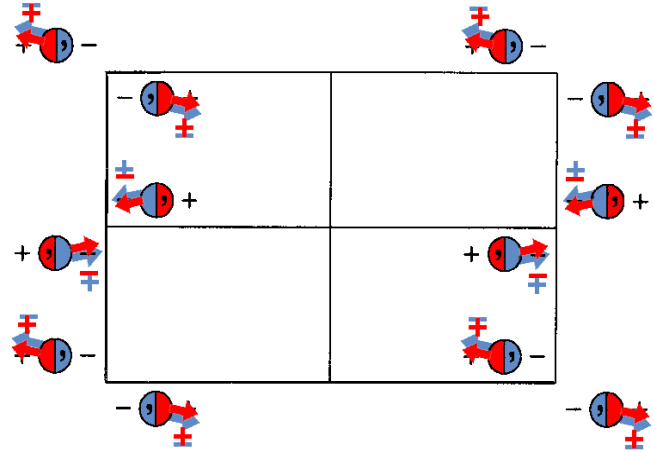
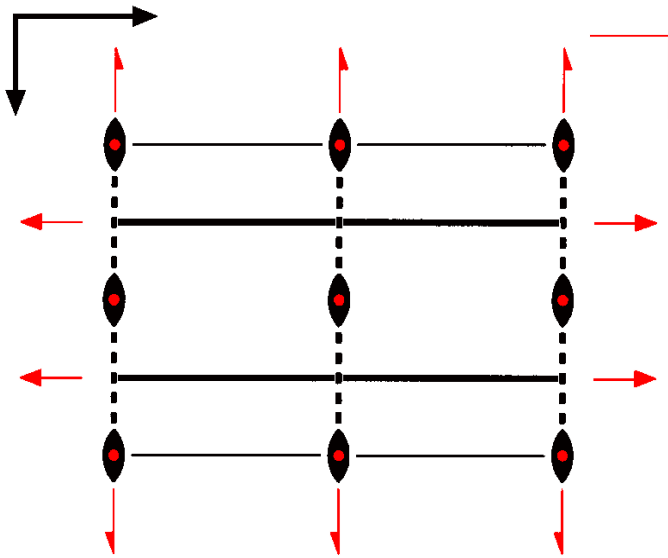
pmam'

No. 40.8.270

mmm'

$p2_1'/m2'/a2/m'$

Orthorhombic/Rectangular



Origin at center ($2/m'$) at $2_1'a2/m'$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'_y$ $1/4, y, 0$
(2_y | $1/2, 0, 0$)'

(3) $2'_z$ $0, 0, z$
(2_z | $0, 0, 0$)

(4) $2'_x$ $(1/2, 0, 0)$ $x, 0, 0$
(2_x | $1/2, 0, 0$)'

(5) $\bar{1}'$ $0, 0, 0$
($\bar{1}$ | $0, 0, 0$)'

(6) a $(1/2, 0, 0)$ $x, 0, z$
(m_y | $1/2, 0, 0$)

(7) m'_z $x, y, 0$
(m_z | $0, 0, 0$)'

(8) m'_y $1/4, y, z$
(m_x | $1/2, 0, 0$)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,y,\bar{z}$ [u, \bar{v} ,w]	(3) \bar{x},\bar{y},z [\bar{u} , \bar{v} ,w]	(4) $x+1/2,\bar{y},\bar{z}$ [\bar{u} ,v,w]
8 h 1	(5) \bar{x},\bar{y},\bar{z} [\bar{u} , \bar{v} , \bar{w}]	(6) $x+1/2,\bar{y},z$ [\bar{u} ,v, \bar{w}]	(7) x,y,\bar{z} [u,v, \bar{w}]	(8) $\bar{x}+1/2,y,z$ [u, \bar{v} , \bar{w}]
4 g m..	$1/4,y,z$ [u,0,0]	$1/4,y,\bar{z}$ [u,0,0]	$3/4,\bar{y},z$ [\bar{u} ,0,0]	$3/4,\bar{y},\bar{z}$ [\bar{u} ,0,0]
4 f ..m'	$x,y,0$ [u,v,0]	$\bar{x}+1/2,y,0$ [u, \bar{v} ,0]	$\bar{x},\bar{y},0$ [\bar{u} , \bar{v} ,0]	$x+1/2,\bar{y},0$ [\bar{u} ,v,0]
4 e ..2	$0,1/2,z$ [0,0,w]	$1/2,1/2,\bar{z}$ [0,0,w]	$0,1/2,\bar{z}$ [0,0, \bar{w}]	$1/2,1/2,z$ [0,0, \bar{w}]
4 d ..2	$0,0,z$ [0,0,w]	$1/2,0,\bar{z}$ [0,0,w]	$0,0,\bar{z}$ [0,0, \bar{w}]	$1/2,0,z$ [0,0, \bar{w}]
2 c m2m'	$1/4,y,0$ [u,0,0]	$3/4,\bar{y},0$ [\bar{u} ,0,0]		
2 b ..2/m'	$0,1/2,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]		
2 a ..2/m'	$0,0,0$ [0,0,0]	$1/2,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] $p2mg$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p2mm1'$
 $a^* = b$
 Origin at x,0,0

Along [010] $p2mm1'$
 $a^* = a/2$
 Origin at 0,y,0

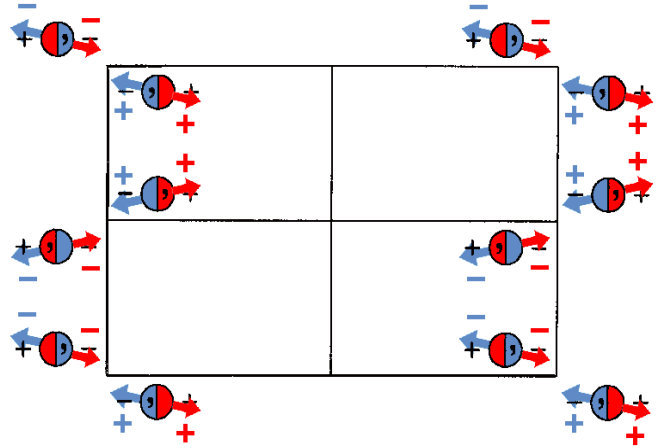
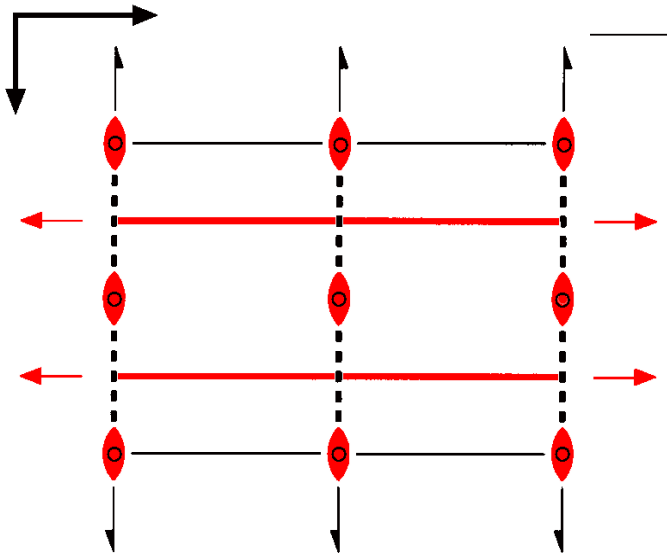
pm'am

No. 40.9.271

m'mm

p2₁/m'2'/a2'/m

Orthorhombic/Rectangular



Origin at center ($2'/m$) at $2, a2'/m$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' $1/4, y, 0$
(2_y| $1/2, 0, 0$)'

(3) 2' $0, 0, z$
(2_z|0,0,0)'

(4) 2 $(1/2, 0, 0)$ $x, 0, 0$
(2_x| $1/2, 0, 0$)

(5) $\bar{1}$ ' $0, 0, 0$
($\bar{1}$ |0,0,0)'

(6) a $(1/2, 0, 0)$ $x, 0, z$
(m_y| $1/2, 0, 0$)

(7) m $x, y, 0$
(m_z|0,0,0)

(8) m' $1/4, y, z$
(m_x| $1/2, 0, 0$)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,y,\bar{z}$ [u,\bar{v},w]	(3) \bar{x},\bar{y},z [u,v,\bar{w}]	(4) $x+1/2,\bar{y},\bar{z}$ [u,\bar{v},\bar{w}]
8 h 1	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) $x+1/2,\bar{y},z$ [\bar{u},v,\bar{w}]	(7) x,y,\bar{z} [\bar{u},\bar{v},w]	(8) $\bar{x}+1/2,y,z$ [\bar{u},v,w]
4 g m'..	$1/4,y,z$ [$0,v,w$]	$1/4,y,\bar{z}$ [$0,\bar{v},w$]	$3/4,\bar{y},z$ [$0,v,\bar{w}$]	$3/4,\bar{y},\bar{z}$ [$0,\bar{v},\bar{w}$]
4 f ..m	$x,y,0$ [$0,0,w$]	$\bar{x}+1/2,y,0$ [$0,0,w$]	$\bar{x},\bar{y},0$ [$0,0,\bar{w}$]	$x+1/2,\bar{y},0$ [$0,0,\bar{w}$]
4 e ..2'	$0,1/2,z$ [$u,v,0$]	$1/2,1/2,\bar{z}$ [$u,\bar{v},0$]	$0,1/2,\bar{z}$ [$\bar{u},\bar{v},0$]	$1/2,1/2,z$ [$\bar{u},v,0$]
4 d ..2'	$0,0,z$ [$u,v,0$]	$1/2,0,\bar{z}$ [$u,\bar{v},0$]	$0,0,\bar{z}$ [$\bar{u},\bar{v},0$]	$1/2,0,z$ [$\bar{u},v,0$]
2 c m'2'm	$1/4,y,0$ [$0,0,w$]	$3/4,\bar{y},0$ [$0,0,\bar{w}$]		
2 b ..2'/m	$0,1/2,0$ [$0,0,0$]	$1/2,1/2,0$ [$0,0,0$]		
2 a ..2'/m	$0,0,0$ [$0,0,0$]	$1/2,0,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $p2mg1'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2mm$ $a^* = b$ Origin at $x,0,0$	Along [010] $p_{2a^*}2mm$ $a^* = a/2$ Origin at $0,y,0$
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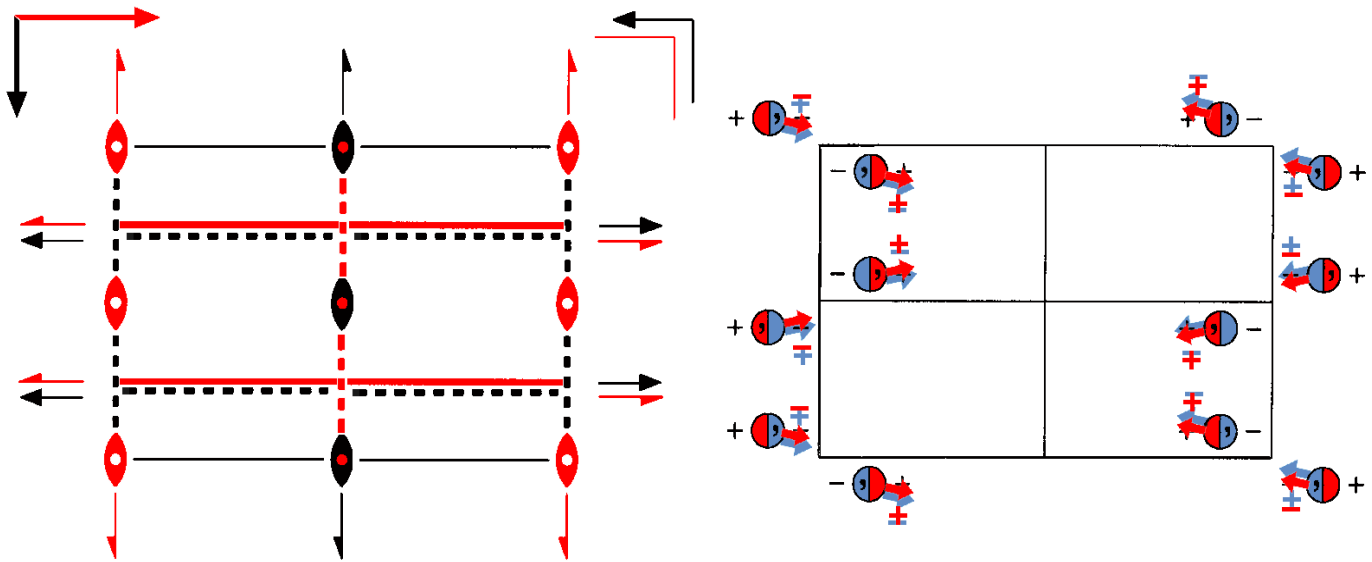
$p_{2b} m' am'$

No. 40.10.272

$mmm1'$

$p_{2b} 2_1'/m'2/a2'/m'$

Orthorhombic/Rectangular



Origin at center ($2'/m'$) at $2_1'a2'/m'$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4,y,0$
(2 _y 1/2,0,0) | (3) 2' 0,0,z
(2 _z 0,0,0)' | (4) 2' (1/2,0,0) x,0,0
(2 _x 1/2,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) a (1/2,0,0) x,0,z
(m _y 1/2,0,0) | (7) m' x,y,0
(m _z 0,0,0)' | (8) m' 1/4,y,z
(m _x 1/2,0,0)' |

For (0,1,0)' + set

- | | | | |
|---|--|--|--|
| (1) t' (0,1,0)
(1 0,1,0)' | (2) 2' (0,1,0) 1/4,y,0
(2 _y 1/2,1,0)' | (3) 2 0,1/2,z
(2 _z 0,1,0) | (4) 2 (1/2,0,0) x,1/2,0
(2 _x 1/2,1,0) |
| (5) $\bar{1}$ ' 0,1/2,0
($\bar{1}$ 0,1,0)' | (6) a' (1/2,0,0) x,1/2,z
(m _y 1/2,1,0)' | (7) b (0,1,0) x,y,0
(m _z 0,1,0) | (8) b (0,1,0) 1/4,y,z
(m _x 1/2,1,0) |

Generators selected (1); t(1,0,0); t(0,1,0)'; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(0,1,0)' +		
8 h 1	(1) x,y,z [u,v,w] (5) \bar{x},\bar{y},\bar{z} [u,v,w]	(2) $\bar{x}+1/2,y,\bar{z}$ [\bar{u},v,\bar{w}] (6) $x+1/2,\bar{y},z$ [\bar{u},v,\bar{w}]	(3) \bar{x},\bar{y},z [u,v, \bar{w}] (7) x,y, \bar{z} [u,v, \bar{w}]	(4) $x+1/2,\bar{y},\bar{z}$ [\bar{u},v,w] (8) $\bar{x}+1/2,y,z$ [\bar{u},v,w]
4 g m'..	1/4,y,z [0,v,w]	1/4,y, \bar{z} [0,v, \bar{w}]	3/4, \bar{y},z [0,v, \bar{w}]	3/4, \bar{y},\bar{z} [0,v,w]
4 f ..m'	x,y,0 [u,v,0]	$\bar{x}+1/2,y,0$ [$\bar{u},v,0$]	$\bar{x},\bar{y},0$ [u,v,0]	$x+1/2,\bar{y},0$ [$\bar{u},v,0$]
4 e ..2	0,1/2,z [0,0,w]	1/2,1/2, \bar{z} [0,0, \bar{w}]	0,1/2, \bar{z} [0,0, \bar{w}]	1/2,1/2,z [0,0,w]
4 d ..2'	0,0,z [u,v,0]	1/2,0, \bar{z} [$\bar{u},v,0$]	0,0, \bar{z} [u,v,0]	1/2,0,z [$\bar{u},v,0$]
2 c m'2m'	1/4,y,0 [0,v,0]	3/4, $\bar{y},0$ [0,v,0]		
2 b ..2/m'	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]		
2 a ..2'/m'	0,0,0 [u,v,0]	1/2,0,0 [$\bar{u},v,0$]		

Symmetry of special projections

Along [001] $p2m'g'$ $a^* = a$ $b^* = b$ Origin at 0,1/2,z	Along [100] $p_{2a^*}2'mm'$ $a^* = b$ Origin at x,0,0	Along [010] $p2mm1'$ $a^* = a/2$ Origin at 0,y,0
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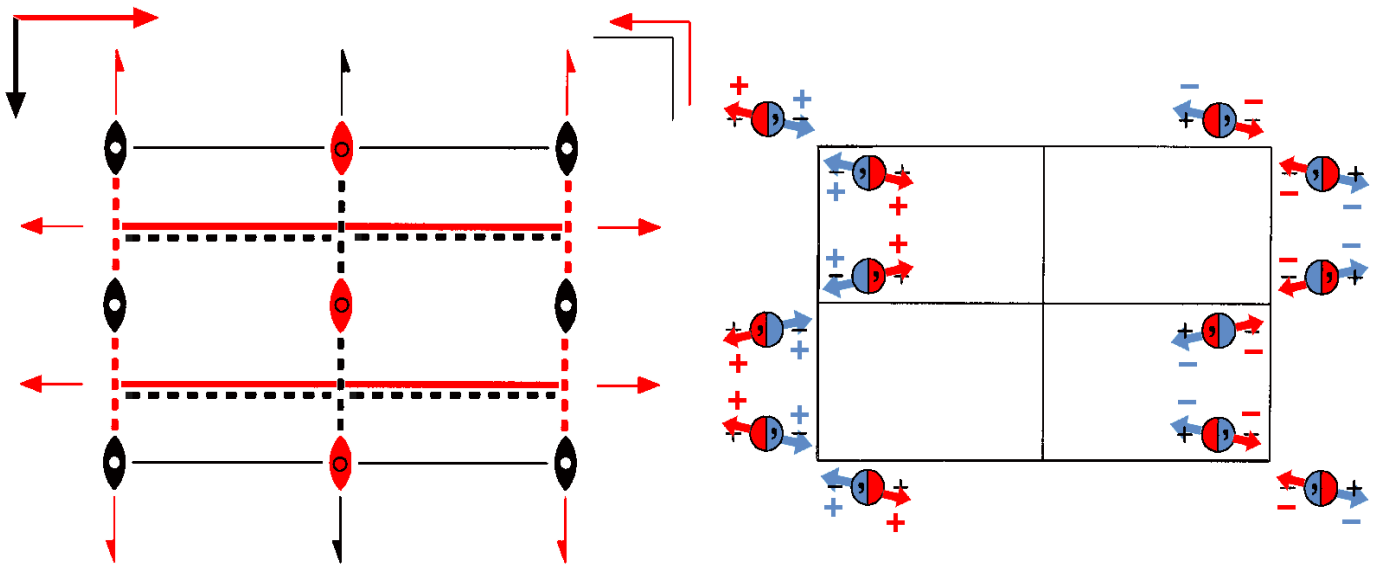
$p_{2b} m' a' m$

No. 40.11.273

$mmm1'$

$p_{2b} 2_1' / m' 2' / a' 2' / m$

Orthorhombic/Rectangular



Origin at center ($2/m$) at $2_1' a' 2' / m$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) $2'$ $1/4, y, 0$
(2_y $1/2, 0, 0$)' | (3) 2 $0, 0, z$
(2_z $0, 0, 0$) | (4) $2'$ $(1/2, 0, 0)$ $x, 0, 0$
(2_x $1/2, 0, 0$)' |
| (5) $\bar{1}$ $0, 0, 0$
($\bar{1}$ $0, 0, 0$) | (6) a' $(1/2, 0, 0)$ $x, 0, z$
(m_y $1/2, 0, 0$)' | (7) m $x, y, 0$
(m_z $0, 0, 0$) | (8) m' $1/4, y, z$
(m_x $1/2, 0, 0$)' |

For $(0,1,0)'$ + set

- | | | | |
|---|--|--|--|
| (1) t' $(0, 1, 0)$
(1 $0, 1, 0$)' | (2) 2 $(0, 1, 0)$ $1/4, y, 0$
(2_y $1/2, 1, 0$) | (3) $2'$ $0, 1/2, z$
(2_z $0, 1, 0$)' | (4) 2 $(1/2, 0, 0)$ $x, 1/2, 0$
(2_x $1/2, 1, 0$) |
| (5) $\bar{1}$ $0, 1/2, 0$
($\bar{1}$ $0, 1, 0$)' | (6) a $(1/2, 0, 0)$ $x, 1/2, z$
(m_y $1/2, 1, 0$) | (7) b' $(0, 1, 0)$ $x, y, 0$
(m_z $0, 1, 0$)' | (8) b $(0, 1, 0)$ $1/4, y, z$
(m_x $1/2, 1, 0$) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		(0,0,0)+	(0,1,0)' +	
8 h 1	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,y,\bar{z}$ [u, \bar{v} ,w]	(3) \bar{x},\bar{y},z [\bar{u} , \bar{v} ,w]	(4) $x+1/2,\bar{y},\bar{z}$ [\bar{u} ,v,w]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x+1/2,\bar{y},z$ [u, \bar{v} ,w]	(7) x,y, \bar{z} [\bar{u} , \bar{v} ,w]	(8) $\bar{x}+1/2,y,z$ [\bar{u} ,v,w]
4 g m'..	1/4,y,z [0,v,w]	1/4,y, \bar{z} [0, \bar{v} ,w]	3/4, \bar{y},z [0, \bar{v} ,w]	3/4, \bar{y},\bar{z} [0,v,w]
4 f ..m	x,y,0 [0,0,w]	$\bar{x}+1/2,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$x+1/2,\bar{y},0$ [0,0,w]
4 e ..2'	0,1/2,z [u,v,0]	1/2,1/2, \bar{z} [u, \bar{v} ,0]	0,1/2, \bar{z} [\bar{u} , \bar{v} ,0]	1/2,1/2,z [\bar{u} ,v,0]
4 d ..2	0,0,z [0,0,w]	1/2,0, \bar{z} [0,0,w]	0,0, \bar{z} [0,0,w]	1/2,0,z [0,0,w]
2 c m'2'm	1/4,y,0 [0,0,w]	3/4, $\bar{y},0$ [0,0,w]		
2 b ..2'/m	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]		
2 a ..2/m	0,0,0 [0,0,w]	1/2,0,0 [0,0,w]		

Symmetry of special projections

Along [001] $p2mg1'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p_{2a^*}2'm'm$ $a^* = b$ Origin at x,0,0	Along [010] $p2mm1'$ $a^* = a/2$ Origin at 0,y,0
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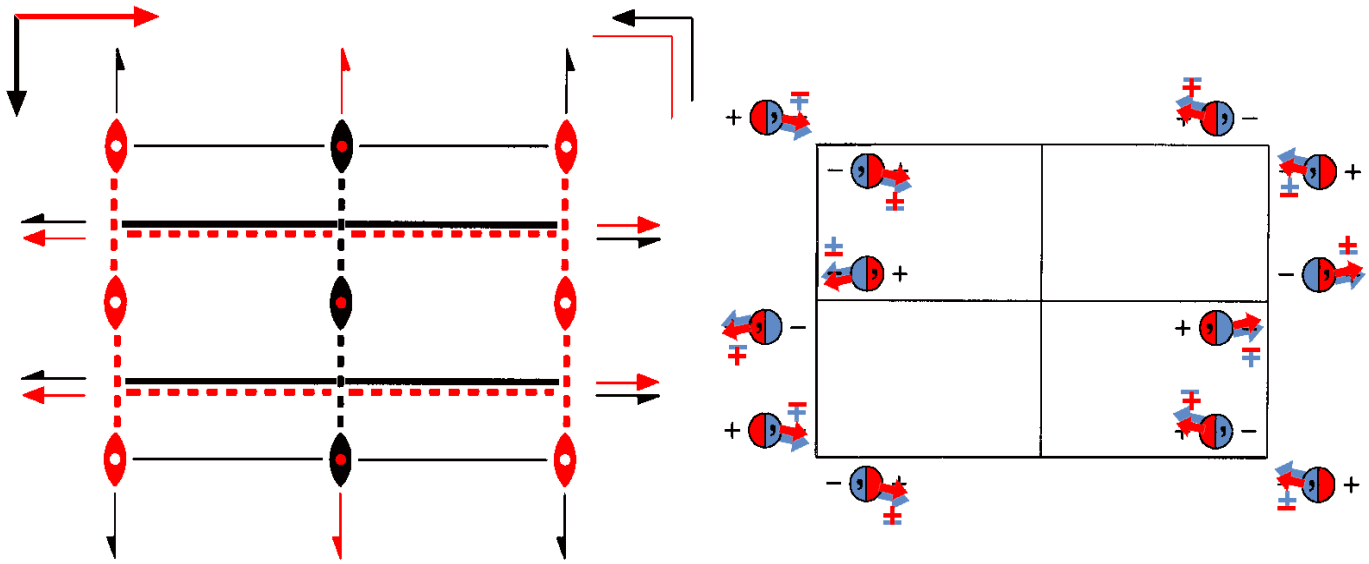
$p_{2b} ma'm'$

No. 40.12.274

$mmm1'$

$p_{2b} 2_1/m2'/a2'/m'$

Orthorhombic/Rectangular



Origin at center ($2'/m'$) at $2_1a'2'/m'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) $2'_1$ $1/4,y,0$
(2_y $1/2,0,0$)' | (3) $2'_z$ $0,0,z$
(2_z $0,0,0$)' | (4) 2 $(1/2,0,0)$ $x,0,0$
(2_x $1/2,0,0$) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ $0,0,0$) | (6) a' $(1/2,0,0)$ $x,0,z$
(m_y $1/2,0,0$)' | (7) m' $x,y,0$
(m_z $0,0,0$)' | (8) m $1/4,y,z$
(m_x $1/2,0,0$) |

For $(0,1,0)$ ' + set

- | | | | |
|---|--|--|--|
| (1) t' $(0,1,0)$
(1 $0,1,0$)' | (2) 2 $(0,1,0)$ $1/4,y,0$
(2_y $1/2,1,0$) | (3) 2 $0,1/2,z$
(2_z $0,1,0$) | (4) $2'_1$ $(1/2,0,0)$ $x,1/2,0$
(2_x $1/2,1,0$)' |
| (5) $\bar{1}$ $0,1/2,0$
($\bar{1}$ $0,1,0$)' | (6) a $(1/2,0,0)$ $x,1/2,z$
(m_y $1/2,1,0$) | (7) b $(0,1,0)$ $x,y,0$
(m_z $0,1,0$) | (8) b' $(0,1,0)$ $1/4,y,z$
(m_x $1/2,1,0$)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		(0,0,0)+	(0,1,0)' +	
8 h 1	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,y,\bar{z}$ [u, \bar{v} ,w]	(3) \bar{x},\bar{y},z [u,v, \bar{w}]	(4) $x+1/2,\bar{y},\bar{z}$ [u, \bar{v} , \bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x+1/2,\bar{y},z$ [u, \bar{v} ,w]	(7) x,y,\bar{z} [u,v, \bar{w}]	(8) $\bar{x}+1/2,y,z$ [u, \bar{v} , \bar{w}]
4 g m..	$1/4,y,z$ [u,0,0]	$1/4,y,\bar{z}$ [u,0,0]	$3/4,\bar{y},z$ [u,0,0]	$3/4,\bar{y},\bar{z}$ [u,0,0]
4 f ..m'	$x,y,0$ [u,v,0]	$\bar{x}+1/2,y,0$ [u, \bar{v} ,0]	$\bar{x},\bar{y},0$ [u,v,0]	$x+1/2,\bar{y},0$ [u, \bar{v} ,0]
4 e ..2	$0,1/2,z$ [0,0,w]	$1/2,1/2,\bar{z}$ [0,0,w]	$0,1/2,\bar{z}$ [0,0, \bar{w}]	$1/2,1/2,z$ [0,0, \bar{w}]
4 d ..2'	$0,0,z$ [u,v,0]	$1/2,0,\bar{z}$ [u, \bar{v} ,0]	$0,0,\bar{z}$ [u,v,0]	$1/2,0,z$ [u, \bar{v} ,0]
2 c m2'm'	$1/4,y,0$ [u,0,0]	$3/4,\bar{y},0$ [u,0,0]		
2 b ..2/m'	$0,1/2,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]		
2 a ..2'/m'	$0,0,0$ [u,v,0]	$1/2,0,0$ [u, \bar{v} ,0]		

Symmetry of special projections

Along [001] p_{2b} 2mg	Along [100] $p2mm1'$	Along [010] $p2mm1'$
$a^* = a$ $b^* = b$	$a^* = b$	$a^* = a/2$
Origin at $0,1/2,z$	Origin at $x,0,0$	Origin at $0,y,0$

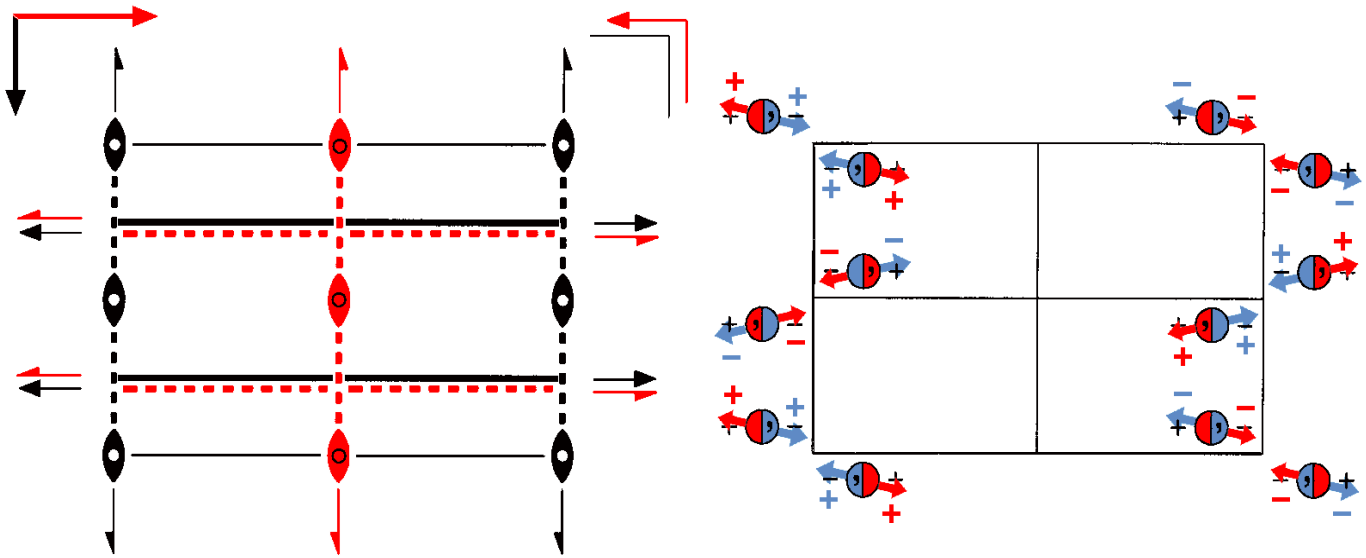
p_{2b} mam

No. 40.13.275

mmm1'

$p_{2b} 2_1/m2/a2/m$

Orthorhombic/Rectangular



Origin at center ($2/m$) at $2_1a2/m$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1$; $0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|--------------------------------------|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4,y,0$
(2_y $1/2,0,0$) | (3) 2 $0,0,z$
(2_z $0,0,0$) | (4) 2 (1/2,0,0) $x,0,0$
(2_x $1/2,0,0$) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ $0,0,0$) | (6) a (1/2,0,0) $x,0,z$
(m_y $1/2,0,0$) | (7) m $x,y,0$
(m_z $0,0,0$) | (8) m $1/4,y,z$
(m_x $1/2,0,0$) |

For (0,1,0)' + set

- | | | | |
|---|--|--|--|
| (1) t' (0,1,0)
(1 $0,1,0$)' | (2) 2' (0,1,0) $1/4,y,0$
(2_y $1/2,1,0$)' | (3) 2' $0,1/2,z$
(2_z $0,1,0$)' | (4) 2' (1/2,0,0) $x,1/2,0$
(2_x $1/2,1,0$)' |
| (5) $\bar{1}$ ' $0,1/2,0$
($\bar{1}$ $0,1,0$)' | (6) a' (1/2,0,0) $x,1/2,z$
(m_y $1/2,1,0$)' | (7) b' (0,1,0) $x,y,0$
(m_z $0,1,0$)' | (8) b' (0,1,0) $1/4,y,z$
(m_x $1/2,1,0$)' |

Generators selected (1); t(1,0,0); t(0,1,0)'; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(0,1,0)' +		
8 h 1	(1) x,y,z [u,v,w] (5) \bar{x},\bar{y},\bar{z} [u,v,w]	(2) $\bar{x}+1/2,y,\bar{z}$ [\bar{u},v,\bar{w}] (6) $x+1/2,\bar{y},z$ [\bar{u},v,\bar{w}]	(3) \bar{x},\bar{y},z [\bar{u},\bar{v},w] (7) x,y,\bar{z} [\bar{u},\bar{v},w]	(4) $x+1/2,\bar{y},\bar{z}$ [u, \bar{v},\bar{w}] (8) $\bar{x}+1/2,y,z$ [u, \bar{v},\bar{w}]
4 g m..	1/4,y,z [u,0,0]	1/4,y, \bar{z} [$\bar{u},0,0$]	3/4, \bar{y},z [$\bar{u},0,0$]	3/4, \bar{y},\bar{z} [u,0,0]
4 f ..m	x,y,0 [0,0,w]	$\bar{x}+1/2,y,0$ [0,0, \bar{w}]	$\bar{x},\bar{y},0$ [0,0,w]	$x+1/2,\bar{y},0$ [0,0, \bar{w}]
4 e ..2'	0,1/2,z [u,v,0]	1/2,1/2, \bar{z} [$\bar{u},v,0$]	0,1/2, \bar{z} [$\bar{u},\bar{v},0$]	1/2,1/2,z [u, $\bar{v},0$]
4 d ..2	0,0,z [0,0,w]	1/2,0, \bar{z} [0,0, \bar{w}]	0,0, \bar{z} [0,0,w]	1/2,0,z [0,0, \bar{w}]
2 c m2m	1/4,y,0 [0,0,0]	3/4, $\bar{y},0$ [0,0,0]		
2 b ..2'/m	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]		
2 a ..2/m	0,0,0 [0,0,w]	1/2,0,0 [0,0, \bar{w}]		

Symmetry of special projections

Along [001] p2mg1' $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p2mm1' $a^* = b$ Origin at x,0,0	Along [010] p2mm1' $a^* = a/2$ Origin at 0,y,0
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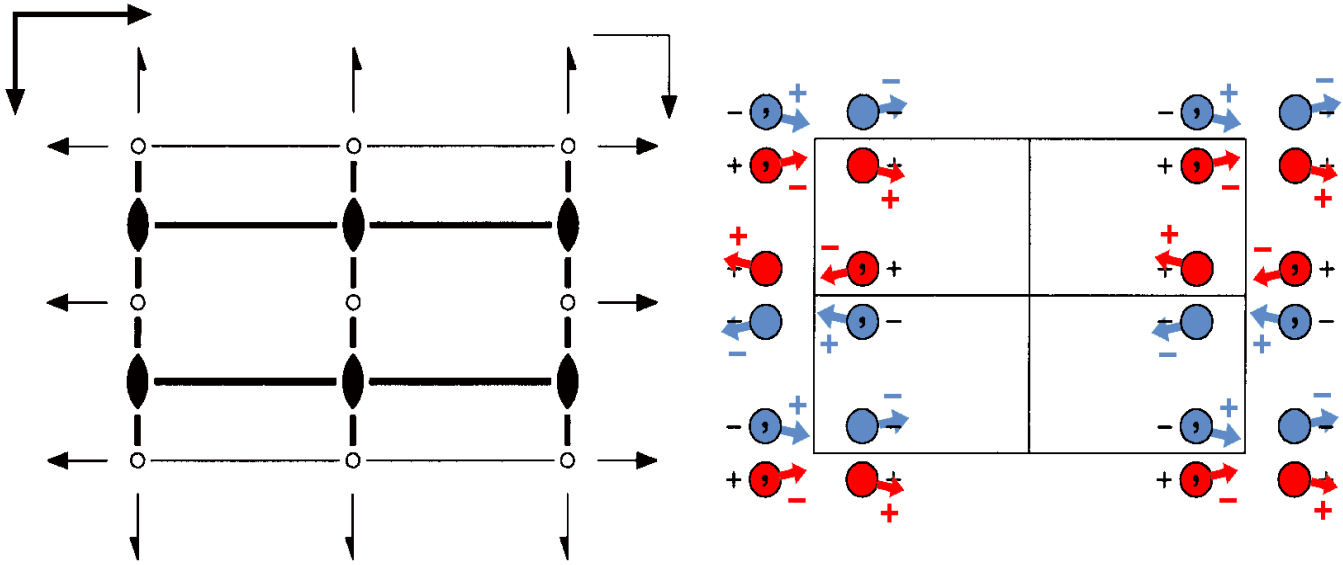
pmma

No. 41.1.276

mmm

$p2_1/m2/m2/a$

Orthorhombic/Rectangular



Origin at center ($2/m$) at $2_1/m$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4,0,z$
(2_z $1/2,0,0$) | (3) 2 $0,y,0$
(2_y $0,0,0$) | (4) 2 $(1/2,0,0)$ $x,0,0$
(2_x $1/2,0,0$) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ $0,0,0$) | (6) a $(1/2,0,0)$ $x,y,0$
(m_z $1/2,0,0$) | (7) m $x,0,z$
(m_y $0,0,0$) | (8) m $1/4,y,z$
(m_x $1/2,0,0$) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y},z$ [\bar{u},\bar{v},w]	(3) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(4) $x+1/2,\bar{y},\bar{z}$ [u,\bar{v},\bar{w}]
8 i 1	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]	(7) x,\bar{y},z [\bar{u},v,\bar{w}]	(8) $\bar{x}+1/2,y,z$ [u,\bar{v},\bar{w}]
4 h m..	$1/4,y,z$ [u,0,0]	$1/4,\bar{y},z$ [$\bar{u},0,0$]	$3/4,y,\bar{z}$ [$\bar{u},0,0$]	$3/4,\bar{y},\bar{z}$ [u,0,0]
4 g .m.	$x,1/2,z$ [0,v,0]	$\bar{x}+1/2,1/2,z$ [0, \bar{v} ,0]	$\bar{x},1/2,\bar{z}$ [0,v,0]	$x+1/2,1/2,\bar{z}$ [0, \bar{v} ,0]
4 f .m.	$x,0,z$ [0,v,0]	$\bar{x}+1/2,0,z$ [0, \bar{v} ,0]	$\bar{x},0,\bar{z}$ [0,v,0]	$x+1/2,0,\bar{z}$ [0, \bar{v} ,0]
4 e .2.	$0,y,0$ [0,v,0]	$1/2,\bar{y},0$ [0, \bar{v} ,0]	$0,\bar{y},0$ [0,v,0]	$1/2,y,0$ [0, \bar{v} ,0]
2 d mm2	$1/4,1/2,z$ [0,0,0]	$3/4,1/2,\bar{z}$ [0,0,0]		
2 c mm2	$1/4,0,z$ [0,0,0]	$3/4,0,\bar{z}$ [0,0,0]		
2 b .2/m.	$0,1/2,0$ [0,v,0]	$1/2,1/2,0$ [0, \bar{v} ,0]		
2 a .2/m.	$0,0,0$ [0,v,0]	$1/2,0,0$ [0, \bar{v} ,0]		

Symmetry of special projections

Along [001] $p_{2a^*}2mm$ $a^* = a/2$ $b^* = b$ Origin at $1/4,0,z$	Along [100] $p2mm1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2mg1'$ $a^* = a$ Origin at $0,y,0$
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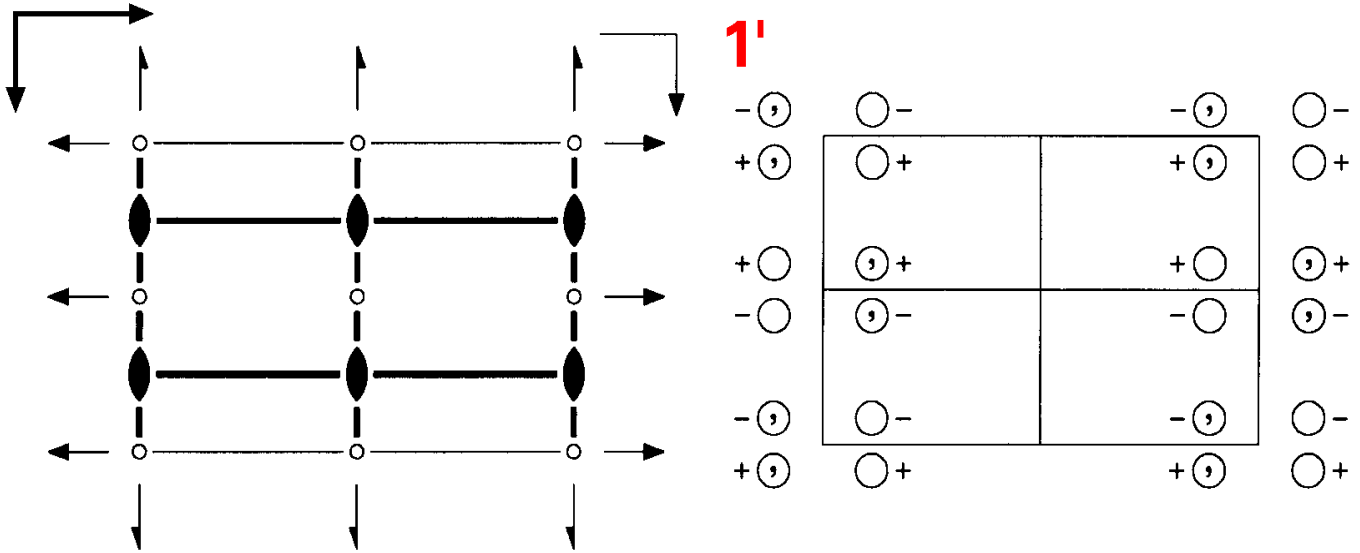
pmma1'

No. 41.2.277

mmm1'

p2₁/m2/m2/a1'

Orthorhombic/Rectangular



Origin at center ($2/m1'$) at $2_12/ma1'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

For 1 + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4,0,z$
(2 _z 1/2,0,0) | (3) 2 $0,y,0$
(2 _y 0,0,0) | (4) 2 $(1/2,0,0)$ $x,0,0$
(2 _x 1/2,0,0) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (6) a $(1/2,0,0)$ $x,y,0$
(m _z 1/2,0,0) | (7) m $x,0,z$
(m _y 0,0,0) | (8) m $1/4,y,z$
(m _x 1/2,0,0) |

For 1' + set

- | | | | |
|---|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' $1/4,0,z$
(2 _z 1/2,0,0)' | (3) 2' $0,y,0$
(2 _y 0,0,0)' | (4) 2' $(1/2,0,0)$ $x,0,0$
(2 _x 1/2,0,0)' |
| (5) $\bar{1}$ ' $0,0,0$
($\bar{1}$ 0,0,0)' | (6) a' $(1/2,0,0)$ $x,y,0$
(m _z 1/2,0,0)' | (7) m' $x,0,z$
(m _y 0,0,0)' | (8) m' $1/4,y,z$
(m _x 1/2,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	$1+$	$1'$	$+$	$+$
8 i $11'$	(1) $x,y,z [0,0,0]$ (5) $\bar{x},\bar{y},\bar{z} [0,0,0]$	(2) $\bar{x}+1/2,\bar{y},z [0,0,0]$ (6) $x+1/2,y,\bar{z} [0,0,0]$	(3) $\bar{x},y,\bar{z} [0,0,0]$ (7) $x,\bar{y},z [0,0,0]$	(4) $x+1/2,\bar{y},\bar{z} [0,0,0]$ (8) $\bar{x}+1/2,y,z [0,0,0]$
4 h $m..1'$	$1/4,y,z [0,0,0]$	$1/4,\bar{y},z [0,0,0]$	$3/4,y,\bar{z} [0,0,0]$	$3/4,\bar{y},\bar{z} [0,0,0]$
4 g $.m.1'$	$x,1/2,z [0,0,0]$	$\bar{x}+1/2,1/2,z [0,0,0]$	$\bar{x},1/2,\bar{z} [0,0,0]$	$x+1/2,1/2,\bar{z} [0,0,0]$
4 f $.m.1'$	$x,0,z [0,0,0]$	$\bar{x}+1/2,0,z [0,0,0]$	$\bar{x},0,\bar{z} [0,0,0]$	$x+1/2,0,\bar{z} [0,0,0]$
4 e $.2.1'$	$0,y,0 [0,0,0]$	$1/2,\bar{y},0 [0,0,0]$	$0,\bar{y},0 [0,0,0]$	$1/2,y,0 [0,0,0]$
2 d $mm21'$	$1/4,1/2,z [0,0,0]$	$3/4,1/2,\bar{z} [0,0,0]$		
2 c $mm21'$	$1/4,0,z [0,0,0]$	$3/4,0,\bar{z} [0,0,0]$		
2 b $.2/m.1'$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		
2 a $.2/m.1'$	$0,0,0 [0,0,0]$	$1/2,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p2mm1'$ $a^* = a/2$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2mm1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2mg1'$ $a^* = a$ Origin at $0,y,0$
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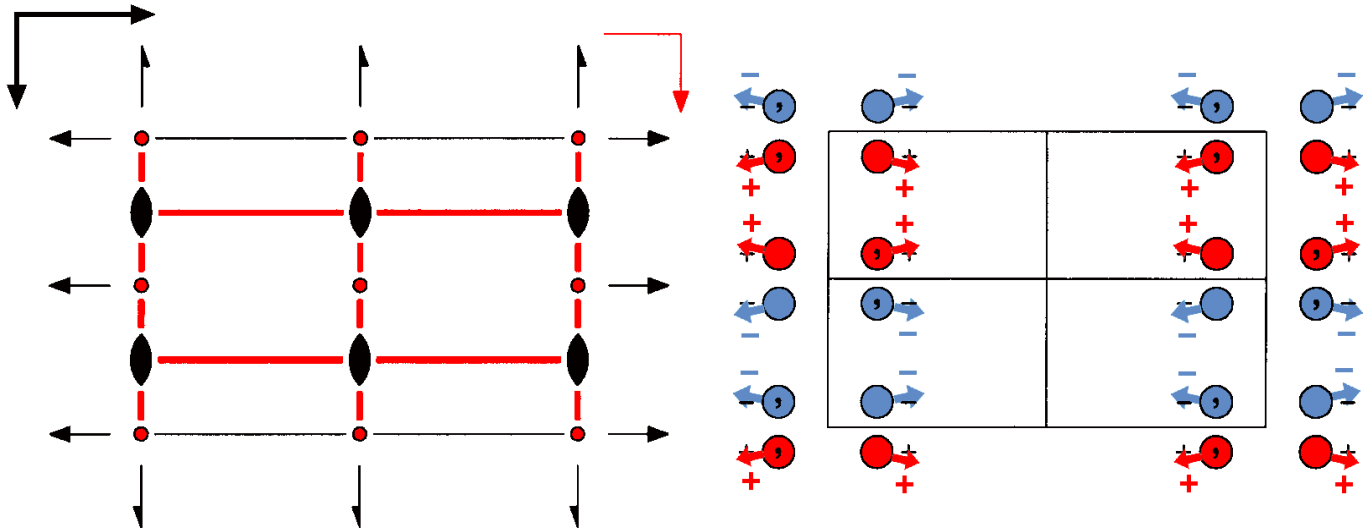
pm'm'a'

No. 41.3.278

m'm'm'

p2₁/m²/m²/a'

Orthorhombic/Rectangular



Origin at center (2/m') at 2₁2/m'a'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 1/4,0,z
(2 _z 1/2,0,0) | (3) 2 0,y,0
(2 _y 0,0,0) | (4) 2 (1/2,0,0) x,0,0
(2 _x 1/2,0,0) |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ ' 0,0,0)' | (6) a' (1/2,0,0) x,y,0
(m _z 1/2,0,0)' | (7) m' x,0,z
(m _y 0,0,0)' | (8) m' 1/4,y,z
(m _x 1/2,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 i 1	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y},z$ [\bar{u},\bar{v},w]	(3) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(4) $x+1/2,\bar{y},\bar{z}$ [u,\bar{v},\bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) $x+1/2,y,\bar{z}$ [u,v,\bar{w}]	(7) x,\bar{y},z [u,\bar{v},w]	(8) $\bar{x}+1/2,y,z$ [\bar{u},v,w]
4 h m'..	1/4,y,z [0,v,w]	1/4, \bar{y},z [0, \bar{v},w]	3/4,y, \bar{z} [0,v, \bar{w}]	3/4, \bar{y},\bar{z} [0, \bar{v},\bar{w}]
4 g .m'.	x,1/2,z [u,0,w]	$\bar{x}+1/2,1/2,z$ [$\bar{u},0,w$]	$\bar{x},1/2,\bar{z}$ [$\bar{u},0,\bar{w}$]	$x+1/2,1/2,\bar{z}$ [$u,0,\bar{w}$]
4 f .m'.	x,0,z [u,0,w]	$\bar{x}+1/2,0,z$ [$\bar{u},0,w$]	$\bar{x},0,\bar{z}$ [$\bar{u},0,\bar{w}$]	$x+1/2,0,\bar{z}$ [$u,0,\bar{w}$]
4 e .2.	0,y,0 [0,v,0]	1/2, $\bar{y},0$ [0, $\bar{v},0$]	0, $\bar{y},0$ [0, $\bar{v},0$]	1/2,y,0 [0,v,0]
2 d m'm'2	1/4,1/2,z [0,0,w]	3/4,1/2, \bar{z} [0,0, \bar{w}]		
2 c m'm'2	1/4,0,z [0,0,w]	3/4,0, \bar{z} [0,0, \bar{w}]		
2 b .2/m'.	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]		
2 a .2/m'.	0,0,0 [0,0,0]	1/2,0,0 [0,0,0]		

Symmetry of special projections

Along [001] p2m'm'	Along [100] p2m'm'	Along [010] p2m'g'
$a^* = a/2$ $b^* = b$	$a^* = b$	$a^* = a$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

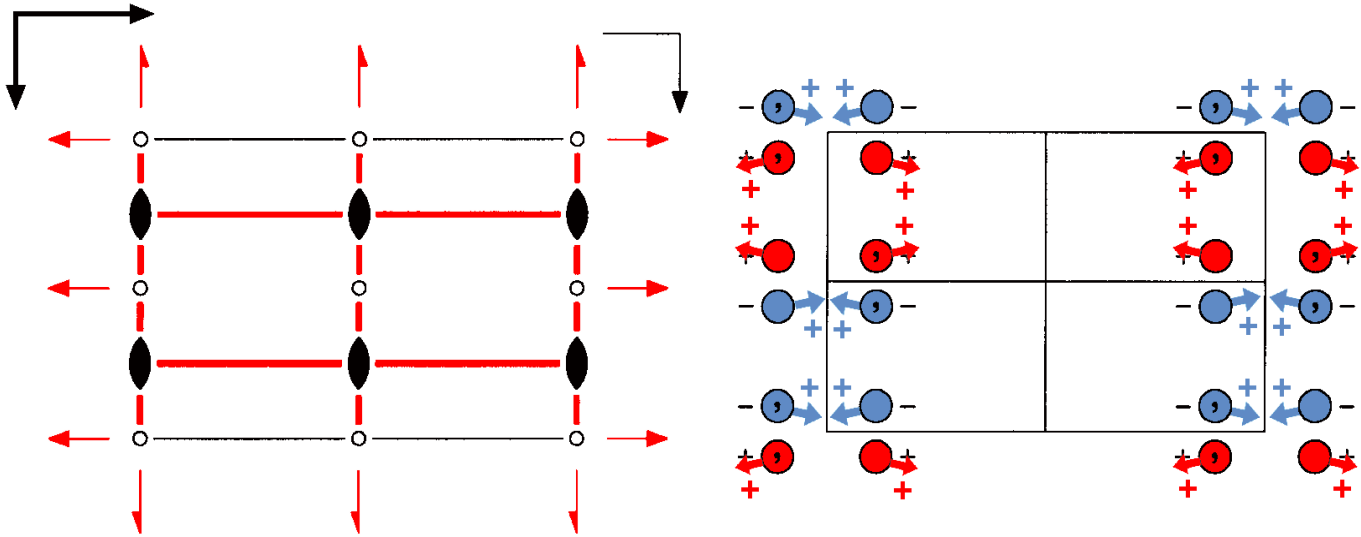
pm'm'a

No. 41.4.279

m'm'm

$p2_1'/m'2'/m'2'/a$

Orthorhombic/Rectangular



Origin at center ($2'/m'$) at $2_1'2'/m'a$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4,0,z$
(2_z $1/2,0,0$) | (3) $2'$ $0,y,0$
(2_y $0,0,0$)' | (4) $2'$ ($1/2,0,0$) $x,0,0$
(2_x $1/2,0,0$)' |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ $0,0,0$) | (6) a ($1/2,0,0$) $x,y,0$
(m_z $1/2,0,0$) | (7) m' $x,0,z$
(m_y $0,0,0$)' | (8) m' $1/4,y,z$
(m_x $1/2,0,0$)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 i 1	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y},z$ [\bar{u},\bar{v},w]	(3) \bar{x},y,\bar{z} [u, \bar{v},w]	(4) $x+1/2,\bar{y},\bar{z}$ [\bar{u},v,w]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]	(7) x,\bar{y},z [u, \bar{v},w]	(8) $\bar{x}+1/2,y,z$ [\bar{u},v,w]
4 h m'..	1/4,y,z [0,v,w]	1/4, \bar{y},z [0, \bar{v},w]	3/4,y, \bar{z} [0, \bar{v},w]	3/4, \bar{y},\bar{z} [0,v,w]
4 g .m'.	x,1/2,z [u,0,w]	$\bar{x}+1/2,1/2,z$ [$\bar{u},0,w$]	$\bar{x},1/2,\bar{z}$ [u,0,w]	$x+1/2,1/2,\bar{z}$ [$\bar{u},0,w$]
4 f .m'.	x,0,z [u,0,w]	$\bar{x}+1/2,0,z$ [$\bar{u},0,w$]	$\bar{x},0,\bar{z}$ [u,0,w]	$x+1/2,0,\bar{z}$ [$\bar{u},0,w$]
4 e .2'.	0,y,0 [u,0,w]	1/2, $\bar{y},0$ [$\bar{u},0,w$]	0, $\bar{y},0$ [u,0,w]	1/2,y,0 [$\bar{u},0,w$]
2 d m'm'2	1/4,1/2,z [0,0,w]	3/4,1/2, \bar{z} [0,0,w]		
2 c m'm'2	1/4,0,z [0,0,w]	3/4,0, \bar{z} [0,0,w]		
2 b .2'/m'.	0,1/2,0 [u,0,w]	1/2,1/2,0 [$\bar{u},0,w$]		
2 a .2'/m'.	0,0,0 [u,0,w]	1/2,0,0 [$\bar{u},0,w$]		

Symmetry of special projections

Along [001] $p_{2a^*}2m'm'$	Along [100] $p2'm'm'$	Along [010] $p2'm'g$
$a^* = a/2$ $b^* = b$	$a^* = b$	$a^* = a$
Origin at 1/4,0,z	Origin at x,0,0	Origin at 0,y,0

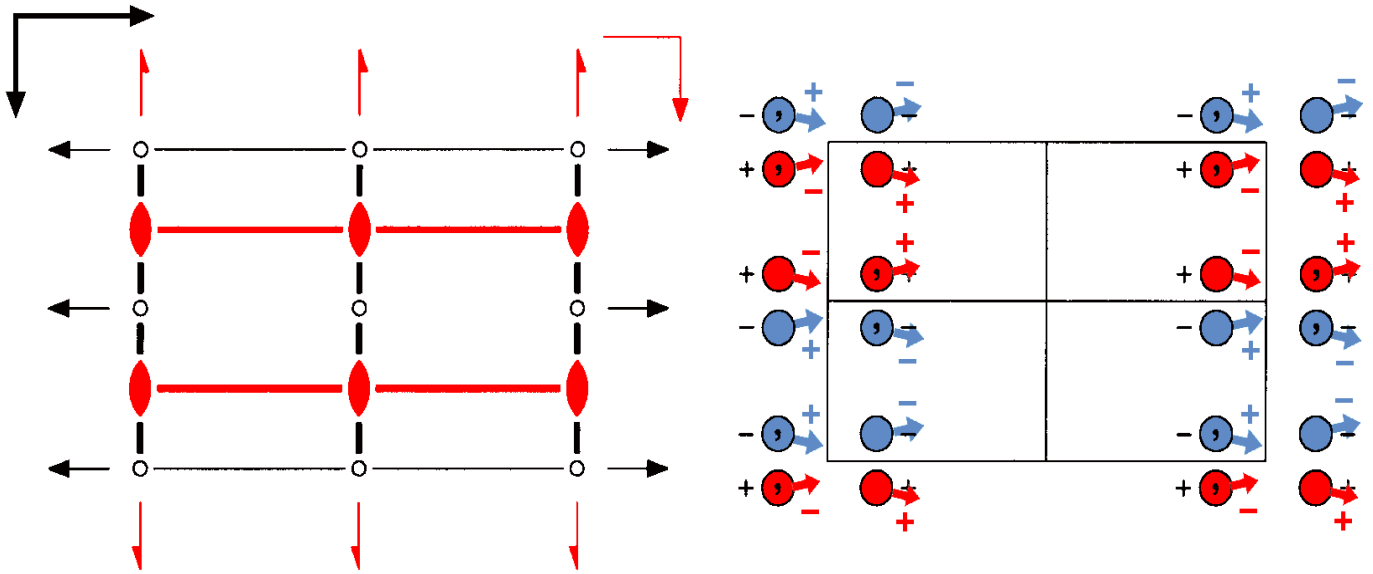
pm'ma'

No. 41.5.280

m'mm'

p2₁'/m'2/m2'/a'

Orthorhombic/Rectangular



Origin at center (2/m) at 2₁'/2/ma'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2' 1/4,0,z
(2 _z 1/2,0,0)' | (3) 2 0,y,0
(2 _y 0,0,0) | (4) 2' (1/2,0,0) x,0,0
(2 _x 1/2,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) a' (1/2,0,0) x,y,0
(m _z 1/2,0,0)' | (7) m x,0,z
(m _y 0,0,0) | (8) m' 1/4,y,z
(m _x 1/2,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]	(3) \bar{x},y,\bar{z} [\bar{u} ,v, \bar{w}]	(4) $x+1/2,\bar{y},\bar{z}$ [\bar{u} ,v,w]
8 i 1	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]	(7) x,\bar{y},z [\bar{u} ,v, \bar{w}]	(8) $\bar{x}+1/2,y,z$ [\bar{u} ,v,w]
4 h m'..	1/4,y,z [0,v,w]	1/4, \bar{y} ,z [0,v, \bar{w}]	3/4,y, \bar{z} [0,v, \bar{w}]	3/4, \bar{y} , \bar{z} [0,v,w]
4 g .m.	x,1/2,z [0,v,0]	$\bar{x}+1/2,1/2,z$ [0,v,0]	$\bar{x},1/2,\bar{z}$ [0,v,0]	$x+1/2,1/2,\bar{z}$ [0,v,0]
4 f .m.	x,0,z [0,v,0]	$\bar{x}+1/2,0,z$ [0,v,0]	$\bar{x},0,\bar{z}$ [0,v,0]	$x+1/2,0,\bar{z}$ [0,v,0]
4 e .2.	0,y,0 [0,v,0]	1/2, \bar{y} ,0 [0,v,0]	0, \bar{y} ,0 [0,v,0]	1/2,y,0 [0,v,0]
2 d m'm2'	1/4,1/2,z [0,v,0]	3/4,1/2, \bar{z} [0,v,0]		
2 c m'm2'	1/4,0,z [0,v,0]	3/4,0, \bar{z} [0,v,0]		
2 b .2/m.	0,1/2,0 [0,v,0]	1/2,1/2,0 [0,v,0]		
2 a .2/m.	0,0,0 [0,v,0]	1/2,0,0 [0,v,0]		

Symmetry of special projections

Along [001] p2'mm'	Along [100] p2'mm'	Along [010] p2mg1'
$a^* = b$ $b^* = -a/2$	$a^* = b$	$a^* = a$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

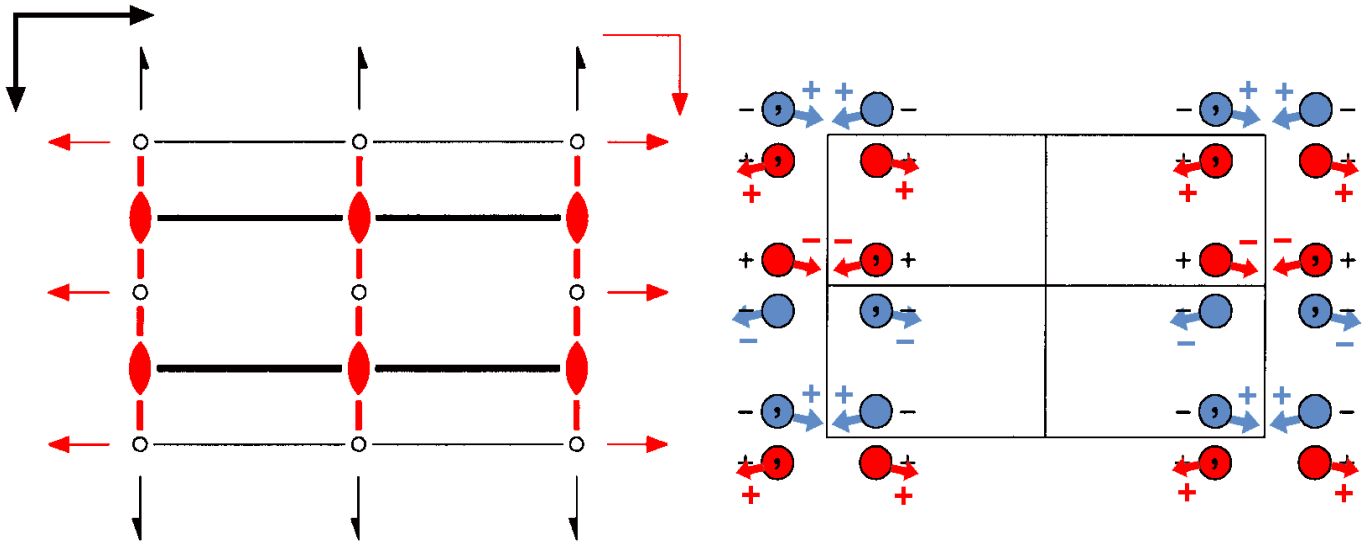
pmm'a'

No. 41.6.281

mm'm'

p2₁/m2₁'/m2₁'/a'

Orthorhombic/Rectangular



Origin at center (2'/m') at 2₁2₁'/m'a'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 1/4,0,z
(2_z|1/2,0,0)'

(3) 2' 0,y,0
(2_y|0,0,0)'

(4) 2 (1/2,0,0) x,0,0
(2_x|1/2,0,0)

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) a' (1/2,0,0) x,y,0
(m_z|1/2,0,0)'

(7) m' x,0,z
(m_y|0,0,0)'

(8) m 1/4,y,z
(m_x|1/2,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]	(3) \bar{x},y,\bar{z} [u, \bar{v} ,w]	(4) $x+1/2,\bar{y},\bar{z}$ [u, \bar{v},\bar{w}]
8 i 1	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]	(7) x,\bar{y},z [u, \bar{v} ,w]	(8) $\bar{x}+1/2,y,z$ [u, \bar{v},\bar{w}]
4 h m..	$1/4,y,z$ [u,0,0]	$1/4,\bar{y},z$ [u,0,0]	$3/4,y,\bar{z}$ [u,0,0]	$3/4,\bar{y},\bar{z}$ [u,0,0]
4 g .m'.	$x,1/2,z$ [u,0,w]	$\bar{x}+1/2,1/2,z$ [u,0, \bar{w}]	$\bar{x},1/2,\bar{z}$ [u,0,w]	$x+1/2,1/2,\bar{z}$ [u,0, \bar{w}]
4 f .m'.	$x,0,z$ [u,0,w]	$\bar{x}+1/2,0,z$ [u,0, \bar{w}]	$\bar{x},0,\bar{z}$ [u,0,w]	$x+1/2,0,\bar{z}$ [u,0, \bar{w}]
4 e .2'.	$0,y,0$ [u,0,w]	$1/2,\bar{y},0$ [u,0, \bar{w}]	$0,\bar{y},0$ [u,0,w]	$1/2,y,0$ [u,0, \bar{w}]
2 d mm'2'	$1/4,1/2,z$ [u,0,0]	$3/4,1/2,\bar{z}$ [u,0,0]		
2 c mm'2'	$1/4,0,z$ [u,0,0]	$3/4,0,\bar{z}$ [u,0,0]		
2 b .2'/m'.	$0,1/2,0$ [u,0,w]	$1/2,1/2,0$ [u,0, \bar{w}]		
2 a .2'/m'.	$0,0,0$ [u,0,w]	$1/2,0,0$ [u,0, \bar{w}]		

Symmetry of special projections

Along [001] $p2'mm'$ $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] $p2mm1'$ $a^* = b$ Origin at x,0,0	Along [010] $p2'mg'$ $a^* = a$ Origin at 0,y,0
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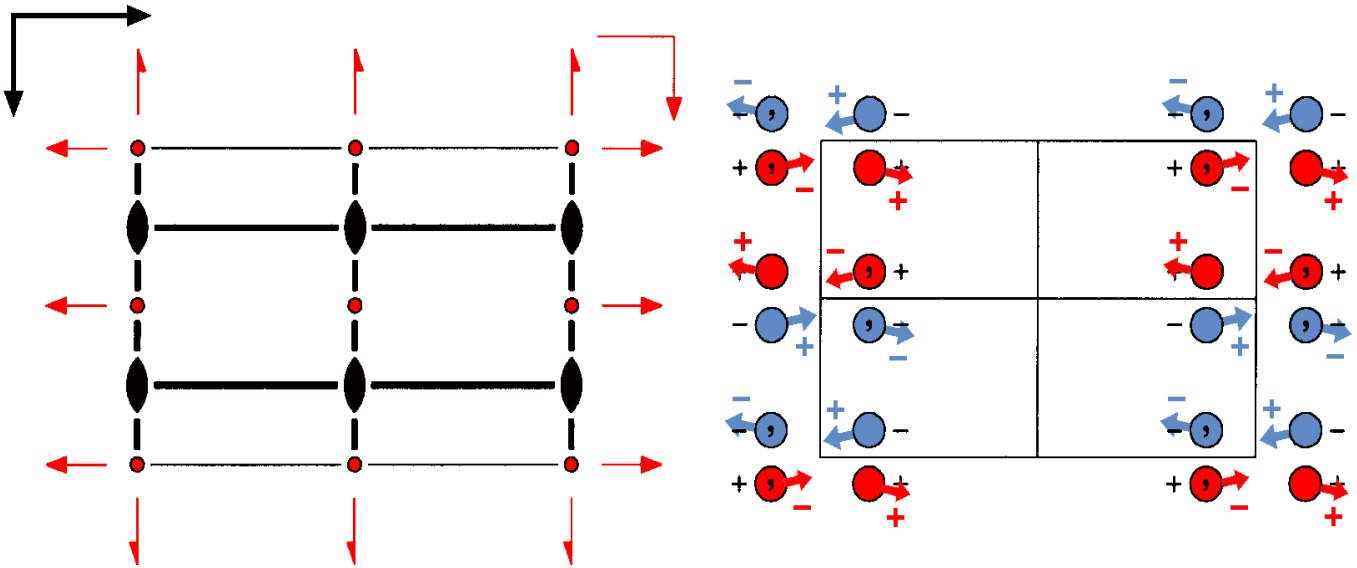
pmma'

No. 41.7.282

mmm'

$p2_1'/m2'/m2/a'$

Orthorhombic/Rectangular



Origin at center ($2'/m$) at $2_1'2'/ma'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4,0,z$
(2_z $1/2,0,0$) | (3) $2'$ $0,y,0$
(2_y $0,0,0$)' | (4) $2'$ $(1/2,0,0)$ $x,0,0$
(2_x $1/2,0,0$)' |
| (5) $\bar{1}'$ $0,0,0$
($\bar{1}$ $0,0,0$)' | (6) a' $(1/2,0,0)$ $x,y,0$
(m_z $1/2,0,0$)' | (7) m $x,0,z$
(m_y $0,0,0$) | (8) m $1/4,y,z$
(m_x $1/2,0,0$) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{x},y,\bar{z} [u,\bar{v},w]$	(4) $x+1/2,\bar{y},\bar{z} [\bar{u},v,w]$
8 i 1	(5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(6) $x+1/2,y,\bar{z} [u,v,\bar{w}]$	(7) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(8) $\bar{x}+1/2,y,z [u,\bar{v},\bar{w}]$
4 h m..	$1/4,y,z [u,0,0]$	$1/4,\bar{y},z [\bar{u},0,0]$	$3/4,y,\bar{z} [u,0,0]$	$3/4,\bar{y},\bar{z} [\bar{u},0,0]$
4 g .m.	$x,1/2,z [0,v,0]$	$\bar{x}+1/2,1/2,z [0,\bar{v},0]$	$\bar{x},1/2,\bar{z} [0,\bar{v},0]$	$x+1/2,1/2,\bar{z} [0,v,0]$
4 f .m.	$x,0,z [0,v,0]$	$\bar{x}+1/2,0,z [0,\bar{v},0]$	$\bar{x},0,\bar{z} [0,\bar{v},0]$	$x+1/2,0,\bar{z} [0,v,0]$
4 e .2'	$0,y,0 [u,0,w]$	$1/2,\bar{y},0 [\bar{u},0,w]$	$0,\bar{y},0 [\bar{u},0,\bar{w}]$	$[u,0,\bar{w}]1/2,y,0$
2 d mm2	$1/4,1/2,z [0,0,0]$	$3/4,1/2,\bar{z} [0,0,0]$		
2 c mm2	$1/4,0,z [0,0,0]$	$3/4,0,\bar{z} [0,0,0]$		
2 b .2'/m.	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		
2 a .2'/m.	$0,0,0 [0,0,0]$	$1/2,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p2mm$
 $a^* = a/2$ $b^* = b$
 Origin at $0,0,z$

Along [100] $p2mm1'$
 $a^* = b$
 Origin at $x,0,0$

Along [010] $p2mg1'$
 $a^* = a$
 Origin at $0,y,0$

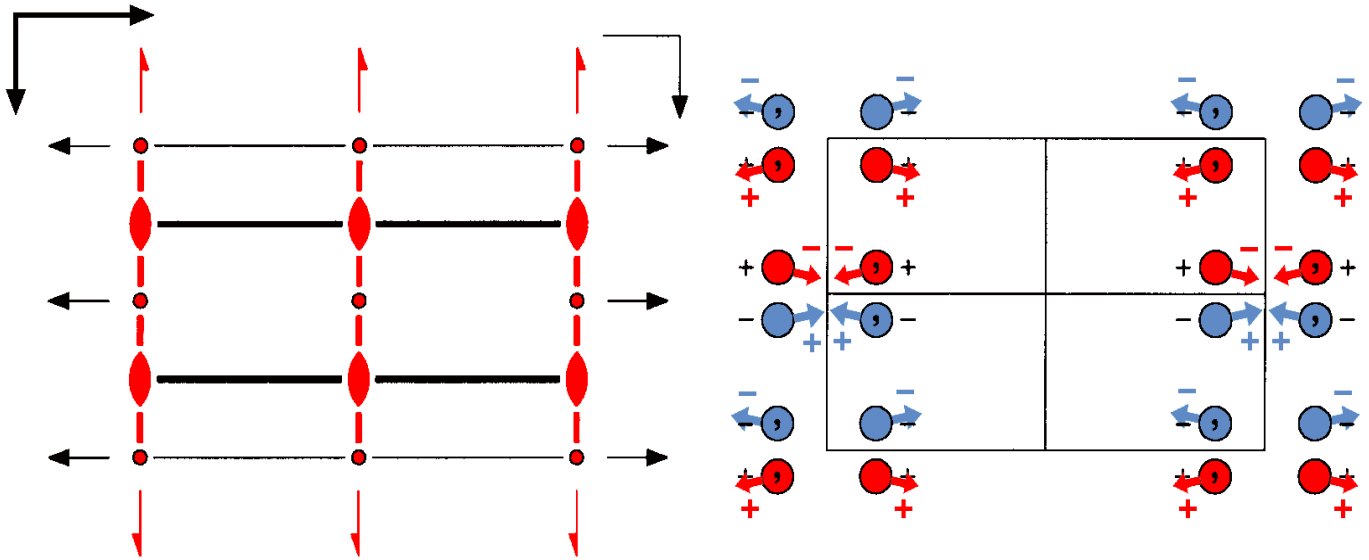
pmm'a

No. 41.8.283

mm'm

$p2_1'/m2/m'2'/a$

Orthorhombic/Rectangular



Origin at center ($2/m'$) at $2_1'2/m'a$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $2'_z$ $1/4,0,z$
($2_z|1/2,0,0$)'

(3) $2'_y$ $0,y,0$
($2_y|0,0,0$)

(4) $2'_x$ $(1/2,0,0)$ $x,0,0$
($2_x|1/2,0,0$)'

(5) $\bar{1}$ $0,0,0$
($\bar{1}|0,0,0$)'

(6) a $(1/2,0,0)$ $x,y,0$
($m_z|1/2,0,0$)

(7) m'_x $x,0,z$
($m_y|0,0,0$)'

(8) m'_y $1/4,y,z$
($m_x|1/2,0,0$)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]	(3) \bar{x},y,\bar{z} [\bar{u} ,v, \bar{w}]	(4) $x+1/2,\bar{y},\bar{z}$ [\bar{u} ,v,w]
8 i 1	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]	(7) x,\bar{y},z [u, \bar{v} ,w]	(8) $\bar{x}+1/2,y,z$ [u, \bar{v},\bar{w}]
4 h m..	$1/4,y,z$ [u,0,0]	$1/4,\bar{y},z$ [u,0,0]	$3/4,y,\bar{z}$ [\bar{u} ,0,0]	$3/4,\bar{y},\bar{z}$ [\bar{u} ,0,0]
4 g .m'.	$x,1/2,z$ [u,0,w]	$\bar{x}+1/2,1/2,z$ [u,0, \bar{w}]	$\bar{x},1/2,\bar{z}$ [\bar{u} ,0, \bar{w}]	$x+1/2,1/2,\bar{z}$ [\bar{u} ,0,w]
4 f .m'.	$x,0,z$ [u,0,w]	$\bar{x}+1/2,0,z$ [u,0, \bar{w}]	$\bar{x},0,\bar{z}$ [\bar{u} ,0, \bar{w}]	$x+1/2,0,\bar{z}$ [\bar{u} ,0,w]
4 e .2.	$0,y,0$ [0,v,0]	$1/2,\bar{y},0$ [0,v,0]	$0,\bar{y},0$ [0, \bar{v} ,0]	$1/2,y,0$ [0, \bar{v} ,0]
2 d mm'2'	$1/4,1/2,z$ [u,0,0]	$3/4,1/2,\bar{z}$ [\bar{u} ,0,0]		
2 c mm'2'	$1/4,0,z$ [u,0,0]	$3/4,0,\bar{z}$ [\bar{u} ,0,0]		
2 b .2/m'.	$0,1/2,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]		
2 a .2/m'.	$0,0,0$ [0,0,0]	$1/2,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] $p_{2a^*}2m'm'$	Along [100] $p2mm1'$	Along [010] $p2mg$
$a^* = a/2$ $b^* = b$	$a^* = b$	$a^* = a$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

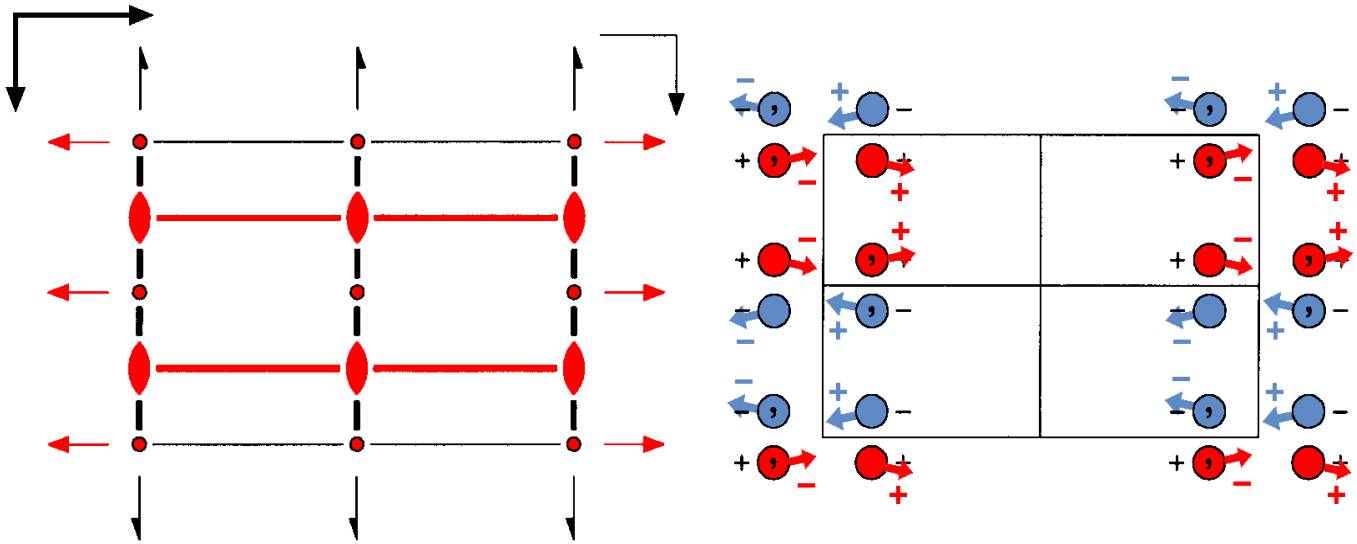
pm'ma

No. 41.9.284

m'mm

p2₁/m'2'/m2'/a

Orthorhombic/Rectangular



Origin at center ($2'/m$) at $2_1 2'/ma$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2'
(2 _z 1/2,0,0)' | (3) 2'
(2 _y 0,0,0)' | (4) 2 (1/2,0,0) x,0,0
(2 _x 1/2,0,0) |
| (5) $\bar{1}$ '
($\bar{1}$ 0,0,0)' | (6) a (1/2,0,0) x,y,0
(m _z 1/2,0,0) | (7) m x,0,z
(m _y 0,0,0) | (8) m'
(m _x 1/2,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y},z$ [u,v,w̄]	(3) \bar{x},y,\bar{z} [u,v̄,w]	(4) $x+1/2,\bar{y},\bar{z}$ [u,v̄,w̄]
8 i 1	(5) \bar{x},\bar{y},\bar{z} [ū,v̄,w̄]	(6) $x+1/2,y,\bar{z}$ [ū,v̄,w]	(7) x,\bar{y},z [ū,v,w̄]	(8) $\bar{x}+1/2,y,z$ [ū,v,w]
4 h m'..	$1/4,y,z$ [0,v,w]	$1/4,\bar{y},z$ [0,v,w̄]	$3/4,y,\bar{z}$ [0,v̄,w]	$3/4,\bar{y},\bar{z}$ [0,v̄,w̄]
4 g .m.	$x,1/2,z$ [0,v,0]	$\bar{x}+1/2,1/2,z$ [0,v,0]	$\bar{x},1/2,\bar{z}$ [0,v̄,0]	$x+1/2,1/2,\bar{z}$ [0,v̄,0]
4 f .m.	$x,0,z$ [0,v,0]	$\bar{x}+1/2,0,z$ [0,v,0]	$\bar{x},0,\bar{z}$ [0,v̄,0]	$x+1/2,0,\bar{z}$ [0,v̄,0]
4 e .2'.	$0,y,0$ [u,0,w]	$1/2,\bar{y},0$ [u,0,w̄]	$0,\bar{y},0$ [ū,0,w̄]	$1/2,y,0$ [ū,0,w]
2 d m'm2'	$1/4,1/2,z$ [0,v,0]	$3/4,1/2,\bar{z}$ [0,v̄,0]		
2 c m'm2'	$1/4,0,z$ [0,v,0]	$3/4,0,\bar{z}$ [0,v̄,0]		
2 b .2'/m.	$0,1/2,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]		
2 a .2'/m.	$0,0,0$ [0,0,0]	$1/2,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] $p_{2a^*}2mm$ $a^* = a/2$ $b^* = b$ Origin at 0,0,z	Along [100] $p2mm$ $a^* = b$ Origin at x,0,0	Along [010] $p2mg1'$ $a^* = a$ Origin at 0,y,0
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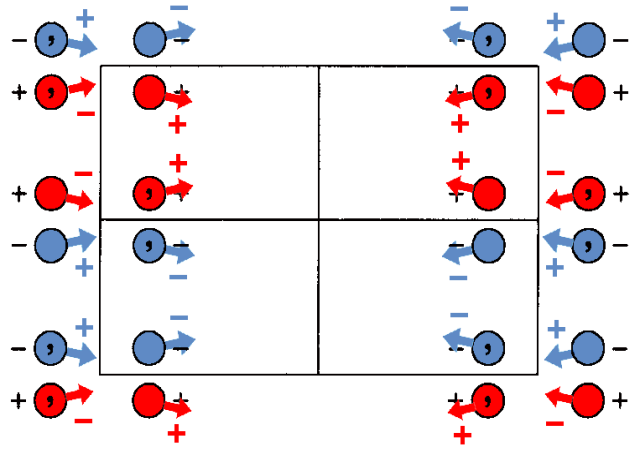
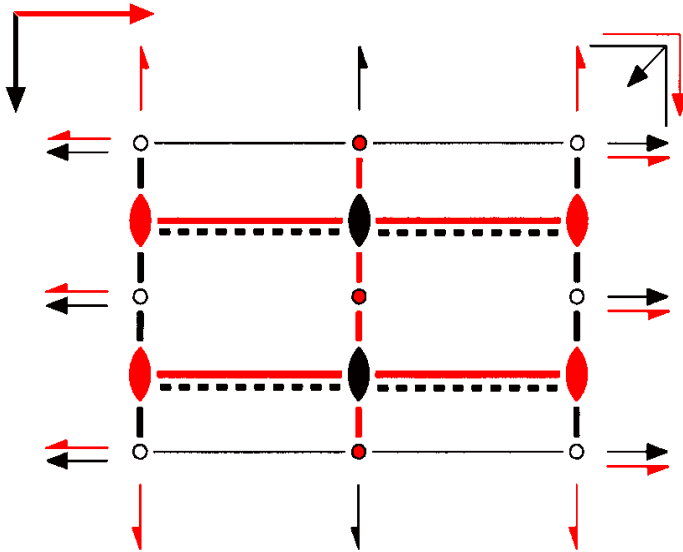
$p_{2b} m' ma'$

No. 41.10.285

$mmm1'$

$p_{2b} 2_1' / m' 2' / m' 2' / a'$

Orthorhombic/Rectangular



Origin at center ($2/m$) at $2_1' 2' / ma'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) $2'$ $1/4,0,z$
(2_z $1/2,0,0$)' | (3) 2 $0,y,0$
(2_y $0,0,0$) | (4) $2'$ ($1/2,0,0$) $x,0,0$
(2_x $1/2,0,0$)' |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ $0,0,0$) | (6) a' ($1/2,0,0$) $x,y,0$
(m_z $1/2,0,0$)' | (7) m $x,0,z$
(m_y $0,0,0$) | (8) m' $1/4,y,z$
(m_x $1/2,0,0$)' |

For $(0,1,0)'$ + set

- | | | | |
|---|--|--|--|
| (1) t' ($0,1,0$)
(1 $0,1,0$)' | (2) 2 $1/4,1/2,z$
(2_z $1/2,1,0$) | (3) $2'$ ($0,1/2,0$) $0,y,0$
(2_y $0,1,0$)' | (4) 2 ($1/2,0,0$) $x,1/2,0$
(2_x $1/2,1,0$) |
| (5) $\bar{1}$ $0,1/2,0$
($\bar{1}$ $0,1,0$)' | (6) n ($1/2,1,0$) $x,y,0$
(m_z $1/2,1,0$) | (7) m' $x,1/2,z$
(m_y $0,1,0$)' | (8) b ($0,1,0$) $1/4,y,z$
(m_x $1/2,1,0$) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		(0,0,0)+	(0,1,0)' +	
8 i 1	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]	(3) \bar{x},y,\bar{z} [\bar{u} ,v, \bar{w}]	(4) $x+1/2,\bar{y},\bar{z}$ [\bar{u} ,v,w]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]	(7) x,\bar{y},z [\bar{u} ,v, \bar{w}]	(8) $\bar{x}+1/2,y,z$ [\bar{u} ,v,w]
4 h m'..	$1/4,y,z$ [0,v,w]	$1/4,\bar{y},z$ [0,v, \bar{w}]	$3/4,y,\bar{z}$ [0,v, \bar{w}]	$3/4,\bar{y},\bar{z}$ [0,v,w]
4 g .m'.	$x,1/2,z$ [u,0,w]	$\bar{x}+1/2,1/2,z$ [\bar{u} ,0,w]	$\bar{x},1/2,\bar{z}$ [\bar{u} ,0, \bar{w}]	$x+1/2,1/2,\bar{z}$ [u,0, \bar{w}]
4 f .m.	$x,0,z$ [0,v,0]	$\bar{x}+1/2,0,z$ [0,v,0]	$\bar{x},0,\bar{z}$ [0,v,0]	$x+1/2,0,\bar{z}$ [0,v,0]
4 e .2.	$0,y,0$ [0,v,0]	$1/2,\bar{y},0$ [0,v,0]	$0,\bar{y},0$ [0,v,0]	$1/2,y,0$ [0,v,0]
2 d m'm'2	$1/4,1/2,z$ [0,0,w]	$3/4,1/2,\bar{z}$ [0,0, \bar{w}]		
2 c m'm'2'	$1/4,0,z$ [0,v,0]	$3/4,0,\bar{z}$ [0,v,0]		
2 b .2/m'.	$0,1/2,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]		
2 a .2/m.	$0,0,0$ [0,v,0]	$1/2,0,0$ [0,v,0]		

Symmetry of special projections

Along [001] $p2'mm'$ $a^* = b$ $b^* = -a/2$ Origin at 0,0,z	Along [100] $p_{2a^*}2m'm'$ $a^* = b$ Origin at $x,1/2,0$	Along [010] $p2mg1'$ $a^* = a$ Origin at 0,y,0
---	---	--

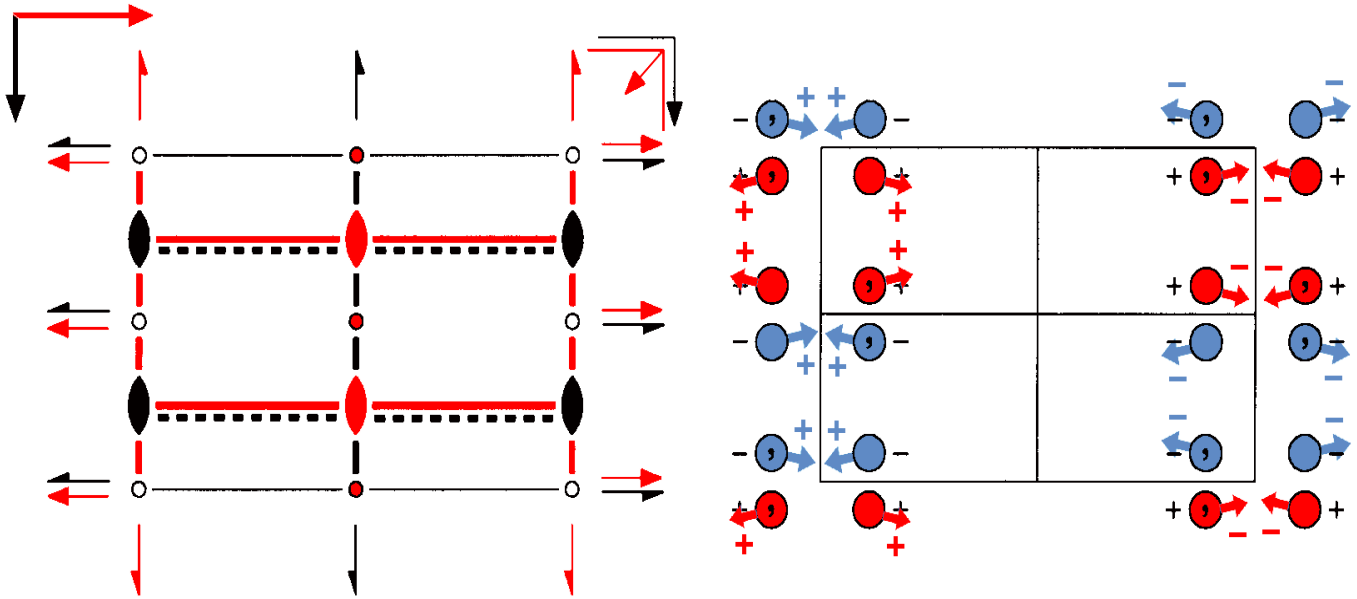
$p_{2b}m'm'a$

No. 41.11.286

$mmm1'$

$p_{2b}2_1'/m'2'/m'2/a$

Orthorhombic/Rectangular



Origin at center ($2'/m'$) at $2_1'2'/m'a$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4,0,z$
(2_z $1/2,0,0$) | (3) $2'$ $0,y,0$
(2_y $0,0,0$)' | (4) $2'$ $(1/2,0,0)$ $x,0,0$
(2_x $1/2,0,0$)' |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ $0,0,0$) | (6) a $(1/2,0,0)$ $x,y,0$
(m_z $1/2,0,0$) | (7) m' $x,0,z$
(m_y $0,0,0$)' | (8) m' $1/4,y,z$
(m_x $1/2,0,0$)' |

For $(0,1,0)'$ + set

- | | | | |
|---|--|--|--|
| (1) t' $(0,1,0)$
(1 $0,1,0$)' | (2) $2'$ $1/4,1/2,z$
(2_z $1/2,1,0$)' | (3) 2 $(0,1/2,0)$ $0,y,0$
(2_y $0,1,0$) | (4) 2 $(1/2,0,0)$ $x,1/2,0$
(2_x $1/2,1,0$) |
| (5) $\bar{1}$ $0,1/2,0$
($\bar{1}$ $0,1,0$)' | (6) n' $(1/2,1,0)$ $x,y,0$
(m_z $1/2,1,0$)' | (7) m $x,1/2,z$
(m_y $0,1,0$) | (8) b $(0,1,0)$ $1/4,y,z$
(m_x $1/2,1,0$) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		$(0,0,0)_+$	$(0,1,0)'$	+
8 i 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{x},y,\bar{z} [u,\bar{v},w]$	(4) $x+1/2,\bar{y},\bar{z} [\bar{u},v,w]$
	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x+1/2,y,\bar{z} [\bar{u},\bar{v},w]$	(7) $x,\bar{y},z [u,\bar{v},w]$	(8) $\bar{x}+1/2,y,z [\bar{u},v,w]$
4 h $m'..$	$1/4,y,z [0,v,w]$	$1/4,\bar{y},z [0,\bar{v},w]$	$3/4,y,\bar{z} [0,\bar{v},w]$	$3/4,\bar{y},\bar{z} [0,v,w]$
4 g $.m.$	$x,1/2,z [0,v,0]$	$\bar{x}+1/2,1/2,z [0,v,0]$	$\bar{x},1/2,\bar{z} [0,\bar{v},0]$	$x+1/2,1/2,\bar{z} [0,\bar{v},0]$
4 f $.m'$	$x,0,z [u,0,w]$	$\bar{x}+1/2,0,z [\bar{u},0,w]$	$\bar{x},0,\bar{z} [u,0,w]$	$x+1/2,0,\bar{z} [\bar{u},0,w]$
4 e $.2'$	$0,y,0 [u,0,w]$	$1/2,\bar{y},0 [\bar{u},0,w]$	$0,\bar{y},0 [u,0,w]$	$1/2,y,0 [\bar{u},0,w]$
2 d $m'm'2'$	$1/4,1/2,z [0,v,0]$	$3/4,1/2,\bar{z} [0,\bar{v},0]$		
2 c $m'm'2$	$1/4,0,z [0,0,w]$	$3/4,0,\bar{z} [0,0,w]$		
2 b $.2'/m.$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		
2 a $.2'/m'$	$0,0,0 [u,0,w]$	$1/2,0,0 [\bar{u},0,w]$		

Symmetry of special projections

Along [001] $p_{c^*}2mm$	Along [100] $p_{2a^*}2m'm'$	Along [010] $p2mg1'$
$a^* = a/2$ $b^* = b$	$a^* = b$	$a^* = a$
Origin at $0,1/2,z$	Origin at $x,1/2,0$	Origin at $0,y,0$

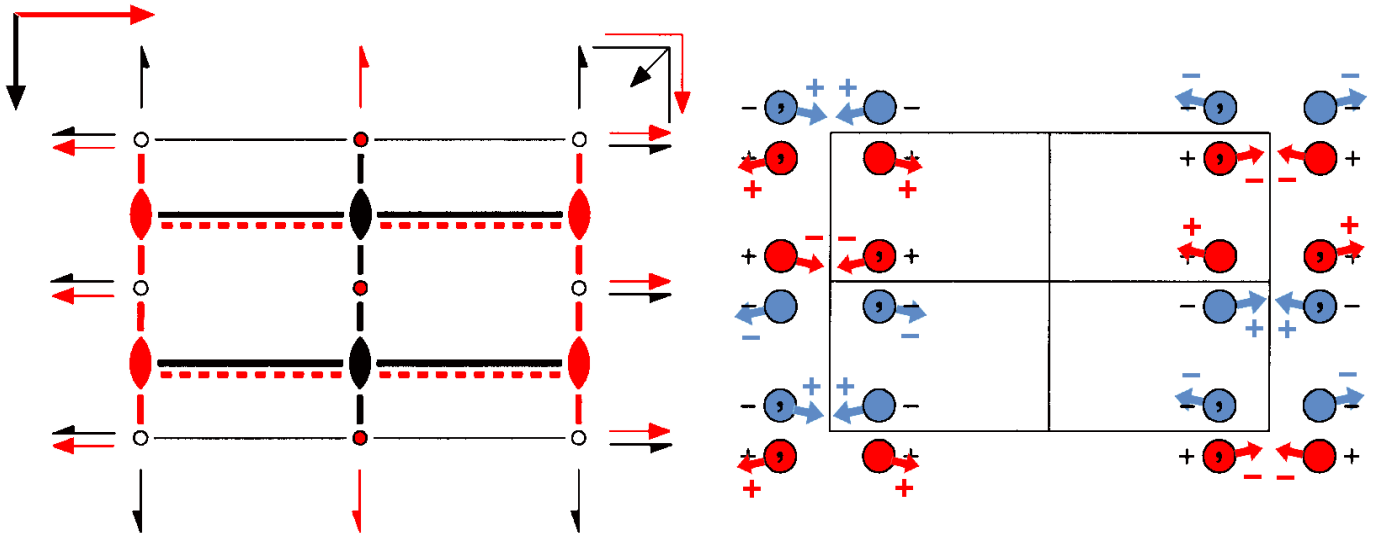
$p_{2b}mm'a'$

No. 41.12.287

$mmm1'$

$p_{2b}2_1/m2'/m'2'/a'$

Orthorhombic/Rectangular



Origin at center ($2'/m'$) at $2,2'/m'a'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) $2'$ $1/4,0,z$
(2_z $1/2,0,0$)' | (3) $2'$ $0,y,0$
(2_y $0,0,0$)' | (4) 2 $(1/2,0,0)$ $x,0,0$
(2_x $1/2,0,0$) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ $0,0,0$) | (6) a' $(1/2,0,0)$ $x,y,0$
(m_z $1/2,0,0$)' | (7) m' $x,0,z$
(m_y $0,0,0$)' | (8) m $1/4,y,z$
(m_x $1/2,0,0$) |

For $(0,1,0)'$ + set

- | | | | |
|---|--|--|--|
| (1) t' $(0,1,0)$
(1 $0,1,0$)' | (2) 2 $1/4,1/2,z$
(2_z $1/2,1,0$) | (3) 2 $(0,1/2,0)$ $0,y,0$
(2_y $0,1,0$) | (4) $2'$ $(1/2,0,0)$ $x,1/2,0$
(2_x $1/2,1,0$)' |
| (5) $\bar{1}$ $0,1/2,0$
($\bar{1}$ $0,1,0$)' | (6) n $(1/2,1,0)$ $x,y,0$
(m_z $1/2,1,0$) | (7) m $x,1/2,z$
(m_y $0,1,0$) | (8) b' $(0,1,0)$ $1/4,y,z$
(m_x $1/2,1,0$)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		$(0,0,0)_+$	$(0,1,0)'$	$+$
8 i 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,\bar{y},z [u,v,\bar{w}]$	(3) $\bar{x},y,\bar{z} [u,\bar{v},w]$	(4) $x+1/2,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x+1/2,y,\bar{z} [u,v,\bar{w}]$	(7) $x,\bar{y},z [u,\bar{v},w]$	(8) $\bar{x}+1/2,y,z [u,\bar{v},\bar{w}]$
4 h m..	$1/4,y,z [u,0,0]$	$1/4,\bar{y},z [u,0,0]$	$3/4,y,\bar{z} [u,0,0]$	$3/4,\bar{y},\bar{z} [u,0,0]$
4 g .m.	$x,1/2,z [0,v,0]$	$\bar{x}+1/2,1/2,z [0,\bar{v},0]$	$\bar{x},1/2,\bar{z} [0,\bar{v},0]$	$x+1/2,1/2,\bar{z} [0,v,0]$
4 f .m'	$x,0,z [u,0,w]$	$\bar{x}+1/2,0,z [u,0,\bar{w}]$	$\bar{x},0,\bar{z} [u,0,w]$	$x+1/2,0,\bar{z} [u,0,\bar{w}]$
4 e .2'	$0,y,0 [u,0,w]$	$1/2,\bar{y},0 [u,0,\bar{w}]$	$0,\bar{y},0 [u,0,w]$	$1/2,y,0 [u,0,\bar{w}]$
2 d mm2	$1/4,1/2,z [0,0,0]$	$3/4,1/2,\bar{z} [0,0,0]$		
2 c mm'2'	$1/4,0,z [u,0,0]$	$3/4,0,\bar{z} [u,0,0]$		
2 b .2'/m.	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		
2 a .2'/m'	$0,0,0 [u,0,w]$	$1/2,0,0 [u,0,\bar{w}]$		

Symmetry of special projections

Along [001] $p2_{2a^*}mm$ $a^* = b$ $b^* = -a/2$ Origin at 0,0,z	Along [100] $p2mm1'$ $a^* = b$ Origin at x,0,0	Along [010] $p2mg1'$ $a^* = a$ Origin at 0,y,0
--	--	--

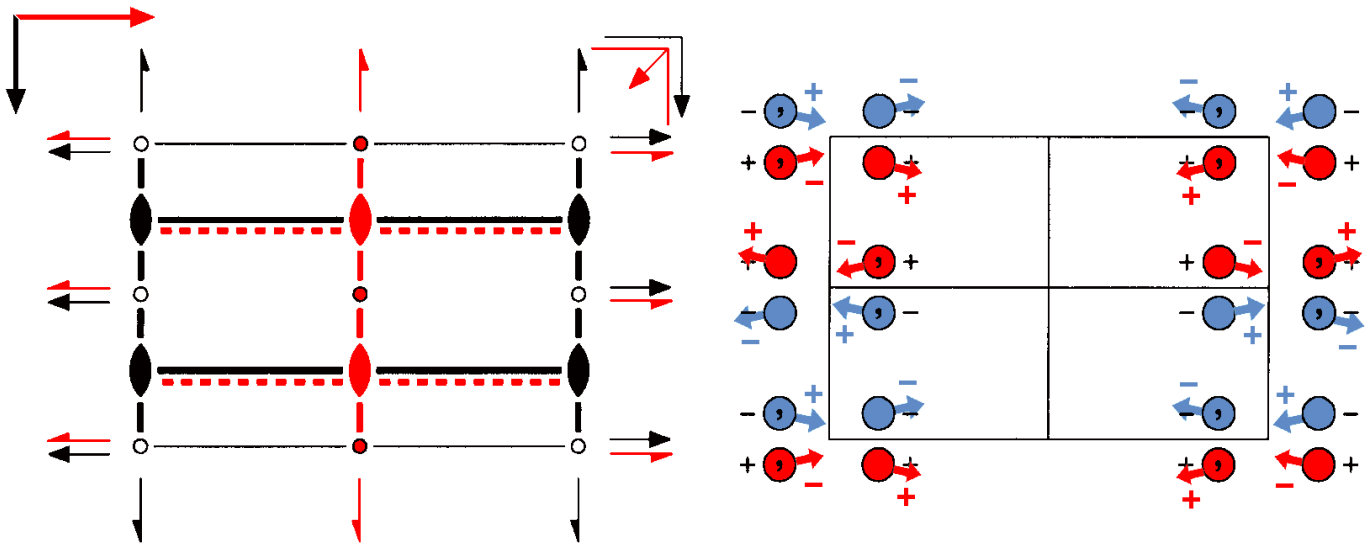
p_{2b} mma

No. 41.13.288

mmm1'

$p_{2b} 2_1/m2/m2/a$

Orthorhombic/Rectangular



Origin at center ($2/m$) at $2_1/2/m_a$

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4,0,z$
(2 _z 1/2,0,0) | (3) 2 $0,y,0$
(2 _y 0,0,0) | (4) 2 $(1/2,0,0)$ $x,0,0$
(2 _x 1/2,0,0) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (6) a $(1/2,0,0)$ $x,y,0$
(m _z 1/2,0,0) | (7) m $x,0,z$
(m _y 0,0,0) | (8) m $1/4,y,z$
(m _x 1/2,0,0) |

For $(0,1,0)'$ + set

- | | | | |
|---|--|--|--|
| (1) t' $(0,1,0)$
(1 0,1,0)' | (2) 2' $1/4,1/2,z$
(2 _z 1/2,1,0)' | (3) 2' $(0,1/2,0)$ $0,y,0$
(2 _y 0,1,0)' | (4) 2' $(1/2,0,0)$ $x,1/2,0$
(2 _x 1/2,1,0)' |
| (5) $\bar{1}$ ' $0,1/2,0$
($\bar{1}$ 0,1,0)' | (6) n' $(1/2,1,0)$ $x,y,0$
(m _z 1/2,1,0)' | (7) m' $x,1/2,z$
(m _y 0,1,0)' | (8) b' $(0,1,0)$ $1/4,y,z$
(m _x 1/2,1,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		(0,0,0)+	(0,1,0)' +	
8 i 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x+1/2,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x+1/2,y,\bar{z} [\bar{u},\bar{v},w]$	(7) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(8) $\bar{x}+1/2,y,z [u,\bar{v},\bar{w}]$
4 h m..	$1/4,y,z [u,0,0]$	$1/4,\bar{y},z [\bar{u},0,0]$	$3/4,y,\bar{z} [\bar{u},0,0]$	$3/4,\bar{y},\bar{z} [u,0,0]$
4 g .m'	$x,1/2,z [u,0,w]$	$\bar{x}+1/2,1/2,z [u,0,\bar{w}]$	$\bar{x},1/2,\bar{z} [\bar{u},0,\bar{w}]$	$x+1/2,1/2,\bar{z} [u,0,w]$
4 f .m.	$x,0,z [0,v,0]$	$\bar{x}+1/2,0,z [0,\bar{v},0]$	$\bar{x},0,\bar{z} [0,v,0]$	$x+1/2,0,\bar{z} [0,\bar{v},0]$
4 e .2.	$0,y,0 [0,v,0]$	$1/2,\bar{y},0 [0,\bar{v},0]$	$0,\bar{y},0 [0,v,0]$	$1/2,y,0 [0,\bar{v},0]$
2 d mm2'	$1/4,1/2,z [u,0,0]$	$3/4,1/2,\bar{z} [\bar{u},0,0]$		
2 c mm2	$1/4,0,z [0,0,0]$	$3/4,0,\bar{z} [0,0,0]$		
2 b .2/m'	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		
2 a .2/m.	$0,0,0 [0,v,0]$	$1/2,0,0 [0,\bar{v},0]$		

Symmetry of special projections

Along [001] p_c2mm $a^* = a/2$ $b^* = b$ Origin at $1/4,0,z$	Along [100] $p2mm1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2mg1'$ $a^* = a$ Origin at $0,y,0$
--	--	--

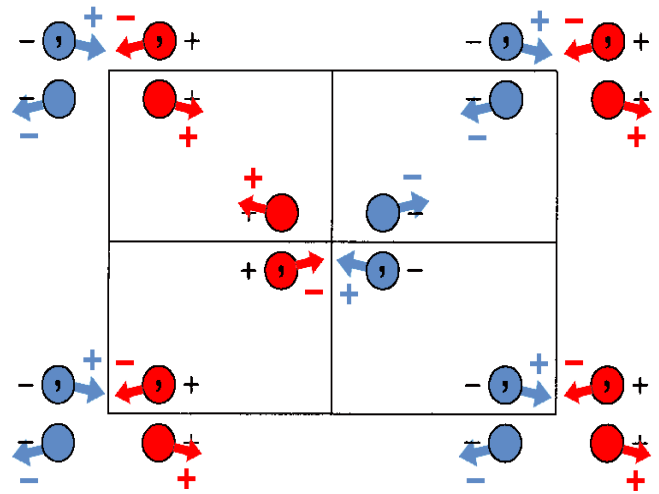
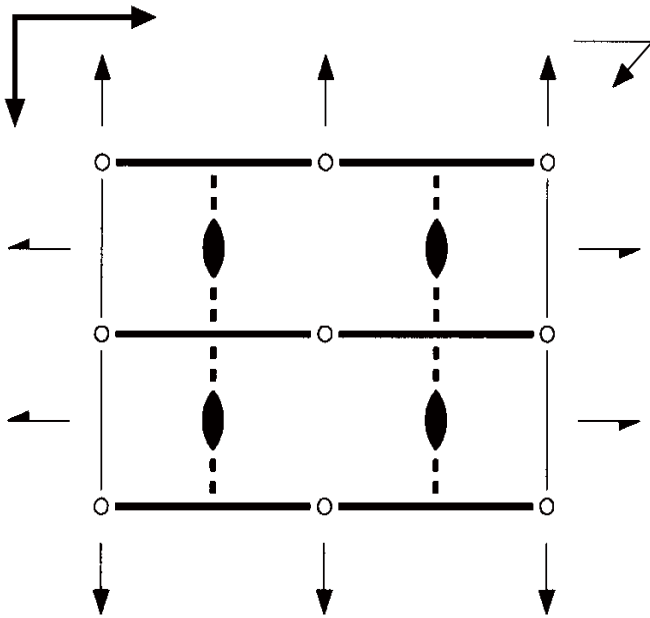
pman

No. 42.1.289

mmm

p2/m2₁/a2/n

Orthorhombic/Rectangular



Origin at center (2/m) at 2/m1n

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (3) 2 1/4,1/4,z
(2 _z 1/2,1/2,0) | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (7) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (8) m 0,y,z
(m _x 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 f 1		(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,y+1/2,\bar{z} [\bar{u},v,\bar{w}]$	(3) $\bar{x}+1/2,\bar{y}+1/2,z [\bar{u},\bar{v},w]$	(4) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
		(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x+1/2,\bar{y}+1/2,z [\bar{u},v,\bar{w}]$	(7) $x+1/2,y+1/2,\bar{z} [\bar{u},\bar{v},w]$	(8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
4 e m..		$0,y,z [u,0,0]$	$1/2,y+1/2,\bar{z} [\bar{u},0,0]$	$1/2,\bar{y}+1/2,z [\bar{u},0,0]$	$0,\bar{y},\bar{z} [u,0,0]$
4 d ..2		$1/4,1/4,z [0,0,w]$	$1/4,3/4,\bar{z} [0,0,\bar{w}]$	$3/4,3/4,\bar{z} [0,0,w]$	$3/4,1/4,z [0,0,\bar{w}]$
4 c 2..		$x,0,0 [u,0,0]$	$\bar{x}+1/2,1/2,0 [\bar{u},0,0]$	$\bar{x},0,0 [u,0,0]$	$x+1/2,1/2,0 [\bar{u},0,0]$
2 b 2/m..		$1/2,0,0 [u,0,0]$	$0,1/2,0 [\bar{u},0,0]$		
2 a 2/m..		$0,0,0 [u,0,0]$	$1/2,1/2,0 [\bar{u},0,0]$		

Symmetry of special projections

Along [001] $c_p, 2'mm'$ $a^* = a \quad b^* = b$ Origin at 0,0,z	Along [100] $p2mg1'$ $a^* = b$ Origin at x,0,0	Along [010] $p_{2a^*}2m'm'$ $a^* = a/2$ Origin at 1/4,y,0
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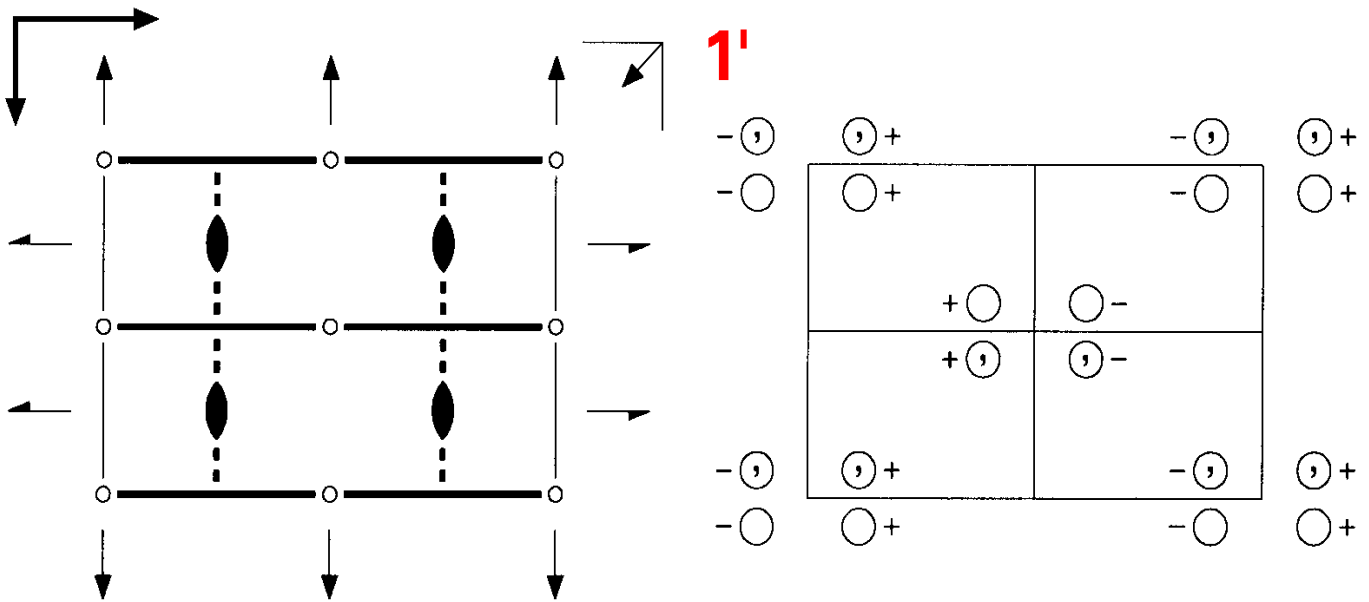
pman1'

No. 42.2.290

mmm1'

p2/m2₁/a2/n1'

Orthorhombic/Rectangular



Origin at center ($2/m1'$) at $2/m1n1'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4$

Symmetry operations

For 1+ set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (3) 2 1/4,1/4,z
(2 _z 1/2,1/2,0) | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (7) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (8) m 0,y,z
(m _x 0,0,0) |

For 1'+ set

- | | | | |
|--|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (3) 2' 1/4,1/4,z
(2 _z 1/2,1/2,0)' | (4) 2' x,0,0
(2 _x 0,0,0)' |
| (5) $\bar{1}'$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (7) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' | (8) m' 0,y,z
(m _x 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	1+	1' +		
8 f 11'	(1) $x,y,z [0,0,0]$	(2) $\bar{x}+1/2,y+1/2,\bar{z} [0,0,0]$	(3) $\bar{x}+1/2,\bar{y}+1/2,z [0,0,0]$	(4) $x,\bar{y},\bar{z} [0,0,0]$
	(5) $\bar{x},\bar{y},\bar{z} [0,0,0]$	(6) $x+1/2,\bar{y}+1/2,z [0,0,0]$	(7) $x+1/2,y+1/2,\bar{z} [0,0,0]$	(8) $\bar{x},y,z [0,0,0]$
4 e m..1'	$0,y,z [0,0,0]$	$1/2,y+1/2,\bar{z} [0,0,0]$	$1/2,\bar{y}+1/2,z [0,0,0]$	$0,\bar{y},\bar{z} [0,0,0]$
4 d ..21'	$1/4,1/4,z [0,0,0]$	$1/4,3/4,\bar{z} [0,0,0]$	$3/4,3/4,\bar{z} [0,0,0]$	$3/4,1/4,z [0,0,0]$
4 c 2..1'	$x,0,0 [0,0,0]$	$\bar{x}+1/2,1/2,0 [0,0,0]$	$\bar{x},0,0 [0,0,0]$	$x+1/2,1/2,0 [0,0,0]$
2 b 2/m..1'	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$		
2 a 2/m..1'	$0,0,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		

Symmetry of special projections

Along [001] $c2mm1'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2mg1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2mm1'$ $a^* = a/2$ Origin at $0,y,0$
--	--	--

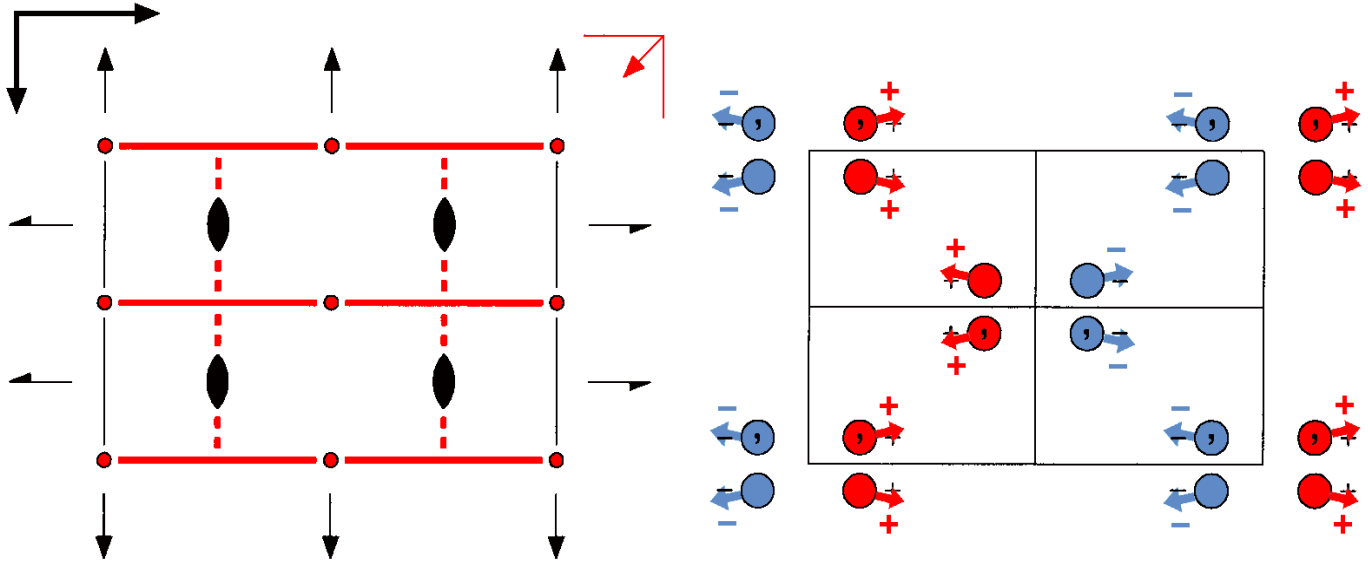
pm'a'n'

No. 42.3.291

m'm'm'

p2/m'2₁/a'2/n'

Orthorhombic/Rectangular



Origin at center (2/m') at 2/m'1n'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (3) 2 1/4,1/4,z
(2 _z 1/2,1/2,0) | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ 0,0,0)' | (6) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (7) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' | (8) m' 0,y,z
(m _x 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates				
	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(3) $\bar{x}+1/2,\bar{y}+1/2,z$ [\bar{u},\bar{v},w]	(4) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]
8 f 1	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(3) $\bar{x}+1/2,\bar{y}+1/2,z$ [\bar{u},\bar{v},w]	(4) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]
4 e m'..	$0,y,z$ [$0,v,w$]	$1/2,y+1/2,\bar{z}$ [$0,v,\bar{w}$]	$1/2,\bar{y}+1/2,z$ [$0,\bar{v},w$]	$0,\bar{y},\bar{z}$ [$0,\bar{v},\bar{w}$]	
4 d ..2	$1/4,1/4,z$ [$0,0,w$]	$1/4,3/4,\bar{z}$ [$0,0,\bar{w}$]	$3/4,3/4,\bar{z}$ [$0,0,\bar{w}$]	$3/4,1/4,z$ [$0,0,w$]	
4 c 2..	$x,0,0$ [$u,0,0$]	$\bar{x}+1/2,1/2,0$ [$\bar{u},0,0$]	$\bar{x},0,0$ [$\bar{u},0,0$]	$x+1/2,1/2,0$ [$u,0,0$]	
2 b 2/m'..	$1/2,0,0$ [$0,0,0$]	$0,1/2,0$ [$0,0,0$]			
2 a 2/m'..	$0,0,0$ [$0,0,0$]	$1/2,1/2,0$ [$0,0,0$]			

Symmetry of special projections

Along [001] $c2m'm'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2m'g'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2m'm'$ $a^* = a/2$ Origin at $0,y,0$

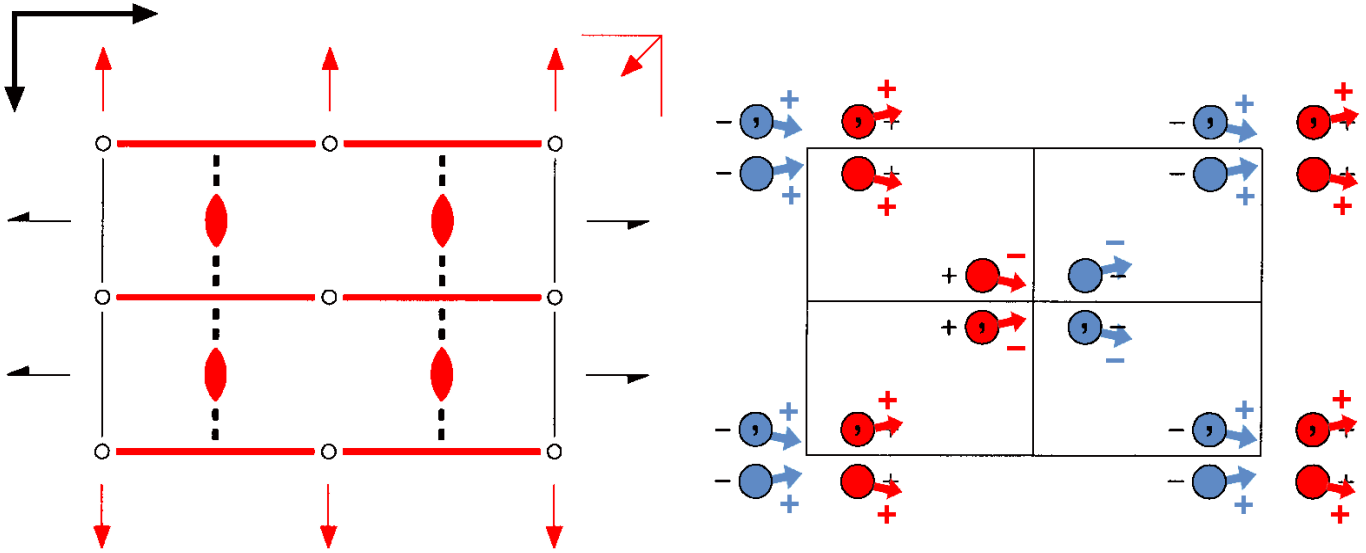
pm'an'

No. 42.4.292

m'mm'

p2'/m'2₁/a2'/n'

Orthorhombic/Rectangular



Origin at center (2'/m') at 2'/m'1n'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (3) 2' 1/4,1/4,z
(2 _z 1/2,1/2,0)' | (4) 2' x,0,0
(2 _x 0,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (7) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' | (8) m' 0,y,z
(m _x 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,y+1/2,\bar{z} [\bar{u},v,\bar{w}]$	(3) $\bar{x}+1/2,\bar{y}+1/2,z [u,v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$
	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x+1/2,\bar{y}+1/2,z [\bar{u},v,\bar{w}]$	(7) $x+1/2,y+1/2,\bar{z} [u,v,\bar{w}]$	(8) $\bar{x},y,z [\bar{u},v,w]$
4 e m'..	$0,y,z [0,v,w]$	$1/2,y+1/2,\bar{z} [0,v,\bar{w}]$	$1/2,\bar{y}+1/2,z [0,v,\bar{w}]$	$0,\bar{y},\bar{z} [0,v,w]$
4 d ..2'	$1/4,1/4,z [u,v,0]$	$1/4,3/4,\bar{z} [\bar{u},v,0]$	$3/4,3/4,\bar{z} [u,v,0]$	$3/4,1/4,z [\bar{u},v,0]$
4 c 2'..	$x,0,0 [0,v,w]$	$\bar{x}+1/2,1/2,0 [0,v,\bar{w}]$	$\bar{x},0,0 [0,v,w]$	$x+1/2,1/2,0 [0,v,\bar{w}]$
2 b 2'/m'..	$1/2,0,0 [0,v,w]$	$0,1/2,0 [0,v,\bar{w}]$		
2 a 2'/m'..	$0,0,0 [0,v,w]$	$1/2,1/2,0 [0,v,\bar{w}]$		

Symmetry of special projections

Along [001] $c2'mm'$ $a^* = b$ $b^* = -a$ Origin at $0,0,z$	Along [100] $p2'mg'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p_{2a}2'm'm$ $a^* = a/2$ Origin at $0,y,0$
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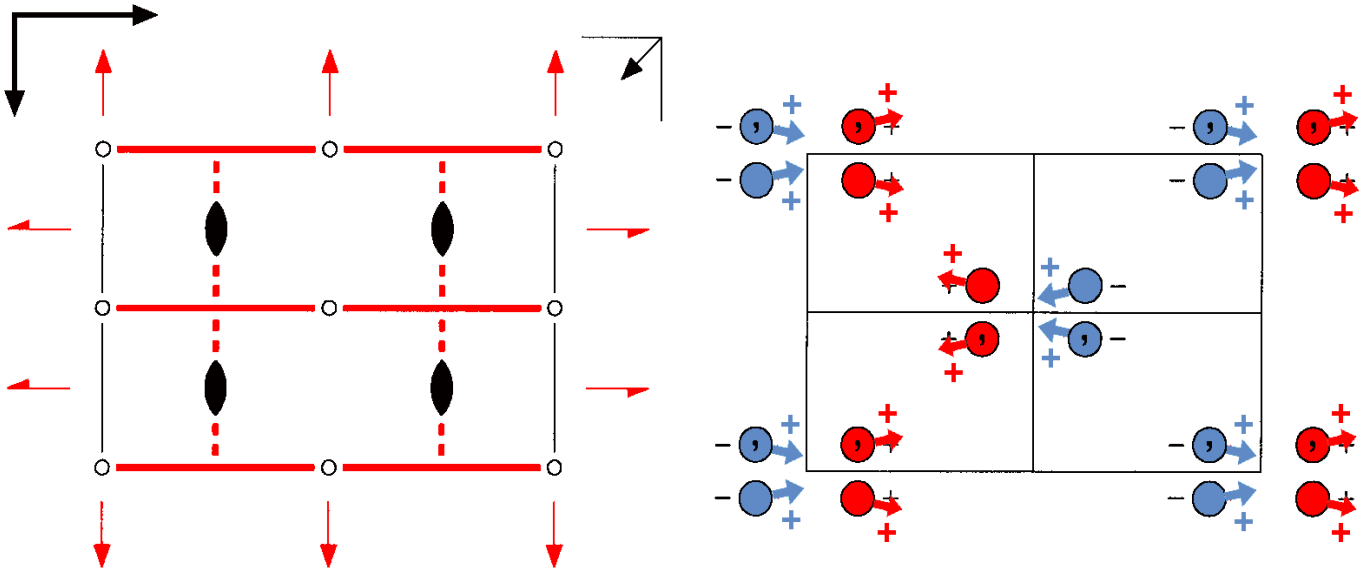
pm'a'n

No. 42.5.293

m'm'm

p2'/m'2₁'/a'2/n

Orthorhombic/Rectangular



Origin at center (2'/m') at 2'/m'1n

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (3) 2 1/4,1/4,z
(2 _z 1/2,1/2,0) | (4) 2' x,0,0
(2 _x 0,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (7) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (8) m' 0,y,z
(m _x 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 f 1		(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,y+1/2,\bar{z} [u,\bar{v},w]$	(3) $\bar{x}+1/2,\bar{y}+1/2,z [\bar{u},\bar{v},w]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$
		(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x+1/2,\bar{y}+1/2,z [u,\bar{v},w]$	(7) $x+1/2,y+1/2,\bar{z} [\bar{u},\bar{v},w]$	(8) $\bar{x},y,z [\bar{u},v,w]$
4 e m'..		$0,y,z [0,v,w]$	$1/2,y+1/2,\bar{z} [0,\bar{v},w]$	$1/2,\bar{y}+1/2,z [0,\bar{v},w]$	$0,\bar{y},\bar{z} [0,v,w]$
4 d ..2		$1/4,1/4,z [0,0,w]$	$1/4,3/4,\bar{z} [0,0,w]$	$3/4,3/4,\bar{z} [0,0,w]$	$3/4,1/4,z [0,0,w]$
4 c 2'..		$x,0,0 [0,v,w]$	$\bar{x}+1/2,1/2,0 [0,\bar{v},w]$	$\bar{x},0,0 [0,v,w]$	$x+1/2,1/2,0 [0,\bar{v},w]$
2 b 2'/m'..		$1/2,0,0 [0,v,w]$	$0,1/2,0 [0,\bar{v},w]$		
2 a 2'/m'..		$0,0,0 [0,v,w]$	$1/2,1/2,0 [0,\bar{v},w]$		

Symmetry of special projections

Along [001] $c_p, 2'mm'$ $a^* = b \quad b^* = -a$ Origin at 0,0,z	Along [100] $p2'm'g$ $a^* = b$ Origin at x,0,0	Along [010] $p2'm'm$ $a^* = a/2$ Origin at 0,y,0
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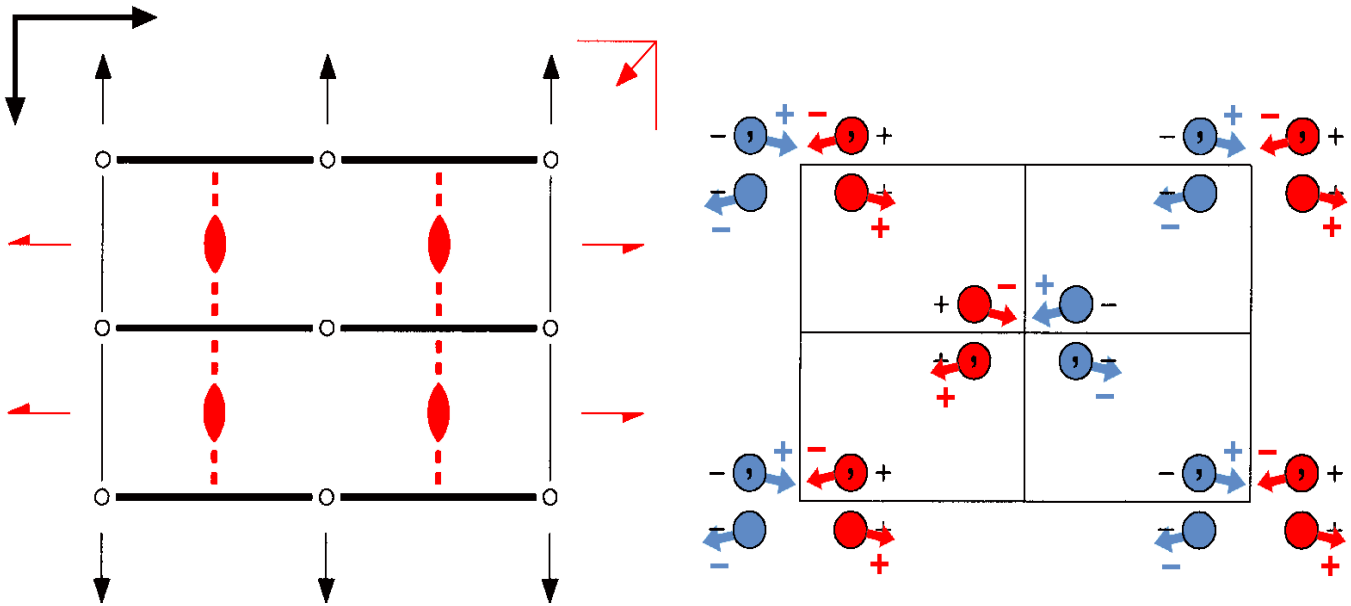
pma'n'

No. 42.6.294

mm'm'

p2/m2₁'/a'2'/n'

Orthorhombic/Rectangular



Origin at center (2/m) at 2/m1n'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (3) 2' 1/4,1/4,z
(2 _z 1/2,1/2,0)' | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (7) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' | (8) m 0,y,z
(m _x 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 f 1		(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,y+1/2,\bar{z} [u,\bar{v},w]$	(3) $\bar{x}+1/2,\bar{y}+1/2,z [u,v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
		(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x+1/2,\bar{y}+1/2,z [u,\bar{v},w]$	(7) $x+1/2,y+1/2,\bar{z} [u,v,\bar{w}]$	(8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
4 e m..		$0,y,z [u,0,0]$	$1/2,y+1/2,\bar{z} [u,0,0]$	$1/2,\bar{y}+1/2,z [u,0,0]$	$0,\bar{y},\bar{z} [u,0,0]$
4 d ..2'		$1/4,1/4,z [u,v,0]$	$1/4,3/4,\bar{z} [u,\bar{v},0]$	$3/4,3/4,\bar{z} [u,v,0]$	$3/4,1/4,z [u,\bar{v},0]$
4 c 2..		$x,0,0 [u,0,0]$	$\bar{x}+1/2,1/2,0 [u,0,0]$	$\bar{x},0,0 [u,0,0]$	$x+1/2,1/2,0 [u,0,0]$
2 b 2/m..		$1/2,0,0 [u,0,0]$	$0,1/2,0 [u,0,0]$		
2 a 2/m..		$0,0,0 [u,0,0]$	$1/2,1/2,0 [u,0,0]$		

Symmetry of special projections

Along [001] $c2'mm'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2mg1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2'mm'$ $a^* = a/2$ Origin at $0,y,0$
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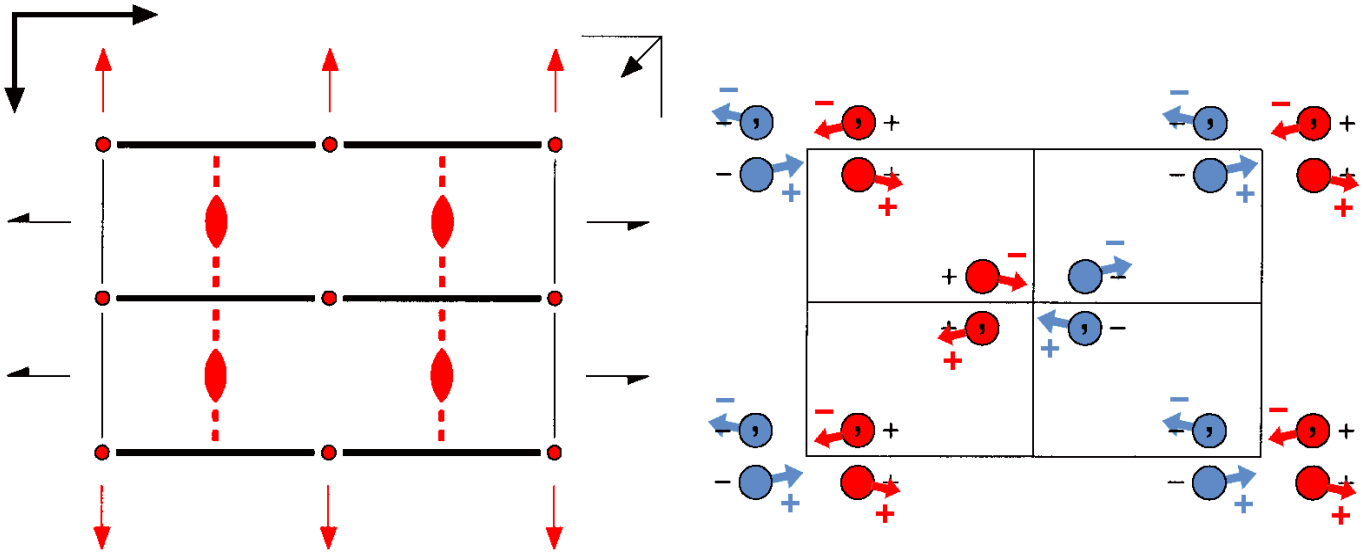
pma'n

No. 42.7.295

mm'm

p2'/m2₁/a'2'/n

Orthorhombic/Rectangular



Origin at center (2'/m) at 2'/m1n

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (3) 2' 1/4,1/4,z
(2 _z 1/2,1/2,0)' | (4) 2' x,0,0
(2 _x 0,0,0)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ ' 0,0,0)' | (6) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (7) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (8) m 0,y,z
(m _x 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,y+1/2,\bar{z} [\bar{u},v,\bar{w}]$	(3) $\bar{x}+1/2,\bar{y}+1/2,z [u,v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$
	(5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(6) $x+1/2,\bar{y}+1/2,z [u,\bar{v},w]$	(7) $x+1/2,y+1/2,\bar{z} [\bar{u},\bar{v},w]$	(8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
4 e m..	$0,y,z [u,0,0]$	$1/2,y+1/2,\bar{z} [\bar{u},0,0]$	$1/2,\bar{y}+1/2,z [u,0,0]$	$0,\bar{y},\bar{z} [\bar{u},0,0]$
4 d ..2'	$1/4,1/4,z [u,v,0]$	$1/4,3/4,\bar{z} [\bar{u},v,0]$	$3/4,3/4,\bar{z} [\bar{u},\bar{v},0]$	$3/4,1/4,z [u,\bar{v},0]$
4 c 2'..	$x,0,0 [0,v,w]$	$\bar{x}+1/2,1/2,0 [0,v,\bar{w}]$	$\bar{x},0,0 [0,\bar{v},\bar{w}]$	$x+1/2,1/2,0 [0,\bar{v},w]$
2 b 2'/m..	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$		
2 a 2'/m..	$0,0,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		

Symmetry of special projections

Along [001] $c_p, 2mm$ $a^* = a \quad b^* = b$ Origin at 0,0,z	Along [100] $p2mg1'$ $a^* = b$ Origin at x,0,0	Along [010] $p2mm$ $a^* = a/2$ Origin at 0,y,0
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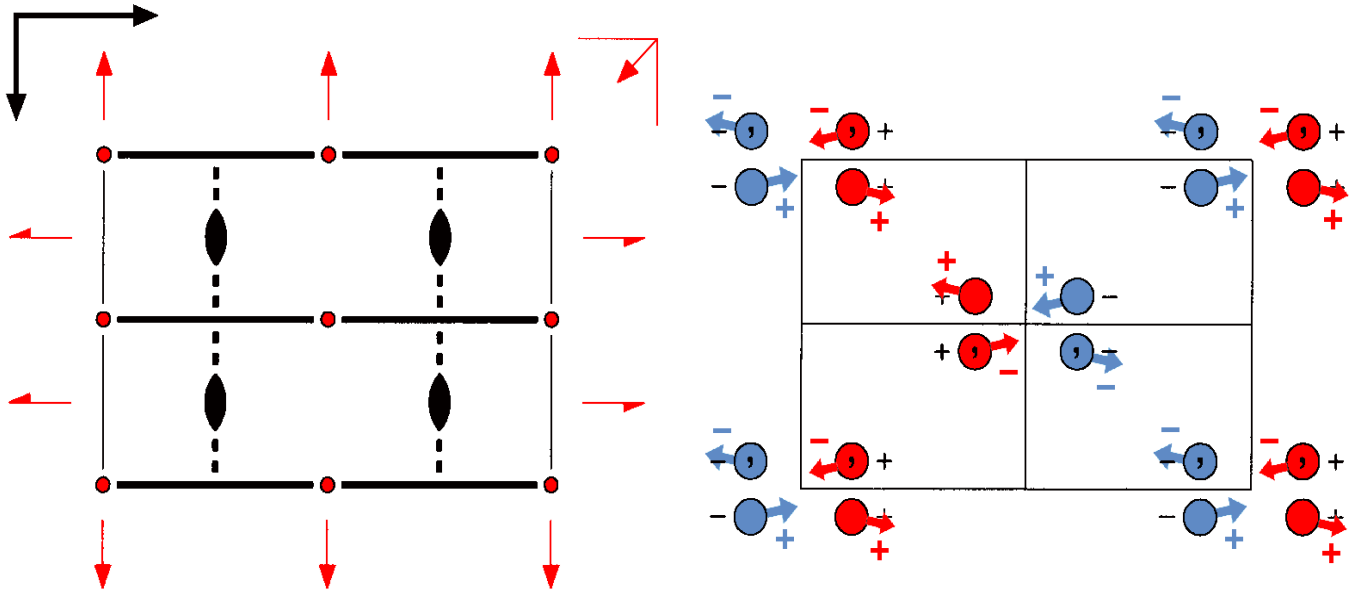
pman'

No. 42.8.296

mmm'

p2'/m2₁'/a2/n'

Orthorhombic/Rectangular



Origin at center (2'/m) at 2'/m1n'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (3) 2 1/4,1/4,z
(2 _z 1/2,1/2,0) | (4) 2' x,0,0
(2 _x 0,0,0)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ 0,0,0)' | (6) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (7) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' | (8) m 0,y,z
(m _x 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,y+1/2,\bar{z} [u,\bar{v},w]$	(3) $\bar{x}+1/2,\bar{y}+1/2,z [\bar{u},\bar{v},w]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$
	(5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(6) $x+1/2,\bar{y}+1/2,z [\bar{u},v,\bar{w}]$	(7) $x+1/2,y+1/2,\bar{z} [u,v,\bar{w}]$	(8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
4 e m..	$0,y,z [u,0,0]$	$1/2,y+1/2,\bar{z} [u,0,0]$	$1/2,\bar{y}+1/2,z [\bar{u},0,0]$	$0,\bar{y},\bar{z} [\bar{u},0,0]$
4 d ..2	$1/4,1/4,z [0,0,w]$	$1/4,3/4,\bar{z} [0,0,w]$	$3/4,3/4,\bar{z} [0,0,\bar{w}]$	$3/4,1/4,z [0,0,\bar{w}]$
4 c 2'..	$x,0,0 [0,v,w]$	$\bar{x}+1/2,1/2,0 [0,\bar{v},w]$	$\bar{x},0,0 [0,\bar{v},\bar{w}]$	$x+1/2,1/2,0 [0,v,\bar{w}]$
2 b 2'/m..	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$		
2 a 2'/m..	$0,0,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		

Symmetry of special projections

Along [001] $c2mm$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2mg1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p_{2a^*}2mm$ $a^* = a/2$ Origin at $0,y,0$
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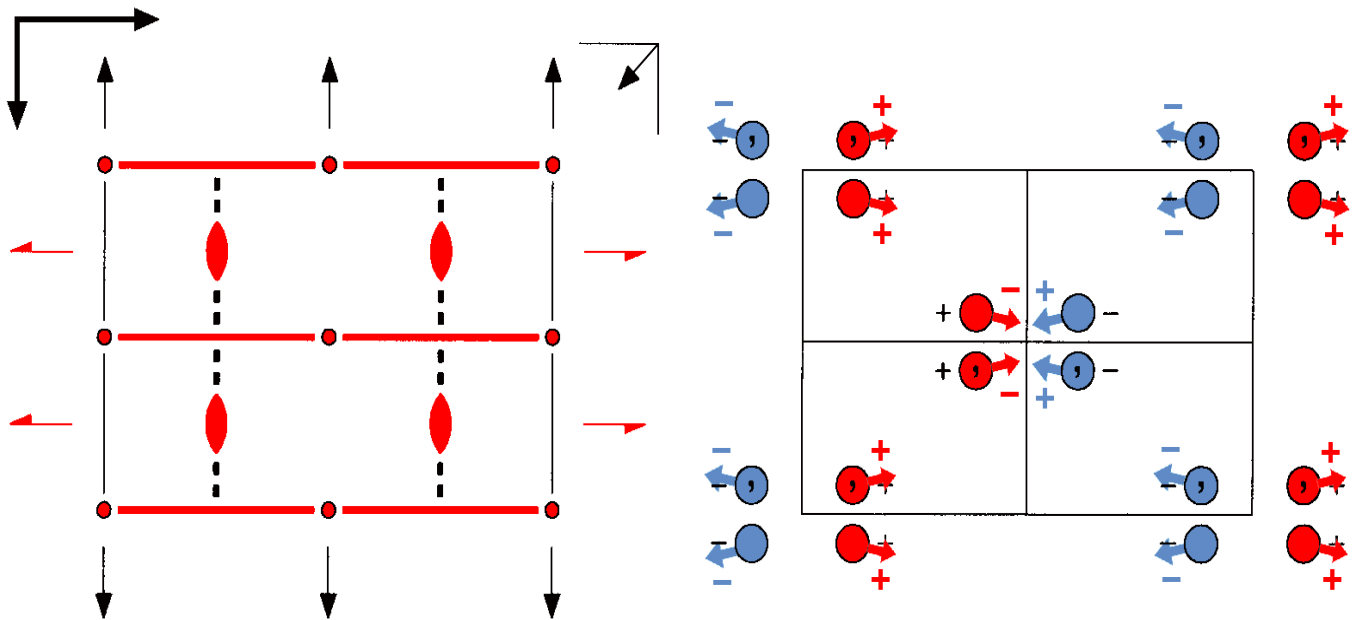
pm'an

No. 42.9.297

m'mm

p2/m'2₁'/a2'/n

Orthorhombic/Rectangular



Origin at center (2/m') at 2/m'1n

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (3) 2' 1/4,1/4,z
(2 _z 1/2,1/2,0)' | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ 0,0,0)' | (6) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (7) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (8) m' 0,y,z
(m _x 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 f 1		(1) $x,y,z [u,v,w]$	(2) $\bar{x}+1/2,y+1/2,\bar{z} [u,\bar{v},w]$	(3) $\bar{x}+1/2,\bar{y}+1/2,z [u,v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
		(5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(6) $x+1/2,\bar{y}+1/2,z [\bar{u},v,\bar{w}]$	(7) $x+1/2,y+1/2,\bar{z} [\bar{u},\bar{v},w]$	(8) $\bar{x},y,z [\bar{u},v,w]$
4 e m'..		$0,y,z [0,v,w]$	$1/2,y+1/2,\bar{z} [0,\bar{v},w]$	$1/2,\bar{y}+1/2,z [0,\bar{v},\bar{w}]$	$0,\bar{y},\bar{z} [0,v,\bar{w}]$
4 d ..2'		$1/4,1/4,z [u,v,0]$	$1/4,3/4,\bar{z} [u,\bar{v},0]$	$3/4,3/4,\bar{z} [\bar{u},\bar{v},0]$	$3/4,1/4,z [\bar{u},v,0]$
4 c 2..		$x,0,0 [u,0,0]$	$\bar{x}+1/2,1/2,0 [u,0,0]$	$\bar{x},0,0 [\bar{u},0,0]$	$x+1/2,1/2,0 [\bar{u},0,0]$
2 b 2/m'..		$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$		
2 a 2/m'..		$0,0,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		

Symmetry of special projections

Along [001] $c_p, 2m'm'$ $a^* = a \quad b^* = b$ Origin at 0,0,z	Along [100] $p2mg$ $a^* = b$ Origin at x,0,0	Along [010] $p_{2a}, 2m'm'$ $a^* = a/2$ Origin at 0,y,0
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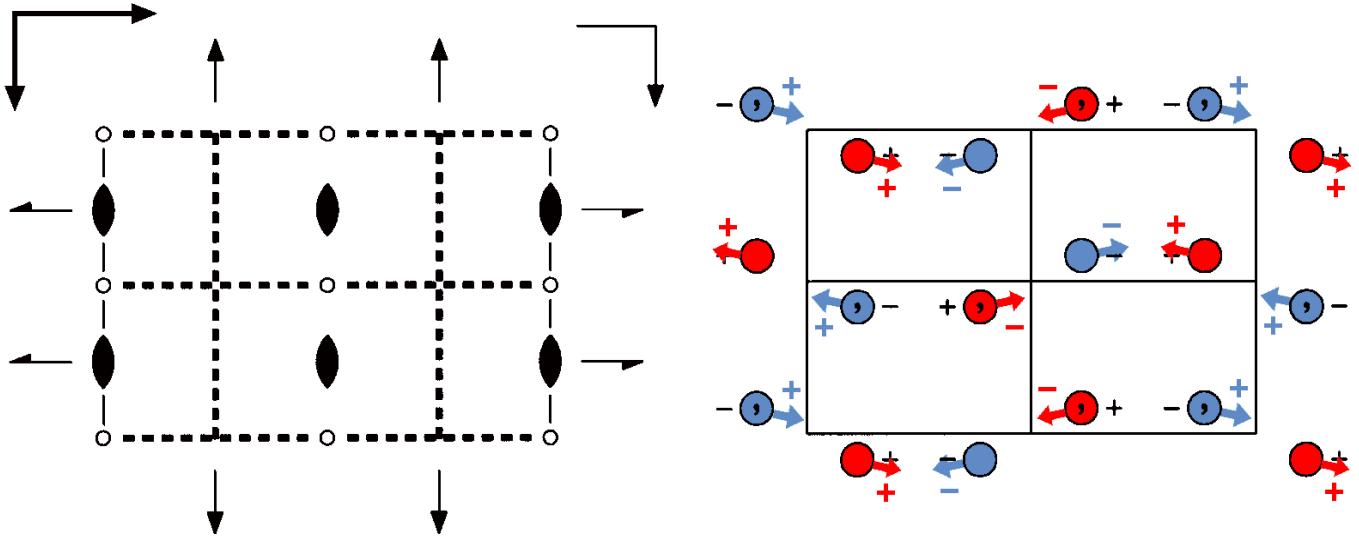
pbaa

No. 43.1.298

mmm

p2/b2₁/a2/a

Orthorhombic/Rectangular



Origin at $\bar{1}$ on b1a

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $x, 1/4, 0$
(2 _x 0,1/2,0) | (3) 2 $1/4, 0, z$
(2 _z 1/2,0,0) | (4) 2 (0,1/2,0) $1/4, y, 0$
(2 _y 1/2,1/2,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) b (0,1/2,0) $0, y, z$
(m _x 0,1/2,0) | (7) a (1/2,0,0) $x, y, 0$
(m _z 1/2,0,0) | (8) a (1/2,0,0) $x, 1/4, z$
(m _y 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

		Coordinates			
Multiplicity, Wyckoff letter, Site symmetry					
8 d 1	(1) x,y,z [u,v,w]	(2) $x,\bar{y}+1/2,\bar{z}$ [u, \bar{v} , \bar{w}]	(3) $\bar{x}+1/2,\bar{y},z$ [\bar{u} , \bar{v} ,w]	(4) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u} ,v, \bar{w}]	
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $\bar{x},y+1/2,z$ [u, \bar{v} , \bar{w}]	(7) $x+1/2,y,\bar{z}$ [\bar{u} , \bar{v} ,w]	(8) $x+1/2,\bar{y}+1/2,z$ [\bar{u} ,v, \bar{w}]	
4 c 2..	$x,1/4,0$ [u,0,0]	$\bar{x}+1/2,3/4,0$ [\bar{u} ,0,0]	$\bar{x},3/4,0$ [u,0,0]	$x+1/2,1/4,0$ [\bar{u} ,0,0]	
4 b ..2	$1/4,0,z$ [0,0,w]	$1/4,1/2,\bar{z}$ [0,0, \bar{w}]	$3/4,0,\bar{z}$ [0,0,w]	$3/4,1/2,z$ [0,0, \bar{w}]	
4 a $\bar{1}$	$0,0,0$ [u,v,w]	$0,1/2,0$ [u, \bar{v} , \bar{w}]	$1/2,0,0$ [\bar{u} , \bar{v} ,w]	$1/2,1/2,0$ [\bar{u} ,v, \bar{w}]	

Symmetry of special projections

Along [001] $p_{2b^*}2m'g'$	Along [100] $p_{2a^*}2m'm'$	Along [010] $p_{2a^*}2mm$
$a^* = b$ $b^* = -a/2$	$a^* = b/2$	$a^* = a/2$
Origin at $1/4,0,z$	Origin at $x,1/4,0$	Origin at $1/4,y,0$

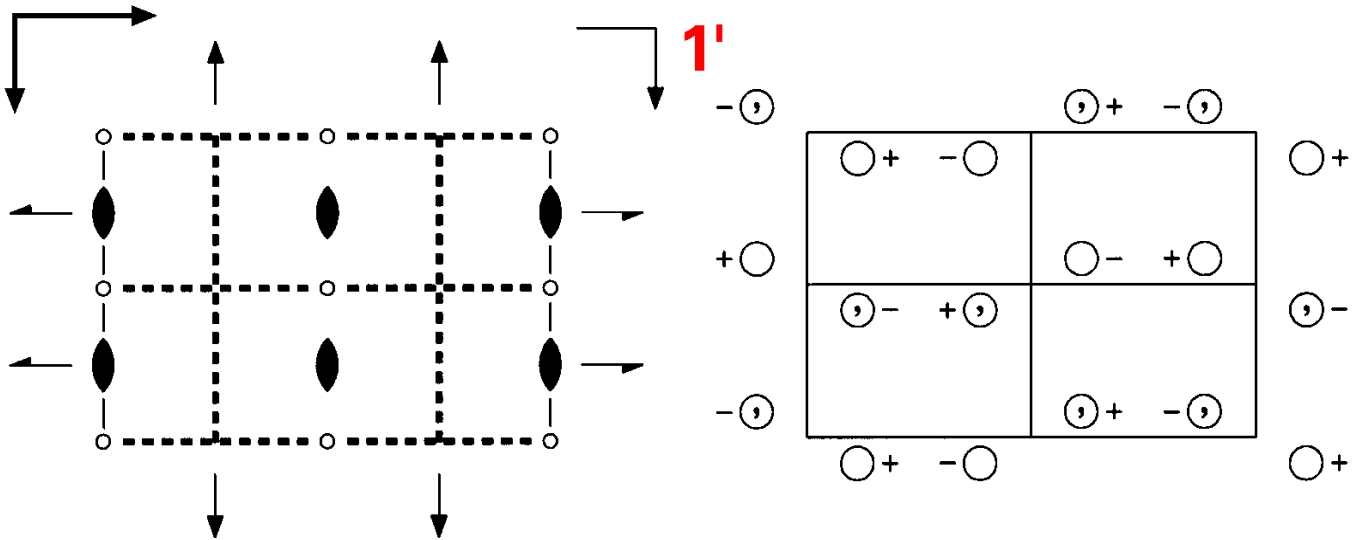
pbaa1'

No. 43.2.299

mmm1'

p2/b2₁/a2/a1'

Orthorhombic/Rectangular



Origin at $\bar{1}1'$ on b1a1'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|--|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 _x x,1/4,0
(2 _x 0,1/2,0) | (3) 2 _z 1/4,0,z
(2 _z 1/2,0,0) | (4) 2 _y (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) b (0,1/2,0) 0,y,z
(m _x 0,1/2,0) | (7) a (1/2,0,0) x,y,0
(m _z 1/2,0,0) | (8) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) |

For 1' + set

- | | | | |
|---|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' _x x,1/4,0
(2' _x 0,1/2,0)' | (3) 2' _z 1/4,0,z
(2' _z 1/2,0,0)' | (4) 2' _y (0,1/2,0) 1/4,y,0
(2' _y 1/2,1/2,0)' |
| (5) $\bar{1}'$ 0,0,0
($\bar{1}'$ 0,0,0)' | (6) b' (0,1/2,0) 0,y,z
(m' _x 0,1/2,0)' | (7) a' (1/2,0,0) x,y,0
(m' _z 1/2,0,0)' | (8) a' (1/2,0,0) x,1/4,z
(m' _y 1/2,1/2,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	1+	1' +		
8 d 11'	(1) x,y,z [0,0,0] (5) \bar{x},\bar{y},\bar{z} [0,0,0]	(2) $x,\bar{y}+1/2,\bar{z}$ [0,0,0] (6) $\bar{x},y+1/2,z$ [0,0,0]	(3) $\bar{x}+1/2,\bar{y},z$ [0,0,0] (7) $x+1/2,y,\bar{z}$ [0,0,0]	(4) $\bar{x}+1/2,y+1/2,\bar{z}$ [0,0,0] (8) $x+1/2,\bar{y}+1/2,z$ [0,0,0]
4 c 2..1'	$x,1/4,0$ [0,0,0]	$\bar{x}+1/2,3/4,0$ [0,0,0]	$\bar{x},3/4,0$ [0,0,0]	$x+1/2,1/4,0$ [0,0,0]
4 b ..21'	$1/4,0,z$ [0,0,0]	$1/4,1/2,\bar{z}$ [0,0,0]	$3/4,0,\bar{z}$ [0,0,0]	$3/4,1/2,z$ [0,0,0]
4 a $\bar{1}1'$	$0,0,0$ [0,0,0]	$0,1/2,0$ [0,0,0]	$1/2,0,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]

Symmetry of special projections

Along [001] $p2mg1'$ $a^* = b$ $b^* = -a/2$ Origin at 0,0,z	Along [100] $p2mm1'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2mm1'$ $a^* = a/2$ Origin at 0,y,0
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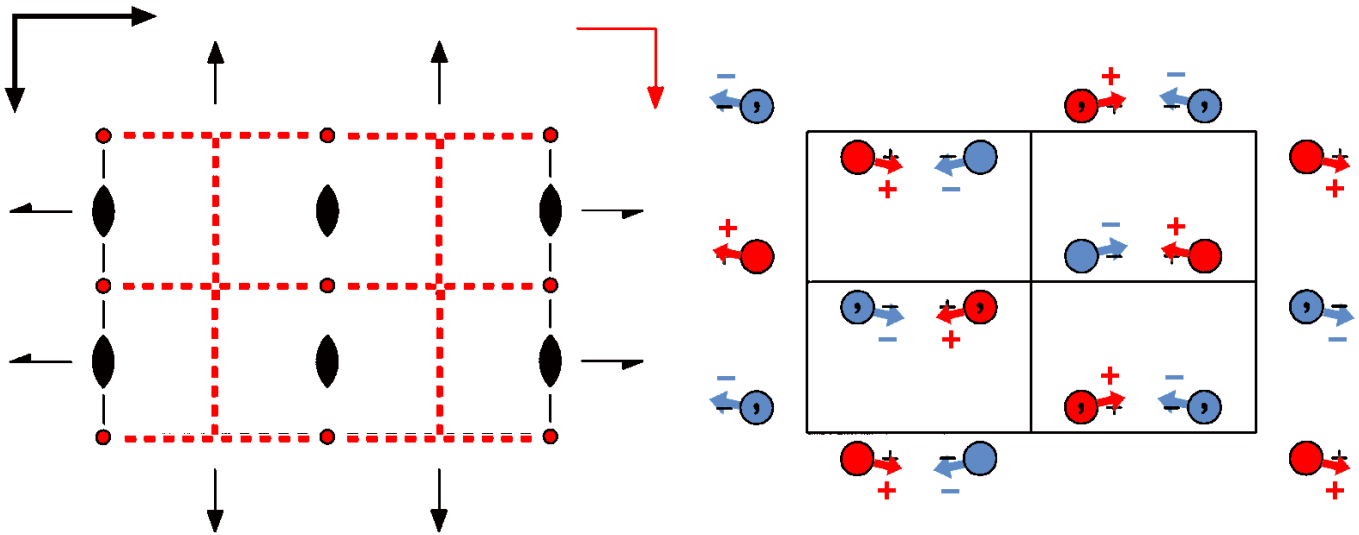
pb'a'a'

No. 43.3.300

m'm'm'

p2/b'2₁/a'2/a'

Orthorhombic/Rectangular



Origin at $\bar{1}$ ' on b'1a'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $x, 1/4, 0$
(2 _x 0,1/2,0) | (3) 2 $1/4, 0, z$
(2 _z 1/2,0,0) | (4) 2 (0,1/2,0) $1/4, y, 0$
(2 _y 1/2,1/2,0) |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ ' 0,0,0)' | (6) b' (0,1/2,0) $0, y, z$
(m _x 0,1/2,0)' | (7) a' (1/2,0,0) $x, y, 0$
(m _z 1/2,0,0)' | (8) a' (1/2,0,0) $x, 1/4, z$
(m _y 1/2,1/2,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 d 1	(1) x,y,z [u,v,w]	(2) $x,\bar{y}+1/2,\bar{z}$ [u, \bar{v} , \bar{w}]	(3) $\bar{x}+1/2,\bar{y},z$ [\bar{u} , \bar{v} ,w]	(4) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u} ,v, \bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [\bar{u} , \bar{v} , \bar{w}]	(6) $\bar{x},y+1/2,z$ [\bar{u} ,v,w]	(7) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]	(8) $x+1/2,\bar{y}+1/2,z$ [u, \bar{v} ,w]
4 c 2..	$x,1/4,0$ [u,0,0]	$\bar{x}+1/2,3/4,0$ [\bar{u} ,0,0]	$\bar{x},3/4,0$ [\bar{u} ,0,0]	$x+1/2,1/4,0$ [u,0,0]
4 b ..2	$1/4,0,z$ [0,0,w]	$1/4,1/2,\bar{z}$ [0,0, \bar{w}]	$3/4,0,\bar{z}$ [0,0, \bar{w}]	$3/4,1/2,z$ [0,0,w]
4 a $\bar{1}$ '	0,0,0 [0,0,0]	0,1/2,0 [0,0,0]	1/2,0,0 [0,0,0]	1/2,1/2,0 [0,0,0]

Symmetry of special projections

Along [001] $p2m'g'$ $a^* = b$ $b^* = -a/2$ Origin at 0,0,z	Along [100] $p2m'm'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2m'm'$ $a^* = a/2$ Origin at 0,y,0
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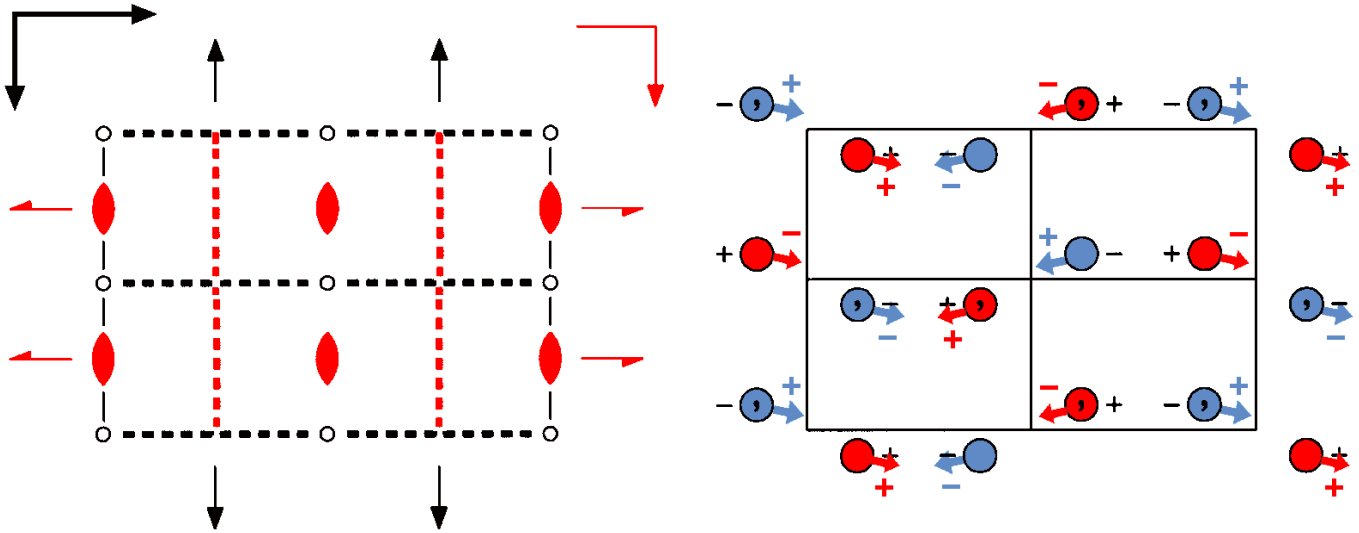
pba'a'

No. 43.4.301

mm'm'

p2/b₂'/a₂'/a'

Orthorhombic/Rectangular



Origin at $\bar{1}$ on b1a'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 _x x,1/4,0
(2 _x 0,1/2,0) | (3) 2' _z 1/4,0,z
(2' _z 1/2,0,0)' | (4) 2' _y (0,1/2,0) 1/4,y,0
(2' _y 1/2,1/2,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) b (0,1/2,0) 0,y,z
(m _x 0,1/2,0) | (7) a' (1/2,0,0) x,y,0
(m _z 1/2,0,0)' | (8) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 d 1	(1) x,y,z [u,v,w]	(2) x, \bar{y} +1/2, \bar{z} [u, \bar{v} , \bar{w}]	(3) \bar{x} +1/2, \bar{y} ,z [u,v, \bar{w}]	(4) \bar{x} +1/2,y+1/2, \bar{z} [u, \bar{v} ,w]
	(5) \bar{x} , \bar{y} , \bar{z} [u,v,w]	(6) \bar{x} ,y+1/2,z [u, \bar{v} , \bar{w}]	(7) x+1/2,y, \bar{z} [u,v, \bar{w}]	(8) x+1/2, \bar{y} +1/2,z [u, \bar{v} ,w]
4 c 2..	x,1/4,0 [u,0,0]	\bar{x} +1/2,3/4,0 [u,0,0]	\bar{x} ,3/4,0 [u,0,0]	x+1/2,1/4,0 [u,0,0]
4 b ..2'	1/4,0,z [u,v,0]	1/4,1/2, \bar{z} [u, \bar{v} ,0]	3/4,0, \bar{z} [u,v,0]	3/4,1/2,z [u, \bar{v} ,0]
4 a $\bar{1}$	0,0,0 [u,v,w]	0,1/2,0 [u, \bar{v} , \bar{w}]	1/2,0,0 [u,v, \bar{w}]	1/2,1/2,0 [u, \bar{v} ,w]

Symmetry of special projections

Along [001] p2m'g' a* = b b* = -a/2 Origin at 0,0,z	Along [100] p _{2a} *2m'm' a* = b/2 Origin at x,1/4,0	Along [010] p2'mm' a* = a/2 Origin at 0,y,0
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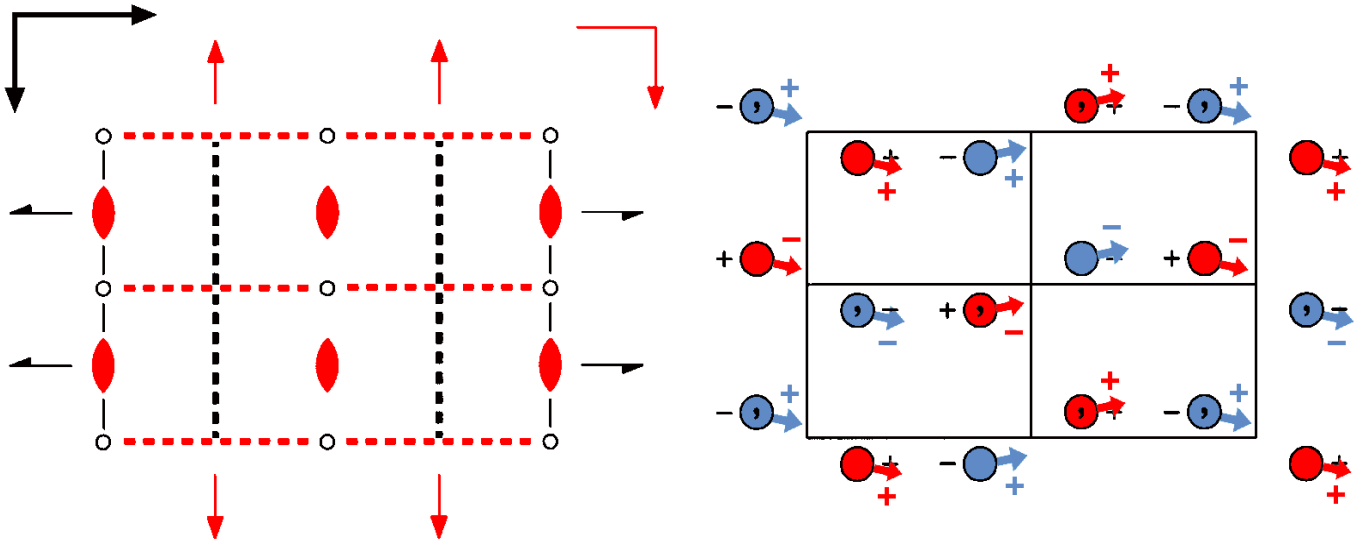
pb'aa'

No. 43.5.302

m'mm'

p2'/b'2₁/a'2'/a'

Orthorhombic/Rectangular



Origin at $\bar{1}$ on b'1a'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2' $x, 1/4, 0$
(2 _x 0,1/2,0)' | (3) 2' $1/4, 0, z$
(2 _z 1/2,0,0)' | (4) 2 (0,1/2,0) $1/4, y, 0$
(2 _y 1/2,1/2,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) b' (0,1/2,0) 0,y,z
(m _x 0,1/2,0)' | (7) a' (1/2,0,0) x,y,0
(m _z 1/2,0,0)' | (8) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) $x,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]	(3) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]	(4) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]
8 d 1	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $\bar{x},y+1/2,z$ [\bar{u},v,w]	(7) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]	(8) $x+1/2,\bar{y}+1/2,z$ [\bar{u},v,\bar{w}]
4 c 2'.	$x,1/4,0$ [0,v,w]	$\bar{x}+1/2,3/4,0$ [0,v, \bar{w}]	$\bar{x},3/4,0$ [0,v,w]	$x+1/2,1/4,0$ [0,v, \bar{w}]
4 b ..2'	$1/4,0,z$ [u,v,0]	$1/4,1/2,\bar{z}$ [u, \bar{v} ,0]	$3/4,0,\bar{z}$ [u,v,0]	$3/4,1/2,z$ [u, \bar{v} ,0]
4 a $\bar{1}$	$0,0,0$ [u,v,w]	$0,1/2,0$ [\bar{u},v,w]	$1/2,0,0$ [u,v, \bar{w}]	$1/2,1/2,0$ [\bar{u},v,\bar{w}]

Symmetry of special projections

Along [001] $p2'mg'$ $a^* = b$ $b^* = -a/2$ Origin at 0,0,z	Along [100] $p2'mm'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p_{2a^*}2mm$ $a^* = a/2$ Origin at 1/4,y,0
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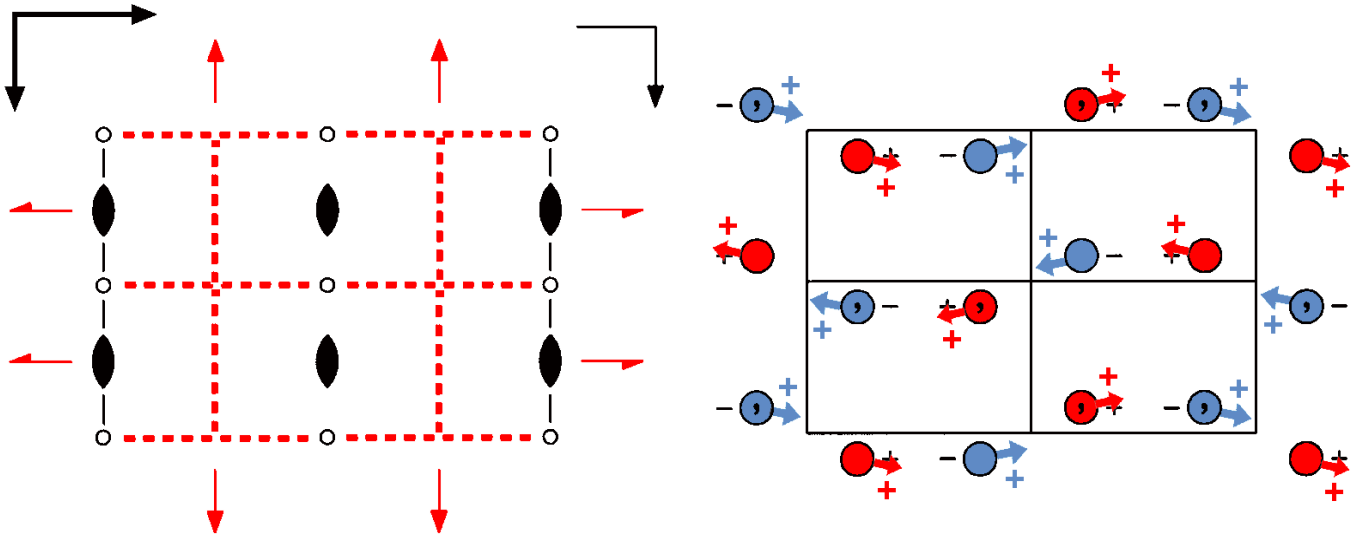
pb'a'a

No. 43.6.303

m'm'm

p2'/b'2₁'/a'2/a

Orthorhombic/Rectangular



Origin at $\bar{1}$ on b'1a

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2' $x, 1/4, 0$
(2 _x 0,1/2,0)' | (3) 2 $1/4, 0, z$
(2 _z 1/2,0,0) | (4) 2' (0,1/2,0) $1/4, y, 0$
(2 _y 1/2,1/2,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) b' (0,1/2,0) $0, y, z$
(m _x 0,1/2,0)' | (7) a (1/2,0,0) $x, y, 0$
(m _z 1/2,0,0) | (8) a' (1/2,0,0) $x, 1/4, z$
(m _y 1/2,1/2,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) $x,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]	(3) $\bar{x}+1/2,\bar{y},z$ [\bar{u},\bar{v},w]	(4) $\bar{x}+1/2,y+1/2,\bar{z}$ [u, \bar{v},w]
8 d 1	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $\bar{x},y+1/2,z$ [\bar{u},v,w]	(7) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]	(8) $x+1/2,\bar{y}+1/2,z$ [u, \bar{v},w]
4 c 2'..	$x,1/4,0$ [0,v,w]	$\bar{x}+1/2,3/4,0$ [0, \bar{v},w]	$\bar{x},3/4,0$ [0,v,w]	$x+1/2,1/4,0$ [0, \bar{v},w]
4 b ..2	$1/4,0,z$ [0,0,w]	$1/4,1/2,\bar{z}$ [0,0,w]	$3/4,0,\bar{z}$ [0,0,w]	$3/4,1/2,z$ [0,0,w]
4 a $\bar{1}$	$0,0,0$ [u,v,w]	$0,1/2,0$ [\bar{u},v,w]	$1/2,0,0$ [\bar{u},\bar{v},w]	$1/2,1/2,0$ [u, \bar{v},w]

Symmetry of special projections

Along [001] $p_{2a^*}2m'g'$ $a^* = b$ $b^* = -a/2$ Origin at $1/4,0,z$	Along [100] $p2'm'm$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p2'm'm$ $a^* = a/2$ Origin at $0,y,0$
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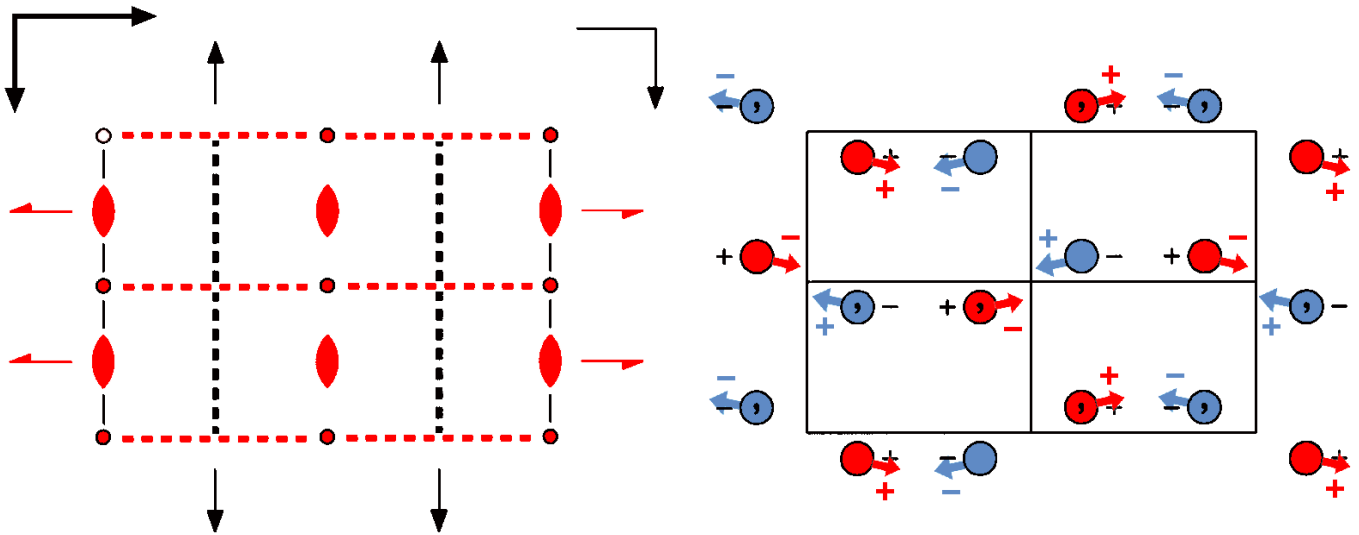
pb'aa

No. 43.7.304

m'mm

p2/b'2₁'/a2'/a

Orthorhombic/Rectangular



Origin at $\bar{1}$ on b'1a

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $x, 1/4, 0$
(2 _x 0,1/2,0) | (3) 2' $1/4, 0, z$
(2 _z 1/2,0,0)' | (4) 2' (0,1/2,0) $1/4, y, 0$
(2 _y 1/2,1/2,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) b' (0,1/2,0) $0, y, z$
(m _x 0,1/2,0)' | (7) a (1/2,0,0) $x, y, 0$
(m _z 1/2,0,0) | (8) a (1/2,0,0) $x, 1/4, z$
(m _y 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 d 1	(1) $x,y,z [u,v,w]$	(2) $x,\bar{y}+1/2,\bar{z} [u,\bar{v},\bar{w}]$	(3) $\bar{x}+1/2,\bar{y},z [u,v,\bar{w}]$	(4) $\bar{x}+1/2,y+1/2,\bar{z} [u,\bar{v},w]$
	(5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(6) $\bar{x},y+1/2,z [\bar{u},v,w]$	(7) $x+1/2,y,\bar{z} [\bar{u},\bar{v},w]$	(8) $x+1/2,\bar{y}+1/2,z [\bar{u},v,\bar{w}]$
4 c 2..	$x,1/4,0 [u,0,0]$	$\bar{x}+1/2,3/4,0 [u,0,0]$	$\bar{x},3/4,0 [\bar{u},0,0]$	$x+1/2,1/4,0 [\bar{u},0,0]$
4 b ..2'	$1/4,0,z [u,v,0]$	$1/4,1/2,\bar{z} [u,\bar{v},0]$	$3/4,0,\bar{z} [\bar{u},\bar{v},0]$	$3/4,1/2,z [\bar{u},v,0]$
4 a $\bar{1}$ '	$0,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$	$1/2,0,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$

Symmetry of special projections

Along [001] $p_{2b^*}2m'g'$ $a^* = b$ $b^* = -a/2$ Origin at 0,0,z	Along [100] $p2mm$ $a^* = b/2$ Origin at x,0,0	Along [010] $p_{2a^*}2m'm'$ $a^* = a/2$ Origin at 0,y,0
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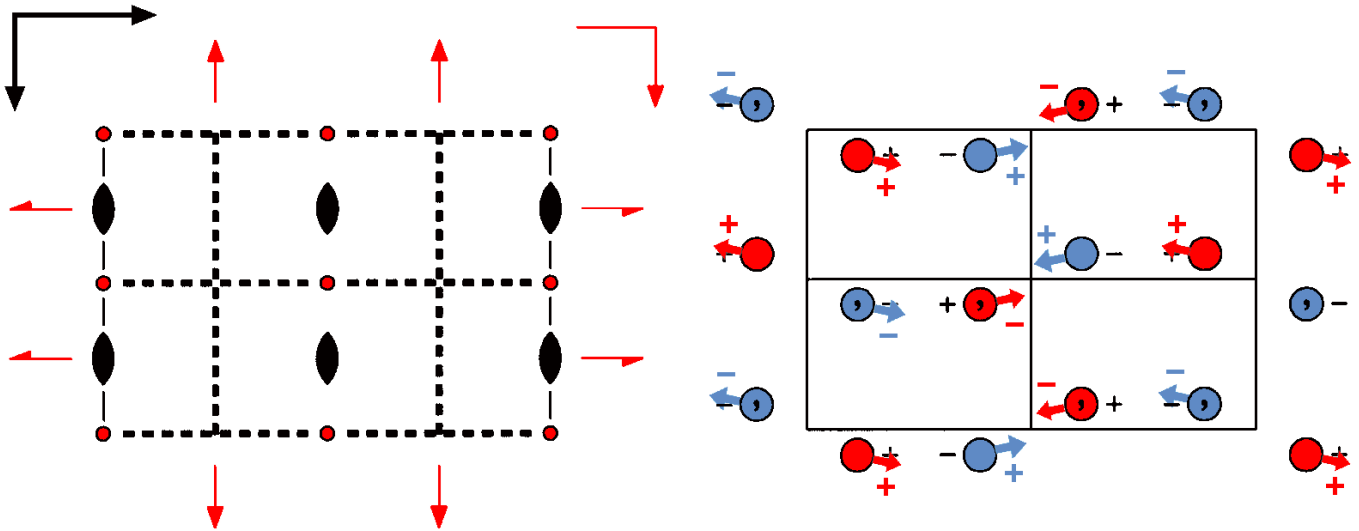
$pb\bar{a}a'$

No. 43.8.305

mmm'

$p2_1'/b2_1'/a2/a'$

Orthorhombic/Rectangular



Origin at $\bar{1}'$ on $b1a'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) $2'_x$ $x, 1/4, 0$
(2_x 0,1/2,0)' | (3) $2'_z$ $1/4, 0, z$
(2_z 1/2,0,0) | (4) $2'_y$ (0,1/2,0) $1/4, y, 0$
(2_y 1/2,1/2,0)' |
| (5) $\bar{1}'$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) b (0,1/2,0) $0, y, z$
(m_x 0,1/2,0) | (7) a'_x (1/2,0,0) $x, y, 0$
(m_z 1/2,0,0)' | (8) a'_y (1/2,0,0) $x, 1/4, z$
(m_y 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 d 1	(1) x,y,z [u,v,w]	(2) $x,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]	(3) $\bar{x}+1/2,\bar{y},z$ [\bar{u},\bar{v},w]	(4) $\bar{x}+1/2,y+1/2,\bar{z}$ [u, \bar{v},w]
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) $\bar{x},y+1/2,z$ [u, \bar{v},\bar{w}]	(7) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]	(8) $x+1/2,\bar{y}+1/2,z$ [\bar{u},v,\bar{w}]
4 c 2 ⁺	$x,1/4,0$ [0,v,w]	$\bar{x}+1/2,3/4,0$ [0, \bar{v},w]	$\bar{x},3/4,0$ [0, \bar{v},\bar{w}]	$x+1/2,1/4,0$ [0,v, \bar{w}]
4 b ..2	$1/4,0,z$ [0,0,w]	$1/4,1/2,\bar{z}$ [0,0,w]	$3/4,0,\bar{z}$ [0,0, \bar{w}]	$3/4,1/2,z$ [0,0, \bar{w}]
4 a $\bar{1}$	0,0,0 [0,0,0]	0,1/2,0 [0,0,0]	1/2,0,0 [0,0,0]	1/2,1/2,0 [0,0,0]

Symmetry of special projections

Along [001] $p2mg$
 $a^* = b$ $b^* = -a/2$
 Origin at 0,0,z

Along [100] $p_{2a^*}2m'm'$
 $a^* = b/2$
 Origin at x,0,0

Along [010] $p_{2a^*}2mm$
 $a^* = a/2$
 Origin at 0,y,0

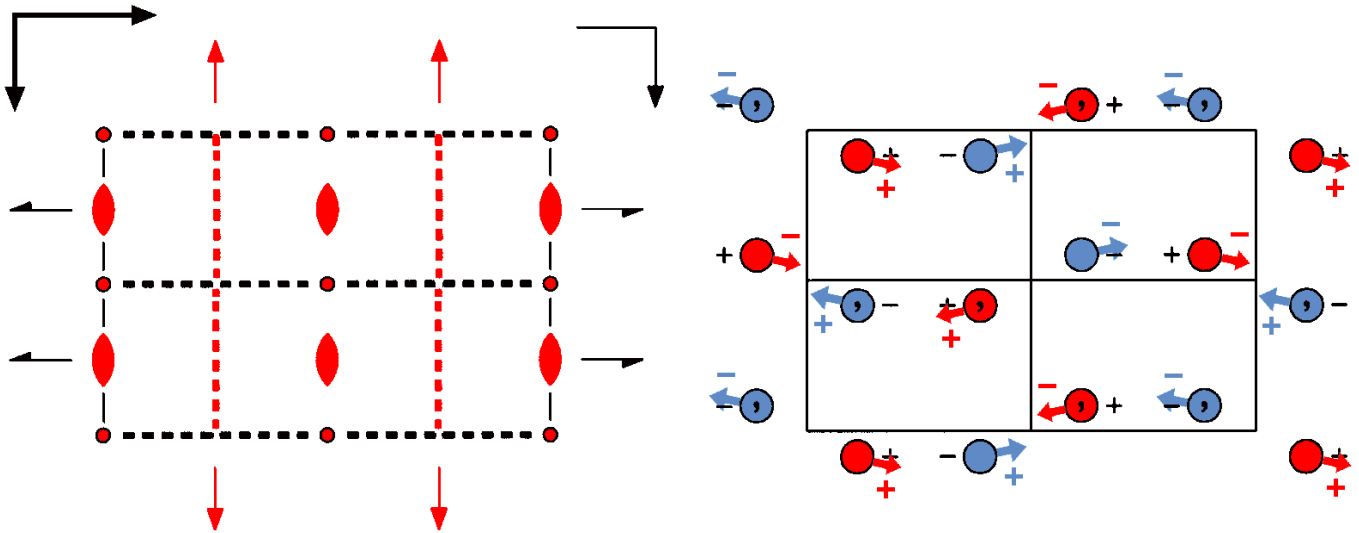
pba'a

No. 43.9.306

mm'm

p2'/b2₁/a'2'/a

Orthorhombic/Rectangular



Origin at $\bar{1}$ on b1a

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2' $x, 1/4, 0$
(2 _x 0,1/2,0)' | (3) 2' $1/4, 0, z$
(2 _z 1/2,0,0)' | (4) 2 (0,1/2,0) $1/4, y, 0$
(2 _y 1/2,1/2,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) b (0,1/2,0) $0, y, z$
(m _x 0,1/2,0) | (7) a (1/2,0,0) $x, y, 0$
(m _z 1/2,0,0) | (8) a' (1/2,0,0) $x, 1/4, z$
(m _y 1/2,1/2,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) $x,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]	(3) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]	(4) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]
8 d 1	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) $\bar{x},y+1/2,z$ [u, \bar{v},\bar{w}]	(7) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]	(8) $x+1/2,\bar{y}+1/2,z$ [u, \bar{v},w]
4 c 2'	$x,1/4,0$ [0,v,w]	$\bar{x}+1/2,3/4,0$ [0,v, \bar{w}]	$\bar{x},3/4,0$ [0, \bar{v},\bar{w}]	$x+1/2,1/4,0$ [0, \bar{v},w]
4 b ..2'	$1/4,0,z$ [u,v,0]	$1/4,1/2,\bar{z}$ [$\bar{u},v,0$]	$3/4,0,\bar{z}$ [$\bar{u},\bar{v},0$]	$3/4,1/2,z$ [u, $\bar{v},0$]
4 a $\bar{1}$ '	$0,0,0$ [0,0,0]	$0,1/2,0$ [0,0,0]	$1/2,0,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]

Symmetry of special projections

Along [001] $p_{2b^*}2mg$ $a^* = b$ $b^* = -a/2$ Origin at 0,0,z	Along [100] $p_{2a^*}2mm$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2mm$ $a^* = a/2$ Origin at 0,y,0
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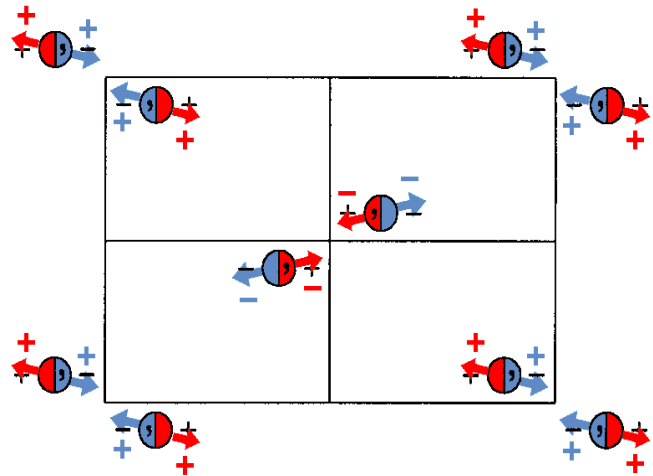
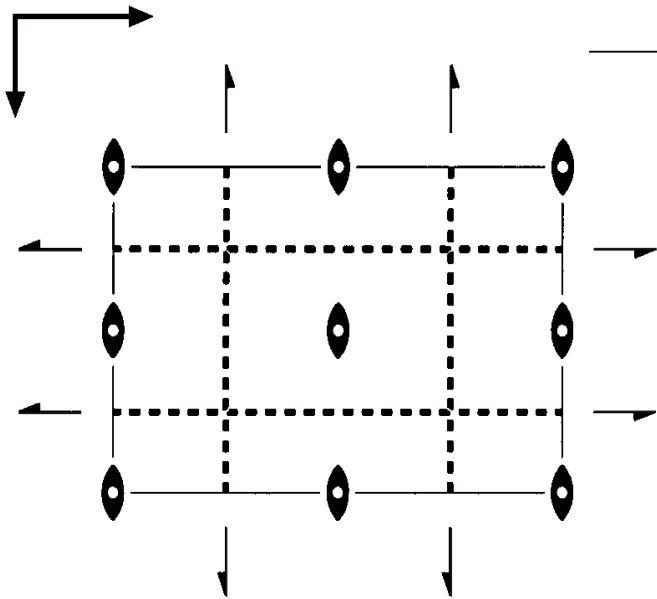
pbam

No. 44.1.307

mmm

$p2_1/b2_1/a2/m$

Orthorhombic/Rectangular



Origin at center (2/m)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 2 (0,1/2,0) 1/4,y,0
(2_y|1/2,1/2,0)

(4) 2 (1/2,0,0) x,1/4,0
(2_x|1/2,1/2,0)

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) m x,y,0
(m_z|0,0,0)

(7) a (1/2,0,0) x,1/4,z
(m_y|1/2,1/2,0)

(8) b (0,1/2,0) 1/4,y,z
(m_x|1/2,1/2,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 f 1		(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{x}+1/2,y+1/2,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x+1/2,\bar{y}+1/2,\bar{z} [u,\bar{v},\bar{w}]$
		(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(7) $x+1/2,\bar{y}+1/2,z [\bar{u},v,\bar{w}]$	(8) $\bar{x}+1/2,y+1/2,z [u,\bar{v},\bar{w}]$
4 e ..m		$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,w]$	$\bar{x}+1/2,y+1/2,0 [0,0,\bar{w}]$	$x+1/2,\bar{y}+1/2,0 [0,0,\bar{w}]$
4 d ..2		$0,1/2,z [0,0,w]$	$1/2,0,\bar{z} [0,0,\bar{w}]$	$0,1/2,\bar{z} [0,0,w]$	$1/2,0,z [0,0,\bar{w}]$
4 c ..2		$0,0,z [0,0,w]$	$1/2,1/2,\bar{z}$	$0,0,\bar{z} [0,0,w]$	$1/2,1/2,z [0,0,\bar{w}]$
2 b ..2/m		$0,1/2,0 [0,0,w]$	$1/2,0,0 [0,0,\bar{w}]$		
2 a ..2/m		$0,0,0 [0,0,w]$	$1/2,1/2,0 [0,0,\bar{w}]$		

Symmetry of special projections

Along [001] $p2gg1'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p_{2a^*}2m'm'$ $a^* = b/2$ Origin at $x,1/4,0$	Along [010] $p_{2a^*}2mm$ $a^* = a/2$ Origin at $1/4,y,0$
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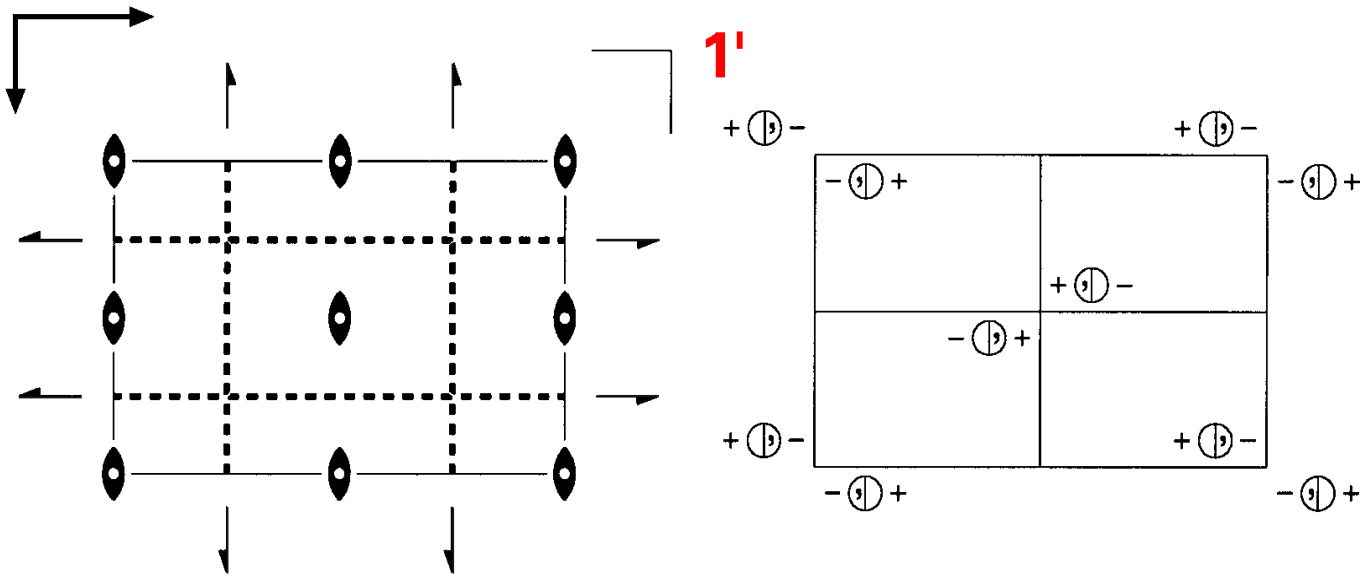
pbam1'

No. 44.2.308

mmm1'

p2₁/b2₁/a2/m1'

Orthorhombic/Rectangular



Origin at center (2/m1')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (4) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m x,y,0
(m _z 0,0,0) | (7) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (8) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) |

For 1' + set

- | | | | |
|---|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (4) 2' (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ 0,0,0)' | (6) m' x,y,0
(m _z 0,0,0)' | (7) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (8) b' (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	1+	1' +		
8 f 11'	(1) $x,y,z [0,0,0]$ (5) $\bar{x},\bar{y},\bar{z} [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$ (6) $x,y,\bar{z} [0,0,0]$	(3) $\bar{x}+1/2,y+1/2,\bar{z} [0,0,0]$ (7) $x+1/2,\bar{y}+1/2,z [0,0,0]$	(4) $x+1/2,\bar{y}+1/2,\bar{z} [0,0,0]$ (8) $\bar{x}+1/2,y+1/2,z [0,0,0]$
4 e ..m1'	$x,y,0 [0,0,0]$	$\bar{x},\bar{y},0 [0,0,0]$	$\bar{x}+1/2,y+1/2,0 [0,0,0]$	$x+1/2,\bar{y}+1/2,0 [0,0,0]$
4 d ..21'	$0,1/2,z [0,0,0]$	$1/2,0,\bar{z} [0,0,0]$	$0,1/2,\bar{z} [0,0,0]$	$1/2,0,z [0,0,0]$
4 c ..21'	$0,0,z [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$	$0,0,\bar{z} [0,0,0]$	$1/2,1/2,z [0,0,0]$
2 b ..2/m1'	$0,1/2,0 [0,0,0]$	$1/2,0,0 [0,0,0]$		
2 a ..2/m1'	$0,0,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p2gg1'$	Along [100] $p2mm1'$	Along [010] $p2mm1'$
$a^* = a$ $b^* = b$	$a^* = b/2$	$a^* = a/2$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $0,y,0$

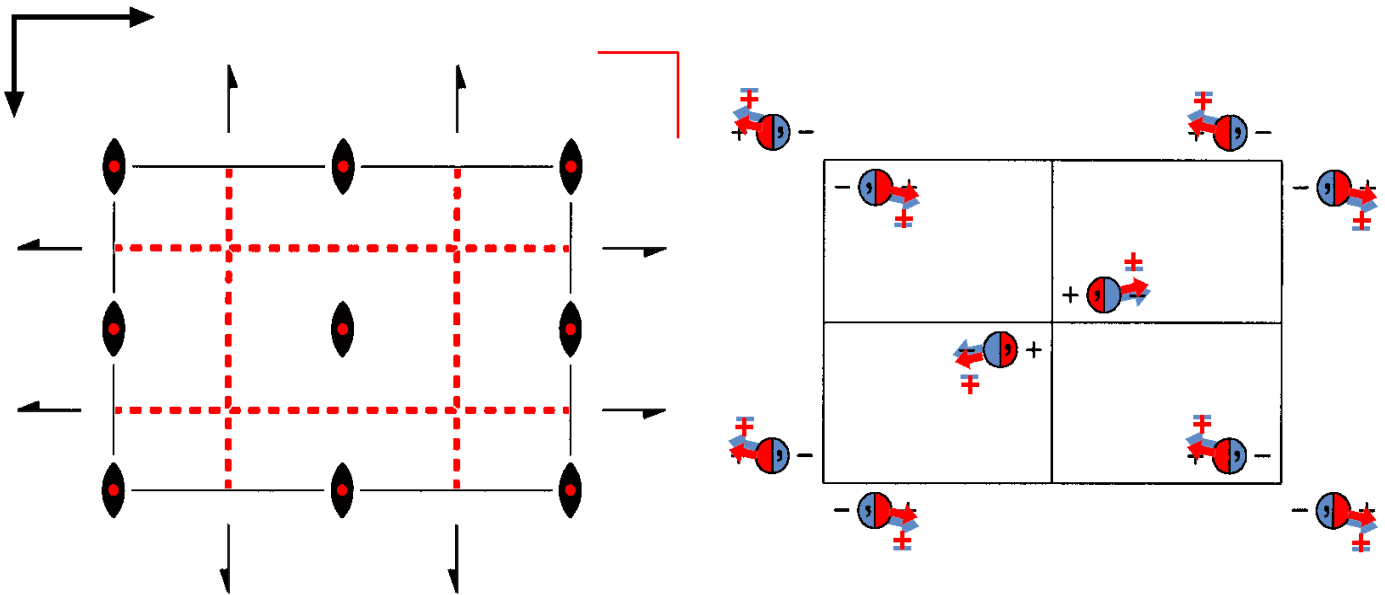
pb'a'm'

No. 44.3.309

m'm'm'

p2₁/b'2₁/a'2/m'

Orthorhombic/Rectangular



Origin at center (2/m)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 2 (0,1/2,0) 1/4,y,0
(2_y|1/2,1/2,0)

(4) 2 (1/2,0,0) x,1/4,0
(2_x|1/2,1/2,0)

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)'

(6) m' x,y,0
(m_z|0,0,0)'

(7) a' (1/2,0,0) x,1/4,z
(m_y|1/2,1/2,0)'

(8) b' (0,1/2,0) 1/4,y,z
(m_x|1/2,1/2,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(4) $x+1/2,\bar{y}+1/2,\bar{z}$ [u, \bar{v},\bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y, \bar{z} [u,v, \bar{w}]	(7) $x+1/2,\bar{y}+1/2,z$ [u, \bar{v},w]	(8) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]
4 e ..m'	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{x}+1/2,y+1/2,0$ [$\bar{u},v,0$]	$x+1/2,\bar{y}+1/2,0$ [u, $\bar{v},0$]
4 d ..2	0,1/2,z [0,0,w]	1/2,0, \bar{z} [0,0, \bar{w}]	0,1/2, \bar{z} [0,0, \bar{w}]	1/2,0,z [0,0,w]
4 c ..2	0,0,z [0,0,w]	1/2,1/2, \bar{z} [0,0, \bar{w}]	0,0, \bar{z} [0,0, \bar{w}]	1/2,1/2,z [0,0,w]
2 b ..2/m'	0,1/2,0 [0,0,0]	1/2,0,0 [0,0,0]		
2 a ..2/m'	0,0,0 [0,0,0]	1/2,1/2,0 [0,0,0]		

Symmetry of special projections

Along [001] p2g'g'	Along [100] p2'm'm	Along [010] p2m'm'
$a^* = a$ $b^* = b$	$a^* = b/2$	$a^* = a/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

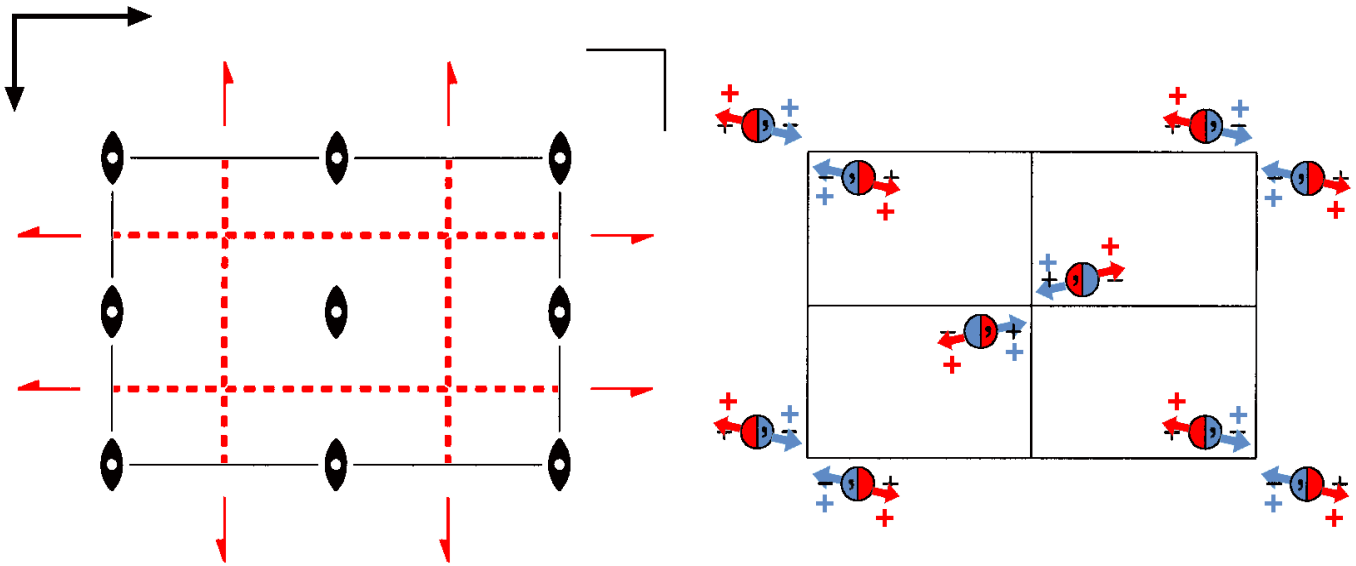
pb'a'm

No. 44.4.310

m'm'm

$p2_1'/b'2_1'/a'2/m$

Orthorhombic/Rectangular



Origin at center (2/m)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2_z 0,0,z
(2_z|0,0,0)

(3) 2'_y (0,1/2,0) 1/4,y,0
(2'_y|1/2,1/2,0)'

(4) 2'_x (1/2,0,0) x,1/4,0
(2'_x|1/2,1/2,0)'

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) m_x x,y,0
(m_x|0,0,0)

(7) a'_y (1/2,0,0) x,1/4,z
(a'_y|1/2,1/2,0)'

(8) b'_x (0,1/2,0) 1/4,y,z
(b'_x|1/2,1/2,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates				
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) $\bar{x}+1/2,y+1/2,\bar{z}$ [u,\bar{v},w]	(4) $x+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]	(5) \bar{x},\bar{y},\bar{z} [u,v,w]
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) $\bar{x}+1/2,y+1/2,\bar{z}$ [u,\bar{v},w]	(4) $x+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]	(5) \bar{x},\bar{y},\bar{z} [u,v,w]
	(6) x,y,\bar{z} [\bar{u},\bar{v},w]	(7) $x+1/2,\bar{y}+1/2,z$ [u,\bar{v},w]	(8) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]		
4 e ..m	$x,y,0$ [$0,0,w$]	$\bar{x},\bar{y},0$ [$0,0,w$]	$\bar{x}+1/2,y+1/2,0$ [$0,0,w$]	$x+1/2,\bar{y}+1/2,0$ [$0,0,w$]	
4 d ..2	$0,1/2,z$ [$0,0,w$]	$1/2,0,\bar{z}$ [$0,0,w$]	$0,1/2,\bar{z}$ [$0,0,w$]	$1/2,0,z$ [$0,0,w$]	
4 c ..2	$0,0,z$ [$0,0,w$]	$1/2,1/2,\bar{z}$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,w$]	$1/2,1/2,z$ [$0,0,w$]	
2 b ..2/m	$0,1/2,0$ [$0,0,w$]	$1/2,0,0$ [$0,0,w$]			
2 a ..2/m	$0,0,0$ [$0,0,w$]	$1/2,1/2,0$ [$0,0,w$]			

Symmetry of special projections

Along [001] $p2gg1'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2'm'm$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p2'm'm$ $a^* = a/2$ Origin at $0,y,0$
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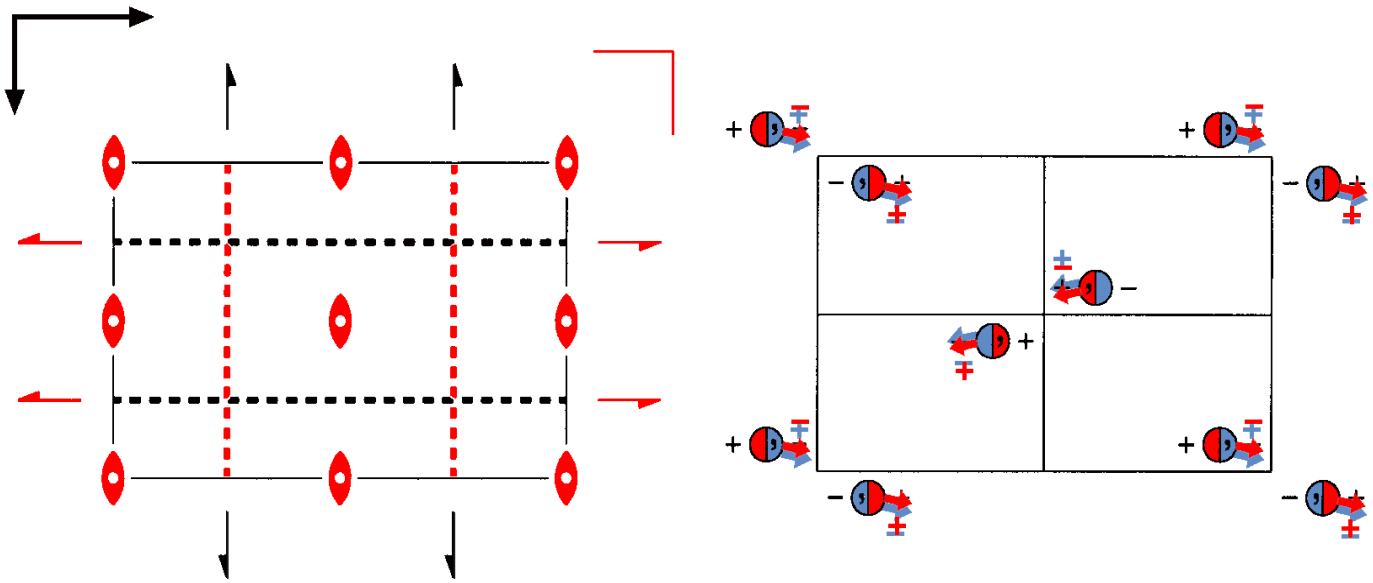
pba'm'

No. 44.5.311

mm'm'

p2₁/b2₁'/a'2'/m'

Orthorhombic/Rectangular



Origin at center (2'/m')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2' 0,0,z
(2_z|0,0,0)'

(3) 2' (0,1/2,0) 1/4,y,0
(2_y|1/2,1/2,0)'

(4) 2 (1/2,0,0) x,1/4,0
(2_x|1/2,1/2,0)

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) m' x,y,0
(m_z|0,0,0)'

(7) a' (1/2,0,0) x,1/4,z
(m_y|1/2,1/2,0)'

(8) b (0,1/2,0) 1/4,y,z
(m_x|1/2,1/2,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x, y, z [u,v,w]	(2) \bar{x}, \bar{y}, z [u,v, \bar{w}]	(3) $\bar{x} + 1/2, y + 1/2, \bar{z}$ [u, \bar{v} ,w]	(4) $x + 1/2, \bar{y} + 1/2, \bar{z}$ [u, \bar{v} , \bar{w}]
8 f 1	(5) $\bar{x}, \bar{y}, \bar{z}$ [u,v,w]	(6) x, y, \bar{z} [u,v, \bar{w}]	(7) $x + 1/2, \bar{y} + 1/2, z$ [u, \bar{v} ,w]	(8) $\bar{x} + 1/2, y + 1/2, z$ [u, \bar{v} , \bar{w}]
4 e ..m'	$x, y, 0$ [u,v,0]	$\bar{x}, \bar{y}, 0$ [u,v,0]	$\bar{x} + 1/2, y + 1/2, 0$ [u, \bar{v} ,0]	$x + 1/2, \bar{y} + 1/2, 0$ [u, \bar{v} ,0]
4 d ..2'	$0, 1/2, z$ [u,v,0]	$1/2, 0, \bar{z}$ [u, \bar{v} ,0]	$0, 1/2, \bar{z}$ [u,v,0]	$1/2, 0, z$ [u, \bar{v} ,0]
4 c ..2'	$0, 0, z$ [u,v,0]	$1/2, 1/2, \bar{z}$ [u, \bar{v} ,0]	$0, 0, \bar{z}$ [u,v,0]	$1/2, 1/2, z$ [u, \bar{v} ,0]
2 b ..2'/m'	$0, 1/2, 0$ [u,v,0]	$1/2, 0, 0$ [u, \bar{v} ,0]		
2 a ..2'/m'	$0, 0, 0$ [u,v,0]	$1/2, 1/2, 0$ [u, \bar{v} ,0]		

Symmetry of special projections

Along [001] $p2'gg'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p_{2a}2mm$ $a^* = b/2$ Origin at $x, 1/4, 0$	Along [010] $p2m'm'$ $a^* = a/2$ Origin at 0,y,0
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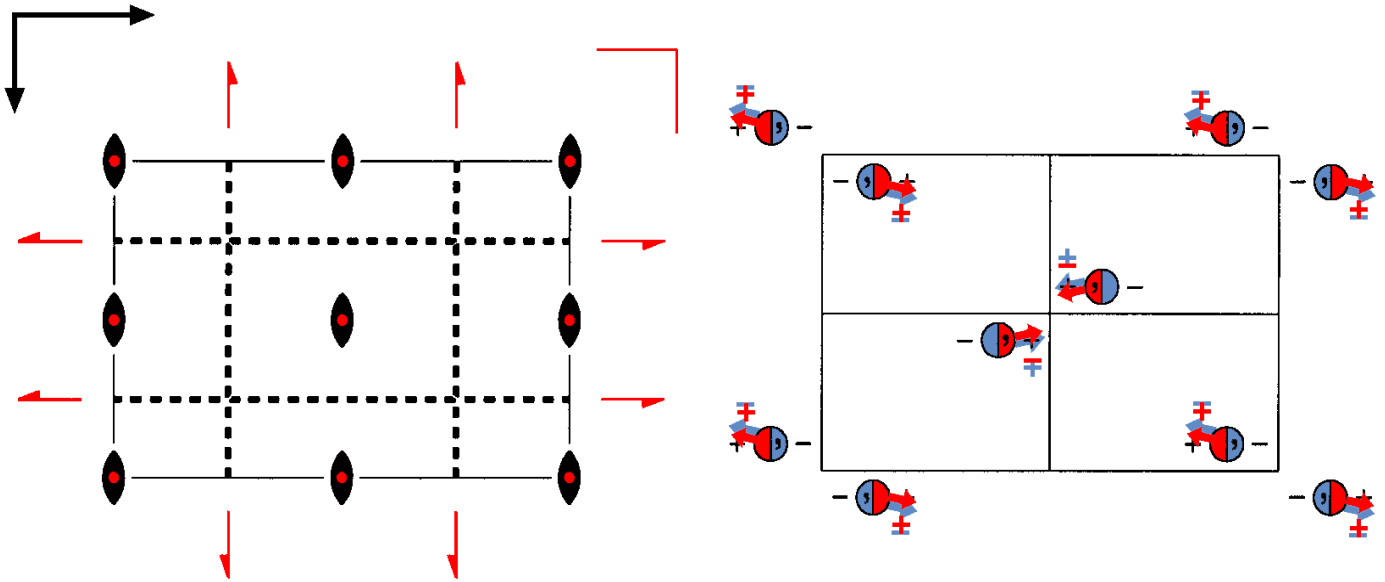
pbam'

No. 44.6.312

mmm'

$p2_1'/b2_1'/a2/m'$

Orthorhombic/Rectangular



Origin at center ($2/m'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|---|------------------------------------|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) $2' (0,1/2,0)$ $1/4,y,0$
(2_y $1/2,1/2,0'$) | (4) $2' (1/2,0,0)$ $x,1/4,0$
(2_x $1/2,1/2,0'$) |
| (5) $\bar{1}' 0,0,0$
($\bar{1}'$ 0,0,0)' | (6) $m' x,y,0$
(m_z 0,0,0)' | (7) a ($1/2,0,0)$ $x,1/4,z$
(m_y $1/2,1/2,0$) | (8) b ($0,1/2,0)$ $1/4,y,z$
(m_x $1/2,1/2,0$) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{x}+1/2,y+1/2,\bar{z} [u,\bar{v},w]$	(4) $x+1/2,\bar{y}+1/2,\bar{z} [\bar{u},v,w]$
	(5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(6) $x,y,\bar{z} [u,v,\bar{w}]$	(7) $x+1/2,\bar{y}+1/2,z [\bar{u},v,\bar{w}]$	(8) $\bar{x}+1/2,y+1/2,z [u,\bar{v},\bar{w}]$
4 e ..m'	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [\bar{u},\bar{v},0]$	$\bar{x}+1/2,y+1/2,0 [u,\bar{v},0]$	$x+1/2,\bar{y}+1/2,0 [\bar{u},v,0]$
4 d ..2	$0,1/2,z [0,0,w]$	$1/2,0,\bar{z} [0,0,w]$	$0,1/2,\bar{z} [0,0,\bar{w}]$	$1/2,0,z [0,0,\bar{w}]$
4 c ..2	$0,0,z [0,0,w]$	$1/2,1/2,\bar{z} [0,0,w]$	$0,0,\bar{z} [0,0,\bar{w}]$	$1/2,1/2,z [0,0,\bar{w}]$
2 b ..2/m'	$0,1/2,0 [0,0,0]$	$1/2,0,0 [0,0,0]$		
2 a ..2/m'	$0,0,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p2gg$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p_{2a^*}2m'm'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p_{2a^*}2m'm'$ $a^* = a/2$ Origin at 0,y,0
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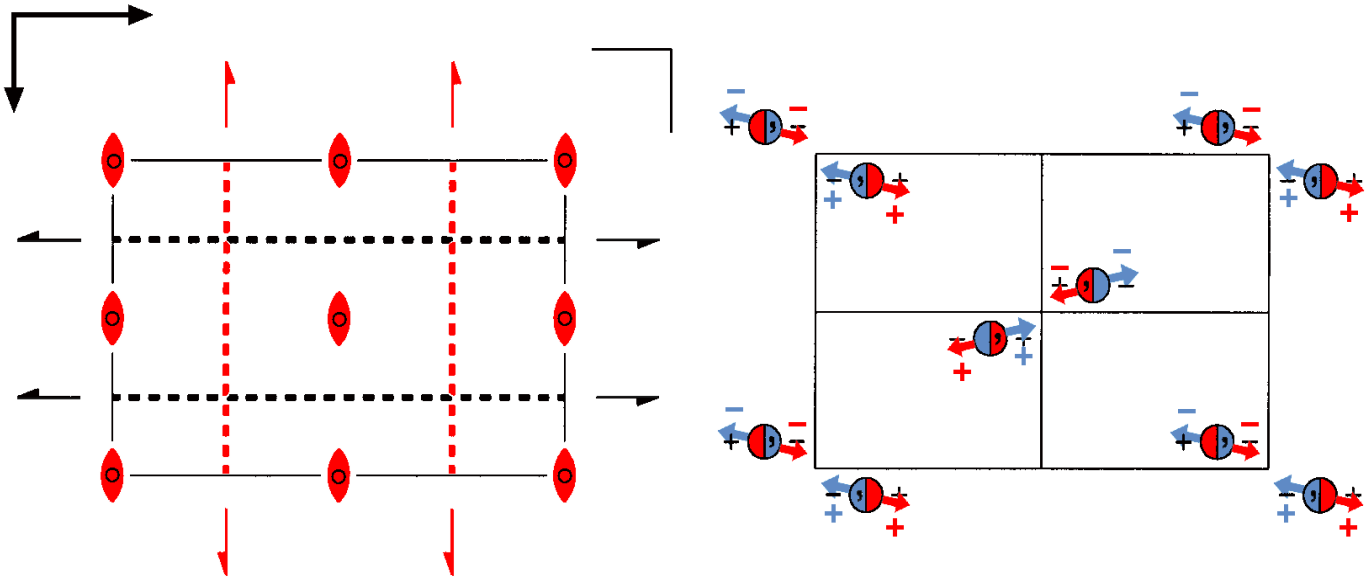
pba'm

No. 44.7.313

mm'm

$p2_1'/b2_1/a'2'/m$

Orthorhombic/Rectangular



Origin at center ($2'/m$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|---|------------------------------------|--|--|
| (1) 1
(1 0,0,0) | (2) $2'$ 0,0,z
(2_z 0,0,0)' | (3) 2 (0,1/2,0) 1/4,y,0
(2_y 1/2,1/2,0) | (4) $2'$ (1/2,0,0) x,1/4,0
(2_x 1/2,1/2,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) m x,y,0
(m_z 0,0,0) | (7) a' (1/2,0,0) x,1/4,z
(m_y 1/2,1/2,0)' | (8) b (0,1/2,0) 1/4,y,z
(m_x 1/2,1/2,0) |

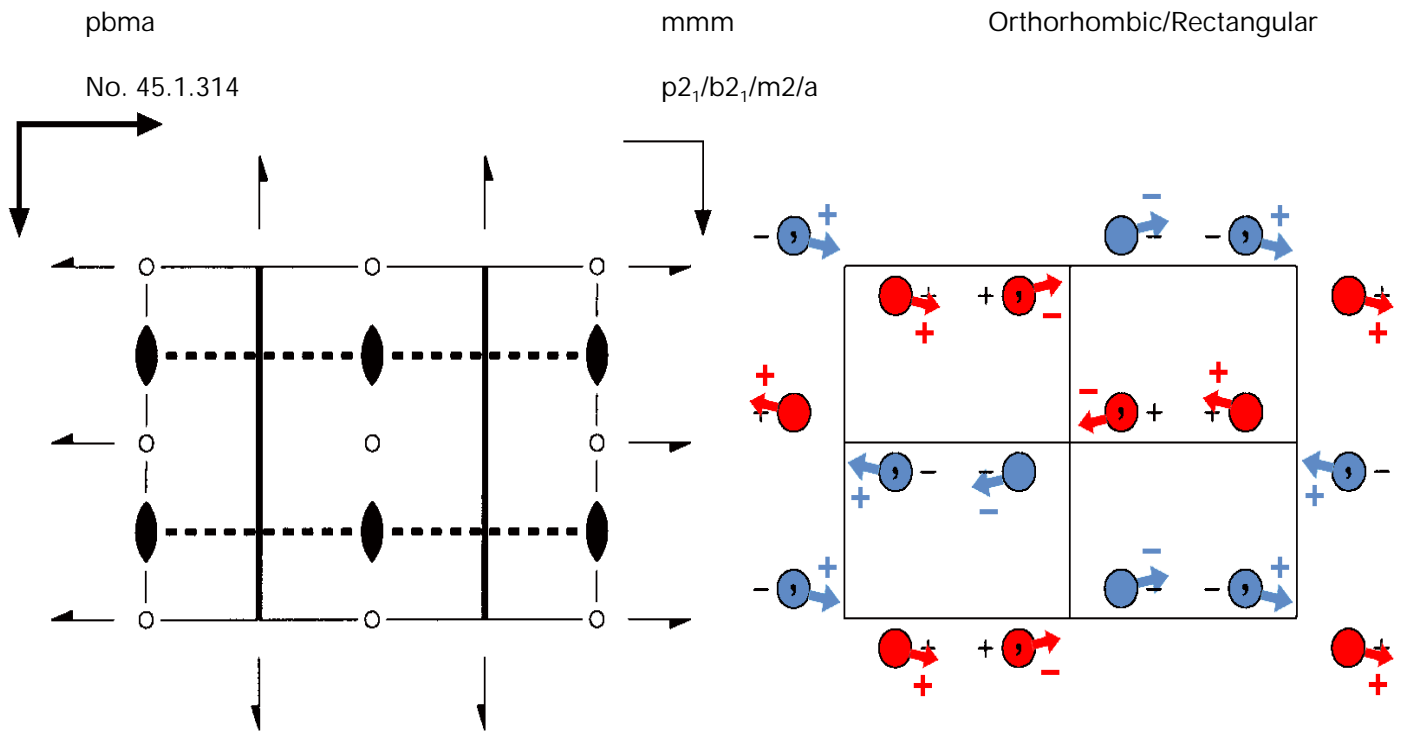
Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 f 1		(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(3) $\bar{x}+1/2,y+1/2,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x+1/2,\bar{y}+1/2,\bar{z} [\bar{u},v,w]$
		(5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(6) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(7) $x+1/2,\bar{y}+1/2,z [u,\bar{v},w]$	(8) $\bar{x}+1/2,y+1/2,z [u,\bar{v},\bar{w}]$
4 e ..m		$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,\bar{w}]$	$\bar{x}+1/2,y+1/2,0 [0,0,\bar{w}]$	$x+1/2,\bar{y}+1/2,0 [0,0,w]$
4 d ..2'		$0,1/2,z [u,v,0]$	$1/2,0,\bar{z} [\bar{u},v,0]$	$0,1/2,\bar{z} [\bar{u},\bar{v},0]$	$1/2,0,z [u,\bar{v},0]$
4 c ..2'		$0,0,z [u,v,0]$	$1/2,1/2,\bar{z} [\bar{u},v,0]$	$0,0,\bar{z} [\bar{u},\bar{v},0]$	$1/2,1/2,z [u,\bar{v},0]$
2 b ..2'/m		$0,1/2,0 [0,0,0]$	$1/2,0,0 [0,0,0]$		
2 a ..2'/m		$0,0,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p2gg1'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p_{2a}2mm$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2mm$ $a^* = a/2$ Origin at 0,y,0
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Origin at $\bar{1}$ on 12,a

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/4$ $0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 (0,1/2,0) 0,y,0
(2 _y 0,1/2,0) | (3) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) | (4) 2 1/4,0,z
(2 _z 1/2,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m x,1/4,z
(m _y 0,1/2,0) | (7) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (8) a (1/2,0,0) x,y,0
(m _z 1/2,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y+1/2,\bar{z} [\bar{u},v,\bar{w}]$	(3) $x+1/2,\bar{y}+1/2,\bar{z} [u,\bar{v},\bar{w}]$	(4) $\bar{x}+1/2,\bar{y},z [\bar{u},\bar{v},w]$
	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x,\bar{y}+1/2,z [\bar{u},v,\bar{w}]$	(7) $\bar{x}+1/2,y+1/2,z [u,\bar{v},\bar{w}]$	(8) $x+1/2,y,\bar{z} [\bar{u},\bar{v},w]$
4 c .m.	$x,1/4,z [0,v,0]$	$\bar{x},3/4,\bar{z} [0,v,0]$	$x+1/2,1/4,\bar{z} [0,\bar{v},0]$	$\bar{x}+1/2,3/4,z [0,\bar{v},0]$
4 b ..2	$1/4,0,z [0,0,w]$	$3/4,1/2,\bar{z} [0,0,\bar{w}]$	$3/4,0,\bar{z} [0,0,\bar{w}]$	$1/4,1/2,z [0,0,w]$
4 a $\bar{1}$	$0,0,0 [u,v,w]$	$0,1/2,0 [\bar{u},v,\bar{w}]$	$1/2,1/2,0 [u,\bar{v},\bar{w}]$	$1/2,0,0 [\bar{u},\bar{v},w]$

Symmetry of special projections

Along [001] $p_{2b} \cdot 2mg$	Along [100] $p_{2a} \cdot 2'm'm$	Along [010] $p2mg1'$
$a^* = b$ $b^* = -a/2$	$a^* = b/2$	$a^* = a$
Origin at $1/4,0,z$	Origin at $x,0,0$	Origin at $0,y,0$

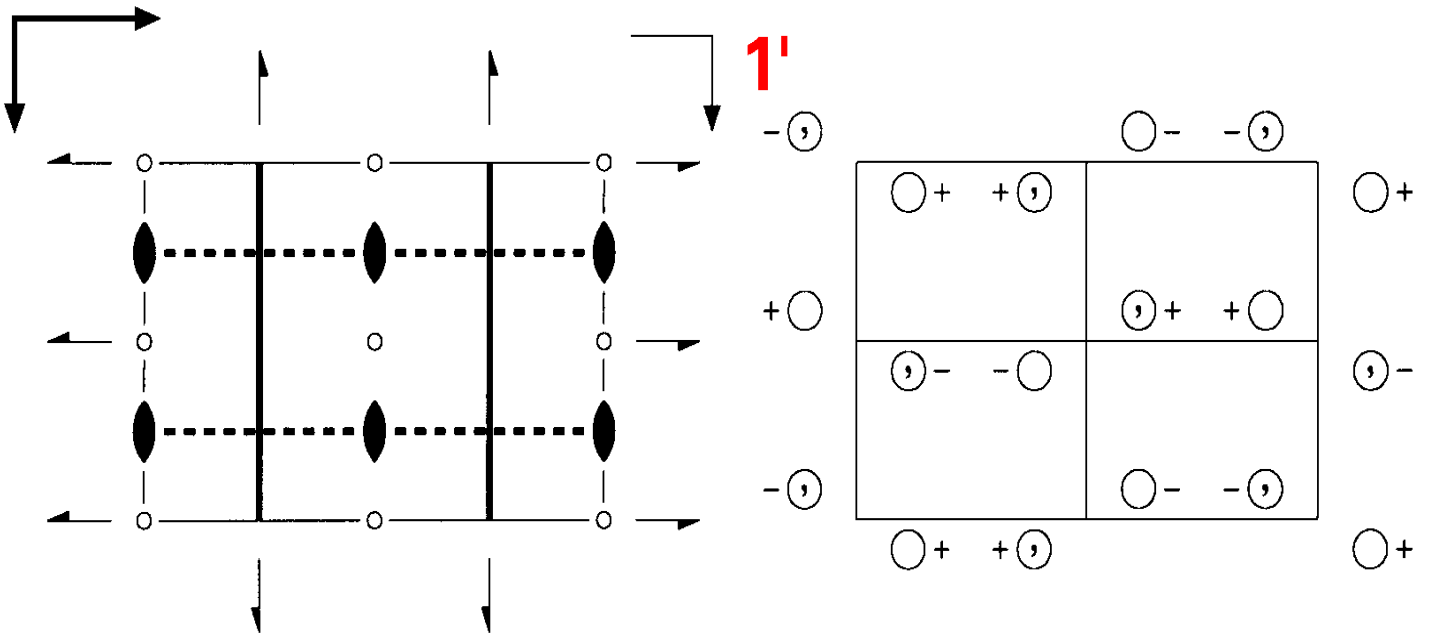
pbma1'

No. 45.2.315

mmm1'

p2₁/b2₁/m2/a1'

Orthorhombic/Rectangular



Origin at $\bar{1}1'$ on 12₁a1'

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/4; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 (0,1/2,0) 0,y,0
(2 _y 0,1/2,0) | (3) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) | (4) 2 1/4,0,z
(2 _z 1/2,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m x,1/4,z
(m _y 0,1/2,0) | (7) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (8) a (1/2,0,0) x,y,0
(m _z 1/2,0,0) |

For 1' + set

- | | | | |
|---|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' (0,1/2,0) 0,y,0
(2 _y 0,1/2,0)' | (3) 2' (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0)' | (4) 2' 1/4,0,z
(2 _z 1/2,0,0)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ 0,0,0)' | (6) m' x,1/4,z
(m _y 0,1/2,0)' | (7) b' (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0)' | (8) a' (1/2,0,0) x,y,0
(m _z 1/2,0,0)' |

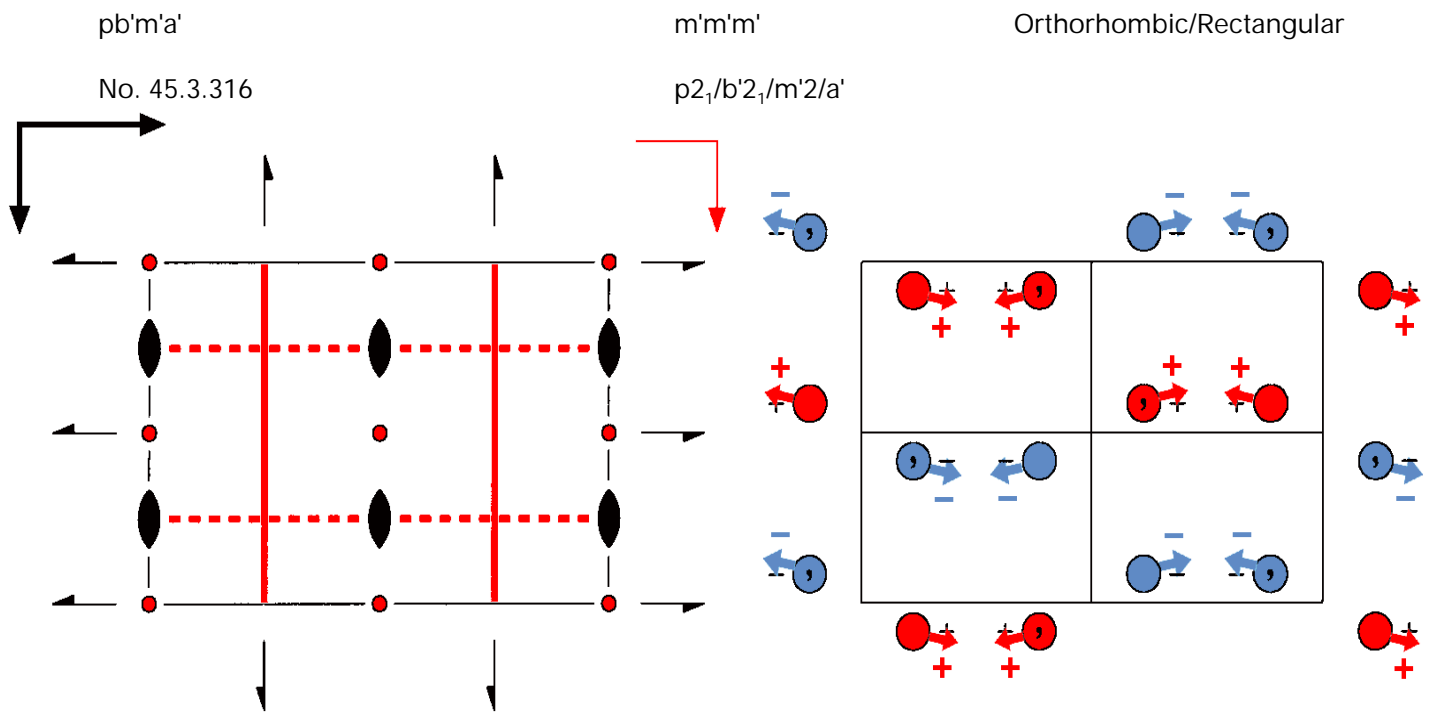
Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	1+	1' +		
8 d 11'	(1) $x,y,z [0,0,0]$ (5) $\bar{x},\bar{y},\bar{z} [0,0,0]$	(2) $\bar{x},y+1/2,\bar{z} [0,0,0]$ (6) $x,\bar{y}+1/2,z [0,0,0]$	(3) $x+1/2,\bar{y}+1/2,\bar{z} [0,0,0]$ (7) $\bar{x}+1/2,y+1/2,z [0,0,0]$	(4) $\bar{x}+1/2,\bar{y},z [0,0,0]$ (8) $x+1/2,y,\bar{z} [0,0,0]$
4 c .m.1'	$x,1/4,z [0,0,0]$	$\bar{x},3/4,\bar{z} [0,0,0]$	$x+1/2,1/4,\bar{z} [0,0,0]$	$\bar{x}+1/2,3/4,z [0,0,0]$
4 b ..21'	$1/4,0,z [0,0,0]$	$3/4,1/2,\bar{z} [0,0,0]$	$3/4,0,\bar{z} [0,0,0]$	$1/4,1/2,z [0,0,0]$
4 a $\bar{1}1'$	$0,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$	$1/2,0,0 [0,0,0]$

Symmetry of special projections

Along [001] $p2mg1'$ $a^* = b$ $b^* = -a/2$ Origin at 0,0,z	Along [100] $p2mm1'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2mg1'$ $a^* = a$ Origin at 0,y,0
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Origin at $\bar{1}$ on $12_1a'$

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/4; 0 \leq z$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 (0,1/2,0) 0,y,0
(2 _y 0,1/2,0) | (3) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) | (4) 2 1/4,0,z
(2 _z 1/2,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) m' x,1/4,z
(m_y 0,1/2,0)' | (7) b' (0,1/2,0) 1/4,y,z
(m_x 1/2,1/2,0)' | (8) a' (1/2,0,0) x,y,0
(m_z 1/2,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 d 1	(1) x,y,z [u,v,w]	(2) $\bar{x},y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(3) $x+1/2,\bar{y}+1/2,\bar{z}$ [u, \bar{v},\bar{w}]	(4) $\bar{x},y+1/2,\bar{z}$ [\bar{u},\bar{v},w]
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) $x,\bar{y}+1/2,z$ [u, \bar{v},w]	(7) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]	(8) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]
4 c .m'	$x,1/4,z$ [u,0,w]	$\bar{x},3/4,\bar{z}$ [$\bar{u},0,\bar{w}$]	$x+1/2,1/4,\bar{z}$ [u,0, \bar{w}]	$\bar{x}+1/2,3/4,z$ [$\bar{u},0,w$]
4 b ..2	$1/4,0,z$ [0,0,w]	$3/4,1/2,\bar{z}$ [0,0, \bar{w}]	$3/4,0,\bar{z}$ [0,0, \bar{w}]	$1/4,1/2,z$ [0,0,w]
4 a $\bar{1}$ '	0,0,0 [0,0,0]	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]	1/2,0,0 [0,0,0]

Symmetry of special projections

Along [001] p2m'g' $a^* = b$ $b^* = -a/2$ Origin at 0,0,z	Along [100] p2m'm' $a^* = b/2$ Origin at x,0,0	Along [010] p2m'g' $a^* = a$ Origin at 0,y,0
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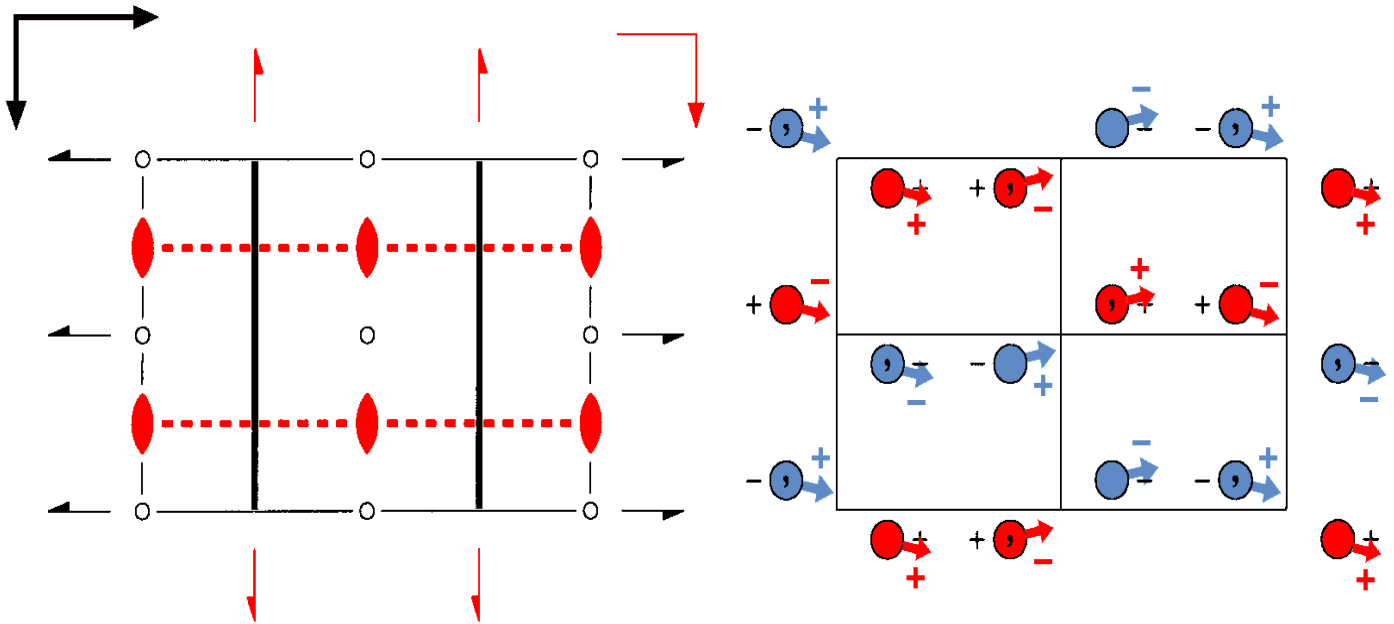
pb'ma'

No. 45.4.317

m'mm'

p2₁'/b'2₁/m2'/a'

Orthorhombic/Rectangular



Origin at $\bar{1}$ on 12, a'

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/4; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 (0,1/2,0) 0,y,0
(2 _y 0,1/2,0) | (3) 2' (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0)' | (4) 2' 1/4,0,z
(2 _z 1/2,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m x,1/4,z
(m _y 0,1/2,0) | (7) b' (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0)' | (8) a' (1/2,0,0) x,y,0
(m _z 1/2,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 d 1	(1) x,y,z [u,v,w]	(2) $\bar{x},y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(3) $x+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]	(4) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x,\bar{y}+1/2,z$ [\bar{u},v,\bar{w}]	(7) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]	(8) $x+1/2,y,\bar{z}$ [u,v, \bar{w}]
4 c .m.	$x,1/4,z$ [0,v,0]	$\bar{x},3/4,\bar{z}$ [0,v,0]	$x+1/2,1/4,\bar{z}$ [0,v,0]	$\bar{x}+1/2,3/4,z$ [0,v,0]
4 b ..2'	$1/4,0,z$ [u,v,0]	$3/4,1/2,\bar{z}$ [u,v,0]	$3/4,0,\bar{z}$ [$\bar{u},v,0$]	$1/4,1/2,z$ [$\bar{u},v,0$]
4 a $\bar{1}$	0,0,0 [u,v,w]	0,1/2,0 [\bar{u},v,\bar{w}]	1/2,1/2,0 [\bar{u},v,w]	1/2,0,0 [u,v, \bar{w}]

Symmetry of special projections

Along [001] $p2'mg'$
 $a^* = b$ $b^* = -a/2$
 Origin at 0,0,z

Along [100] $p2'mm'$
 $a^* = b/2$
 Origin at x,0,0

Along [010] $p2mg1'$
 $a^* = a$
 Origin at 0,y,0

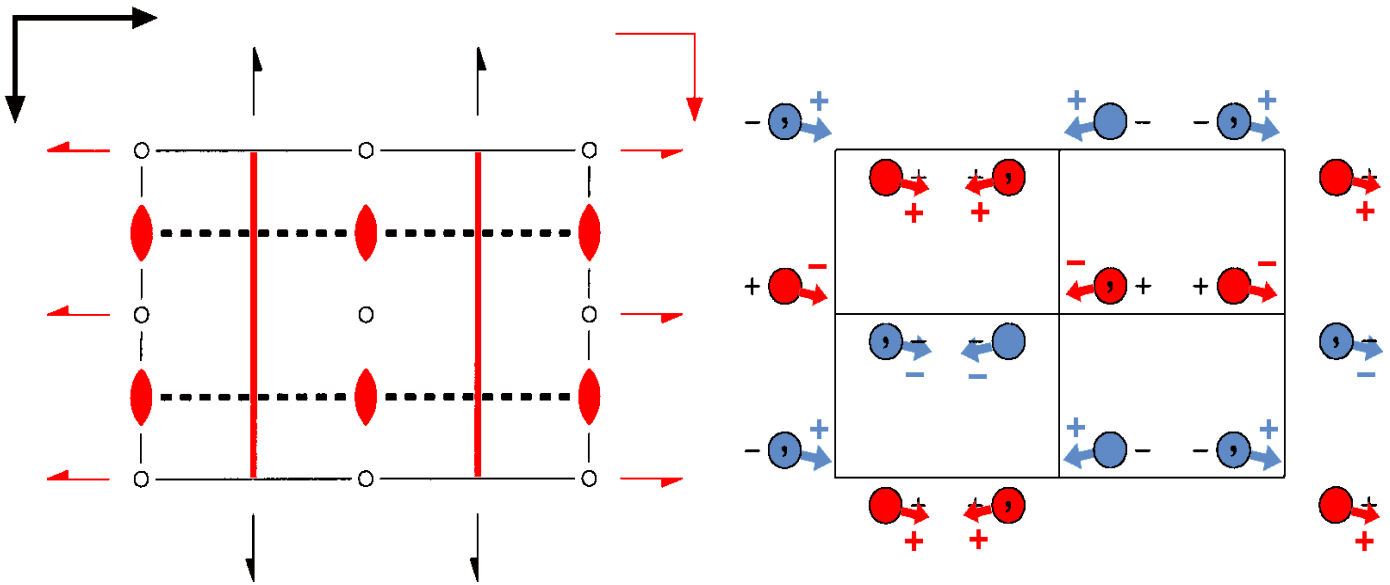
pbm'a'

No. 45.5.318

mm'm'

p2₁/b2₁'/m'2'/a'

Orthorhombic/Rectangular



Origin at $\bar{1}$ on 12, a'

Asymmetric unit $0 \leq x \leq 1$; $0 \leq y \leq 1/4$ $0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2' (0,1/2,0) 0,y,0
(2 _y 0,1/2,0)' | (3) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) | (4) 2' 1/4,0,z
(2 _z 1/2,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m' x,1/4,z
(m _y 0,1/2,0)' | (7) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (8) a' (1/2,0,0) x,y,0
(m _z 1/2,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y+1/2,\bar{z} [u,\bar{v},w]$	(3) $x+1/2,\bar{y}+1/2,\bar{z} [u,\bar{v},\bar{w}]$	(4) $\bar{x}+1/2,\bar{y},z [u,v,\bar{w}]$
	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x,\bar{y}+1/2,z [u,\bar{v},w]$	(7) $\bar{x}+1/2,y+1/2,z [u,\bar{v},\bar{w}]$	(8) $x+1/2,y,\bar{z} [u,v,\bar{w}]$
4 c .m'	$x,1/4,z [u,0,w]$	$\bar{x},3/4,\bar{z} [u,0,w]$	$x+1/2,1/4,\bar{z} [u,0,\bar{w}]$	$\bar{x}+1/2,3/4,z [u,0,\bar{w}]$
4 b ..2'	$1/4,0,z [u,v,0]$	$3/4,1/2,\bar{z} [u,\bar{v},0]$	$3/4,0,\bar{z} [u,v,0]$	$1/4,1/2,z \bar{z} [u,\bar{v},0]$
4 a $\bar{1}$	$0,0,0 [u,v,w]$	$0,1/2,0 [u,\bar{v},w]$	$1/2,1/2,0 [u,\bar{v},\bar{w}]$	$1/2,0,0 [u,v,\bar{w}]$

Symmetry of special projections

Along [001] $p2'm'g$ $a^* = b$ $b^* = -a/2$ Origin at $0,0,z$	Along [100] $p_{2a^*}2'mm'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p2'mg'$ $a^* = a$ Origin at $0,y,0$
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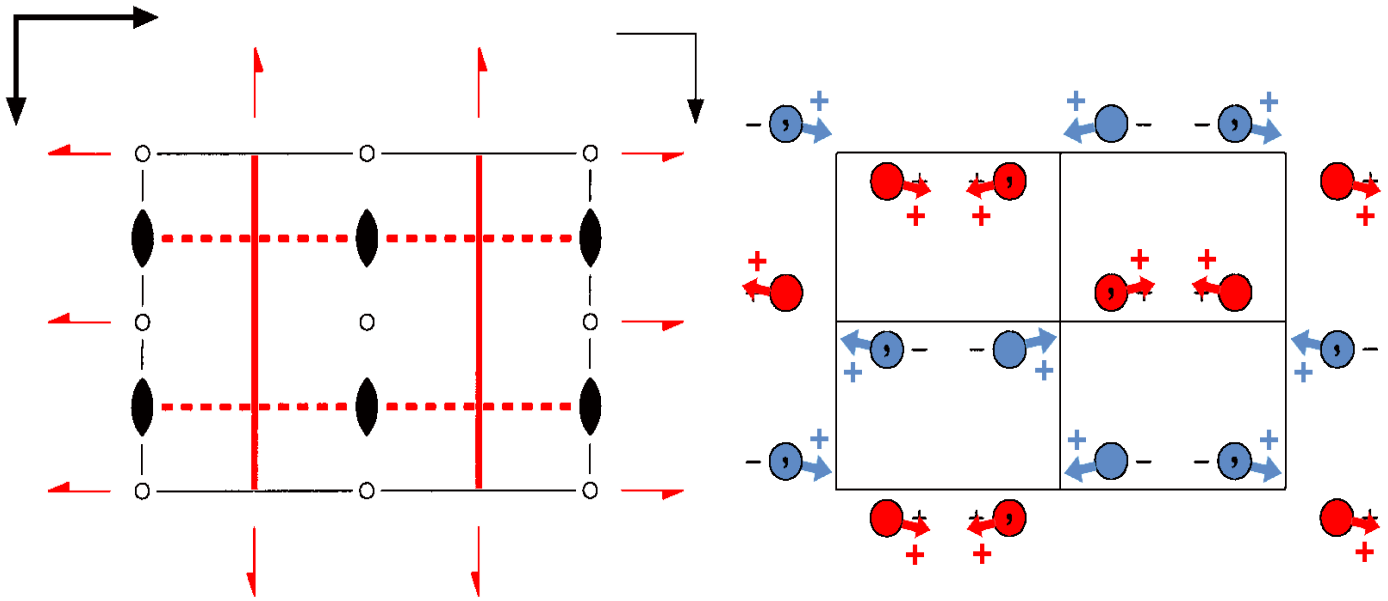
pb'm'a

No. 45.6.319

m'm'm

$p2_1'/b'2_1'/m'2/a$

Orthorhombic/Rectangular



Origin at $\bar{1}$ on 12,a

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/4; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) $2' (0,1/2,0) \quad 0,y,0$
($2_y 0,1/2,0$)' | (3) $2' (1/2,0,0) \quad x,1/4,0$
($2_x 1/2,1/2,0$)' | (4) $2 \quad 1/4,0,z$
($2_z 1/2,0,0$) |
| (5) $\bar{1} \quad 0,0,0$
($\bar{1} 0,0,0$) | (6) $m' \quad x,1/4,z$
($m_y 0,1/2,0$)' | (7) $b' (0,1/2,0) \quad 1/4,y,z$
($m_x 1/2,1/2,0$)' | (8) $a (1/2,0,0) \quad x,y,0$
($m_z 1/2,0,0$) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y+1/2,\bar{z} [u,\bar{v},w]$	(3) $x+1/2,\bar{y}+1/2,\bar{z} [\bar{u},v,w]$	(4) $\bar{x}+1/2,\bar{y},z [\bar{u},\bar{v},w]$
	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x,\bar{y}+1/2,z [u,\bar{v},w]$	(7) $\bar{x}+1/2,y+1/2,z [\bar{u},v,w]$	(8) $x+1/2,y,\bar{z} [\bar{u},\bar{v},w]$
4 c .m'	$x,1/4,z [u,0,w]$	$\bar{x},3/4,\bar{z} [u,0,w]$	$x+1/2,1/4,\bar{z} [\bar{u},0,w]$	$\bar{x}+1/2,3/4,z [\bar{u},0,w]$
4 b ..2	$1/4,0,z [0,0,w]$	$3/4,1/2,\bar{z} [0,0,w]$	$3/4,0,\bar{z} [0,0,w]$	$1/4,1/2,z [0,0,w]$
4 a $\bar{1}$	$0,0,0 [u,v,w]$	$0,1/2,0 [u,\bar{v},w]$	$1/2,1/2,0 [\bar{u},v,w]$	$1/2,0,0 [\bar{u},\bar{v},w]$

Symmetry of special projections

Along [001] $p2mg1'$ $a^* = b$ $b^* = -a/2$ Origin at $0,0,z$	Along [100] $p2'm'm$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p2'm'g$ $a^* = a$ Origin at $0,y,0$
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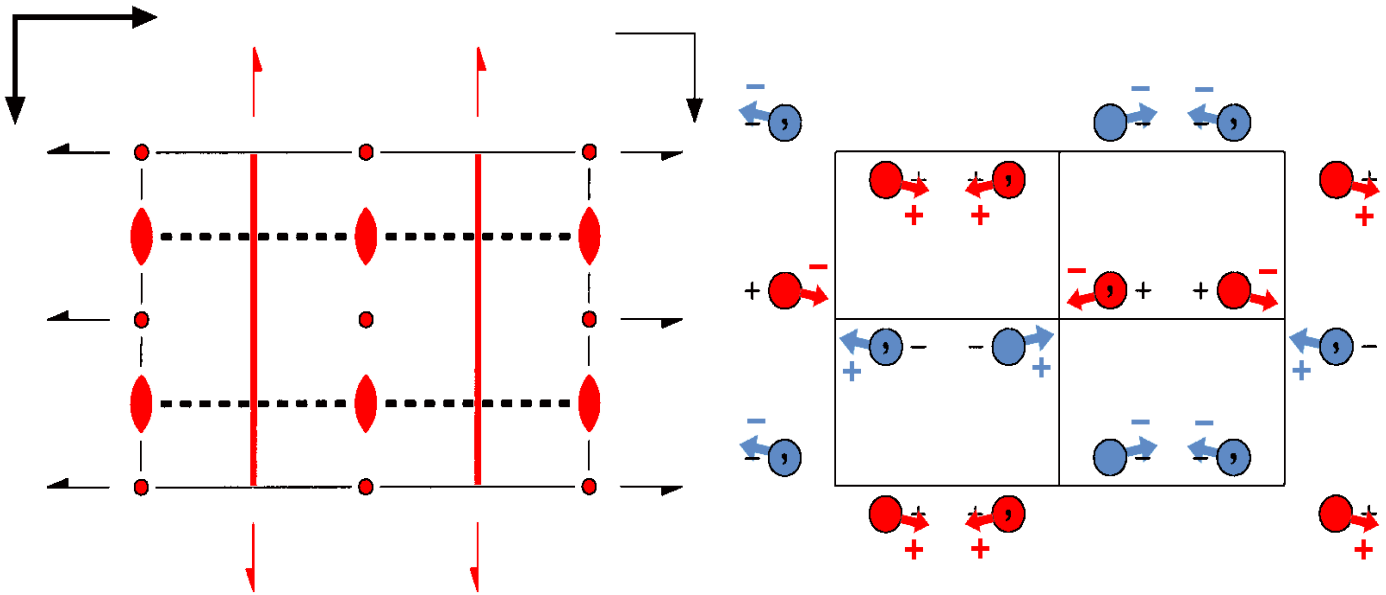
pbm'a

No. 45.7.320

mm'm

$p2_1'/b2_1'/m'2'/a$

Orthorhombic/Rectangular



Origin at $\bar{1}$ on 12₁a

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/4; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 (0,1/2,0) 0,y,0
(2_y|0,1/2,0)

(3) 2' (1/2,0,0) x,1/4,0
(2_x|1/2,1/2,0)'

(4) 2' 1/4,0,z
(2_z|1/2,0,0)'

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)'

(6) m' x,1/4,z
(m_y|0,1/2,0)'

(7) b (0,1/2,0) 1/4,y,z
(m_x|1/2,1/2,0)

(8) a (1/2,0,0) x,y,0
(m_z|1/2,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 d 1	(1) x,y,z [u,v,w]	(2) $\bar{x},y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(3) $x+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]	(4) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) $x,\bar{y}+1/2,z$ [u, \bar{v},w]	(7) $\bar{x}+1/2,y+1/2,z$ [u, \bar{v},\bar{w}]	(8) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]
4 c .m'	$x,1/4,z$ [u,0,w]	$\bar{x},3/4,\bar{z}$ [$\bar{u},0,\bar{w}$]	$x+1/2,1/4,\bar{z}$ [$\bar{u},0,w$]	$\bar{x}+1/2,3/4,z$ [u,0, \bar{w}]
4 b ..2'	$1/4,0,z$ [u,v,0]	$3/4,1/2,\bar{z}$ [$\bar{u},v,0$]	$3/4,0,\bar{z}$ [$\bar{u},\bar{v},0$]	$1/4,1/2,z$ [u, $\bar{v},0$]
4 a $\bar{1}$ '	0,0,0 [0,0,0]	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]	1/2,0,0 [0,0,0]

Symmetry of special projections

Along [001] $p2_{2b^*}m'g'$ $a^* = b$ $b^* = -a/2$ Origin at 0,0,z	Along [100] $p_{2a^*}2mm$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2mg$ $a^* = a$ Origin at 0,y,0
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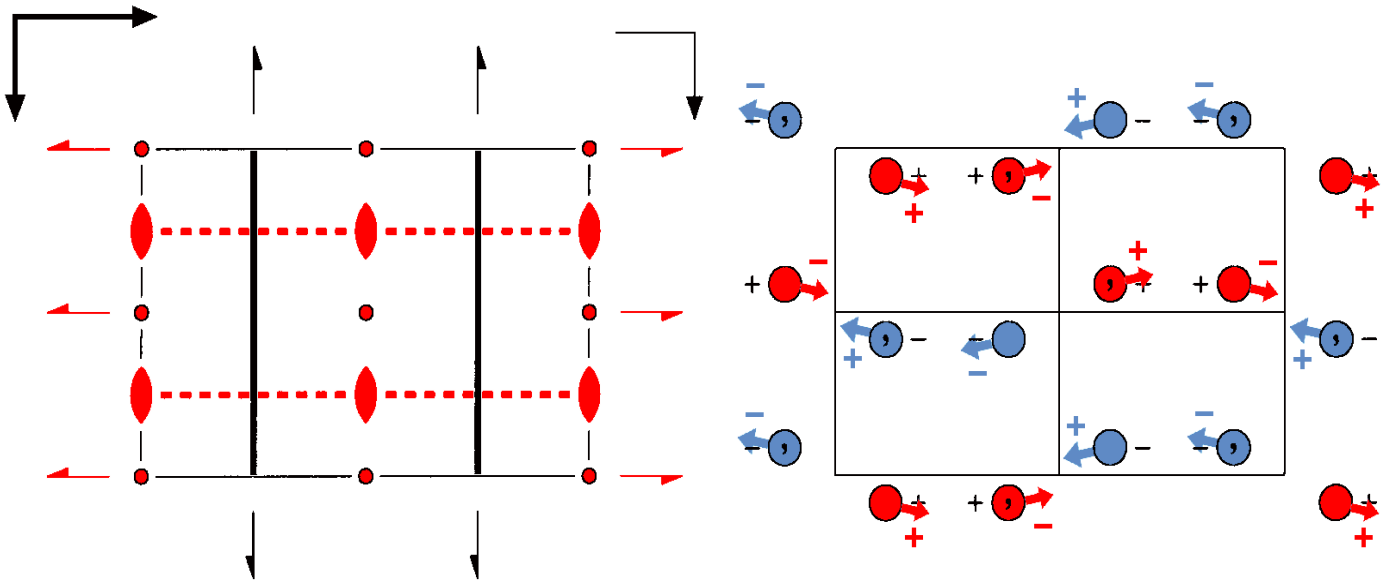
pb'ma

No. 45.8.321

m'mm

$p2_1/b'2_1'/m2'/a$

Orthorhombic/Rectangular



Origin at $\bar{1}$ on $12_1'a$

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/4; 0 \leq z$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) $2' (0,1/2,0)$ $0,y,0$
($2_y 0,1/2,0$)' | (3) $2 (1/2,0,0)$ $x,1/4,0$
($2_x 1/2,1/2,0$) | (4) $2' (1/4,0,z)$
($2_z 1/2,0,0$)' |
| (5) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$)' | (6) $m (x,1/4,z)$
($m_y 0,1/2,0$) | (7) $b' (0,1/2,0)$ $1/4,y,z$
($m_x 1/2,1/2,0$)' | (8) $a (1/2,0,0)$ $x,y,0$
($m_z 1/2,0,0$) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates				
	(1) x,y,z [u,v,w]	(2) $\bar{x},y+1/2,\bar{z}$ [u, \bar{v} ,w]	(3) $x+1/2,\bar{y}+1/2,\bar{z}$ [u, \bar{v},\bar{w}]	(4) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]
8 d 1	(1) x,y,z [u,v,w]	(2) $\bar{x},y+1/2,\bar{z}$ [u, \bar{v} ,w]	(3) $x+1/2,\bar{y}+1/2,\bar{z}$ [u, \bar{v},\bar{w}]	(4) $\bar{x}+1/2,\bar{y},z$ [u,v, \bar{w}]	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]
	(6) $x,\bar{y}+1/2,z$ [\bar{u},v,\bar{w}]	(7) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]	(8) $x+1/2,y,\bar{z}$ [\bar{u},\bar{v},w]		
4 c .m.	$x,1/4,z$ [0,v,0]	$\bar{x},3/4,\bar{z}$ [0, \bar{v} ,0]	$x+1/2,1/4,\bar{z}$ [0, \bar{v} ,0]	$\bar{x}+1/2,3/4,z$ [0,v,0]	
4 b ..2'	$1/4,0,z$ [u,v,0]	$3/4,1/2,\bar{z}$ [u, \bar{v} ,0]	$3/4,0,\bar{z}$ [\bar{u},\bar{v} ,0]	$1/4,1/2,z$ [$\bar{u},v,0$]	
4 a $\bar{1}$ '	0,0,0 [0,0,0]	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]	1/2,0,0 [0,0,0]	

Symmetry of special projections

Along [001] $p_{2b} \cdot 2mg$ $a^* = b$ $b^* = -a/2$ Origin at 0,0,z	Along [100] $p2mm$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2mg1'$ $a^* = a$ Origin at 0,y,0
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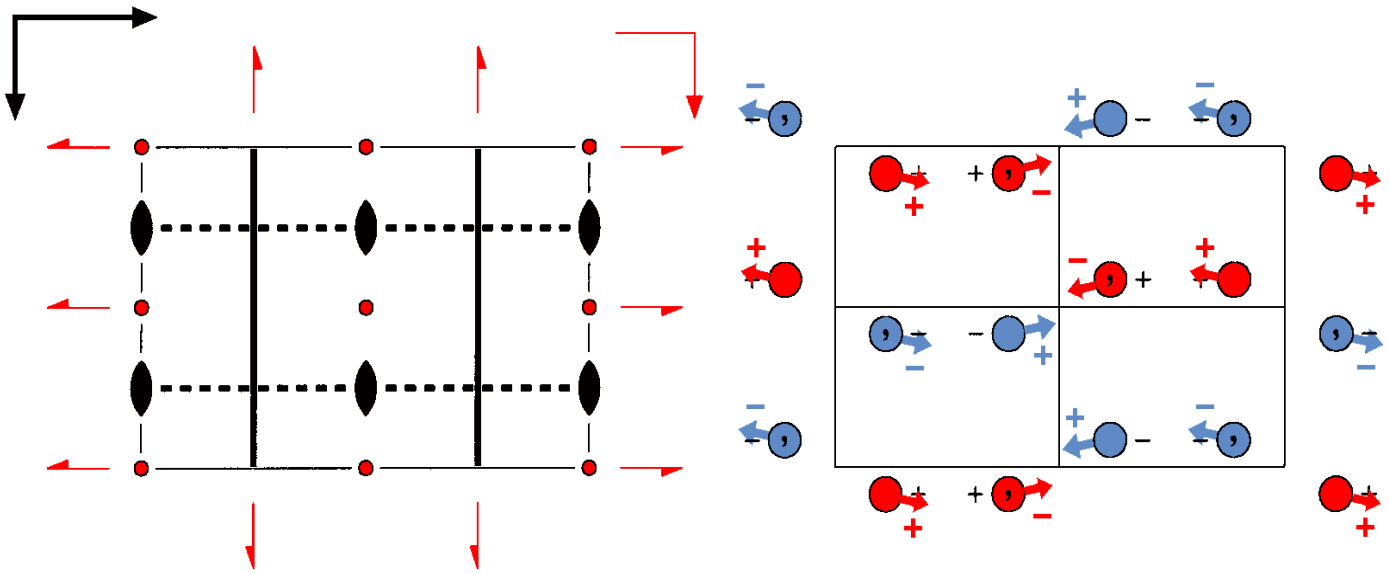
pbma'

No. 45.9.322

mmm'

$p2_1'/b2_1'/m2/a'$

Orthorhombic/Rectangular



Origin at $\bar{1}$ on $12_1'a'$

Asymmetric unit $0 \leq x \leq 1; 0 \leq y \leq 1/4; 0 \leq z$

Symmetry operations

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) $2' (0,1/2,0) \quad 0,y,0$
($2_y 0,1/2,0$)' | (3) $2' (1/2,0,0) \quad x,1/4,0$
($2_x 1/2,1/2,0$)' | (4) $2 \quad 1/4,0,z$
($2_z 1/2,0,0$) |
| (5) $\bar{1} \quad 0,0,0$
($\bar{1} 0,0,0$)' | (6) $m \quad x,1/4,z$
($m_y 0,1/2,0$) | (7) $b (0,1/2,0) \quad 1/4,y,z$
($m_x 1/2,1/2,0$) | (8) $a' (1/2,0,0) \quad x,y,0$
($m_z 1/2,0,0$)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},y+1/2,\bar{z} [u,\bar{v},w]$	(3) $x+1/2,\bar{y}+1/2,\bar{z} [\bar{u},v,w]$	(4) $\bar{x}+1/2,\bar{y},z [\bar{u},\bar{v},w]$
	(5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(6) $x,\bar{y}+1/2,z [\bar{u},v,\bar{w}]$	(7) $\bar{x}+1/2,y+1/2,z [u,\bar{v},\bar{w}]$	(8) $x+1/2,y,\bar{z} [u,v,\bar{w}]$
4 c .m.	$x,1/4,z [0,v,0]$	$\bar{x},3/4,\bar{z} [0,\bar{v},0]$	$x+1/2,1/4,\bar{z} [0,v,0]$	$\bar{x}+1/2,3/4,z [0,\bar{v},0]$
4 b ..2	$1/4,0,z [0,0,w]$	$3/4,1/2,\bar{z} [0,0,w]$	$3/4,0,\bar{z} [0,0,\bar{w}]$	$1/4,1/2,z [0,0,\bar{w}]$
4 a $\bar{1}$ '	$0,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$	$1/2,0,0 [0,0,0]$

Symmetry of special projections

Along [001] $p2mg$ $a^* = b$ $b^* = -a/2$ Origin at 0,0,z	Along [100] $p_{2a^*}2m'm'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2mg1'$ $a^* = a$ Origin at 0,y,0
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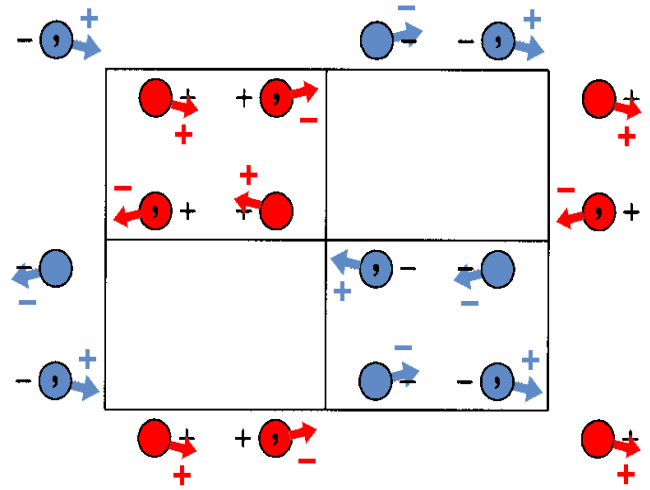
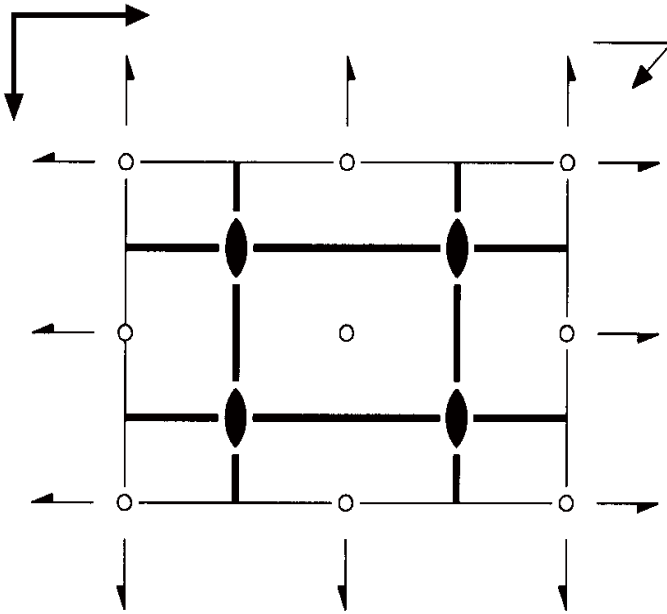
pmmn

No. 46.1.323

mmm

$p2_1/m2_1/m2/n$

Orthorhombic/Rectangular



Origin at $\bar{1}$ on $2_1, 2, n$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4, 1/4, z$
(2_z $1/2, 1/2, 0$) | (3) 2 (0,1/2,0) 0,y,0
(2_y 0,1/2,0) | (4) 2 (1/2,0,0) x,0,0
(2_x 1/2,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) n (1/2,1/2,0) x,y,0
(m_z $1/2, 1/2, 0$) | (7) m x,1/4,z
(m_y 0,1/2,0) | (8) m 1/4,y,z
(m_x 1/2,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 f 1	(1) x, y, z [u,v,w]	(2) $\bar{x} + 1/2, \bar{y} + 1/2, z$ [\bar{u}, \bar{v}, w]	(3) $\bar{x}, y + 1/2, \bar{z}$ [\bar{u}, v, \bar{w}]	(4) $x + 1/2, \bar{y}, \bar{z}$ [u, \bar{v}, \bar{w}]
	(5) $\bar{x}, \bar{y}, \bar{z}$ [u,v,w]	(6) $x + 1/2, y + 1/2, \bar{z}$ [\bar{u}, \bar{v}, w]	(7) $x, \bar{y} + 1/2, z$ [\bar{u}, v, \bar{w}]	(8) $\bar{x} + 1/2, y, z$ [u, \bar{v}, \bar{w}]
4 e .m.	$x, 1/4, z$ [0,v,0]	$\bar{x} + 1/2, 1/4, z$ [0, \bar{v} ,0]	$\bar{x}, 3/4, \bar{z}$ [0,v,0]	$x + 1/2, 3/4, \bar{z}$ [0, \bar{v} ,0]
4 d m..	$1/4, y, z$ [u,0,0]	$1/4, \bar{y} + 1/2, z$ [\bar{u} ,0,0]	$3/4, y + 1/2, \bar{z}$ [\bar{u} ,0,0]	$3/4, \bar{y}, \bar{z}$ [u,0,0]
4 c $\bar{1}$	0,0,0 [u,v,w]	$1/2, 1/2, 0$ [\bar{u}, \bar{v}, w]	$0, 1/2, 0$ [\bar{u}, v, \bar{w}]	$1/2, 0, 0$ [u, \bar{v}, \bar{w}]
2 b mm2	$1/4, 3/4, z$ [0,0,0]	$3/4, 1/4, \bar{z}$ [0,0,0]		
2 a mm2	$1/4, 1/4, z$ [0,0,0]	$3/4, 3/4, \bar{z}$ [0,0,0]		

Symmetry of special projections

Along [001] $c_p, 2mm$ $a^* = a$ $b^* = b$ Origin at $1/4, 1/4, z$	Along [100] $p2mg1'$ $a^* = b$ Origin at $x, 0, 0$	Along [010] $p2mg1'$ $a^* = a$ Origin at $0, y, 0$
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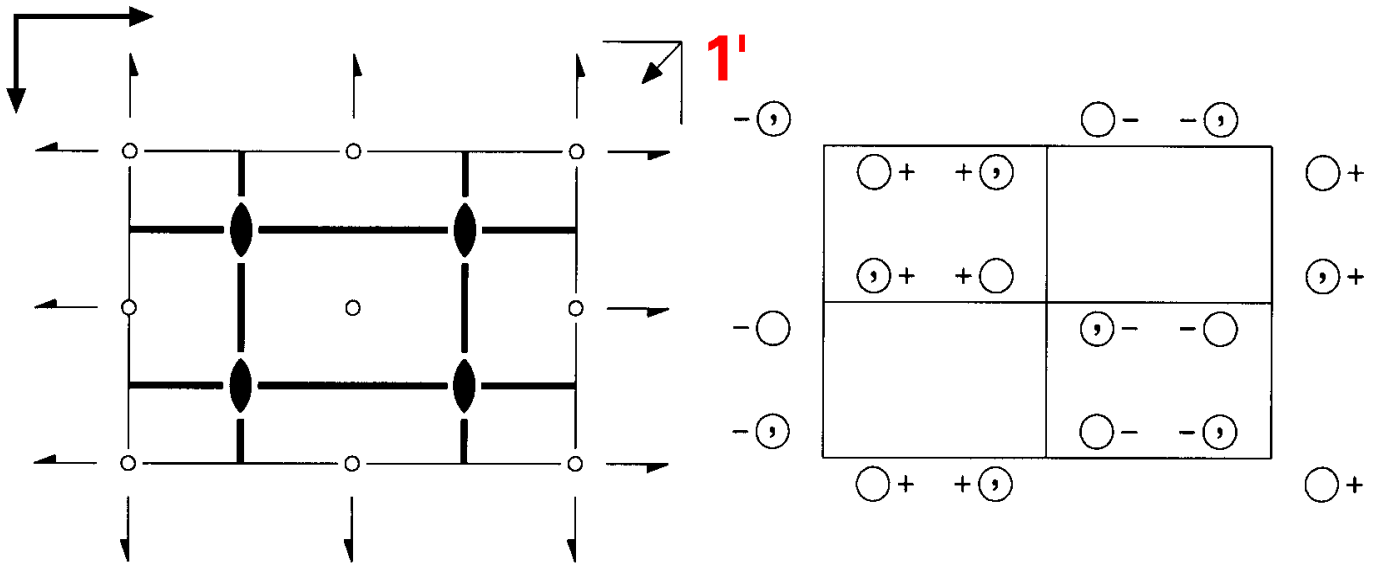
pmmn1'

No. 46.2.324

mmm1'

$2_1/m2_1/m2/n1'$

Orthorhombic/Rectangular



Origin at $\bar{1}1'$ on $2_1, 2, n1'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

For 1 + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) $2_{1/4} \ 1/4, 1/4, z$
(2_z $1/2, 1/2, 0$) | (3) $2_{(0,1/2,0)} \ 0, y, 0$
(2_y $0, 1/2, 0$) | (4) $2_{(1/2,0,0)} \ x, 0, 0$
(2_x $1/2, 0, 0$) |
| (5) $\bar{1} \ 0, 0, 0$
($\bar{1}$ $0, 0, 0$) | (6) $n \ (1/2, 1/2, 0) \ x, y, 0$
(m_z $1/2, 1/2, 0$) | (7) $m \ x, 1/4, z$
(m_y $0, 1/2, 0$) | (8) $m \ 1/4, y, z$
(m_x $1/2, 0, 0$) |

For 1' + set

- | | | | |
|---|---|---|---|
| (1) 1'
(1 0,0,0)' | (2) $2'_{1/4} \ 1/4, 1/4, z$
($2'_z$ $1/2, 1/2, 0$)' | (3) $2'_{(0,1/2,0)} \ 0, y, 0$
($2'_y$ $0, 1/2, 0$)' | (4) $2'_{(1/2,0,0)} \ x, 0, 0$
($2'_x$ $1/2, 0, 0$)' |
| (5) $\bar{1}' \ 0, 0, 0$
($\bar{1}'$ $0, 0, 0$)' | (6) $n' \ (1/2, 1/2, 0) \ x, y, 0$
(m'_z $1/2, 1/2, 0$)' | (7) $m' \ x, 1/4, z$
(m'_y $0, 1/2, 0$)' | (8) $m' \ 1/4, y, z$
(m'_x $1/2, 0, 0$)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	1+	1' +		
8 f 11'	(1) $x,y,z [0,0,0]$ (5) $\bar{x},\bar{y},\bar{z} [0,0,0]$	(2) $\bar{x}+1/2,\bar{y}+1/2,z [0,0,0]$ (6) $x+1/2,y+1/2,\bar{z} [0,0,0]$	(3) $\bar{x},y+1/2,\bar{z} [0,0,0]$ (7) $x,\bar{y}+1/2,z [0,0,0]$	(4) $x+1/2,\bar{y},\bar{z} [0,0,0]$ (8) $\bar{x}+1/2,y,z [0,0,0]$
4 e .m.1'	$x,1/4,z [0,0,0]$	$\bar{x}+1/2,1/4,z [0,0,0]$	$\bar{x},3/4,\bar{z} [0,0,0]$	$x+1/2,3/4,\bar{z} [0,0,0]$
4 d m..1'	$1/4,y,z [0,0,0]$	$1/4,\bar{y}+1/2,z [0,0,0]$	$3/4,y+1/2,\bar{z} [0,0,0]$	$3/4,\bar{y},\bar{z} [0,0,0]$
4 c $\bar{1}1'$	$0,0,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$	$0,1/2,0 [0,0,0]$	$1/2,0,0 [0,0,0]$
2 b mm21'	$1/4,3/4,z [0,0,0]$	$3/4,1/4,\bar{z} [0,0,0]$		
2 a mm21'	$1/4,1/4,z [0,0,0]$	$3/4,3/4,\bar{z} [0,0,0]$		

Symmetry of special projections

Along [001] $c2mm1'$ $a^* = a$ $b^* = b$ Origin at $1/4,1/4,z$	Along [100] $p2mg1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2mg1'$ $a^* = a$ Origin at $0,y,0$
--	--	--

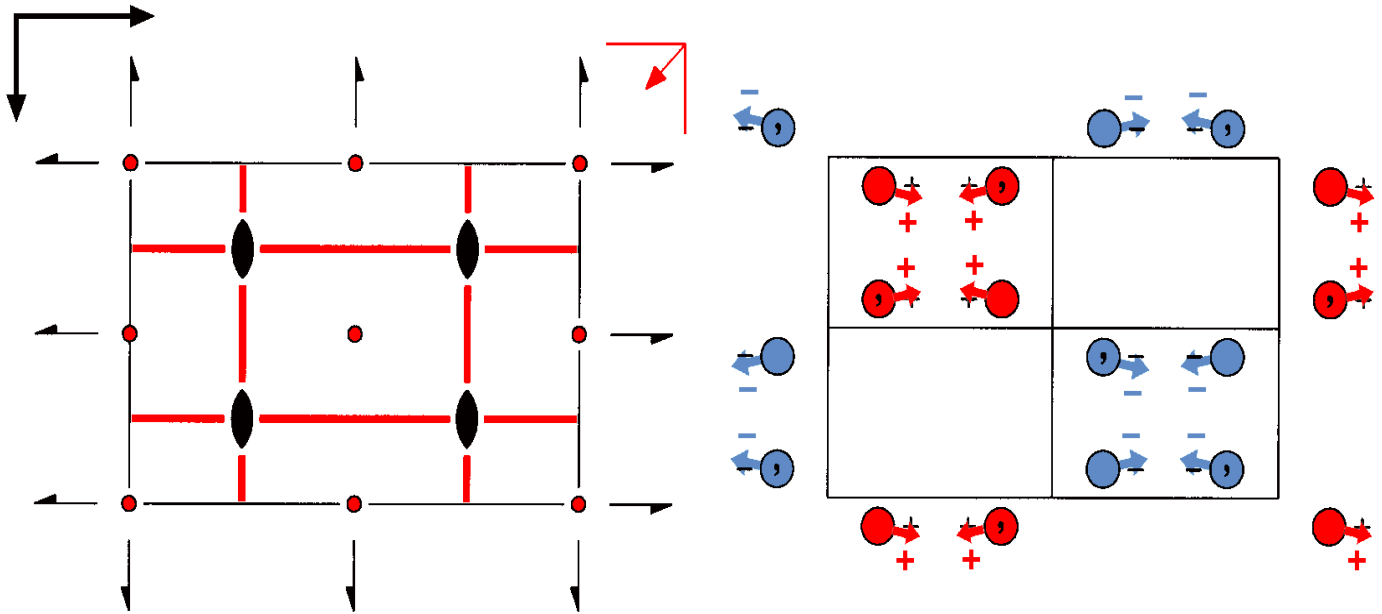
pm'm'n'

No. 46.3.325

m'm'm'

p2₁/m'2₁/m'2/n'

Orthorhombic/Rectangular



Origin at $\bar{1}$ on 2₁2₁n'

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 $1/4, 1/4, z$
(2_z|1/2, 1/2, 0)

(3) 2 (0, 1/2, 0) 0, y, 0
(2_y|0, 1/2, 0)

(4) 2 (1/2, 0, 0) x, 0, 0
(2_x|1/2, 0, 0)

(5) $\bar{1}$ 0, 0, 0
($\bar{1}$ |0, 0, 0)'

(6) n' (1/2, 1/2, 0) x, y, 0
(m_z|1/2, 1/2, 0)'

(7) m' x, 1/4, z
(m_y|0, 1/2, 0)'

(8) m' 1/4, y, z
(m_x|1/2, 0, 0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 f 1	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y}+1/2,z$ [\bar{u},\bar{v},w]	(3) $\bar{x},y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(4) $x+1/2,\bar{y},\bar{z}$ [u, \bar{v},\bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) $x+1/2,y+1/2,\bar{z}$ [u,v, \bar{w}]	(7) $x,\bar{y}+1/2,z$ [u, \bar{v},w]	(8) $\bar{x}+1/2,y,z$ [\bar{u},v,w]
4 e .m'	$x,1/4,z$ [u,0,w]	$\bar{x}+1/2,1/4,z$ [$\bar{u},0,w$]	$\bar{x},3/4,\bar{z}$ [$\bar{u},0,\bar{w}$]	$x+1/2,3/4,\bar{z}$ [u,0, \bar{w}]
4 d m'..	$1/4,y,z$ [0,v,w]	$1/4,\bar{y}+1/2,z$ [0, \bar{v},w]	$3/4,y+1/2,\bar{z}$ [0,v, \bar{w}]	$3/4,\bar{y},\bar{z}$ [0, \bar{v},\bar{w}]
4 c $\bar{1}$ '	0,0,0 [0,0,0]	$1/2,1/2,0$ [0,0,0]	$0,1/2,0$ [0,0,0]	$1/2,0,0$ [0,0,0]
2 b m'm'2	$1/4,3/4,z$ [0,0,w]	$3/4,1/4,\bar{z}$ [0,0, \bar{w}]		
2 a m'm'2	$1/4,1/4,z$ [0,0,w]	$3/4,3/4,\bar{z}$ [0,0, \bar{w}]		

Symmetry of special projections

Along [001] c2m'm'	Along [100] p2m'g'	Along [010] p2m'g'
$a^* = a$ $b^* = b$	$a^* = b$	$a^* = a$
Origin at $1/4,1/4,z$	Origin at x,0,0	Origin at 0,y,0

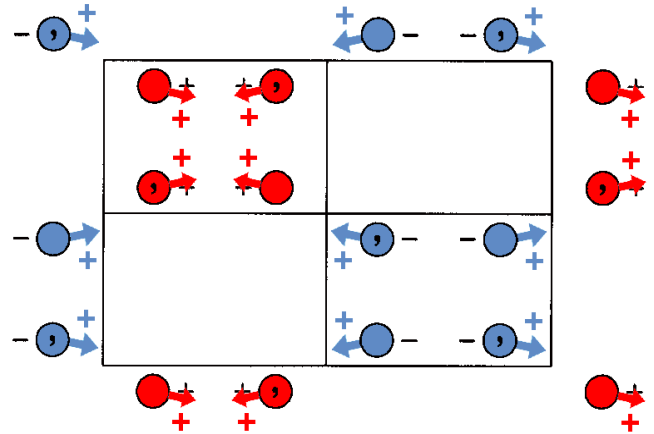
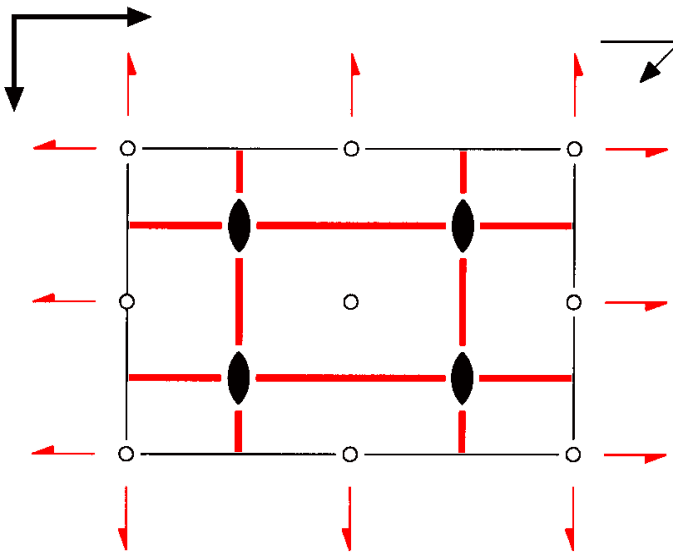
pm'm'n

No. 46.4.326

m'm'm

p2₁'/m'2₁'/m'2/n

Orthorhombic/Rectangular



Origin at $\bar{1}$ on 2₁'2₁'n

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 1/4,1/4,z
(2 _z 1/2,1/2,0) | (3) 2' (0,1/2,0) 0,y,0
(2 _y 0,1/2,0)' | (4) 2' (1/2,0,0) x,0,0
(2 _x 1/2,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (7) m' x,1/4,z
(m _y 0,1/2,0)' | (8) m' 1/4,y,z
(m _x 1/2,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 f 1	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y}+1/2,z$ [\bar{u},\bar{v},w]	(3) $\bar{x},y+1/2,\bar{z}$ [u, \bar{v},w]	(4) $x+1/2,\bar{y},\bar{z}$ [\bar{u},v,w]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x+1/2,y+1/2,\bar{z}$ [\bar{u},\bar{v},w]	(7) $x,\bar{y}+1/2,z$	(8) $\bar{x}+1/2,y,z$ [\bar{u},v,w]
4 e .m'	$x,1/4,z$ [u,0,w]	$\bar{x}+1/2,1/4,z$ [$\bar{u},0,w$]	$\bar{x},3/4,\bar{z}$ [u,0,w]	$x+1/2,3/4,\bar{z}$ [$\bar{u},0,w$]
4 d m'..	$1/4,y,z$ [0,v,w]	$1/4,\bar{y}+1/2,z$ [0, \bar{v},w]	$3/4,y+1/2,\bar{z}$ [0, \bar{v},w]	$3/4,\bar{y},\bar{z}$ [0,v,w]
4 c $\bar{1}$	0,0,0 [u,v,w]	$1/2,1/2,0$ [\bar{u},\bar{v},w]	0,1/2,0 [u, \bar{v},w]	$1/2,0,0$ [\bar{u},v,w]
2 b m'm'2	$1/4,3/4,z$ [0,0,w]	$3/4,1/4,\bar{z}$ [0,0,w]		
2 a m'm'2	$1/4,1/4,z$ [0,0,w]	$3/4,3/4,\bar{z}$ [0,0,w]		

Symmetry of special projections

Along [001] $c_p, 2mm$ $a^* = a \quad b^* = b$ Origin at $1/4, 1/4, z$	Along [100] $p2'm'g$ $a^* = b$ Origin at $x, 0, 0$	Along [010] $p2'm'g$ $a^* = a$ Origin at $0, y, 0$
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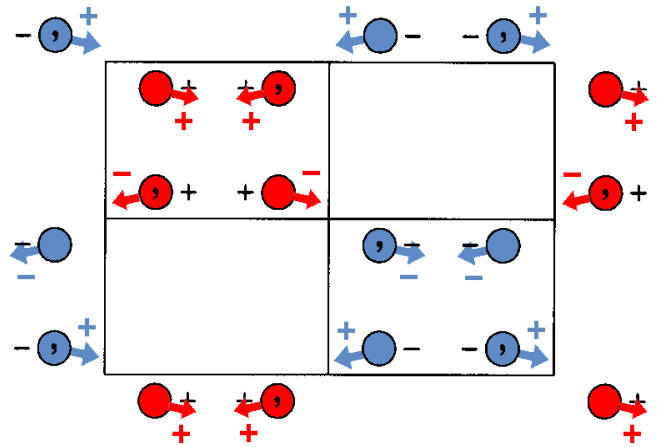
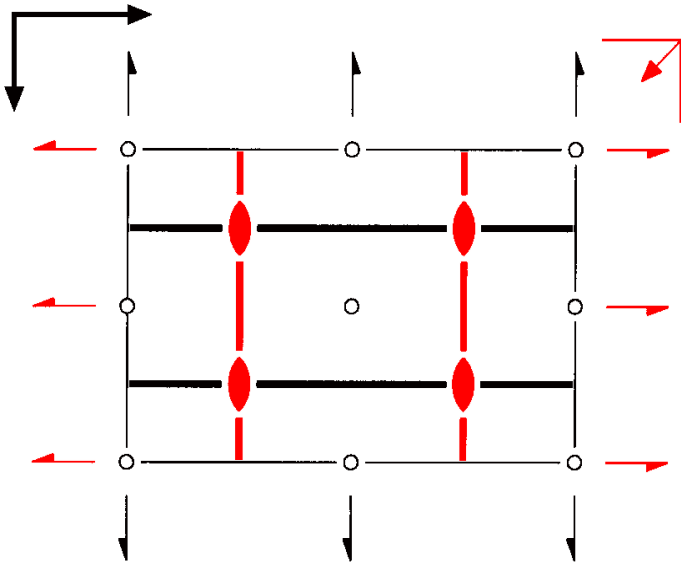
pmm'n'

No. 46.5.327

mm'm'

p2₁/m2₁'/m'2'/n'

Orthorhombic/Rectangular



Origin at $\bar{1}$ on 2₁2₁'n'

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2' 1/4,1/4,z
(2 _z 1/2,1/2,0)' | (3) 2' (0,1/2,0) 0,y,0
(2 _y 0,1/2,0)' | (4) 2 (1/2,0,0) x,0,0
(2 _x 1/2,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' | (7) m' x,1/4,z
(m _y 0,1/2,0)' | (8) m 1/4,y,z
(m _x 1/2,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 f 1	(1) x,y,z [u,v,w]	(2) $\bar{x}+1/2,\bar{y}+1/2,z$ [u,v, \bar{w}]	(3) $\bar{x},y+1/2,\bar{z}$ [u, \bar{v} ,w]	(4) $x+1/2,\bar{y},\bar{z}$ [u, \bar{v},\bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x+1/2,y+1/2,\bar{z}$ [u,v, \bar{w}]	(7) $x,\bar{y}+1/2,z$ [u, \bar{v} ,w]	(8) $\bar{x}+1/2,y,z$ [u, \bar{v},\bar{w}]
4 e .m'	$x,1/4,z$ [u,0,w]	$\bar{x}+1/2,1/4,z$ [u,0, \bar{w}]	$\bar{x},3/4,\bar{z}$ [u,0,w]	$x+1/2,3/4,\bar{z}$ [u,0, \bar{w}]
4 d m..	$1/4,y,z$ [u,0,0]	$1/4,\bar{y}+1/2,z$ [u,0,0]	$3/4,y+1/2,\bar{z}$ [u,0,0]	$3/4,\bar{y},\bar{z}$ [u,0,0]
4 c $\bar{1}$	0,0,0 [u,v,w]	$1/2,1/2,0$ [u,v, \bar{w}]	$0,1/2,0$ [u, \bar{v} ,w]	$1/2,0,0$ [u, \bar{v},\bar{w}]
2 b mm'2'	$1/4,3/4,z$ [u,0,0]	$3/4,1/4,\bar{z}$ [u,0,0]		
2 a mm'2'	$1/4,1/4,z$ [u,0,0]	$3/4,3/4,\bar{z}$ [u,0,0]		

Symmetry of special projections

Along [001] $c2'mm'$ $a^* = a$ $b^* = b$ Origin at $1/4,1/4,z$	Along [100] $p2mg1'$ $a^* = b$ Origin at $x,0,0$	Along [010] $p2'mg'$ $a^* = a$ Origin at $0,y,0$
--	--	--

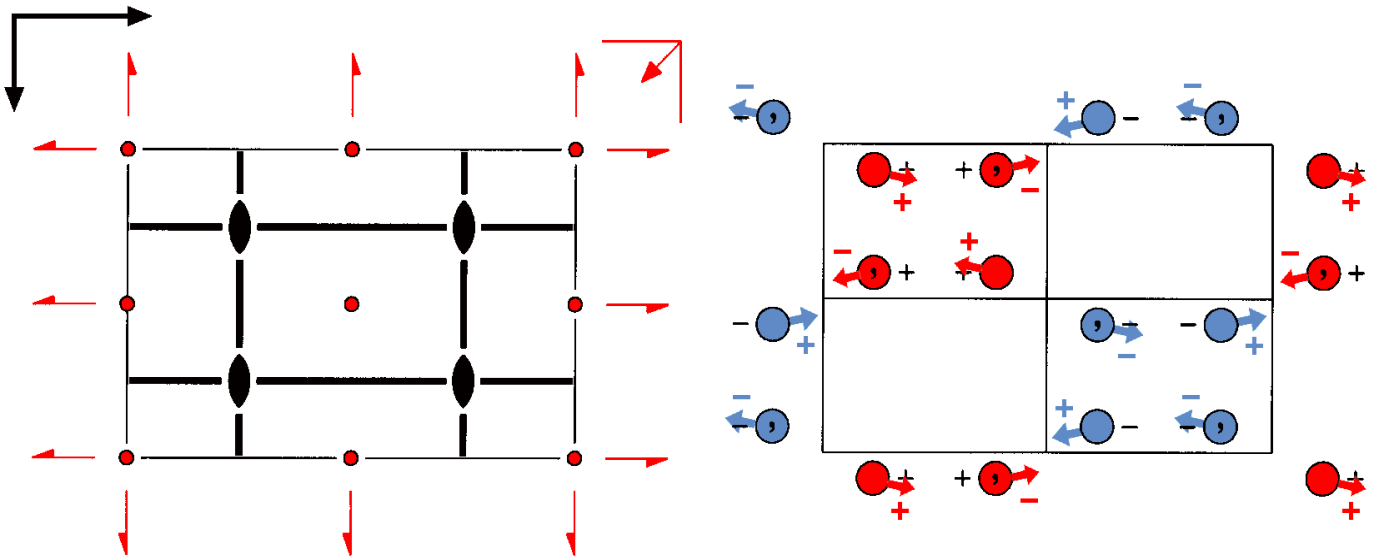
pmmn'

No. 46.6.328

mmm'

$p2_1'/m2_1'/m2/n'$

Orthorhombic/Rectangular



Origin at $\bar{1}'$ on $2_1'2_1'n'$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $1/4,1/4,z$
(2_z $1/2,1/2,0$) | (3) $2' (0,1/2,0)$ $0,y,0$
(2_y $0,1/2,0$)' | (4) $2' (1/2,0,0)$ $x,0,0$
(2_x $1/2,0,0$)' |
| (5) $\bar{1}' 0,0,0$
($\bar{1}$ $0,0,0$)' | (6) $n' (1/2,1/2,0)$ $x,y,0$
(m_z $1/2,1/2,0$)' | (7) m $x,1/4,z$
(m_y $0,1/2,0$) | (8) m $1/4,y,z$
(m_x $1/2,0,0$) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 f 1	(1) x, y, z [u,v,w]	(2) $\bar{x} + 1/2, \bar{y} + 1/2, z$ [\bar{u}, \bar{v}, w]	(3) $\bar{x}, y + 1/2, \bar{z}$ [u, \bar{v} ,w]	(4) $x + 1/2, \bar{y}, \bar{z}$ [\bar{u}, v, w]
	(5) $\bar{x}, \bar{y}, \bar{z}$ [$\bar{u}, \bar{v}, \bar{w}$]	(6) $x + 1/2, y + 1/2, \bar{z}$ [u,v, \bar{w}]	(7) $x, \bar{y} + 1/2, z$ [\bar{u}, v, \bar{w}]	(8) $\bar{x} + 1/2, y, z$ [u, \bar{v}, \bar{w}]
4 e .m.	$x, 1/4, z$ [0,v,0]	$\bar{x} + 1/2, 1/4, z$ [0, \bar{v} ,0]	$\bar{x}, 3/4, \bar{z}$ [0, \bar{v} ,0]	$x + 1/2, 3/4, \bar{z}$ [0,v,0]
4 d m..	$1/4, y, z$ [u,0,0]	$1/4, \bar{y} + 1/2, z$ [\bar{u} ,0,0]	$3/4, y + 1/2, \bar{z}$ [u,0,0]	$3/4, \bar{y}, \bar{z}$ [\bar{u} ,0,0]
4 c $\bar{1}$ '	0,0,0 [0,0,0]	$1/2, 1/2, 0$ [0,0,0]	$0, 1/2, 0$ [0,0,0]	$1/2, 0, 0$ [0,0,0]
2 b mm2	$1/4, 3/4, z$ [0,0,0]	$3/4, 1/4, \bar{z}$ [0,0,0]		
2 a mm2	$1/4, 1/4, z$ [0,0,0]	$3/4, 3/4, \bar{z}$ [0,0,0]		

Symmetry of special projections

Along [001] c_p -2mm $a^* = a$ $b^* = b$ Origin at $1/4, 1/4, z$	Along [100] $p2mg1'$ $a^* = b$ Origin at $x, 0, 0$	Along [010] $p2mg1'$ $a^* = a$ Origin at $0, y, 0$
--	--	--

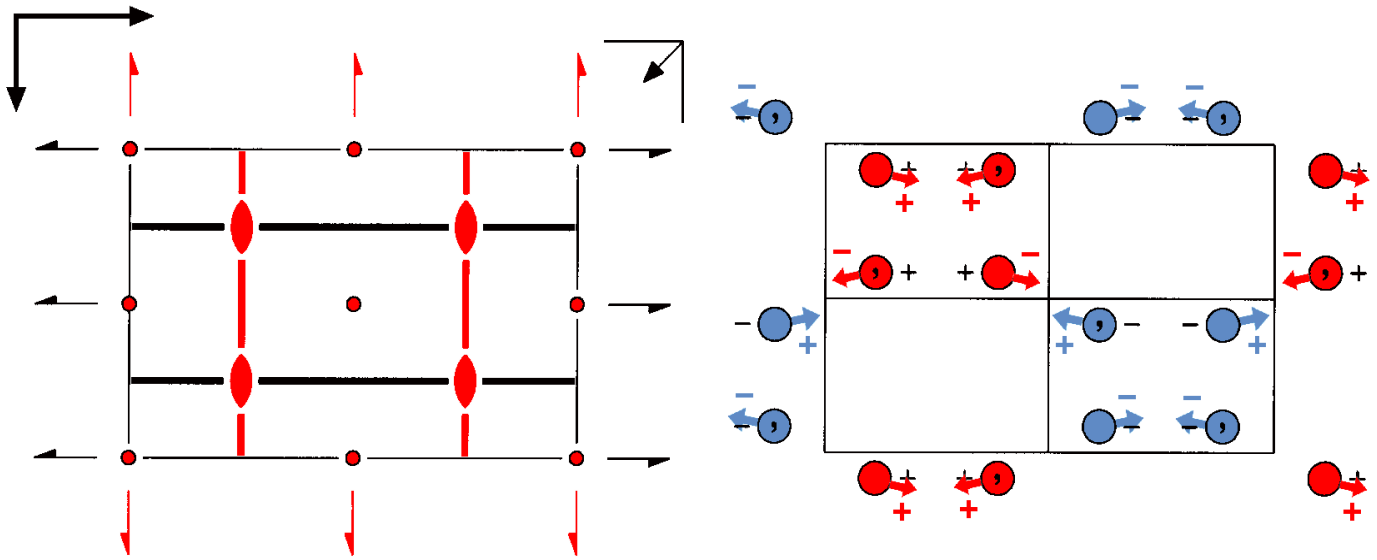
pmm'n

No. 46.7.329

mm'm

$p2_1'/m2_1/m'2'/n$

Orthorhombic/Rectangular



Origin at $\bar{1}$ on $2_1'2_1n$

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2$

Symmetry operations

- | | | | |
|---|--|---|--|
| (1) 1
(1 0,0,0) | (2) $2'_z$ $1/4, 1/4, z$
(2_z $1/2, 1/2, 0$)' | (3) $2'_y$ (0,1/2,0) 0,y,0
(2_y 0,1/2,0) | (4) $2'_x$ (1/2,0,0) x,0,0
(2_x 1/2,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) n (1/2,1/2,0) x,y,0
(m_z 1/2,1/2,0) | (7) m'_x x,1/4,z
(m_y 0,1/2,0)' | (8) m $1/4, y, z$
(m_x 1/2,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 f 1	(1) x, y, z [u,v,w]	(2) $\bar{x} + 1/2, \bar{y} + 1/2, z$ [u,v,w̄]	(3) $\bar{x}, y + 1/2, \bar{z}$ [ū,v,w̄]	(4) $x + 1/2, \bar{y}, \bar{z}$ [ū,v,w]
	(5) $\bar{x}, \bar{y}, \bar{z}$ [ū,v̄,w̄]	(6) $x + 1/2, y + 1/2, \bar{z}$ [ū,v̄,w]	(7) $x, \bar{y} + 1/2, z$ [u,v̄,w]	(8) $\bar{x} + 1/2, y, z$ [u,v̄,w̄]
4 e .m'	$x, 1/4, z$ [u,0,w]	$\bar{x} + 1/2, 1/4, z$ [u,0,w̄]	$\bar{x}, 3/4, \bar{z}$ [ū,0,w̄]	$x + 1/2, 3/4, \bar{z}$ [ū,0,w]
4 d m..	$1/4, y, z$ [u,0,0]	$1/4, \bar{y} + 1/2, z$ [u,0,0]	$3/4, y + 1/2, \bar{z}$ [ū,0,0]	$3/4, \bar{y}, \bar{z}$ [ū,0,0]
4 c $\bar{1}$ '	$0, 0, 0$ [0,0,0]	$1/2, 1/2, 0$ [0,0,0]	$0, 1/2, 0$ [0,0,0]	$1/2, 0, 0$ [0,0,0]
2 b mm'2'	$1/4, 3/4, z$ [u,0,0]	$3/4, 1/4, \bar{z}$ [ū,0,0]		
2 a mm'2'	$1/4, 1/4, z$ [u,0,0]	$3/4, 3/4, \bar{z}$ [ū,0,0]		

Symmetry of special projections

Along [001] $c_p, 2'mm'$	Along [100] $p2mg1'$	Along [010] $p2mg$
$a^* = a \quad b^* = b$	$a^* = b$	$a^* = a$
Origin at $1/4, 1/4, z$	Origin at $x, 0, 0$	Origin at $0, y, 0$

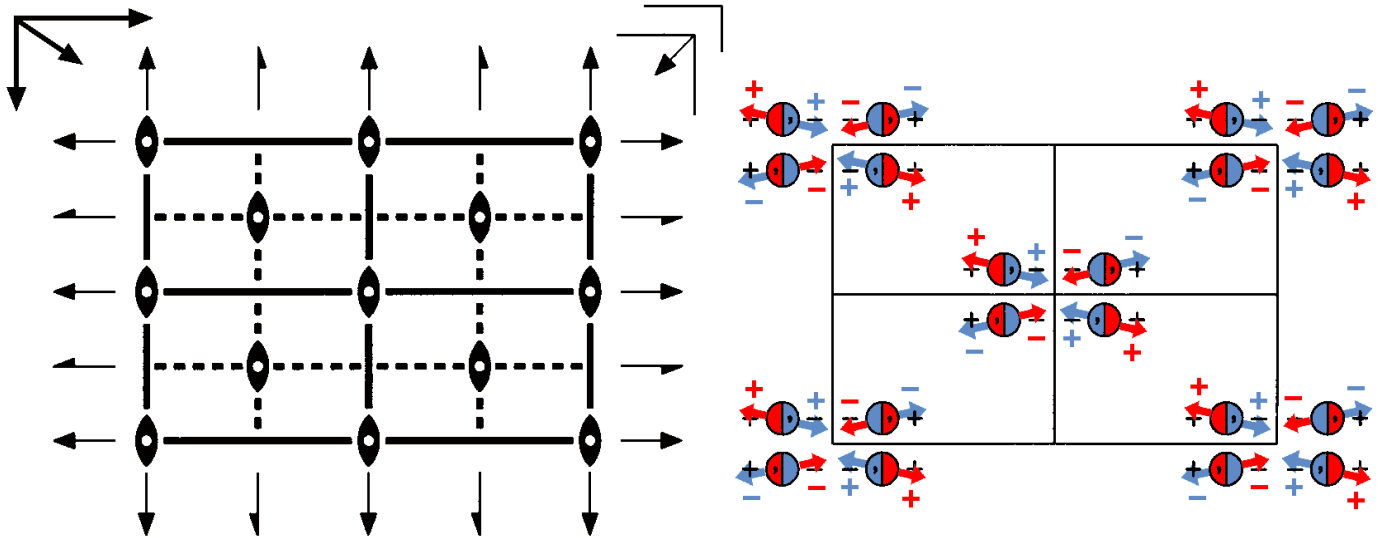
cmmm

No. 47.1.330

mmm

c2/m2/m2/m

Orthorhombic/Rectangular



Origin at center (mmm)

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$ $0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2 0,y,0
(2 _y 0,0,0) | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m x,y,0
(m _z 0,0,0) | (7) m x,0,z
(m _y 0,0,0) | (8) m 0,y,z
(m _x 0,0,0) |

For (1/2,1/2,0) + set

- | | | | |
|--|--|--|--|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) 2 1/4,1/4,z
(2 _z 1/2,1/2,0) | (3) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (4) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) |
| (5) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (6) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (7) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (8) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) |

Continued

No. 47.1.330

cmmm

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0) +		
16 l 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(7) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
8 k ..m	$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,w]$	$\bar{x},y,0 [0,0,\bar{w}]$	$x,\bar{y},0 [0,0,\bar{w}]$
8 j .m.	$x,0,z [0,v,0]$	$\bar{x},0,z [0,\bar{v},0]$	$\bar{x},0,\bar{z} [0,v,0]$	$x,0,\bar{z} [0,\bar{v},0]$
8 i m..	$0,y,z [u,0,0]$	$0,\bar{y},z [\bar{u},0,0]$	$0,y,\bar{z} [\bar{u},0,0]$	$0,\bar{y},\bar{z} [u,0,0]$
8 h ..2	$1/4,1/4,z [0,0,w]$	$3/4,1/4,\bar{z} [0,0,\bar{w}]$	$3/4,3/4,\bar{z} [0,0,w]$	$1/4,3/4,z [0,0,\bar{w}]$
4 g mm2	$0,1/2,z [0,0,0]$	$0,1/2,\bar{z} [0,0,0]$		
4 f mm2	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$		
4 e m2m	$0,y,0 [0,0,0]$	$0,\bar{y},0 [0,0,0]$		
4 d 2mm	$x,0,0 [0,0,0]$	$\bar{x},0,0 [0,0,0]$		
4 c ..2/m	$1/4,1/4,0 [0,0,w]$	$3/4,1/4,0 [0,0,\bar{w}]$		
2 b mmm	$1/2,0,0 [0,0,0]$			
2 a mmm	$0,0,0 [0,0,0]$			

Continued

No. 47.1.330

cmmm

Symmetry of special projections

Along [001] $c2mm1'$

$a^* = a$ $b^* = b$

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = b/2$

Origin at x,0,0

Along [010] $p2mm1'$

$a^* = a/2$

Origin at 0,y,0

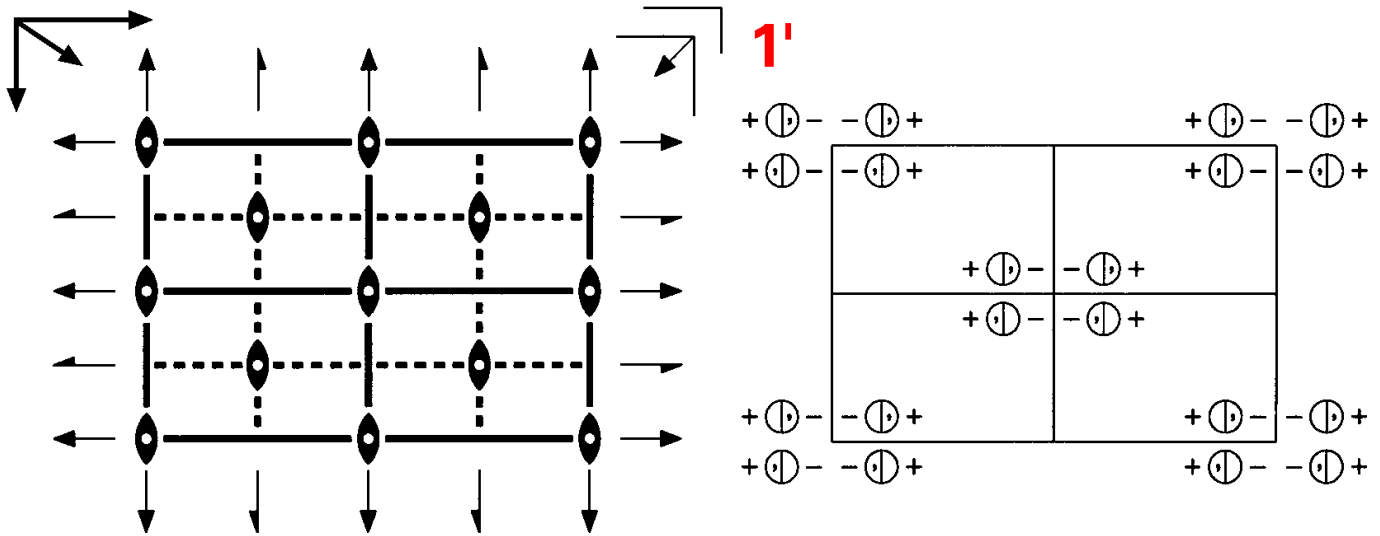
cmmm1'

No. 47.2.331

mmm1'

c2/m2/m2/m1'

Orthorhombic/Rectangular



Origin at center (mmm1')

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2 0,y,0
(2 _y 0,0,0) | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m x,y,0
(m _z 0,0,0) | (7) m x,0,z
(m _y 0,0,0) | (8) m 0,y,z
(m _x 0,0,0) |

For (1/2,1/2,0) + set

- | | | | |
|--|--|--|--|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) 2 1/4,1/4,z
(2 _z 1/2,1/2,0) | (3) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (4) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) |
| (5) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (6) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (7) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (8) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) |

For (0,0,0)' + set

- | | | | |
|---|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 2' 0,y,0
(2 _y 0,0,0)' | (4) 2' x,0,0
(2 _x 0,0,0)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ 0,0,0)' | (6) m' x,y,0
(m _z 0,0,0)' | (7) m' x,0,z
(m _y 0,0,0)' | (8) m' 0,y,z
(m _x 0,0,0)' |

For $(1/2, 1/2, 0)'$ + set

(1) $t' (1/2, 1/2, 0)$ $(1 1/2, 1/2, 0)'$	(2) $2' 1/4, 1/4, z$ $(2_z 1/2, 1/2, 0)'$	(3) $2' (0, 1/2, 0)$ $1/4, y, 0$ $(2_y 1/2, 1/2, 0)'$	(4) $2' (1/2, 0, 0)$ $x, 1/4, 0$ $(2_x 1/2, 1/2, 0)'$
(5) $\bar{1}' 1/4, 1/4, 0$ $(\bar{1} 1/2, 1/2, 0)'$	(6) $n' (1/2, 1/2, 0)$ $x, y, 0$ $(m_z 1/2, 1/2, 0)'$	(7) $a' (1/2, 0, 0)$ $x, 1/4, z$ $(m_y 1/2, 1/2, 0)'$	(8) $b' (0, 1/2, 0)$ $1/4, y, z$ $(m_x 1/2, 1/2, 0)'$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2); (3); (5); $1'$

Positions

	Coordinates				
		$(0,0,0) +$ $(0,0,0)'$	$(1/2,1/2,0) +$ $(1/2,1/2,0)'$		
16 l 11'	(1) $x, y, z [0,0,0]$	(2) $\bar{x}, \bar{y}, z [0,0,0]$	(3) $\bar{x}, y, \bar{z} [0,0,0]$	(4) $x, \bar{y}, \bar{z} [0,0,0]$	
	(5) $\bar{x}, \bar{y}, \bar{z} [0,0,0]$	(6) $x, y, \bar{z} [0,0,0]$	(7) $x, \bar{y}, z [0,0,0]$	(8) $\bar{x}, y, z [0,0,0]$	
8 k ..m1'	$x, y, 0 [0,0,0]$	$\bar{x}, \bar{y}, 0 [0,0,0]$	$\bar{x}, y, 0 [0,0,0]$	$x, \bar{y}, 0 [0,0,0]$	
8 j .m.1'	$x, 0, z [0,0,0]$	$\bar{x}, 0, z [0,0,0]$	$\bar{x}, 0, \bar{z} [0,0,0]$	$x, 0, \bar{z} [0,0,0]$	
8 i m..1'	$0, y, z [0,0,0]$	$0, \bar{y}, z [0,0,0]$	$0, y, \bar{z} [0,0,0]$	$0, \bar{y}, \bar{z} [0,0,0]$	
8 h ..21'	$1/4, 1/4, z [0,0,0]$	$3/4, 1/4, \bar{z} [0,0,0]$	$3/4, 3/4, \bar{z} [0,0,0]$	$1/4, 3/4, z [0,0,0]$	
4 g mm21'	$0, 1/2, z [0,0,0]$	$0, 1/2, \bar{z} [0,0,0]$			
4 f mm21'	$0, 0, z [0,0,0]$	$0, 0, \bar{z} [0,0,0]$			
4 e m2m1'	$0, y, 0 [0,0,0]$	$0, \bar{y}, 0 [0,0,0]$			
4 d 2mm1'	$x, 0, 0 [0,0,0]$	$\bar{x}, 0, 0 [0,0,0]$			
4 c ..2/m1'	$1/4, 1/4, 0 [0,0,0]$	$3/4, 1/4, 0 [0,0,0]$			

Continued

No. 47.2.331

$cmmm1'$

$21' b mmm \frac{1}{2}, 0, 0 [0, 0, 0]$

$21' a mmm 0, 0, 0 [0, 0, 0]$

Symmetry of special projections

Along $[001]$ $c2mm1'$

$a^* = a \quad b^* = b$

Origin at $0, 0, z$

Along $[100]$ $p2mm1'$

$a^* = b/2$

Origin at $x, 0, 0$

Along $[010]$ $p2mm1'$

$a^* = a/2$

Origin at $0, y, 0$

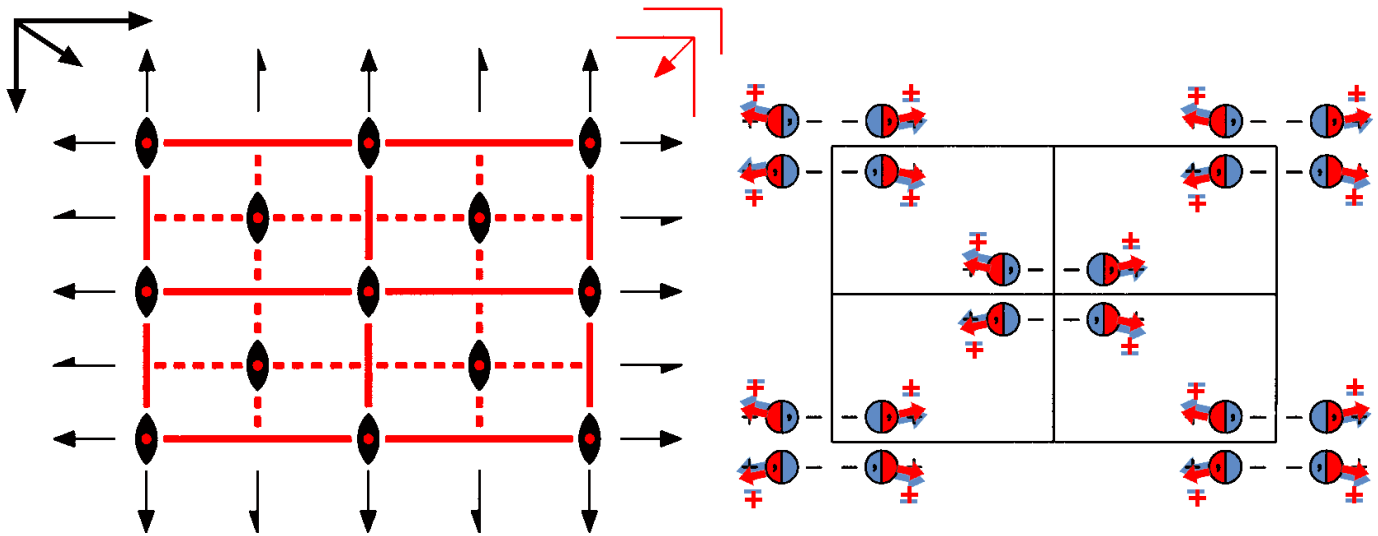
cm'm'm'

No. 47.3.332

m'm'm'

c2/m'2/m'2/m'

Orthorhombic/Rectangular



Origin at center (m'm'm')

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$ $0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2 0,y,0
(2 _y 0,0,0) | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) m' x,y,0
(m _z 0,0,0)' | (7) m' x,0,z
(m _y 0,0,0)' | (8) m' 0,y,z
(m _x 0,0,0)' |

For (1/2,1/2,0) + set

- | | | | |
|---|--|--|--|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) 2 1/4,1/4,z
(2 _z 1/2,1/2,0) | (3) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (4) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) |
| (5) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0)' | (6) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' | (7) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (8) b' (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0)' |

Continued

No. 47.3.332

cm'm'm'

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0) +		
16 l 1	(1) x,y,z [u,v,w] (5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w] (6) x,y, \bar{z} [u,v, \bar{w}]	(3) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}] (7) x, \bar{y},z [u, \bar{v},w]	(4) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}] (8) \bar{x},y,z [\bar{u},v,w]
8 k ..m'	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{x},y,0$ [$\bar{u},v,0$]	x, $\bar{y},0$ [u, $\bar{v},0$]
8 j .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	$\bar{x},0,\bar{z}$ [$\bar{u},0,\bar{w}$]	x,0, \bar{z} [u,0, \bar{w}]
8 i m'..	0,y,z [0,v,w]	0, \bar{y},z [0, \bar{v},w]	0,y, \bar{z} [0,v, \bar{w}]	0, \bar{y},\bar{z} [0, \bar{v},\bar{w}]
8 h ..2	1/4,1/4,z [0,0,w]	3/4,1/4, \bar{z} [0,0, \bar{w}]	3/4,3/4, \bar{z} [0,0, \bar{w}]	1/4,3/4,z [0,0,w]
4 g m'm'2	0,1/2,z [0,0,w]	0,1/2, \bar{z} [0,0, \bar{w}]		
4 f m'm'2	0,0,z [0,0,w]	0,0, \bar{z} [0,0, \bar{w}]		
4 e m'2m'	0,y,0 [0,v,0]	0, $\bar{y},0$ [0, $\bar{v},0$]		
4 d 2m'm'	x,0,0 [u,0,0]	$\bar{x},0,0$ [$\bar{u},0,0$]		
4 c ..2/m'	1/4,1/4,0 [0,0,0]	3/4,1/4,0 [0,0,0]		
2 b m'm'm'	1/2,0,0 [0,0,0]			
2 a m'm'm'	0,0,0 [0,0,0]			

Continued

No. 47.3.332

cm'm'm'

Symmetry of special projections

Along [001] $c2m'm'$
 $a^* = a$ $b^* = b$
Origin at 0,0,z

Along [100] $p2m'm'$
 $a^* = b/2$
Origin at x,0,0

Along [010] $p2m'm'$
 $a^* = a/2$
Origin at 0,y,0

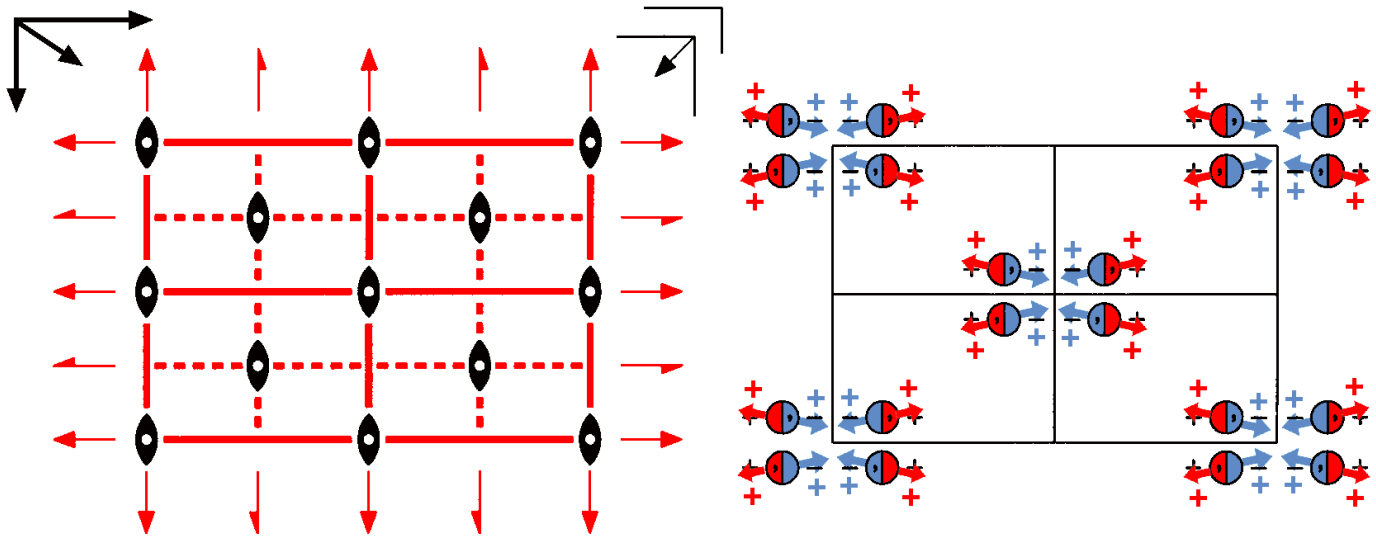
cm'm'm

No. 47.4.333

m'm'm

c2'/m'2'/m'2'/m

Orthorhombic/Rectangular



Origin at center (m'm'm)

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2' 0,y,0
(2 _y 0,0,0)' | (4) 2' x,0,0
(2 _x 0,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m x,y,0
(m _z 0,0,0) | (7) m' x,0,z
(m _y 0,0,0)' | (8) m' 0,y,z
(m _x 0,0,0)' |

For (1/2,1/2,0) + set

- | | | | |
|--|--|--|--|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) 2 1/4,1/4,z
(2 _z 1/2,1/2,0) | (3) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (4) 2' (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0)' |
| (5) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (6) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (7) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (8) b' (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0) +		
16 l 1	(1) x,y,z [u,v,w] (5) \bar{x},\bar{y},\bar{z} [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w] (6) x,y, \bar{z} [\bar{u},\bar{v},w]	(3) \bar{x},y,\bar{z} [u, \bar{v},w] (7) x, \bar{y},z [u, \bar{v},w]	(4) x, \bar{y},\bar{z} [\bar{u},v,w] (8) \bar{x},y,z [\bar{u},v,w]
8 k ..m	x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{x},y,0$ [0,0,w]	x, $\bar{y},0$ [0,0,w]
8 j .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	$\bar{x},0,\bar{z}$ [u,0,w]	x,0, \bar{z} [$\bar{u},0,w$]
8 i m'..	0,y,z [0,v,w]	0, \bar{y},z [0, \bar{v},w]	0,y, \bar{z} [0, \bar{v},w]	0, \bar{y},\bar{z} [0,v,w]
8 h ..2	1/4,1/4,z [0,0,w]	3/4,1/4, \bar{z} [0,0,w]	3/4,3/4, \bar{z} [0,0,w]	1/4,3/4,z [0,0,w]
4 g m'm'2	0,1/2,z [0,0,w]	0,1/2, \bar{z} [0,0,w]		
4 f m'm'2	0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]		
4 e m'2'm	0,y,0 [0,0,w]	0, $\bar{y},0$ [0,0,w]		
4 d 2'm'm	x,0,0 [0,0,w]	$\bar{x},0,0$ [0,0,w]		
4 c ..2/m	1/4,1/4,0 [0,0,w]	3/4,1/4,0 [0,0,w]		
2 b m'm'm	1/2,0,0 [0,0,w]			
2 a m'm'm	0,0,0 [0,0,w]			

Continued

No. 47.4.333

cm'm'm

Symmetry of special projections

Along [001] $c2mm1'$
 $a^* = a$ $b^* = b$
Origin at 0,0,z

Along [100] $p2'm'm$
 $a^* = b/2$
Origin at x,0,0

Along [010] $p2'm'm$
 $a^* = a/2$
Origin at 0,y,0

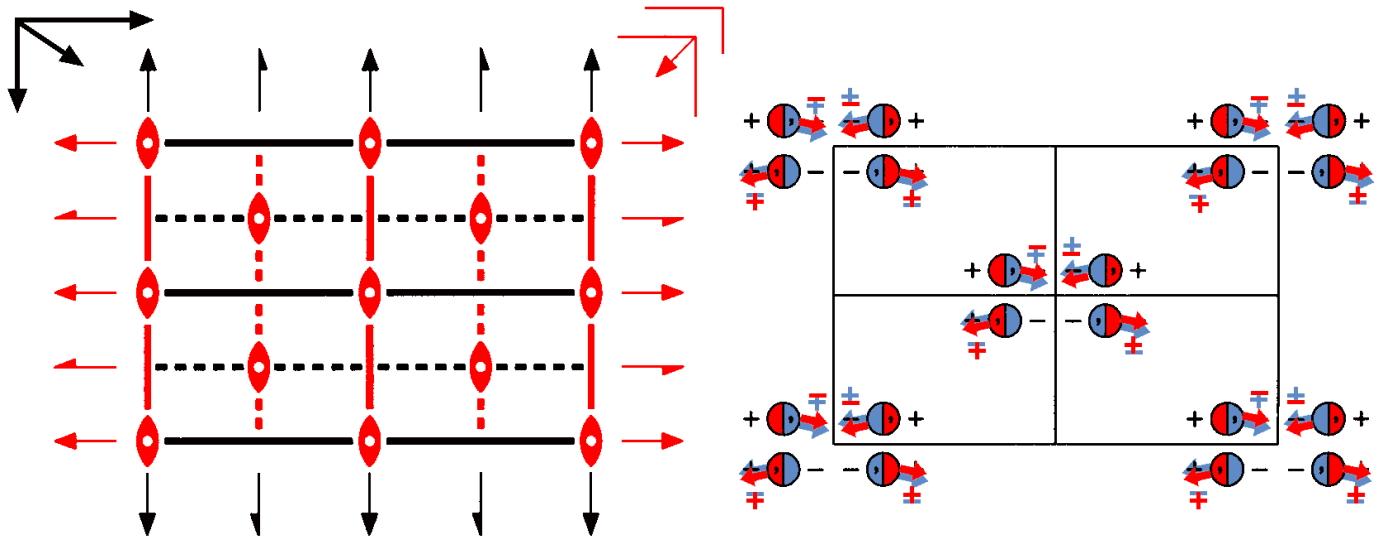
cmm'm'

No. 47.5.334

mm'm'

c2/m2'/m'2'/m'

Orthorhombic/Rectangular



Origin at center (mm'm')

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$ $0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 2' 0,y,0
(2 _y 0,0,0)' | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m' x,y,0
(m _z 0,0,0)' | (7) m' x,0,z
(m _y 0,0,0)' | (8) m 0,y,z
(m _x 0,0,0) |

For (1/2,1/2,0) + set

- | | | | |
|--|--|--|--|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) 2' 1/4,1/4,z
(2 _z 1/2,1/2,0)' | (3) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (4) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) |
| (5) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (6) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' | (7) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (8) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0) +		
16 l 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]	(3) \bar{x},y,\bar{z} [u, \bar{v} ,w]	(4) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y, \bar{z} [u,v, \bar{w}]	(7) x, \bar{y},z [u, \bar{v} ,w]	(8) \bar{x},y,z [u, \bar{v},\bar{w}]
8 k ..m'	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [u,v,0]	$\bar{x},y,0$ [u, \bar{v} ,0]	x, $\bar{y},0$ [u, \bar{v} ,0]
8 j .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [u,0, \bar{w}]	$\bar{x},0,\bar{z}$ [u,0,w]	x,0, \bar{z} [u,0, \bar{w}]
8 i m..	0,y,z [u,0,0]	0, \bar{y},z [u,0,0]	0,y, \bar{z} [u,0,0]	0, \bar{y},\bar{z} [u,0,0]
8 h ..2'	1/4,1/4,z [u,v,0]	3/4,1/4, \bar{z} [u, \bar{v} ,0]	3/4,3/4, \bar{z} [u,v,0]	1/4,3/4,z [u, \bar{v} ,0]
4 g mm'2'	0,1/2,z [u,0,0]	0,1/2, \bar{z} [u,0,0]		
4 f mm'2'	0,0,z [u,0,0]	0,0, \bar{z} [u,0,0]		
4 e m2'm'	0,y,0 [u,0,0]	0, $\bar{y},0$ [u,0,0]		
4 d 2m'm'	x,0,0 [u,0,0]	$\bar{x},0,0$ [u,0,0]		
4 c ..2'/m'	1/4,1/4,0 [u,v,0]	3/4,1/4,0 [u, \bar{v} ,0]		
2 b mm'm'	1/2,0,0 [u,0,0]			
2 a mm'm'	0,0,0 [u,0,0]			

Continued

No. 47.5.334

cmm'm'

Symmetry of special projections

Along [001] $c2'mm'$
 $a^* = a$ $b^* = b$
Origin at 0,0,z

Along [100] $p2mm1'$
 $a^* = b/2$
Origin at x,0,0

Along [010] $p2'mm'$
 $a^* = a/2$
Origin at 0,y,0

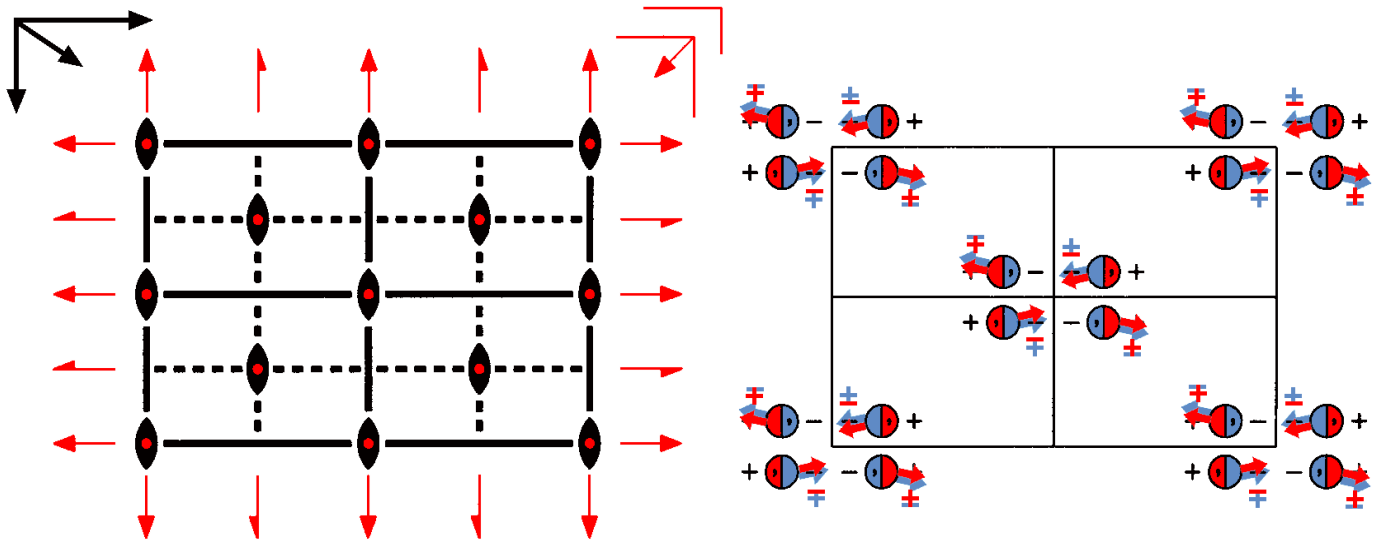
cmmm'

No. 47.6.335

mmm'

c2'/m2'/m2'/m'

Orthorhombic/Rectangular



Origin at center (mmm')

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$ $0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 2' 0,y,0
(2 _y 0,0,0)' | (4) 2' x,0,0
(2 _x 0,0,0)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ ' 0,0,0)' | (6) m' x,y,0
(m _z ' 0,0,0)' | (7) m x,0,z
(m _y 0,0,0) | (8) m 0,y,z
(m _x 0,0,0) |

For (1/2,1/2,0) + set

- | | | | |
|--|---|---|---|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) 2 1/4,1/4,z
(2 _z 1/2,1/2,0) | (3) 2' (0,1/2,0) 1/4,y,0
(2 _y ' 1/2,1/2,0)' | (4) 2' (1/2,0,0) x,1/4,0
(2 _x ' 1/2,1/2,0)' |
| (5) $\bar{1}$ ' 1/4,1/4,0
($\bar{1}$ ' 1/2,1/2,0)' | (6) n' (1/2,1/2,0) x,y,0
(m _z ' 1/2,1/2,0)' | (7) a (1/2,0,0) x,1/4,z
(m _y ' 1/2,1/2,0) | (8) b (0,1/2,0) 1/4,y,z
(m _x ' 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0) +		
16 l 1	(1) $x,y,z [u,v,w]$ (5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$ (6) $x,y,\bar{z} [u,v,\bar{w}]$	(3) $\bar{x},y,\bar{z} [u,\bar{v},w]$ (7) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$ (8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
8 k ..m'	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [\bar{u},\bar{v},0]$	$\bar{x},y,0 [u,\bar{v},0]$	$x,\bar{y},0 [\bar{u},v,0]$
8 j .m.	$x,0,z [0,v,0]$	$\bar{x},0,z [0,\bar{v},0]$	$\bar{x},0,\bar{z} [0,\bar{v},0]$	$x,0,\bar{z} [0,v,0]$
8 i m..	$0,y,z [u,0,0]$	$0,\bar{y},z [\bar{u},0,0]$	$0,y,\bar{z} [u,0,0]$	$0,\bar{y},\bar{z} [\bar{u},0,0]$
8 h ..2	$1/4,1/4,z [0,0,w]$	$3/4,1/4,\bar{z} [0,0,w]$	$3/4,3/4,\bar{z} [0,0,\bar{w}]$	$1/4,3/4,z [0,0,\bar{w}]$
4 g mm2	$0,1/2,z [0,0,0]$	$0,1/2,\bar{z} [0,0,0]$		
4 f mm2	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$		
4 e m2'm'	$0,y,0 [u,0,0]$	$0,\bar{y},0 [\bar{u},0,0]$		
4 d 2'mm'	$x,0,0 [0,v,0]$	$\bar{x},0,0 [0,\bar{v},0]$		
4 c ..2/m'	$1/4,1/4,0 [0,0,0]$	$3/4,1/4,0 [0,0,0]$		
2 b mmm'	$1/2,0,0 [0,0,0]$			
2 a mmm'	$0,0,0 [0,0,0]$			

Continued

No. 47.6.335

$cm\bar{m}m'$

Symmetry of special projections

Along $[001]$ $c2mm$
 $a^* = a$ $b^* = b$
Origin at $0,0,z$

Along $[100]$ $p2mm1'$
 $a^* = b/2$
Origin at $x,0,0$

Along $[010]$ $p2mm1'$
 $a^* = a/2$
Origin at $0,y,0$

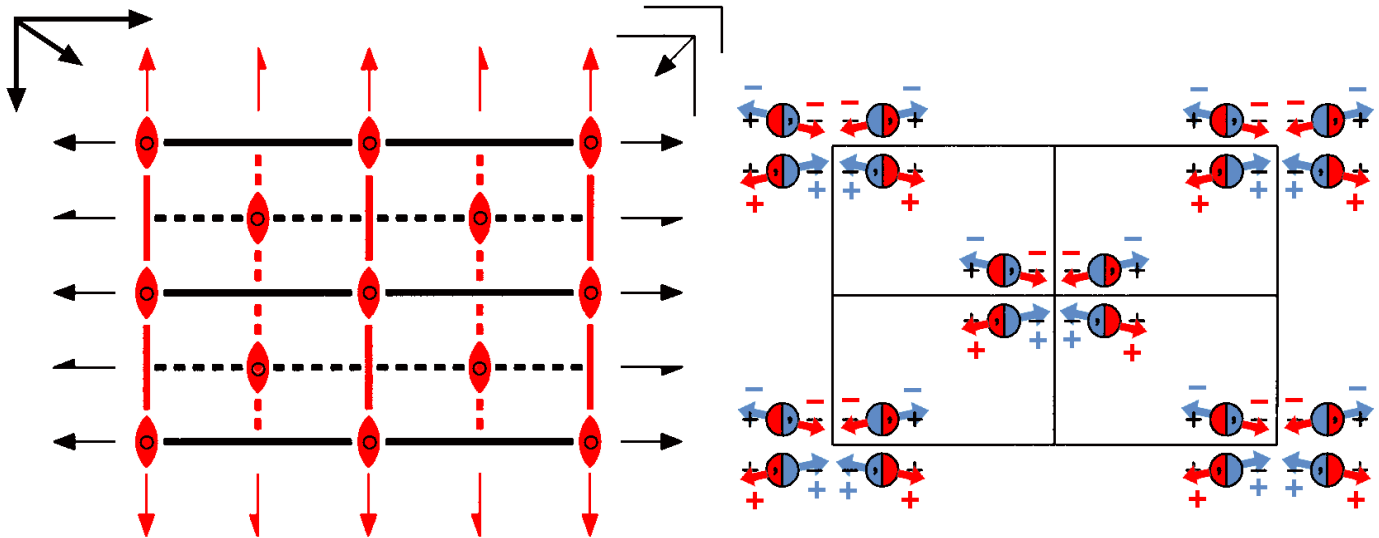
cmm'm

No. 47.7.336

mm'm

c2'/m2/m'2'/m

Orthorhombic/Rectangular



Origin at center (mm'm)

Asymmetric unit $0 \leq x \leq 1/4$; $0 \leq y \leq 1/2$ $0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 2 0,y,0
(2 _y 0,0,0) | (4) 2' x,0,0
(2 _x 0,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) m x,y,0
(m _z 0,0,0) | (7) m' x,0,z
(m _y 0,0,0)' | (8) m 0,y,z
(m _x 0,0,0) |

For (1/2,1/2,0) + set

- | | | | |
|---|--|--|--|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) 2' 1/4,1/4,z
(2 _z 1/2,1/2,0)' | (3) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (4) 2' (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0)' |
| (5) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0)' | (6) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (7) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (8) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0) +		
16 l 1	(1) $x,y,z [u,v,w]$ (5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(2) $\bar{x},\bar{y},z [u,v,\bar{w}]$ (6) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(3) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$ (7) $x,\bar{y},z [u,\bar{v},w]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$ (8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
8 k ..m	$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,\bar{w}]$	$\bar{x},y,0 [0,0,\bar{w}]$	$x,\bar{y},0 [0,0,w]$
8 j .m'	$x,0,z [u,0,w]$	$\bar{x},0,z [u,0,\bar{w}]$	$\bar{x},0,\bar{z} [\bar{u},0,\bar{w}]$	$x,0,\bar{z} [\bar{u},0,w]$
8 i m..	$0,y,z [u,0,0]$	$0,\bar{y},z [u,0,0]$	$0,y,\bar{z} [\bar{u},0,0]$	$0,\bar{y},\bar{z} [\bar{u},0,0]$
8 h ..2'	$1/4,1/4,z [u,v,0]$	$3/4,1/4,\bar{z} [\bar{u},v,0]$	$3/4,3/4,\bar{z} [\bar{u},\bar{v},0]$	$1/4,3/4,z [u,\bar{v},0]$
4 g mm'2'	$0,1/2,z [u,0,0]$	$0,1/2,\bar{z} [\bar{u},0,0]$		
4 f mm'2'	$0,0,z [u,0,0]$	$0,0,\bar{z} [\bar{u},0,0]$		
4 e m2m	$0,y,0 [0,0,0]$	$0,\bar{y},0 [0,0,0]$		
4 d 2'm'm	$x,0,0 [0,0,w]$	$\bar{x},0,0 [0,0,\bar{w}]$		
4 c ..2'/m	$1/4,1/4,0 [0,0,0]$	$3/4,1/4,0 [0,0,0]$		
2 b mmm'	$1/2,0,0 [0,0,0]$			
2 a mmm'	$0,0,0 [0,0,0]$			

Continued

No. 47.7.336

cmm'm

Symmetry of special projections

Along [001] $c2mm1'$
 $a^* = a$ $b^* = b$
Origin at 0,0,z

Along [100] $p2mm1'$
 $a^* = b/2$
Origin at x,0,0

Along [010] $p2mm$
 $a^* = a/2$
Origin at 0,y,0

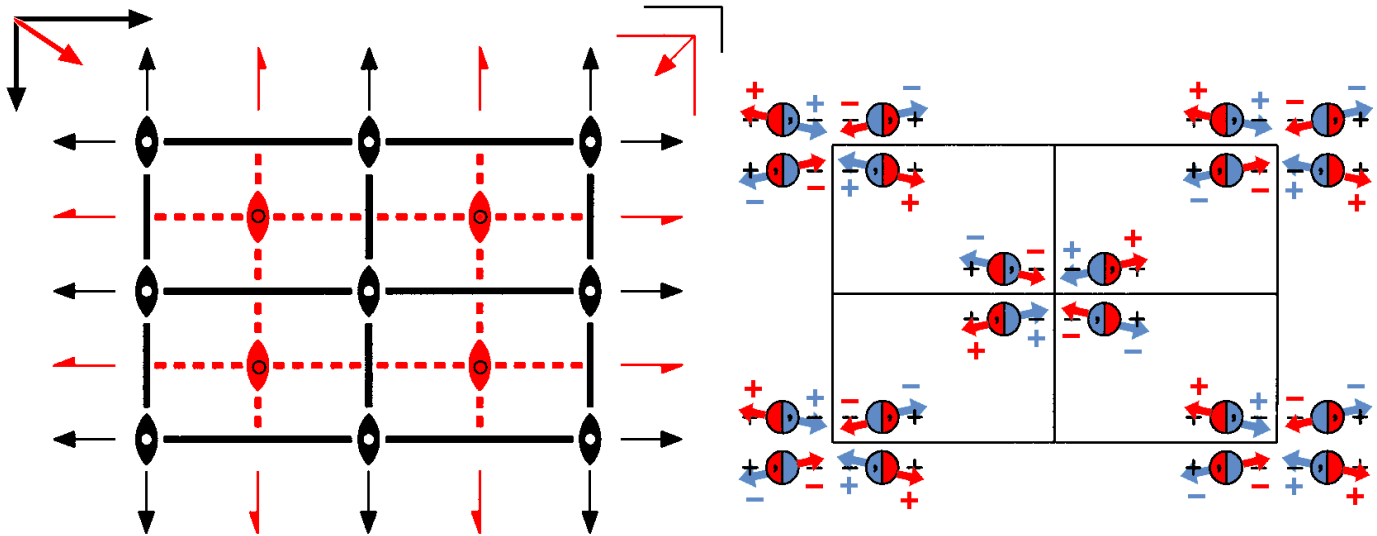
$c_p mmm$

No. 47.8.337

$mmm1'$

$c_p 2/m2/m2/m$

Orthorhombic/Rectangular



Origin at center (mmm)

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2 \quad 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) 2 $0,y,0$
(2 _y 0,0,0) | (4) 2 $x,0,0$
(2 _x 0,0,0) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (6) m $x,y,0$
(m_z 0,0,0) | (7) m $x,0,z$
(m_y 0,0,0) | (8) m $0,y,z$
(m_x 0,0,0) |

For $(1/2,1/2,0)'$ + set

- | | | | |
|---|--|--|--|
| (1) t' $(1/2,1/2,0)$
(1 $1/2,1/2,0$)' | (2) 2' $1/4,1/4,z$
(2 _z $1/2,1/2,0$)' | (3) 2' $(0,1/2,0)$ $1/4,y,0$
(2 _y $1/2,1/2,0$)' | (4) 2' $(1/2,0,0)$ $x,1/4,0$
(2 _x $1/2,1/2,0$)' |
| (5) $\bar{1}$ ' $1/4,1/4,0$
($\bar{1}$ $1/2,1/2,0$)' | (6) n' $(1/2,1/2,0)$ $x,y,0$
(m_z $1/2,1/2,0$)' | (7) a' $(1/2,0,0)$ $x,1/4,z$
(m_y $1/2,1/2,0$)' | (8) b' $(0,1/2,0)$ $1/4,y,z$
(m_x $1/2,1/2,0$)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		(0,0,0) +	(1/2,1/2,0)' +	
16 l 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(4) x,\bar{y},\bar{z} [u, \bar{v},\bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y,\bar{z} [\bar{u},\bar{v},w]	(7) x,\bar{y},z [\bar{u},v,\bar{w}]	(8) \bar{x},y,z [u, \bar{v},\bar{w}]
8 k ..m	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{x},y,0$ [0,0, \bar{w}]	$x,\bar{y},0$ [0,0, \bar{w}]
8 j .m.	$x,0,z$ [0,v,0]	$\bar{x},0,z$ [0, \bar{v} ,0]	$\bar{x},0,\bar{z}$ [0,v,0]	$x,0,\bar{z}$ [0, \bar{v} ,0]
8 i m..	$0,y,z$ [u,0,0]	$0,\bar{y},z$ [\bar{u} ,0,0]	$0,y,\bar{z}$ [\bar{u} ,0,0]	$0,\bar{y},\bar{z}$ [u,0,0]
8 h ..2'	$1/4,1/4,z$ [u,v,0]	$3/4,1/4,\bar{z}$ [$\bar{u},v,0$]	$3/4,3/4,\bar{z}$ [u,v,0]	$1/4,3/4,z$ [$\bar{u},v,0$]
4 g mm2	$0,1/2,z$ [0,0,0]	$0,1/2,\bar{z}$ [0,0,0]		
4 f mm2	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]		
4 e m2m	$0,y,0$ [0,0,0]	$0,\bar{y},0$ [0,0,0]		
4 d 2mm	$x,0,0$ [0,0,0]	$\bar{x},0,0$ [0,0,0]		
4 c ..2'/m	$1/4,1/4,0$ [0,0,0]	$3/4,1/4,0$ [0,0,0]		
2 b mmm	$1/2,0,0$ [0,0,0]			
2 a mmm	$0,0,0$ [0,0,0]			

Continued

No. 47.8.337

c_p mmm

Symmetry of special projections

Along [001] $c2mm1'$

$a^* = a$ $b^* = b$

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = b/2$

Origin at x,0,0

Along [010] $p2mm1'$

$a^* = a/2$

Origin at 0,y,0

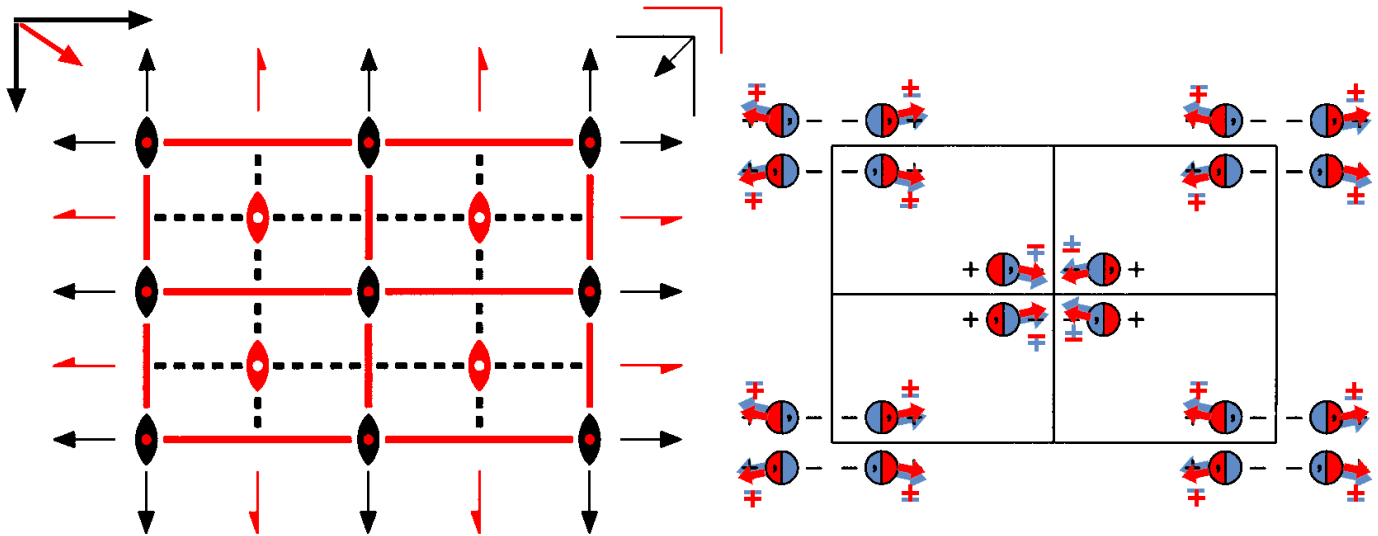
$c_p m' m' m'$

No. 47.9.338

$mmm1'$

$c_p 2/m' 2/m' 2/m'$

Orthorhombic/Rectangular



Origin at center ($m' m' m'$)

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) 2 $0,y,0$
(2 _y 0,0,0) | (4) 2 $x,0,0$
(2 _x 0,0,0) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0)' | (6) m' $x,y,0$
(m_z 0,0,0)' | (7) m' $x,0,z$
(m_y 0,0,0)' | (8) m' $0,y,z$
(m_x 0,0,0)' |

For $(1/2,1/2,0)'$ + set

- | | | | |
|--|--|--|--|
| (1) t' $(1/2,1/2,0)$
(1 1/2,1/2,0)' | (2) 2' $1/4,1/4,z$
(2 _z 1/2,1/2,0)' | (3) 2' $(0,1/2,0)$ $1/4,y,0$
(2 _y 1/2,1/2,0)' | (4) 2' $(1/2,0,0)$ $x,1/4,0$
(2 _x 1/2,1/2,0)' |
| (5) $\bar{1}$ $1/4,1/4,0$
($\bar{1}$ 1/2,1/2,0) | (6) n $(1/2,1/2,0)$ $x,y,0$
(m_z 1/2,1/2,0) | (7) a $(1/2,0,0)$ $x,1/4,z$
(m_y 1/2,1/2,0) | (8) b $(0,1/2,0)$ $1/4,y,z$
(m_x 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0)' +		
16 l 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(6) $x,y,\bar{z} [u,v,\bar{w}]$	(7) $x,\bar{y},z [u,\bar{v},w]$	(8) $\bar{x},y,z [\bar{u},v,w]$
8 k ..m'	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [\bar{u},\bar{v},0]$	$\bar{x},y,0 [\bar{u},v,0]$	$x,\bar{y},0 [u,\bar{v},0]$
8 j .m'	$x,0,z [u,0,w]$	$\bar{x},0,z [\bar{u},0,w]$	$\bar{x},0,\bar{z} [\bar{u},0,\bar{w}]$	$x,0,\bar{z} [u,0,\bar{w}]$
8 i m'..	$0,y,z [0,v,w]$	$0,\bar{y},z [0,\bar{v},w]$	$0,y,\bar{z} [0,v,\bar{w}]$	$0,\bar{y},\bar{z} [0,\bar{v},\bar{w}]$
8 h ..2'	$1/4,1/4,z [u,v,0]$	$3/4,1/4,\bar{z} [\bar{u},v,0]$	$3/4,3/4,\bar{z} [\bar{u},\bar{v},0]$	$1/4,3/4,z [u,\bar{v},0]$
4 g m'm'2	$0,1/2,z [0,0,w]$	$0,1/2,\bar{z} [0,0,\bar{w}]$		
4 f m'm'2	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,\bar{w}]$		
4 e m'2m'	$0,y,0 [0,v,0]$	$0,\bar{y},0 [0,\bar{v},0]$		
4 d 2m'm'	$x,0,0 [u,0,0]$	$\bar{x},0,0 [\bar{u},0,0]$		
4 c ..2'/m'	$1/4,1/4,0 [u,v,0]$	$3/4,1/4,0 [\bar{u},v,0]$		
2 b m'm'm'	$1/2,0,0 [0,0,0]$			
2 a m'm'm'	$0,0,0 [0,0,0]$			

Continued

No. 47.9.338

$c_p m'm'm'$

Symmetry of special projections

Along [001] $c_p 2m'm'$
 $a^* = a \quad b^* = b$
Origin at 0,0,z

Along [100] $p_{2a^*} 2m'm'$
 $a^* = b/2$
Origin at x,0,0

Along [010] $p_{2a^*} 2m'm'$
 $a^* = a/2$
Origin at 0,y,0

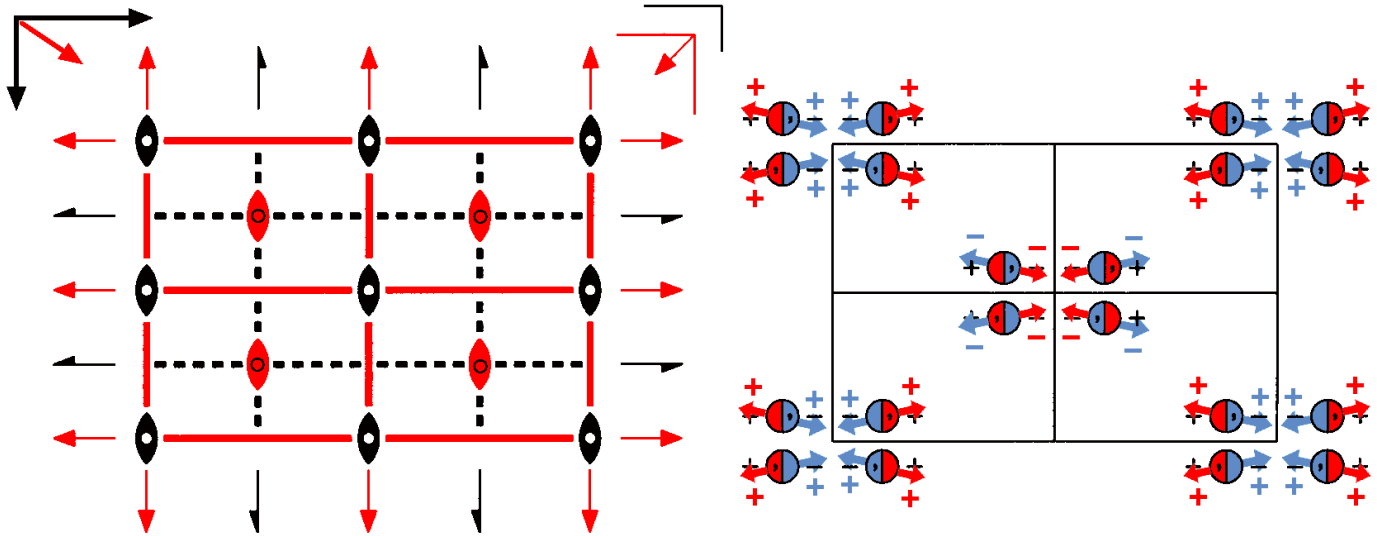
$c_p m' m' m$

No. 47.10.339

$mmm1'$

$c_p 2'/m'2'/m'2'/m$

Orthorhombic/Rectangular



Origin at center ($m' m' m$)

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) 2' $0,y,0$
(2 _y 0,0,0)' | (4) 2' $x,0,0$
(2 _x 0,0,0)' |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (6) m $x,y,0$
(m _z 0,0,0) | (7) m' $x,0,z$
(m _y 0,0,0)' | (8) m' $0,y,z$
(m _x 0,0,0)' |

For $(1/2,1/2,0)'$ + set

- | | | | |
|--|--|--|--|
| (1) t' $(1/2,1/2,0)$
(1 1/2,1/2,0)' | (2) 2' $1/4,1/4,z$
(2 _z 1/2,1/2,0)' | (3) 2 $(0,1/2,0)$ $1/4,y,0$
(2 _y 1/2,1/2,0) | (4) 2 $(1/2,0,0)$ $x,1/4,0$
(2 _x 1/2,1/2,0) |
| (5) $\bar{1}$ ' $1/4,1/4,0$
($\bar{1}$ ' 1/2,1/2,0)' | (6) n' $(1/2,1/2,0)$ $x,y,0$
(m _z 1/2,1/2,0)' | (7) a $(1/2,0,0)$ $x,1/4,z$
(m _y 1/2,1/2,0) | (8) b $(0,1/2,0)$ $1/4,y,z$
(m _x 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3); (5)

Positions

		Coordinates			
Multiplicity, Wyckoff letter, Site symmetry		(0,0,0) +	(1/2,1/2,0)' +		
16	l 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{x},y,\bar{z} [u,\bar{v},w]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$
		(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(7) $x,\bar{y},z [u,\bar{v},w]$	(8) $\bar{x},y,z [\bar{u},v,w]$
8	k ..m	$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,w]$	$\bar{x},y,0 [0,0,w]$	$x,\bar{y},0 [0,0,w]$
8	j .m'	$x,0,z [u,0,w]$	$\bar{x},0,z [\bar{u},0,w]$	$\bar{x},0,\bar{z} [u,0,w]$	$x,0,\bar{z} [\bar{u},0,w]$
8	i m'..	$0,y,z [0,v,w]$	$0,\bar{y},z [0,\bar{v},w]$	$0,y,\bar{z} [0,\bar{v},w]$	$0,\bar{y},\bar{z} [0,v,w]$
8	h ..2'	$1/4,1/4,z [u,v,0]$	$3/4,1/4,\bar{z} [u,\bar{v},0]$	$3/4,3/4,\bar{z} [u,v,0]$	$1/4,3/4,z [u,\bar{v},0]$
4	g m'm'2	$0,1/2,z [0,0,w]$	$0,1/2,\bar{z} [0,0,w]$		
4	f m'm'2	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$		
4	e m'2'm	$0,y,0 [0,0,w]$	$0,\bar{y},0 [0,0,w]$		
4	d 2'm'm	$x,0,0 [0,0,w]$	$\bar{x},0,0 [0,0,w]$		
4	c ..2/m	$1/4,1/4,0 [0,0,w]$	$3/4,1/4,0 [0,0,w]$		
2	b m'm'm	$1/2,0,0 [0,0,w]$			
2	a m'm'm	$0,0,0 [0,0,w]$			

Symmetry of special projectionsAlong [001] $c2mm1'$ $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] $p_{2a^*}2m'm'$ $a^* = b/2$

Origin at x, 1/4,0

Along [010] $p_{2a^*}2mm$ $a^* = a/2$

Origin at 1/4,y,0

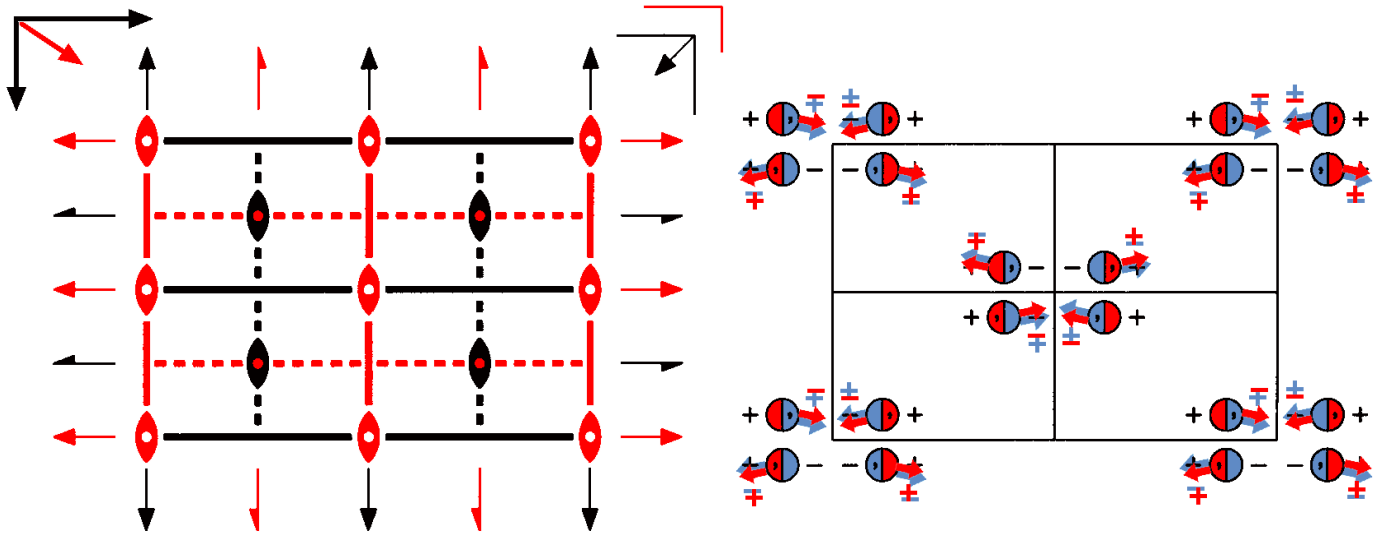
$c_p, mm'm'$

No. 47.11.340

$mmm1'$

$c_p 2/m2'/m2'/m'$

Orthorhombic/Rectangular



Origin at center ($mm'm'$)

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--------------------------------------|--------------------------------------|-------------------------------------|
| (1) 1
(1 0,0,0) | (2) $2'_z$ 0,0,z
(2_z 0,0,0)' | (3) $2'_y$ 0,y,0
(2_y 0,0,0)' | (4) $2'_x$ x,0,0
(2_x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m'_z x,y,0
(m_z 0,0,0)' | (7) m'_y x,0,z
(m_y 0,0,0)' | (8) m'_x 0,y,z
(m_x 0,0,0) |

For $(1/2,1/2,0)$ ' + set

- | | | | |
|---|---|--|--|
| (1) t' $(1/2,1/2,0)$
(1 $1/2,1/2,0$)' | (2) $2'_z$ $1/4,1/4,z$
(2_z $1/2,1/2,0$)' | (3) $2'_y$ $(0,1/2,0)$ $1/4,y,0$
(2_y $1/2,1/2,0$)' | (4) $2'_x$ $(1/2,0,0)$ $x,1/4,0$
(2_x $1/2,1/2,0$)' |
| (5) $\bar{1}$ $1/4,1/4,0$
($\bar{1}$ $1/2,1/2,0$)' | (6) n $(1/2,1/2,0)$ $x,y,0$
(m_z $1/2,1/2,0$)' | (7) a $(1/2,0,0)$ $x,1/4,z$
(m_y $1/2,1/2,0$)' | (8) b' $(0,1/2,0)$ $1/4,y,z$
(m_x $1/2,1/2,0$)' |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0)'; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0)' +		
16 l 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [u,v, \bar{w}]	(3) \bar{x},y,\bar{z} [u, \bar{v} ,w]	(4) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y, \bar{z} [u,v, \bar{w}]	(7) x, \bar{y},z [u, \bar{v} ,w]	(8) \bar{x},y,z [u, \bar{v},\bar{w}]
8 k ..m'	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [u,v,0]	$\bar{x},y,0$ [u, \bar{v} ,0]	x, $\bar{y},0$ [u, \bar{v} ,0]
8 j .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [u,0, \bar{w}]	$\bar{x},0,\bar{z}$ [u,0,w]	x,0, \bar{z} [u,0, \bar{w}]
8 i m..	0,y,z [u,0,0]	0, \bar{y},z [u,0,0]	0,y, \bar{z} [u,0,0]	0, \bar{y},\bar{z} [u,0,0]
8 h ..2	1/4,1/4,z [0,0,w]	3/4,1/4, \bar{z} [0,0,w]	3/4,3/4, \bar{z} [0,0,w]	1/4,3/4,z [0,0,w]
4 g mm'2'	0,1/2,z [u,0,0]	0,1/2, \bar{z} [u,0,0]		
4 f mm'2'	0,0,z [u,0,0]	0,0, \bar{z} [u,0,0]		
4 e m2'm'	0,y,0 [u,0,0]	0, $\bar{y},0$ [u,0,0]		
4 d 2m'm'	x,0,0 [u,0,0]	$\bar{x},0,0$ [u,0,0]		
4 c ..2'/m'	1/4,1/4,0 [u,v,0]	3/4,1/4,0 [u, \bar{v} ,0]		
2 b mm'm'	1/2,0,0 [u,0,0]			
2 a mm'm'	0,0,0 [u,0,0]			

Continued

No. 47.11.340

c_p mm'm'

Symmetry of special projections

Along [001] c_p 2'mm'
 $a^* = a$ $b^* = b$
Origin at 0,0,z

Along [100] p 2mm1'
 $a^* = b/2$
Origin at x,0,0

Along [010] p_{2a^*} 2m'm'
 $a^* = a/2$
Origin at 1/4,y,0

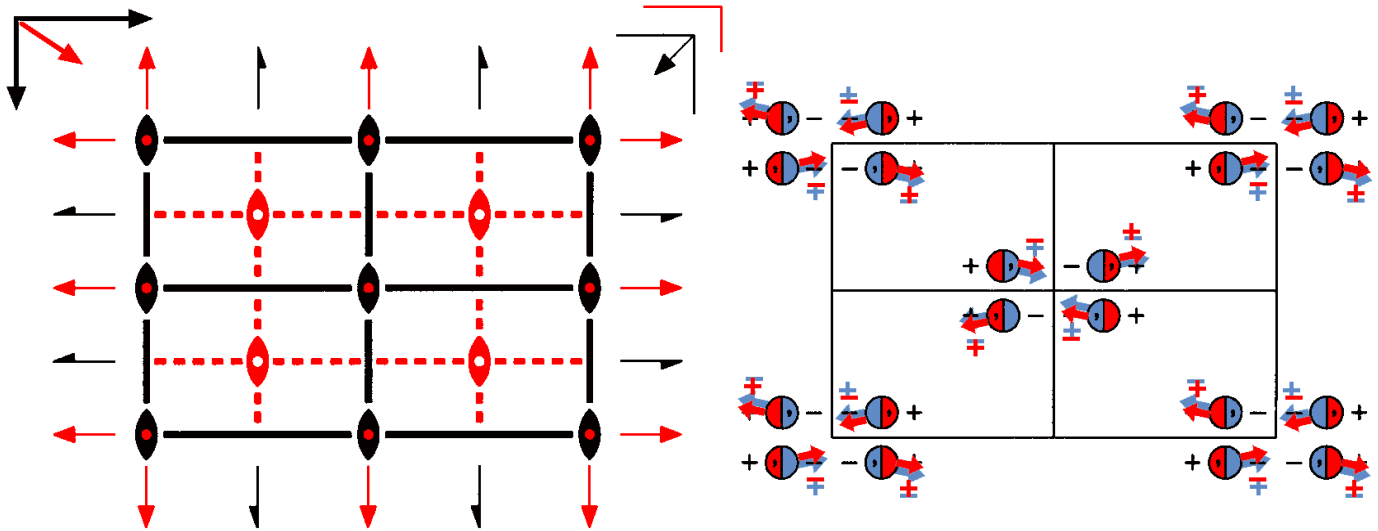
$c_p mmm'$

No. 47.12.341

$mmm1'$

$c_p 2'/m2'/m2/m'$

Orthorhombic/Rectangular



Origin at center (mmm')

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) 2' $0,y,0$
(2 _y 0,0,0)' | (4) 2' $x,0,0$
(2 _x 0,0,0)' |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0)' | (6) m' $x,y,0$
(m_z 0,0,0)' | (7) m $x,0,z$
(m_y 0,0,0) | (8) m $0,y,z$
(m_x 0,0,0) |

For $(1/2,1/2,0)'$ + set

- | | | | |
|--|--|--|--|
| (1) t' $(1/2,1/2,0)$
(1 1/2,1/2,0)' | (2) 2' $1/4,1/4,z$
(2 _z 1/2,1/2,0)' | (3) 2 $(0,1/2,0)$ $1/4,y,0$
(2 _y 1/2,1/2,0) | (4) 2 $(1/2,0,0)$ $x,1/4,0$
(2 _x 1/2,1/2,0) |
| (5) $\bar{1}$ $1/4,1/4,0$
($\bar{1}$ 1/2,1/2,0) | (6) n $(1/2,1/2,0)$ $x,y,0$
(m_z 1/2,1/2,0) | (7) a' $(1/2,0,0)$ $x,1/4,z$
(m_y 1/2,1/2,0)' | (8) b' $(0,1/2,0)$ $1/4,y,z$
(m_x 1/2,1/2,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0)' +		
16 l 1	(1) $x,y,z [u,v,w]$ (5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$ (6) $x,y,\bar{z} [u,v,\bar{w}]$	(3) $\bar{x},y,\bar{z} [u,\bar{v},w]$ (7) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$ (8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
8 k ..m'	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [\bar{u},\bar{v},0]$	$\bar{x},y,0 [u,\bar{v},0]$	$x,\bar{y},0 [\bar{u},v,0]$
8 j .m.	$x,0,z [0,v,0]$	$\bar{x},0,z [0,\bar{v},0]$	$\bar{x},0,\bar{z} [0,\bar{v},0]$	$x,0,\bar{z} [0,v,0]$
8 i m..	$0,y,z [u,0,0]$	$0,\bar{y},z [\bar{u},0,0]$	$0,y,\bar{z} [u,0,0]$	$0,\bar{y},\bar{z} [\bar{u},0,0]$
8 h ..2'	$1/4,1/4,z [u,v,0]$	$3/4,1/4,\bar{z} [u,\bar{v},0]$	$3/4,3/4,\bar{z} [\bar{u},\bar{v},0]$	$1/4,3/4,z [\bar{u},v,0]$
4 g mm2	$0,1/2,z [0,0,0]$	$0,1/2,\bar{z} [0,0,0]$		
4 f mm2	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$		
4 e m2'm'	$0,y,0 [u,0,0]$	$0,\bar{y},0 [\bar{u},0,0]$		
4 d 2'mm'	$x,0,0 [0,v,0]$	$\bar{x},0,0 [0,\bar{v},0]$		
4 c ..2'/m'	$1/4,1/4,0 [u,v,0]$	$3/4,1/4,0 [u,\bar{v},0]$		
2 b mmm'	$1/2,0,0 [0,0,0]$			
2 a mmm'	$0,0,0 [0,0,0]$			

Continued

No. 47.12.341

$c_p mmm'$

Symmetry of special projections

Along $[001]$ $c_p 2mm$
 $a^* = a$ $b^* = b$
Origin at $0,0,z$

Along $[100]$ $p2mm1'$
 $a^* = b/2$
Origin at $x,0,0$

Along $[010]$ $p2mm1'$
 $a^* = a/2$
Origin at $0,y,0$

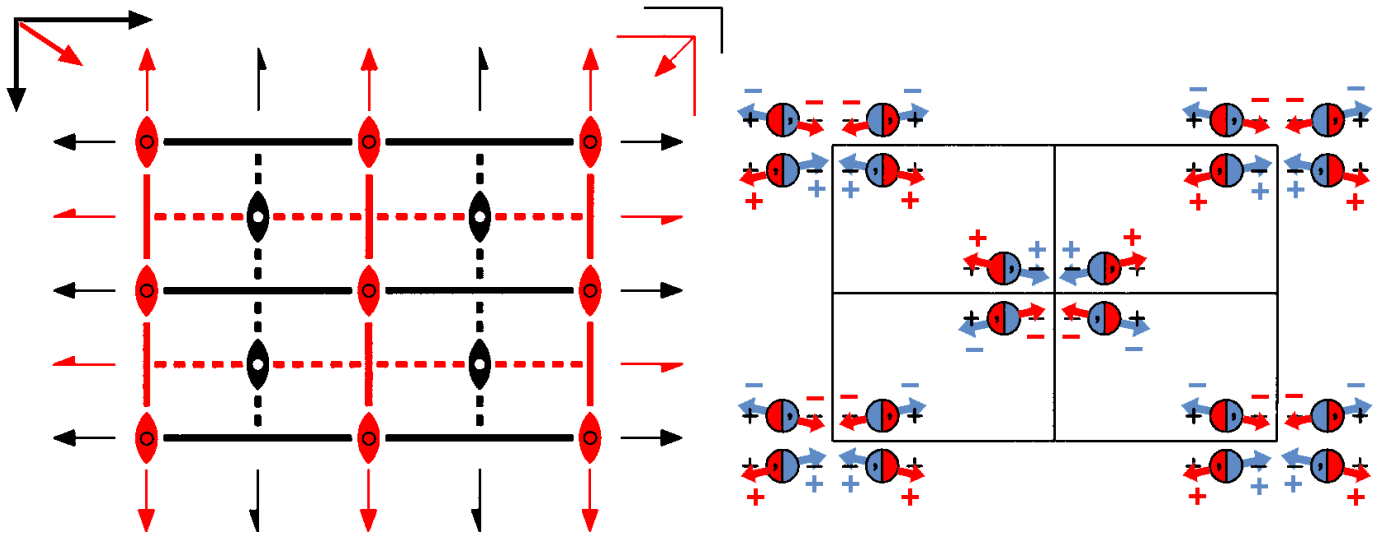
$c_p, mm'm$

No. 47.13.342

$mmm1'$

$c_p 2'/m2/m'2'/m$

Orthorhombic/Rectangular



Origin at center ($mm'm$)

Asymmetric unit $0 \leq x \leq 1/4; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|---|--------------------------------------|--------------------------------------|--------------------------------------|
| (1) 1
(1 0,0,0) | (2) $2'_z$ 0,0,z
(2_z 0,0,0)' | (3) $2'_y$ 0,y,0
(2_y 0,0,0) | (4) $2'_x$ x,0,0
(2_x 0,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) m x,y,0
(m_z 0,0,0) | (7) m'_y x,0,z
(m_y 0,0,0)' | (8) m 0,y,z
(m_x 0,0,0) |

For $(1/2,1/2,0)$ ' + set

- | | | | |
|---|--|--|--|
| (1) t' $(1/2,1/2,0)$
(1 $1/2,1/2,0$)' | (2) $2'_z$ $1/4,1/4,z$
(2_z $1/2,1/2,0$)' | (3) $2'_y$ $(0,1/2,0)$ $1/4,y,0$
(2_y $1/2,1/2,0$)' | (4) $2'_x$ $(1/2,0,0)$ $x,1/4,0$
(2_x $1/2,1/2,0$)' |
| (5) $\bar{1}$ $1/4,1/4,0$
($\bar{1}$ $1/2,1/2,0$)' | (6) n'_z $(1/2,1/2,0)$ x,y,0
(m_z $1/2,1/2,0$)' | (7) a $(1/2,0,0)$ x, $1/4,z$
(m_y $1/2,1/2,0$)' | (8) b'_x $(0,1/2,0)$ $1/4,y,z$
(m_x $1/2,1/2,0$)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0)' +		
16 l 1	(1) x,y,z [u,v,w] (5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(2) \bar{x},\bar{y},z [u,v, \bar{w}] (6) x,y,\bar{z} [\bar{u},\bar{v},w]	(3) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}] (7) x,\bar{y},z [u, \bar{v},w]	(4) x,\bar{y},\bar{z} [\bar{u},v,w] (8) \bar{x},y,z [u, \bar{v},\bar{w}]
8 k ..m	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0, \bar{w}]	$\bar{x},y,0$ [0,0, \bar{w}]	$x,\bar{y},0$ [0,0,w]
8 j .m'	$x,0,z$ [u,0,w]	$\bar{x},0,z$ [u,0, \bar{w}]	$\bar{x},0,\bar{z}$ [$\bar{u},0,\bar{w}$]	$x,0,\bar{z}$ [$\bar{u},0,w$]
8 i m..	$0,y,z$ [u,0,0]	$0,\bar{y},z$ [u,0,0]	$0,y,\bar{z}$ [$\bar{u},0,0$]	$0,\bar{y},\bar{z}$ [$\bar{u},0,0$]
8 h ..2	$1/4,1/4,z$ [0,0,w]	$3/4,1/4,\bar{z}$ [0,0, \bar{w}]	$3/4,3/4,\bar{z}$ [0,0, \bar{w}]	$1/4,3/4,z$ [0,0,w]
4 g mm'2'	$0,1/2,z$ [u,0,0]	$0,1/2,\bar{z}$ [$\bar{u},0,0$]		
4 f mm'2'	$0,0,z$ [u,0,0]	$0,0,\bar{z}$ [$\bar{u},0,0$]		
4 e m2m	$0,y,0$ [0,0,0]	$0,\bar{y},0$ [0,0,0]		
4 d 2'm'm	$x,0,0$ [0,0,w]	$\bar{x},0,0$ [0,0, \bar{w}]		
4 c ..2/m	$1/4,1/4,0$ [0,0,w]	$3/4,1/4,0$ [0,0, \bar{w}]		
2 b mm'm	$1/2,0,0$ [0,0,0]			
2 a mm'm	$0,0,0$ [0,0,0]			

Symmetry of special projectionsAlong [001] $c2mm1'$ $a^* = a$ $b^* = b$

Origin at 0,0,z

Along [100] $p2mm1'$ $a^* = b/2$

Origin at x,0,0

Along [010] $p_{2A^*}2mm$ $a^* = a/2$

Origin at 0,y,0

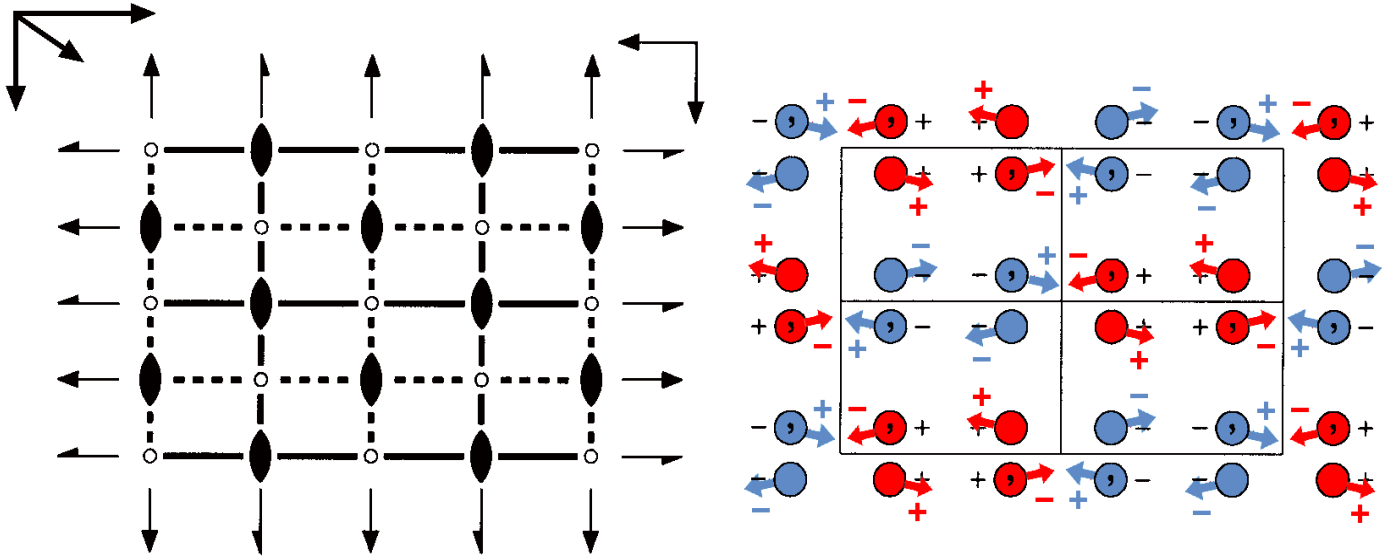
cmme

No. 48.1.343

mmm

c2/m2/m2/e

Orthorhombic/Rectangular



Origin at center (2/m) at $2/m_2, /ae$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4 \quad 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0, 1/4, z$
(2 _z 0,1/2,0) | (3) 2 (0,1/2,0) $0, y, 0$
(2 _y 0,1/2,0) | (4) 2 $x, 0, 0$
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) b (0,1/2,0) $x, y, 0$
(m _z 0,1/2,0) | (7) m $x, 1/4, z$
(m _y 0,1/2,0) | (8) m $0, y, z$
(m _x 0,0,0) |

For (1/2,1/2,0) + set

- | | | | |
|--|--|--|--|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) 2 $1/4, 0, z$
(2 _z 1/2,0,0) | (3) 2 $1/4, y, 0$
(2 _y 1/2,0,0) | (4) 2 (1/2,0,0) $x, 1/4, 0$
(2 _x 1/2,1/2,0) |
| (5) $\bar{1}$ $1/4, 1/4, 0$
($\bar{1}$ 1/2,1/2,0) | (6) a (1/2,0,0) $x, y, 0$
(m _z 1/2,0,0) | (7) a (1/2,0,0) $x, 0, z$
(m _y 1/2,0,0) | (8) b (0,1/2,0) $1/4, y, z$
(m _x 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0) +		
16 j 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y}+1/2,z [\bar{u},\bar{v},w]$	(3) $\bar{x},y+1/2,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x,y+1/2,\bar{z} [\bar{u},\bar{v},w]$	(7) $x,\bar{y}+1/2,z [\bar{u},v,\bar{w}]$	(8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
8 i .m.	$x,1/4,z [0,v,0]$	$\bar{x},1/4,z [0,\bar{v},0]$	$\bar{x},3/4,\bar{z} [0,v,0]$	$x,3/4,\bar{z} [0,\bar{v},0]$
8 h m..	$0,y,z [u,0,0]$	$0,\bar{y}+1/2,z [\bar{u},0,0]$	$0,y+1/2,\bar{z} [\bar{u},0,0]$	$0,\bar{y},\bar{z} [u,0,0]$
8 g ..2	$1/4,0,z [0,0,w]$	$3/4,1/2,\bar{z} [0,0,\bar{w}]$	$3/4,0,\bar{z} [0,0,w]$	$1/4,1/2,z [0,0,\bar{w}]$
8 f .2.	$1/4,y,0 [0,v,0]$	$3/4,\bar{y}+1/2,0 [0,\bar{v},0]$	$3/4,\bar{y},0 [0,v,0]$	$1/4,y+1/2,0 [0,\bar{v},0]$
8 e 2..	$x,0,0 [u,0,0]$	$\bar{x},1/2,0 [\bar{u},0,0]$	$\bar{x},0,0 [u,0,0]$	$x,1/2,0 [\bar{u},0,0]$
4 d mm2	$0,1/4,z [0,0,0]$	$0,3/4,\bar{z} [0,0,0]$		
4 c .2/m.	$1/4,1/4,0 [0,v,0]$	$3/4,1/4,0 [0,\bar{v},0]$		
4 b 2/m..	$0,0,0 [u,0,0]$	$0,1/2,0 [\bar{u},0,0]$		
4 a 222	$1/4,0,0 [0,0,0]$	$3/4,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p_{2a^*}2m'm'$	Along [100] $p2mm1'$	Along [010] $p2mm1'$
$a^* = a/2$ $b^* = b/2$	$a^* = b/2$	$a^* = a/2$
Origin at $1/4,0,z$	Origin at $x,0,0$	Origin at $0,y,0$

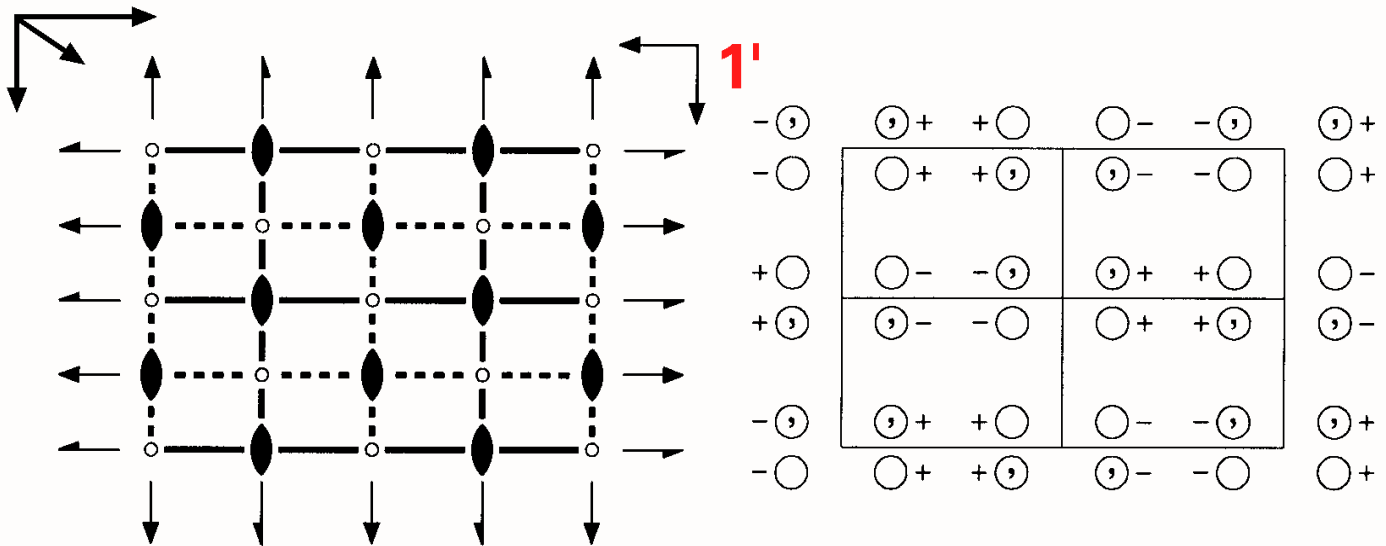
cmme1'

No. 48.2.344

mmm1'

c2/m2/m2/e1'

Orthorhombic/Rectangular



Origin at center ($2/m1'$) at $2/m2_1/ae1'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4; 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,1/4,z
(2 _z 0,1/2,0) | (3) 2 _y (0,1/2,0) 0,y,0
(2 _y 0,1/2,0) | (4) 2 _x x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) b (0,1/2,0) x,y,0
(m _z 0,1/2,0) | (7) m _y x,1/4,z
(m _y 0,1/2,0) | (8) m _x 0,y,z
(m _x 0,0,0) |

For (1/2,1/2,0) + set

- | | | | |
|--|---|---|---|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) 2 _z 1/4,0,z
(2 _z 1/2,0,0) | (3) 2 _y 1/4,y,0
(2 _y 1/2,0,0) | (4) 2 _x (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) |
| (5) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (6) a (1/2,0,0) x,y,0
(m _z 1/2,0,0) | (7) a (1/2,0,0) x,0,z
(m _y 1/2,0,0) | (8) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) |

For (0,0,0)' + set

- | | | | |
|---|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' _z 0,1/4,z
(2' _z 0,1/2,0)' | (3) 2' _y (0,1/2,0) 0,y,0
(2' _y 0,1/2,0)' | (4) 2' _x x,0,0
(2' _x 0,0,0)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ 0,0,0)' | (6) b' (0,1/2,0) x,y,0
(m' _z 0,1/2,0)' | (7) m' _y x,1/4,z
(m' _y 0,1/2,0)' | (8) m' _x 0,y,z
(m' _x 0,0,0)' |

For $(1/2, 1/2, 0)'$ + set

(1) $t' (1/2, 1/2, 0)$ $(1 1/2, 1/2, 0)'$	(2) $2' 1/4, 0, z$ $(2_z 1/2, 0, 0)'$	(3) $2' 1/4, y, 0$ $(2_y 1/2, 0, 0)'$	(4) $2' (1/2, 0, 0)$ $x, 1/4, 0$ $(2_x 1/2, 1/2, 0)'$
(5) $\bar{1}' 1/4, 1/4, 0$ $(\bar{1} 1/2, 1/2, 0)'$	(6) $a' (1/2, 0, 0)$ $x, y, 0$ $(m_z 1/2, 0, 0)'$	(7) $a' (1/2, 0, 0)$ $x, 0, z$ $(m_y 1/2, 0, 0)'$	(8) $b' (0, 1/2, 0)$ $1/4, y, z$ $(m_x 1/2, 1/2, 0)'$

Generators selected (1); $t(1, 0, 0)$; $t(0, 1, 0)$; $t(1/2, 1/2, 0)$; (2); (3); (5); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	$(0, 0, 0) +$ $(0, 0, 0)'$	$(1/2, 1/2, 0) +$ $(1/2, 1/2, 0)'$		
16 j $11'$	(1) $x, y, z [0, 0, 0]$	(2) $\bar{x}, \bar{y} + 1/2, z [0, 0, 0]$	(3) $\bar{x}, y + 1/2, \bar{z} [0, 0, 0]$	(4) $x, \bar{y}, \bar{z} [0, 0, 0]$
	(5) $\bar{x}, \bar{y}, \bar{z} [0, 0, 0]$	(6) $x, y + 1/2, \bar{z} [0, 0, 0]$	(7) $x, \bar{y} + 1/2, z [0, 0, 0]$	(8) $\bar{x}, y, z [0, 0, 0]$
8 i $.m.1'$	$x, 1/4, z [0, 0, 0]$	$\bar{x}, 1/4, z [0, 0, 0]$	$\bar{x}, 3/4, \bar{z} [0, 0, 0]$	$x, 3/4, \bar{z} [0, 0, 0]$
8 h $m..1'$	$0, y, z [0, 0, 0]$	$0, \bar{y} + 1/2, z [0, 0, 0]$	$0, y + 1/2, \bar{z} [0, 0, 0]$	$0, \bar{y}, \bar{z} [0, 0, 0]$
8 g $..21'$	$1/4, 0, z [0, 0, 0]$	$3/4, 1/2, \bar{z} [0, 0, 0]$	$3/4, 0, \bar{z} [0, 0, 0]$	$1/4, 1/2, z [0, 0, 0]$
8 f $.2.1'$	$1/4, y, 0 [0, 0, 0]$	$3/4, \bar{y} + 1/2, 0 [0, 0, 0]$	$3/4, \bar{y}, 0 [0, 0, 0]$	$1/4, y + 1/2, 0 [0, 0, 0]$
8 e $2..1'$	$x, 0, 0 [0, 0, 0]$	$\bar{x}, 1/2, 0 [0, 0, 0]$	$\bar{x}, 0, 0 [0, 0, 0]$	$x, 1/2, 0 [0, 0, 0]$
4 d $mm21'$	$0, 1/4, z [0, 0, 0]$	$0, 3/4, \bar{z} [0, 0, 0]$		
4 c $.2/m.1'$	$1/4, 1/4, 0 [0, 0, 0]$	$3/4, 1/4, 0 [0, 0, 0]$		
4 b $2/m..1'$	$0, 0, 0 [0, 0, 0]$	$0, 1/2, 0 [0, 0, 0]$		
4 a $2221'$	$1/4, 0, 0 [0, 0, 0]$	$3/4, 0, 0 [0, 0, 0]$		

Symmetry of special projectionsAlong [001] $p2mm1'$ $a^* = a/2$ $b^* = b/2$

Origin at 0,0,z

Along [100] $p2mm1'$ $a^* = b/2$

Origin at x,0,0

Along [010] $p2mm1'$ $a^* = a/2$

Origin at 0,y,0

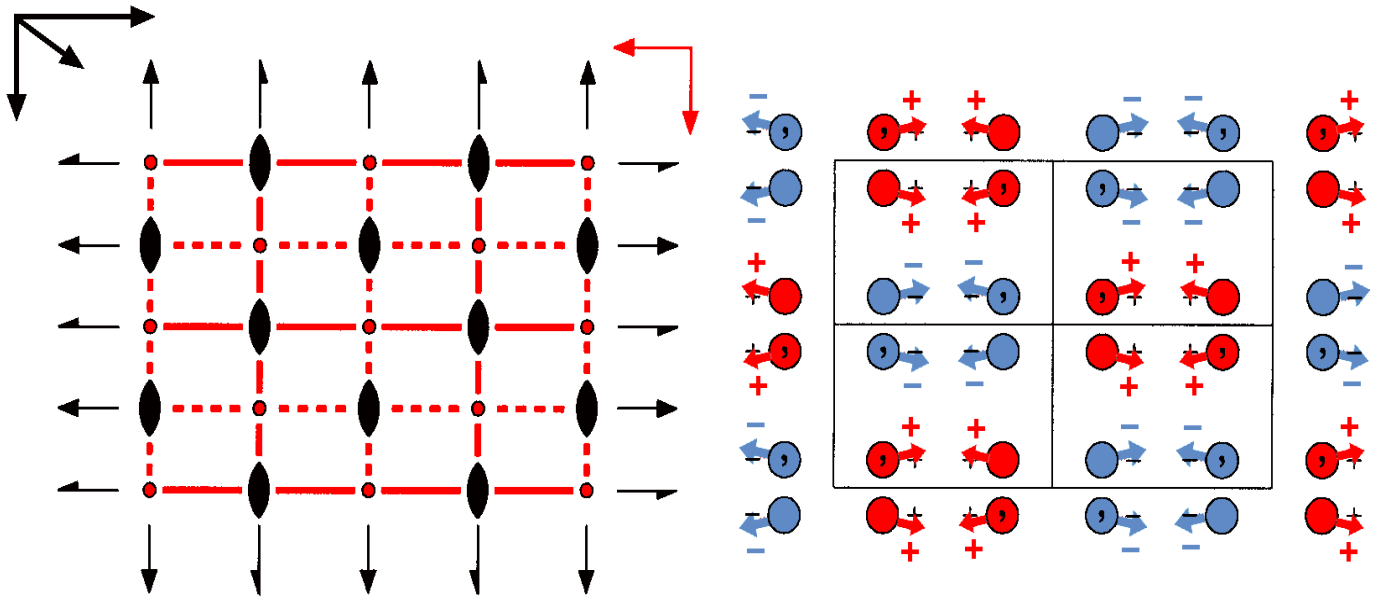
cm'm'e'

No. 48.3.345

m'm'm'

c2/m'2/m'2/e'

Orthorhombic/Rectangular



Origin at center (2/m') at $2/m'2_1/a'e'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4; 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,1/4,z$
(2 _z 0,1/2,0) | (3) 2 (0,1/2,0) $0,y,0$
(2 _y 0,1/2,0) | (4) 2 $x,0,0$
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) b' (0,1/2,0) $x,y,0$
(m _z 0,1/2,0)' | (7) m' $x,1/4,z$
(m _y 0,1/2,0)' | (8) m' $0,y,z$
(m _x 0,0,0)' |

For (1/2,1/2,0) + set

- | | | | |
|---|--|--|--|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) 2 $1/4,0,z$
(2 _z 1/2,0,0) | (3) 2 $1/4,y,0$
(2 _y 1/2,0,0) | (4) 2 (1/2,0,0) $x,1/4,0$
(2 _x 1/2,1/2,0) |
| (5) $\bar{1}$ $1/4,1/4,0$
($\bar{1}$ 1/2,1/2,0)' | (6) a' (1/2,0,0) $x,y,0$
(m _z 1/2,0,0)' | (7) a' (1/2,0,0) $x,0,z$
(m _y 1/2,0,0)' | (8) b' (0,1/2,0) $1/4,y,z$
(m _x 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0) +		
16 j 1	(1) x,y,z [u,v,w]	(2) $\bar{x},\bar{y}+1/2,z$ [\bar{u},\bar{v},w]	(3) $\bar{x},y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(4) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y+1/2, \bar{z} [u,v, \bar{w}]	(7) x, $\bar{y}+1/2,z$ [u, \bar{v},w]	(8) \bar{x},y,z [\bar{u},v,w]
8 i .m'	x,1/4,z [u,0,w]	$\bar{x},1/4,z$ [$\bar{u},0,w$]	$\bar{x},3/4,\bar{z}$ [$\bar{u},0,\bar{w}$]	x,3/4, \bar{z} [u,0, \bar{w}]
8 h m'..	0,y,z [0,v,w]	0, $\bar{y}+1/2,z$ [0, \bar{v},w]	0,y+1/2, \bar{z} [0,v, \bar{w}]	0, \bar{y},\bar{z} [0, \bar{v},\bar{w}]
8 g ..2	1/4,0,z [0,0,w]	3/4,1/2, \bar{z} [0,0, \bar{w}]	3/4,0, \bar{z} [0,0, \bar{w}]	1/4,1/2,z [0,0,w]
8 f .2.	1/4,y,0 [0,v,0]	3/4, $\bar{y}+1/2,0$ [0, $\bar{v},0$]	3/4, $\bar{y},0$ [0, $\bar{v},0$]	1/4,y+1/2,0 [0,v,0]
8 e 2..	x,0,0 [u,0,0]	$\bar{x},1/2,0$ [$\bar{u},0,0$]	$\bar{x},0,0$ [$\bar{u},0,0$]	x,1/2,0 [u,0,0]
4 d m'm'2	0,1/4,z [0,0,w]	0,3/4, \bar{z} [0,0, \bar{w}]		
4 c .2/m'	1/4,1/4,0 [0,0,0]	3/4,1/4,0 [0,0,0]		
4 b 2/m'..	0,0,0 [0,0,0]	0,1/2,0 [0,0,0]		
4 a 222	1/4,0,0 [0,0,0]	3/4,0,0 [0,0,0]		

Symmetry of special projections

Along [001] p2m'm'
 $a^* = a/2$ $b^* = b/2$
 Origin at 0,0,z

Along [100] p2m'm'
 $a^* = b/2$
 Origin at x,0,0

Along [010] p2m'm'
 $a^* = a/2$
 Origin at 0,y,0

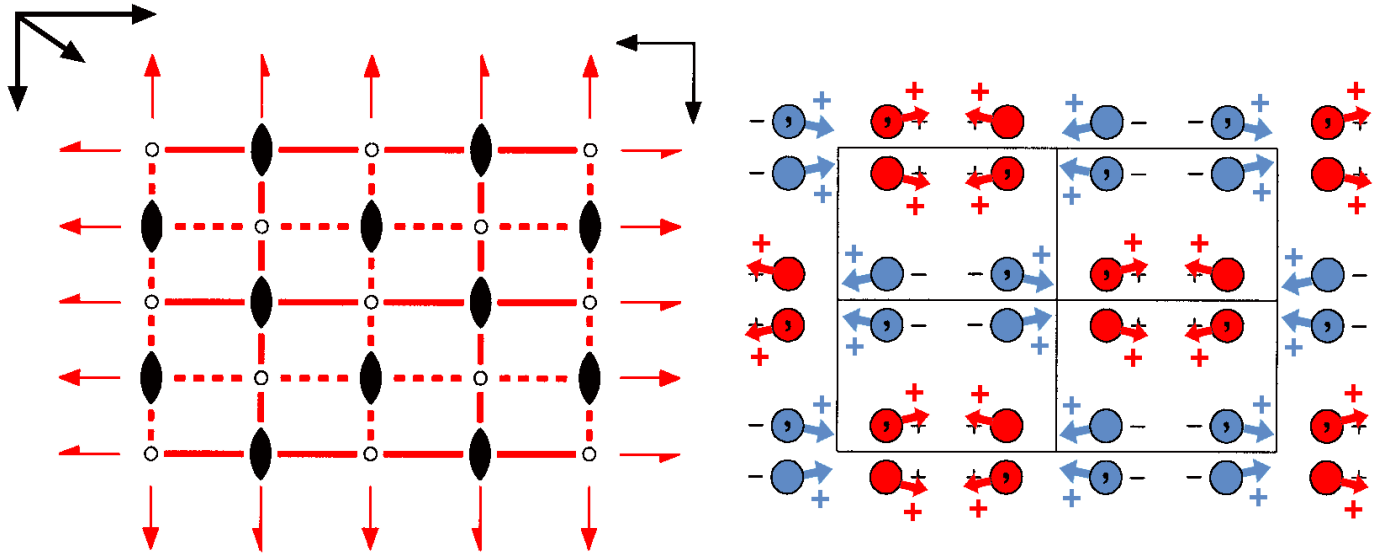
cm'm'e

No. 48.4.346

m'm'm

c2'/m'2'/m'2'/e

Orthorhombic/Rectangular



Origin at center ($2'/m'$) at $2'/m'2',/a'e$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4 \quad 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,1/4,z$
(2 _z 0,1/2,0) | (3) 2' (0,1/2,0) $0,y,0$
(2 _y 0,1/2,0)' | (4) 2' $x,0,0$
(2 _x 0,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) b (0,1/2,0) $x,y,0$
(m _z 0,1/2,0) | (7) m' $x,1/4,z$
(m _y 0,1/2,0)' | (8) m' $0,y,z$
(m _x 0,0,0)' |

For (1/2,1/2,0) + set

- | | | | |
|--|--|--|--|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) 2 $1/4,0,z$
(2 _z 1/2,0,0) | (3) 2' $1/4,y,0$
(2 _y 1/2,0,0)' | (4) 2' (1/2,0,0) $x,1/4,0$
(2 _x 1/2,1/2,0)' |
| (5) $\bar{1}$ $1/4,1/4,0$
($\bar{1}$ 1/2,1/2,0) | (6) a (1/2,0,0) $x,y,0$
(m _z 1/2,0,0) | (7) a' (1/2,0,0) $x,0,z$
(m _y 1/2,0,0)' | (8) b' (0,1/2,0) $1/4,y,z$
(m _x 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); t(1/2,1/2,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0) +		
16 j 1	(1) x,y,z [u,v,w]	(2) $\bar{x},\bar{y}+1/2,z$ [\bar{u},\bar{v},w]	(3) $\bar{x},y+1/2,\bar{z}$ [u, \bar{v},w]	(4) x, \bar{y},\bar{z} [\bar{u},v,w]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y+1/2, \bar{z} [\bar{u},\bar{v},w]	(7) x, $\bar{y}+1/2,z$ [u, \bar{v},w]	(8) \bar{x},y,z [\bar{u},v,w]
8 i .m'	x,1/4,z [u,0,w]	$\bar{x},1/4,z$ [$\bar{u},0,w$]	$\bar{x},3/4,\bar{z}$ [u,0,w]	x,3/4, \bar{z} [$\bar{u},0,w$]
8 h m'..	0,y,z [0,v,w]	0, $\bar{y}+1/2,z$ [0, \bar{v},w]	0,y+1/2, \bar{z} [0, \bar{v},w]	0, \bar{y},\bar{z} [0,v,w]
8 g ..2	1/4,0,z [0,0,w]	3/4,1/2, \bar{z} [0,0,w]	3/4,0, \bar{z} [0,0,w]	1/4,1/2,z [0,0,w]
8 f .2'	1/4,y,0 [u,0,w]	3/4, $\bar{y}+1/2,0$ [$\bar{u},0,w$]	3/4, $\bar{y},0$ [u,0,w]	1/4,y+1/2,0 [$\bar{u},0,w$]
8 e 2'..	x,0,0 [0,v,w]	$\bar{x},1/2,0$ [0, \bar{v},w]	$\bar{x},0,0$ [0,v,w]	x,1/2,0 [0, \bar{v},w]
4 d m'm'2	0,1/4,z [0,0,w]	0,3/4, \bar{z} [0,0,w]		
4 c .2'/m'	1/4,1/4,0 [u,0,w]	3/4,1/4,0 [$\bar{u},0,w$]		
4 b 2'/m'..	0,0,0 [0,v,w]	0,1/2,0 [0, \bar{v},w]		
4 a 2'2'2	1/4,0,0 [0,0,w]	3/4,0,0 [0,0,w]		

Symmetry of special projections

Along [001] $p_{2a^*}2mm$	Along [100] $p2'm'm$	Along [010] $p2'm'm$
$a^* = a/2$ $b^* = b/2$	$a^* = b/2$	$a^* = a/2$
Origin at 1/4,0,z	Origin at x,0,0	Origin at 0,y,0

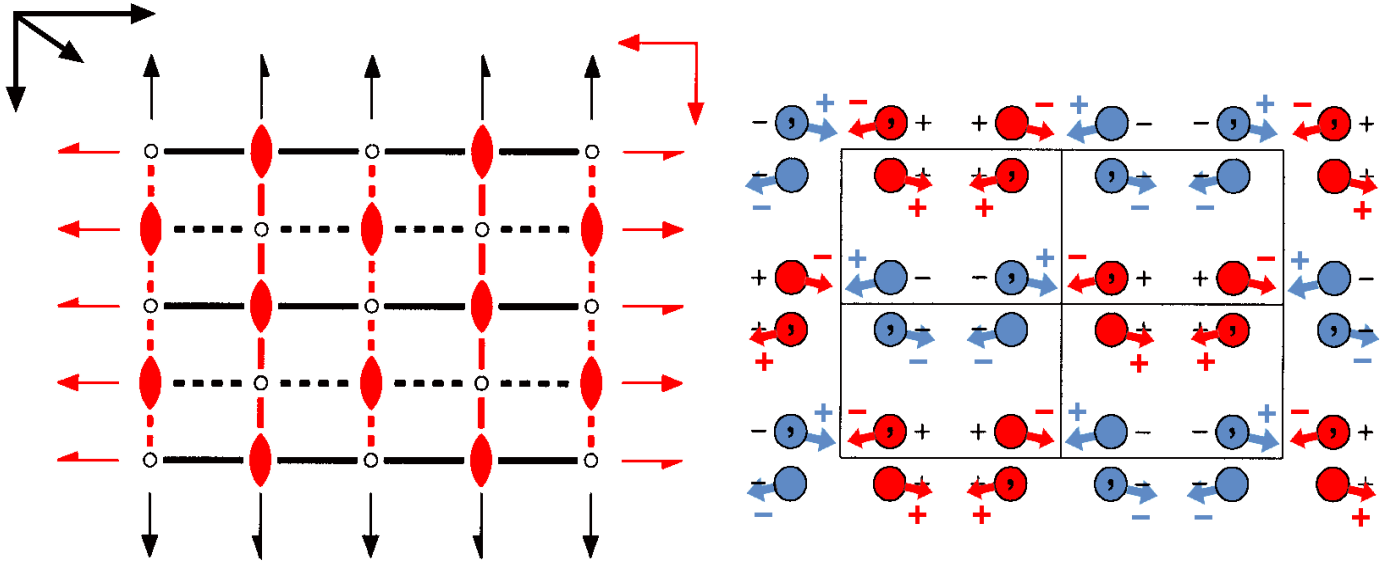
cmm'e'

No. 48.5.347

mm'm'

c2/m2'/m'2'/e'

Orthorhombic/Rectangular



Origin at center (2/m) at 2/m2,'a'e'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4 \quad 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2' 0,1/4,z
(2 _z 0,1/2,0)' | (3) 2' (0,1/2,0) 0,y,0
(2 _y 0,1/2,0)' | (4) 2 x,0,0
(2 _x 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) b' (0,1/2,0) x,y,0
(m _z 0,1/2,0)' | (7) m' x,1/4,z
(m _y 0,1/2,0)' | (8) m 0,y,z
(m _x 0,0,0) |

For (1/2,1/2,0) + set

- | | | | |
|--|--|--|--|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) 2' 1/4,0,z
(2 _z 1/2,0,0)' | (3) 2' 1/4,y,0
(2 _y 1/2,0,0)' | (4) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) |
| (5) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (6) a' (1/2,0,0) x,y,0
(m _z 1/2,0,0)' | (7) a' (1/2,0,0) x,0,z
(m _y 1/2,0,0)' | (8) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0) +		
16 j 1	(1) x,y,z [u,v,w]	(2) $\bar{x},\bar{y}+1/2,z$ [u,v, \bar{w}]	(3) $\bar{x},y+1/2,\bar{z}$ [u, \bar{v} ,w]	(4) x,\bar{y},\bar{z} [u, \bar{v},\bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x,y+1/2,\bar{z}$ [u,v, \bar{w}]	(7) $x,\bar{y}+1/2,z$ [u, \bar{v} ,w]	(8) \bar{x},y,z [u, \bar{v},\bar{w}]
8 i .m'	$x,1/4,z$ [u,0,w]	$\bar{x},1/4,z$ [u,0, \bar{w}]	$\bar{x},3/4,\bar{z}$ [u,0,w]	$x,3/4,\bar{z}$ [u,0, \bar{w}]
8 h m..	$0,y,z$ [u,0,0]	$0,\bar{y}+1/2,z$ [u,0,0]	$0,y+1/2,\bar{z}$ [u,0,0]	$0,\bar{y},\bar{z}$ [u,0,0]
8 g ..2'	$1/4,0,z$ [u,v,0]	$3/4,1/2,\bar{z}$ [u, \bar{v} ,0]	$3/4,0,\bar{z}$ [u,v,0]	$1/4,1/2,z$ [u, \bar{v} ,0]
8 f .2'	$1/4,y,0$ [u,0,w]	$3/4,\bar{y}+1/2,0$ [u,0, \bar{w}]	$3/4,\bar{y},0$ [u,0,w]	$1/4,y+1/2,0$ [u,0, \bar{w}]
8 e 2..	$x,0,0$ [u,0,0]	$\bar{x},1/2,0$ [u,0,0]	$\bar{x},0,0$ [u,0,0]	$x,1/2,0$ [u,0,0]
4 d mm'2'	$0,1/4,z$ [u,0,0]	$0,3/4,\bar{z}$ [u,0,0]		
4 c .2'/m'	$1/4,1/4,0$ [u,0,w]	$3/4,1/4,0$ [u,0, \bar{w}]		
4 b 2/m..	$0,0,0$ [u,0,0]	$0,1/2,0$ [u,0,0]		
4 a 22'2'	$1/4,0,0$ [u,0,0]	$3/4,0,0$ [u,0,0]		

Symmetry of special projections

Along [001] $p2'mm'$ $a^* = a/2$ $b^* = b/2$ Origin at 0,0,z	Along [100] $p2mm1'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2'mm'$ $a^* = a/2$ Origin at 0,y,0
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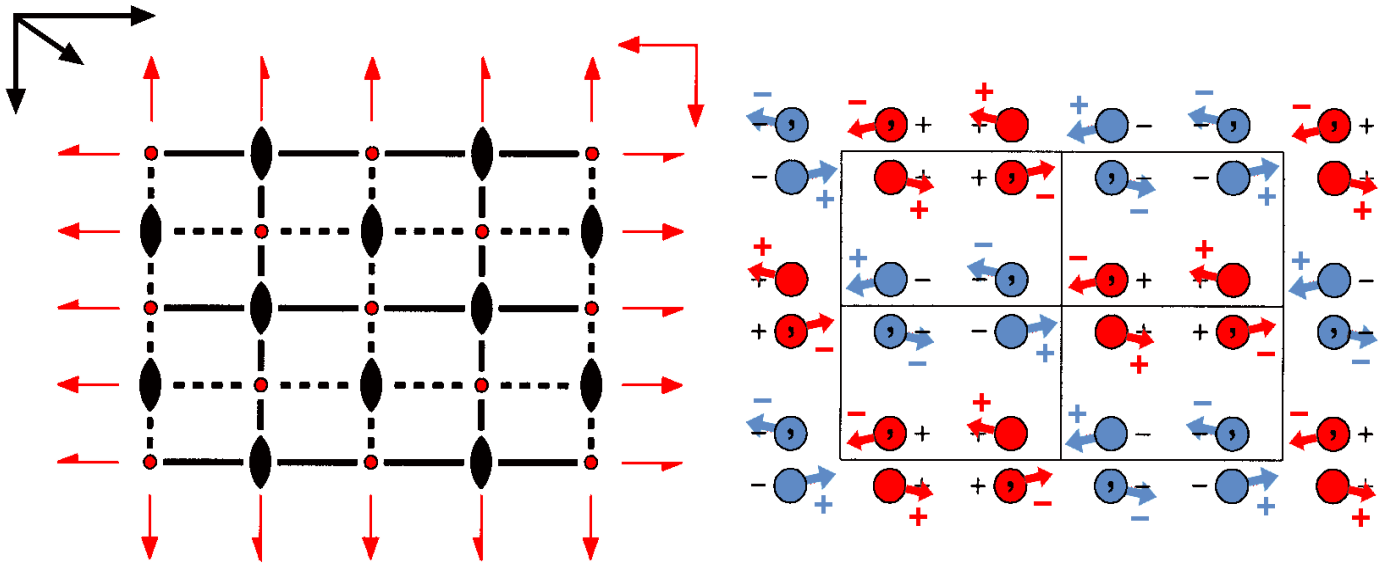
cmme'

No. 48.6.348

mmm'

c2'/m2'/m2'/e'

Orthorhombic/Rectangular



Origin at center ($2'/m$) at $2'/m2_1'/ae'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4; 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,1/4,z
(2 _z 0,1/2,0) | (3) 2' _y (0,1/2,0) 0,y,0
(2' _y 0,1/2,0)' | (4) 2' _x x,0,0
(2' _x 0,0,0)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ ' 0,0,0)' | (6) b' _z (0,1/2,0) x,y,0
(m _z 0,1/2,0)' | (7) m _y x,1/4,z
(m _y 0,1/2,0) | (8) m _x 0,y,z
(m _x 0,0,0) |

For (1/2,1/2,0) + set

- | | | | |
|--|---|---|--|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) 2 _z 1/4,0,z
(2 _z 1/2,0,0) | (3) 2' _y 1/4,y,0
(2' _y 1/2,0,0)' | (4) 2' _x (1/2,0,0) x,1/4,0
(2' _x 1/2,1/2,0)' |
| (5) $\bar{1}$ ' 1/4,1/4,0
($\bar{1}$ ' 1/2,1/2,0)' | (6) a' _z (1/2,0,0) x,y,0
(m _z 1/2,0,0)' | (7) a _y (1/2,0,0) x,0,z
(m _y 1/2,0,0) | (8) b _x (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0) +		
16 j 1	(1) $x,y,z [u,v,w]$ (5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(2) $\bar{x},\bar{y}+1/2,z [\bar{u},\bar{v},w]$ (6) $x,y+1/2,\bar{z} [u,v,\bar{w}]$	(3) $\bar{x},y+1/2,\bar{z} [u,\bar{v},w]$ (7) $x,\bar{y}+1/2,z [\bar{u},v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$ (8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
8 i .m.	$x,1/4,z [0,v,0]$	$\bar{x},1/4,z [0,\bar{v},0]$	$\bar{x},3/4,\bar{z} [0,\bar{v},0]$	$x,3/4,\bar{z} [0,v,0]$
8 h m..	$0,y,z [u,0,0]$	$0,\bar{y}+1/2,z [\bar{u},0,0]$	$0,y+1/2,\bar{z} [u,0,0]$	$0,\bar{y},\bar{z} [\bar{u},0,0]$
8 g ..2	$1/4,0,z [0,0,w]$	$3/4,1/2,\bar{z} [0,0,w]$	$3/4,0,\bar{z} [0,0,\bar{w}]$	$1/4,1/2,z [0,0,\bar{w}]$
8 f .2'.	$1/4,y,0 [u,0,w]$	$3/4,\bar{y}+1/2,0 [\bar{u},0,w]$	$3/4,\bar{y},0 [\bar{u},0,\bar{w}]$	$1/4,y+1/2,0 [u,0,\bar{w}]$
8 e 2'..	$x,0,0 [0,v,w]$	$\bar{x},1/2,0 [0,\bar{v},w]$	$\bar{x},0,0 [0,\bar{v},\bar{w}]$	$x,1/2,0 [0,v,\bar{w}]$
4 d mm2	$0,1/4,z [0,0,0]$	$0,3/4,\bar{z} [0,0,0]$		
4 c .2'/m.	$1/4,1/4,0 [0,0,0]$	$3/4,1/4,0 [0,0,0]$		
4 b 2'/m..	$0,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$		
4 a 2'2'2	$1/4,0,0 [0,0,w]$	$3/4,0,0 [0,0,\bar{w}]$		

Symmetry of special projections

Along [001] $p2mm$
 $a^* = a/2$ $b^* = b/2$
 Origin at 0,0,z

Along [100] $p2mm1'$
 $a^* = b/2$
 Origin at x,0,0

Along [010] $p2mm1'$
 $a^* = a/2$
 Origin at 0,y,0

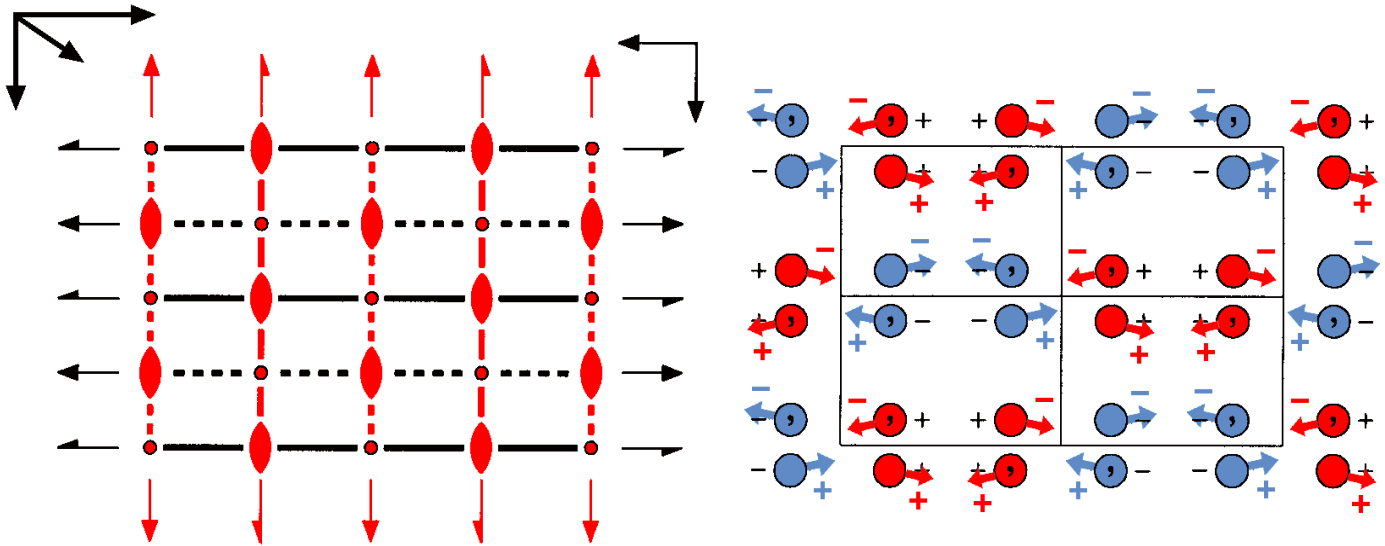
cmm'e

No. 48.7.349

mm'm

c2'/m2/m'2'/e

Orthorhombic/Rectangular



Origin at center ($2'/m$) at $2'/m2_1/a'e$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4; 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) $2'_z$ 0,1/4,z
(2 _z 0,1/2,0)' | (3) 2 (0,1/2,0) 0,y,0
(2 _y 0,1/2,0) | (4) $2'_x$ x,0,0
(2 _x 0,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) b (0,1/2,0) x,y,0
(m _z 0,1/2,0) | (7) m' x,1/4,z
(m _y 0,1/2,0)' | (8) m 0,y,z
(m _x 0,0,0) |

For (1/2,1/2,0) + set

- | | | | |
|---|--|--|--|
| (1) t (1/2,1/2,0)
(1 1/2,1/2,0) | (2) $2'_z$ 1/4,0,z
(2 _z 1/2,0,0)' | (3) 2 1/4,y,0
(2 _y 1/2,0,0) | (4) $2'_x$ (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0)' |
| (5) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0)' | (6) a (1/2,0,0) x,y,0
(m _z 1/2,0,0) | (7) a' (1/2,0,0) x,0,z
(m _y 1/2,0,0)' | (8) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0) +		
16 j 1	(1) $x,y,z [u,v,w]$ (5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(2) $\bar{x},\bar{y}+1/2,z [u,v,\bar{w}]$ (6) $x,y+1/2,\bar{z} [\bar{u},\bar{v},w]$	(3) $\bar{x},y+1/2,\bar{z} [\bar{u},v,\bar{w}]$ (7) $x,\bar{y}+1/2,z [u,\bar{v},w]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$ (8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
8 i .m'	$x,1/4,z [u,0,w]$	$\bar{x},1/4,z [u,0,\bar{w}]$	$\bar{x},3/4,\bar{z} [\bar{u},0,\bar{w}]$	$x,3/4,\bar{z} [\bar{u},0,w]$
8 h m..	$0,y,z [u,0,0]$	$0,\bar{y}+1/2,z [u,0,0]$	$0,y+1/2,\bar{z} [\bar{u},0,0]$	$0,\bar{y},\bar{z} [\bar{u},0,0]$
8 g ..2'	$1/4,0,z [u,v,0]$	$3/4,1/2,\bar{z} [\bar{u},v,0]$	$3/4,0,\bar{z} [\bar{u},\bar{v},0]$	$1/4,1/2,z [u,\bar{v},0]$
8 f .2.	$1/4,y,0 [0,v,0]$	$3/4,\bar{y}+1/2,0 [0,v,0]$	$3/4,\bar{y},0 [0,\bar{v},0]$	$1/4,y+1/2,0 [0,\bar{v},0]$
8 e 2'..	$x,0,0 [0,v,w]$	$\bar{x},1/2,0 [0,v,\bar{w}]$	$\bar{x},0,0 [0,\bar{v},\bar{w}]$	$x,1/2,0 [0,\bar{v},w]$
4 d mm'2'	$0,1/4,z [u,0,0]$	$0,3/4,\bar{z} [\bar{u},0,0]$		
4 c .2/m'	$1/4,1/4,0 [0,0,0]$	$3/4,1/4,0 [0,0,0]$		
4 b 2'/m..	$0,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$		
4 a 2'22'	$1/4,0,0 [0,v,0]$	$3/4,0,0 [0,\bar{v},0]$		

Symmetry of special projections

Along [001] $p2'mm'$ $a^* = a/2$ $b^* = b/2$ Origin at 0,0,z	Along [100] $p2mm1'$ $a^* = b/2$ Origin at x,0,0	Along [010] $p2'mm'$ $a^* = a/2$ Origin at 0,y,0
--	--	--

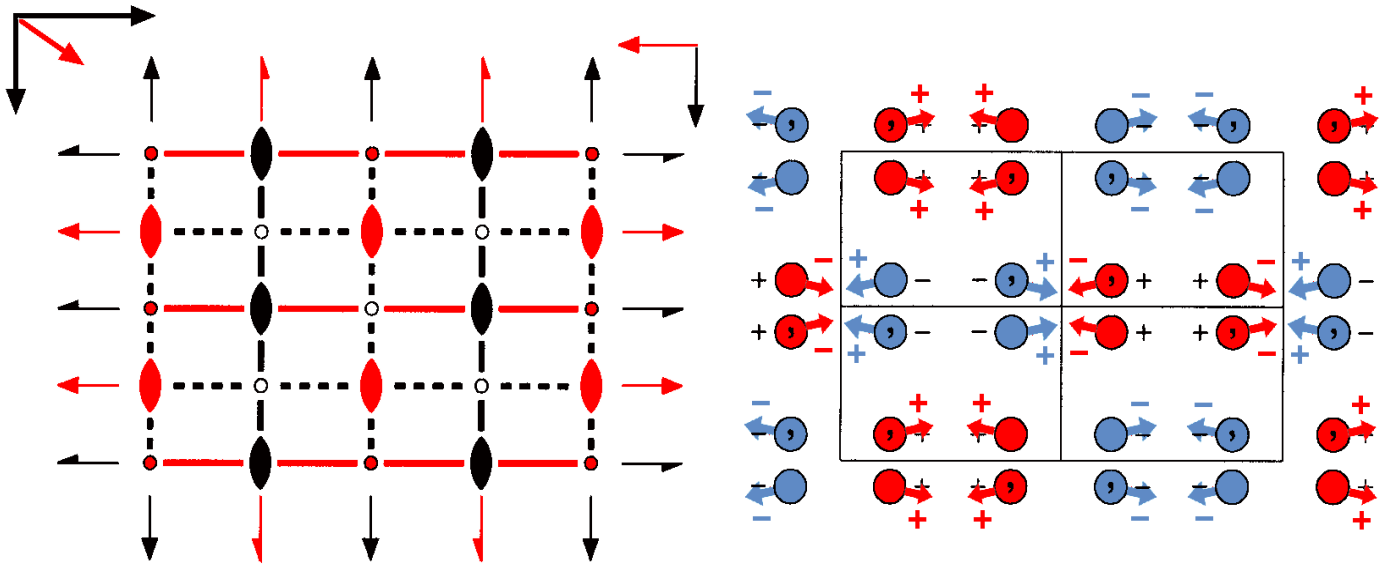
$c_p m' m' e'$

No. 48.8.350

$mmm1'$

$c_p 2/m' 2/m' 2/e'$

Orthorhombic/Rectangular



Origin at center ($2/m'$) at $2/m' 2_1/a e'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0, 1/4, z$
(2 _z 0,1/2,0) | (3) 2 $(0, 1/2, 0)$ $0, y, 0$
(2 _y 0,1/2,0) | (4) 2 $x, 0, 0$
(2 _x 0,0,0) |
| (5) $\bar{1}'$ $0, 0, 0$
($\bar{1}'$ 0,0,0)' | (6) b' $(0, 1/2, 0)$ $x, y, 0$
(m _z 0,1/2,0)' | (7) m' $x, 1/4, z$
(m _y 0,1/2,0)' | (8) m' $0, y, z$
(m _x 0,0,0)' |

For $(1/2, 1/2, 0)'$ + set

- | | | | |
|--|--|--|--|
| (1) t' $(1/2, 1/2, 0)$
(1 1/2,1/2,0)' | (2) 2' $1/4, 0, z$
(2 _z 1/2,0,0)' | (3) 2' $1/4, y, 0$
(2 _y 1/2,0,0)' | (4) 2' $(1/2, 0, 0)$ $x, 1/4, 0$
(2 _x 1/2,1/2,0)' |
| (5) $\bar{1}'$ $1/4, 1/4, 0$
($\bar{1}'$ 1/2,1/2,0) | (6) a $(1/2, 0, 0)$ $x, y, 0$
(m _z 1/2,0,0) | (7) a $(1/2, 0, 0)$ $x, 0, z$
(m _y 1/2,0,0) | (8) b $(0, 1/2, 0)$ $1/4, y, z$
(m _x 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0)' +		
16 j 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y}+1/2,z [\bar{u},\bar{v},w]$	(3) $\bar{x},y+1/2,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$
	(5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(6) $x,y+1/2,\bar{z} [u,v,\bar{w}]$	(7) $x,\bar{y}+1/2,z [u,\bar{v},w]$	(8) $\bar{x},y,z [\bar{u},v,w]$
8 i .m'	$x,1/4,z [u,0,w]$	$\bar{x},1/4,z [\bar{u},0,w]$	$\bar{x},3/4,\bar{z} [\bar{u},0,\bar{w}]$	$x,3/4,\bar{z} [u,0,\bar{w}]$
8 h m'..	$0,y,z [0,v,w]$	$0,\bar{y}+1/2,z [0,\bar{v},w]$	$0,y+1/2,\bar{z} [0,v,\bar{w}]$	$0,\bar{y},\bar{z} [0,\bar{v},\bar{w}]$
8 g ..2'	$1/4,0,z [u,v,0]$	$3/4,1/2,\bar{z} [\bar{u},v,0]$	$3/4,0,\bar{z} [\bar{u},\bar{v},0]$	$1/4,1/2,z [u,\bar{v},0]$
8 f .2'	$1/4,y,0 [u,0,w]$	$3/4,\bar{y}+1/2,0 [\bar{u},0,w]$	$3/4,\bar{y},0 [\bar{u},0,\bar{w}]$	$1/4,y+1/2,0 [u,0,\bar{w}]$
8 e 2..	$x,0,0 [u,0,0]$	$\bar{x},1/2,0 [\bar{u},0,0]$	$\bar{x},0,0 [\bar{u},0,0]$	$x,1/2,0 [u,0,0]$
4 d m'm'2	$0,1/4,z [0,0,w]$	$0,3/4,\bar{z} [0,0,\bar{w}]$		
4 c .2'/m'	$1/4,1/4,0 [u,0,w]$	$3/4,1/4,0 [\bar{u},0,w]$		
4 b 2/m'..	$0,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$		
4 a 22'2'	$1/4,0,0 [u,0,0]$	$3/4,0,0 [\bar{u},0,0]$		

Symmetry of special projections

Along [001] $p_{2a^*}2mm$ $a^* = a/2$ $b^* = b/2$ Origin at $1/4,0,z$	Along [100] $p_{2a^*}2mm$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p_{2a^*}2m'm'$ $a^* = a/2$ Origin at $0,y,0$
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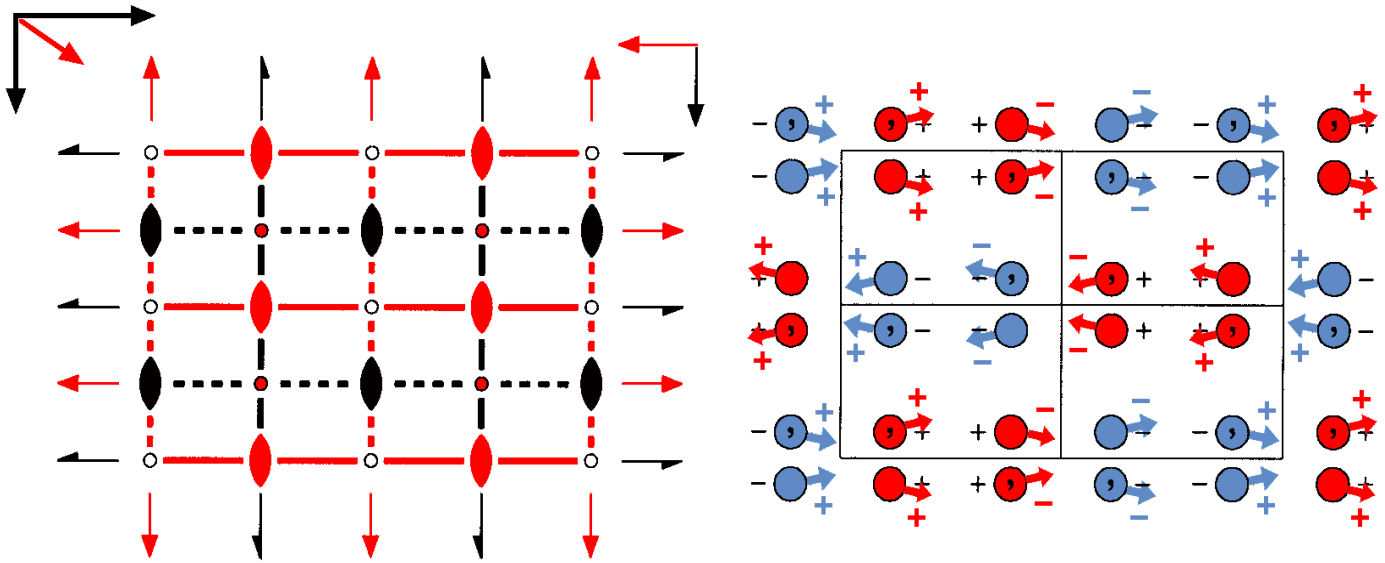
$c_p m' m e'$

No. 48.9.351

$m m m 1'$

$c_p 2'/m'2/m2'/e'$

Orthorhombic/Rectangular



Origin at center ($2'/m'$) at $2'/m'2',/a'e'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4 \quad 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|---|--|---------------------------------------|
| (1) 1
(1 0,0,0) | (2) $2'_z$ 0,1/4,z
($2'_z$ 0,1/2,0)' | (3) 2 (0,1/2,0) 0,y,0
(2_y 0,1/2,0) | (4) $2'_x$ x,0,0
($2'_x$ 0,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) b'_z (0,1/2,0) x,y,0
(m'_z 0,1/2,0)' | (7) m'_x x,1/4,z
(m'_y 0,1/2,0) | (8) m'_y 0,y,z
(m'_x 0,0,0)' |

For (1/2,1/2,0)' + set

- | | | | |
|---|--|---|--|
| (1) t' (1/2,1/2,0)
(1 1/2,1/2,0)' | (2) 2 1/4,0,z
(2_z 1/2,0,0) | (3) $2'_y$ 1/4,y,0
($2'_y$ 1/2,0,0)' | (4) 2 (1/2,0,0) x,1/4,0
(2_x 1/2,1/2,0) |
| (5) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0)' | (6) a'_z (1/2,0,0) x,y,0
(m'_z 1/2,0,0) | (7) a'_y (1/2,0,0) x,0,z
(m'_y 1/2,0,0)' | (8) b'_x (0,1/2,0) 1/4,y,z
(m'_x 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0)' +		
16 j 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y}+1/2,z [u,v,\bar{w}]$	(3) $\bar{x},y+1/2,\bar{z} [\bar{u},v,\bar{w}]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$
	(5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(6) $x,y+1/2,\bar{z} [u,v,\bar{w}]$	(7) $x,\bar{y}+1/2,z [\bar{u},v,\bar{w}]$	(8) $\bar{x},y,z [\bar{u},v,w]$
8 i .m.	$x,1/4,z [0,v,0]$	$\bar{x},1/4,z [0,v,0]$	$\bar{x},3/4,\bar{z} [0,v,0]$	$x,3/4,\bar{z} [0,v,0]$
8 h m'..	$0,y,z [0,v,w]$	$0,\bar{y}+1/2,z [0,v,\bar{w}]$	$0,y+1/2,\bar{z} [0,v,\bar{w}]$	$0,\bar{y},\bar{z} [0,v,w]$
8 g ..2	$1/4,0,z [0,0,w]$	$3/4,1/2,\bar{z} [0,0,\bar{w}]$	$3/4,0,\bar{z} [0,0,w]$	$1/4,1/2,z [0,0,\bar{w}]$
8 f .2'.	$1/4,y,0 [u,0,w]$	$3/4,\bar{y}+1/2,0 [u,0,\bar{w}]$	$3/4,\bar{y},0 [u,0,w]$	$1/4,y+1/2,0 [u,0,\bar{w}]$
8 e 2'..	$x,0,0 [0,v,w]$	$\bar{x},1/2,0 [0,v,\bar{w}]$	$\bar{x},0,0 [0,v,w]$	$x,1/2,0 [0,v,\bar{w}]$
4 d m'm2'	$0,1/4,z [0,v,0]$	$0,3/4,\bar{z} [0,v,0]$		
4 c .2'/m.	$1/4,1/4,0 [0,v,0]$	$3/4,1/4,0 [0,v,0]$		
4 b 2'/m'..	$0,0,0 [0,v,w]$	$0,1/2,0 [0,v,\bar{w}]$		
4 a 2'2'2	$1/4,0,0 [0,0,w]$	$3/4,0,0 [0,0,w]$		

Symmetry of special projections

Along [001] $p_{2a^*}2mm$ $a^* = a/2$ $b^* = b/2$ Origin at $1/4,0,z$	Along [100] $p_{2a^*}2mm$ $a^* = b/2$ Origin at $x,1/4,0$	Along [010] $p2mm1'$ $a^* = a/2$ Origin at $0,y,0$
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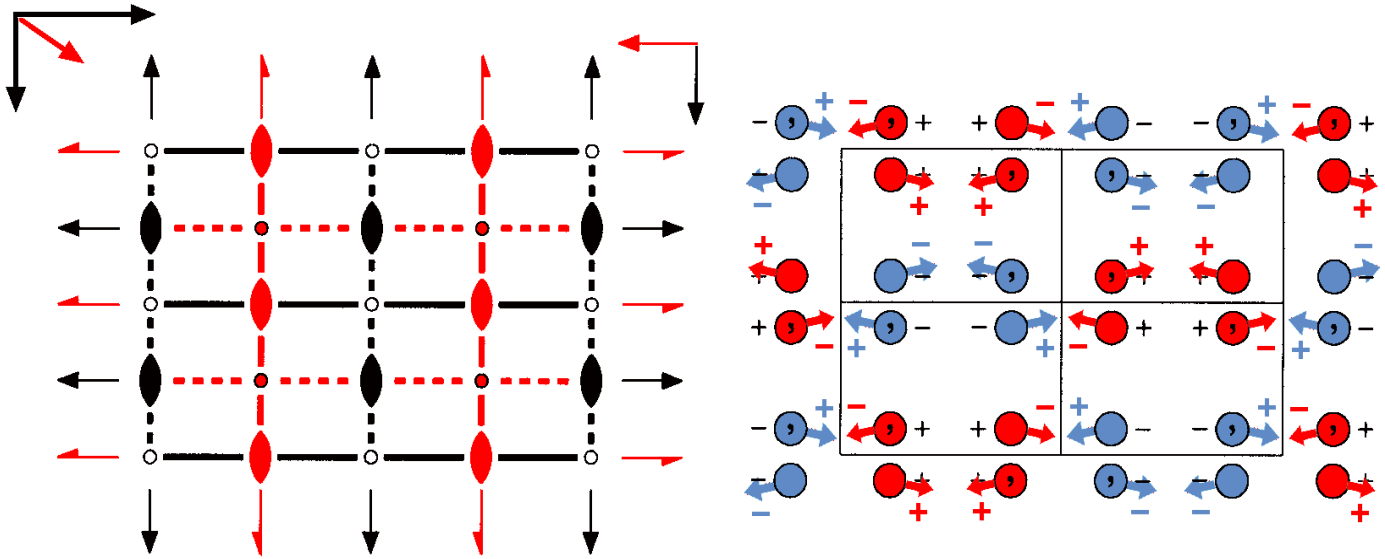
$c_p, mm'e'$

No. 48.10.352

$mmm1'$

$c_p 2/m2'/m'2'/e'$

Orthorhombic/Rectangular



Origin at center ($2/m$) at $2/m2', ae'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4 \quad 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--|--|---|
| (1) 1
(1 0,0,0) | (2) $2'_z$ $0, 1/4, z$
(2_z $0, 1/2, 0$)' | (3) $2'_y$ $(0, 1/2, 0)$ $0, y, 0$
(2_y $0, 1/2, 0$)' | (4) $2'_x$ $x, 0, 0$
(2_x $0, 0, 0$) |
| (5) $\bar{1}$ $0, 0, 0$
($\bar{1}$ $0, 0, 0$) | (6) b'_z $(0, 1/2, 0)$ $x, y, 0$
(m_z $0, 1/2, 0$)' | (7) m'_y $x, 1/4, z$
(m_y $0, 1/2, 0$)' | (8) m'_x $0, y, z$
(m_x $0, 0, 0$) |

For $(1/2, 1/2, 0)$ ' + set

- | | | | |
|---|---|---|--|
| (1) t' $(1/2, 1/2, 0)$
(1 $1/2, 1/2, 0$)' | (2) $2'_z$ $1/4, 0, z$
(2_z $1/2, 0, 0$) | (3) $2'_y$ $1/4, y, 0$
(2_y $1/2, 0, 0$) | (4) $2'_x$ $(1/2, 0, 0)$ $x, 1/4, 0$
(2_x $1/2, 1/2, 0$)' |
| (5) $\bar{1}$ $1/4, 1/4, 0$
($\bar{1}$ $1/2, 1/2, 0$)' | (6) a'_z $(1/2, 0, 0)$ $x, y, 0$
(m_z $1/2, 0, 0$) | (7) a'_y $(1/2, 0, 0)$ $x, 0, z$
(m_y $1/2, 0, 0$) | (8) b'_x $(0, 1/2, 0)$ $1/4, y, z$
(m_x $1/2, 1/2, 0$)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0)' +		
16 j 1	(1) x,y,z [u,v,w]	(2) $\bar{x},\bar{y}+1/2,z$ [u,v, \bar{w}]	(3) $\bar{x},y+1/2,\bar{z}$ [u, \bar{v} ,w]	(4) x,\bar{y},\bar{z} [u, \bar{v},\bar{w}]
	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) $x,y+1/2,\bar{z}$ [u,v, \bar{w}]	(7) $x,\bar{y}+1/2,z$ [u, \bar{v} ,w]	(8) \bar{x},y,z [u, \bar{v},\bar{w}]
8 i .m'	$x,1/4,z$ [u,0,w]	$\bar{x},1/4,z$ [u,0, \bar{w}]	$\bar{x},3/4,\bar{z}$ [u,0,w]	$x,3/4,\bar{z}$ [u,0, \bar{w}]
8 h m..	$0,y,z$ [u,0,0]	$0,\bar{y}+1/2,z$ [u,0,0]	$0,y+1/2,\bar{z}$ [u,0,0]	$0,\bar{y},\bar{z}$ [u,0,0]
8 g ..2	$1/4,0,z$ [0,0,w]	$3/4,1/2,\bar{z}$ [0,0,w]	$3/4,0,\bar{z}$ [0,0,w]	$1/4,1/2,z$ [0,0,w]
8 f .2.	$1/4,y,0$ [0,v,0]	$3/4,\bar{y}+1/2,0$ [0,v,0]	$3/4,\bar{y},0$ [0,v,0]	$1/4,y+1/2,0$ [0,v,0]
8 e 2..	$x,0,0$ [u,0,0]	$\bar{x},1/2,0$ [u,0,0]	$\bar{x},0,0$ [u,0,0]	$x,1/2,0$ [u,0,0]
4 d mm'2'	$0,1/4,z$ [u,0,0]	$0,3/4,\bar{z}$ [u,0,0]		
4 c .2/m'	$1/4,1/4,0$ [0,0,0]	$3/4,1/4,0$ [0,0,0]		
4 b 2/m..	$0,0,0$ [u,0,0]	$0,1/2,0$ [u,0,0]		
4 a 222	$1/4,0,0$ [0,0,0]	$3/4,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] $p_{2a^*}2m'm'$ $a^* = a/2$ $b^* = b/2$ Origin at $1/4,0,z$	Along [100] $p2mm1'$ $a^* = b/2$ Origin at $x,0,0$	Along [010] $p_{2a^*}2m'm'$ $a^* = a/2$ Origin at $1/4,y,0$
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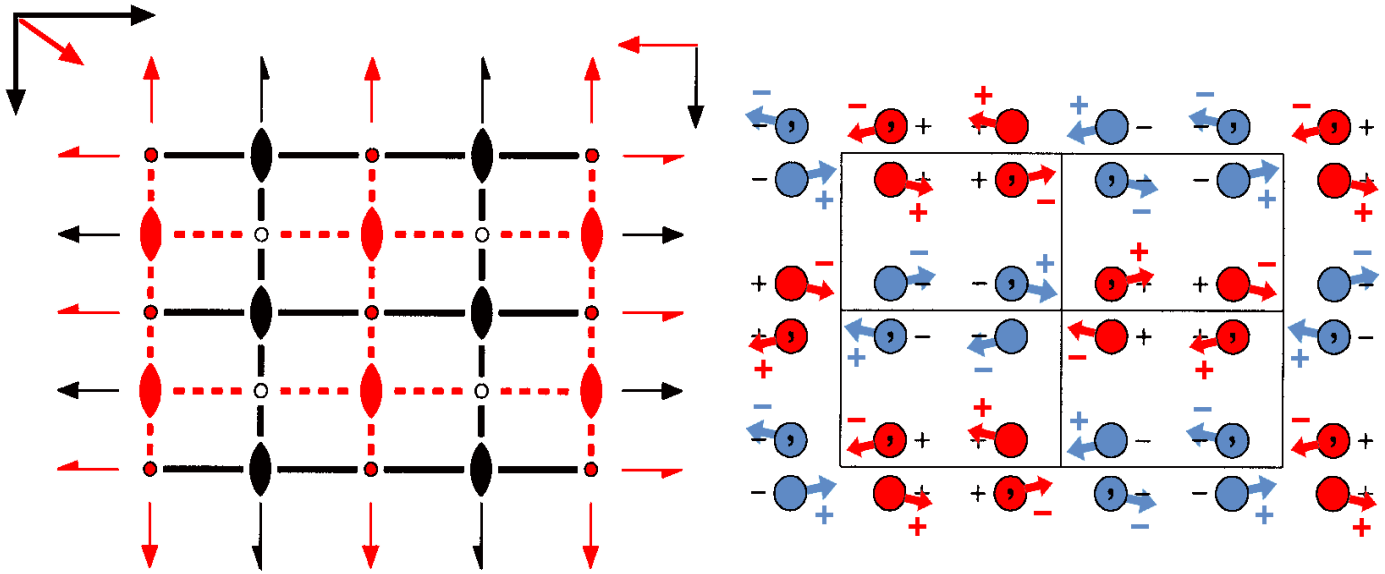
$c_p m m e'$

No. 48.11.353

$m m m 1'$

$c_p 2'/m2'/m2/e'$

Orthorhombic/Rectangular



Origin at center ($2'/m$) at $2'/m2_1/a'e'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/4; 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|---|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,1/4,z$
(2 _z 0,1/2,0) | (3) 2' (0,1/2,0) $0,y,0$
(2 _y 0,1/2,0)' | (4) 2' $x,0,0$
(2 _x 0,0,0)' |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (6) b' (0,1/2,0) $x,y,0$
(m _z 0,1/2,0)' | (7) m $x,1/4,z$
(m _y 0,1/2,0) | (8) m $0,y,z$
(m _x 0,0,0) |

For (1/2,1/2,0)' + set

- | | | | |
|--|--|--|--|
| (1) t' (1/2,1/2,0)
(1 1/2,1/2,0)' | (2) 2' $1/4,0,z$
(2 _z 1/2,0,0)' | (3) 2 $1/4,y,0$
(2 _y 1/2,0,0) | (4) 2 (1/2,0,0) $x,1/4,0$
(2 _x 1/2,1/2,0) |
| (5) $\bar{1}$ $1/4,1/4,0$
($\bar{1}$ 1/2,1/2,0) | (6) a (1/2,0,0) $x,y,0$
(m _z 1/2,0,0) | (7) a' (1/2,0,0) $x,0,z$
(m _y 1/2,0,0)' | (8) b' (0,1/2,0) $1/4,y,z$
(m _x 1/2,1/2,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; $t(1/2,1/2,0)'$; (2); (3); (5)

Positions

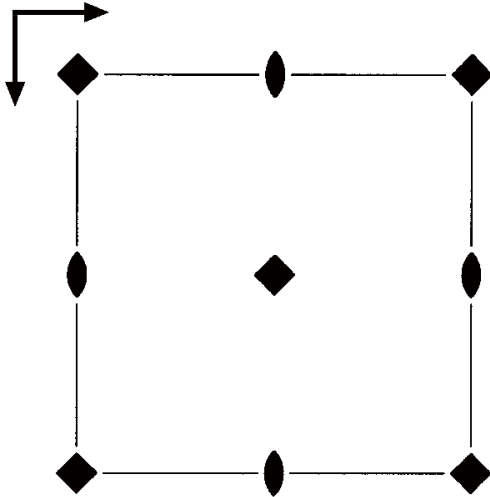
Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +	(1/2,1/2,0)' +		
16 j 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y}+1/2,z [\bar{u},\bar{v},w]$	(3) $\bar{x},y+1/2,\bar{z} [u,\bar{v},w]$	(4) $x,\bar{y},\bar{z} [\bar{u},v,w]$
	(5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(6) $x,y+1/2,\bar{z} [u,v,\bar{w}]$	(7) $x,\bar{y}+1/2,z [\bar{u},v,\bar{w}]$	(8) $\bar{x},y,z [u,\bar{v},\bar{w}]$
8 i .m.	$x,1/4,z [0,v,0]$	$\bar{x},1/4,z [0,\bar{v},0]$	$\bar{x},3/4,\bar{z} [0,\bar{v},0]$	$x,3/4,\bar{z} [0,v,0]$
8 h m..	$0,y,z [u,0,0]$	$0,\bar{y}+1/2,z [\bar{u},0,0]$	$0,y+1/2,\bar{z} [u,0,0]$	$0,\bar{y},\bar{z} [\bar{u},0,0]$
8 g ..2'	$1/4,0,z [u,v,0]$	$3/4,1/2,\bar{z} [u,\bar{v},0]$	$3/4,0,\bar{z} [\bar{u},\bar{v},0]$	$1/4,1/2,z [\bar{u},v,0]$
8 f .2.	$1/4,y,0 [0,v,0]$	$3/4,\bar{y}+1/2,0 [0,\bar{v},0]$	$3/4,\bar{y},0 [0,\bar{v},0]$	$1/4,y+1/2,0 [0,v,0]$
8 e 2'..	$x,0,0 [0,v,w]$	$\bar{x},1/2,0 [0,\bar{v},w]$	$\bar{x},0,0 [0,\bar{v},\bar{w}]$	$x,1/2,0 [0,v,\bar{w}]$
4 d mm2	$0,1/4,z [0,0,0]$	$0,3/4,\bar{z} [0,0,0]$		
4 c .2/m.	$1/4,1/4,0 [0,v,0]$	$3/4,1/4,0 [0,\bar{v},0]$		
4 b 2'/m..	$0,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$		
4 a 2'22'	$1/4,0,0 [0,v,0]$	$3/4,0,0 [0,\bar{v},0]$		

Symmetry of special projections

Along [001] $p_{2a^*}2mm$	Along [100] $p2mm1'$	Along [010] $p2mm1'$
$a^* = a/2$ $b^* = b/2$	$a^* = b/2$	$a^* = a/2$
Origin at 0,0,z	Origin at x,0,0	Origin at 0,y,0

p4

No. 49.1.354



Origin on 4

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

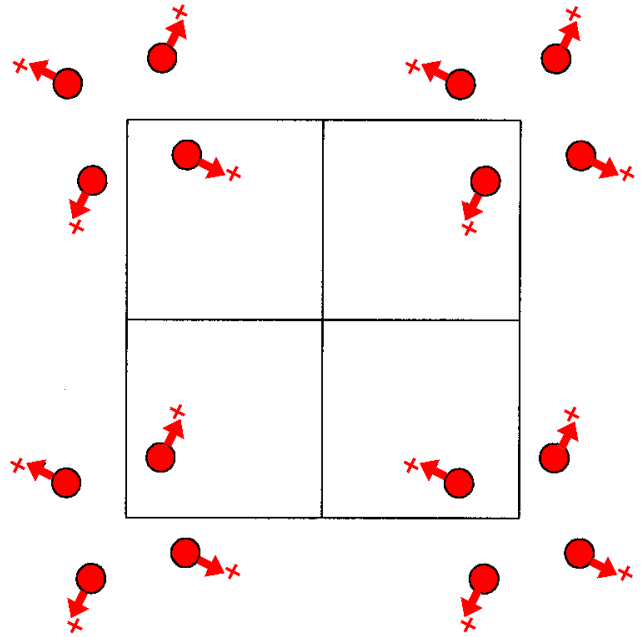
(3) 4⁺ 0,0,z
(4_z⁺|0,0,0)

(4) 4⁻ 0,0,z
(4_z⁻|0,0,0)

4

Tetragonal/Square

p4



Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

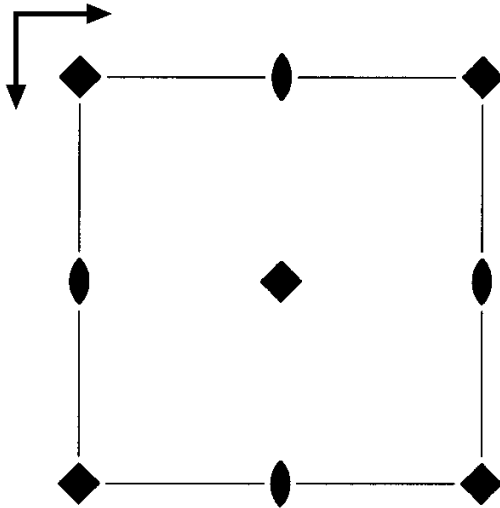
		Coordinates			
Multiplicity, Wyckoff letter, Site symmetry					
4 d 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]	
2 c 2..	$0,1/2,z$ [$0,0,w$]	$1/2,0,z$ [$0,0,w$]			
1 b 4..	$1/2,1/2,z$ [$0,0,w$]				
1 a 4..	$0,0,z$ [$0,0,w$]				

Symmetry of special projections

Along [001] $p4$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p1m'1$ $a^* = b$ Origin at $x,0,0$	Along [110] $p1m'1$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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p41'

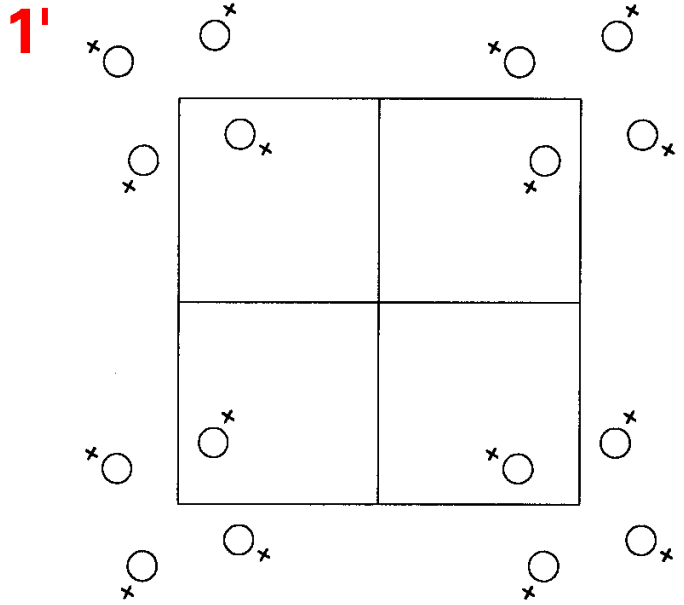
No. 49.2.355



41'

p41'

Tetragonal/Square



Origin on 41'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For 1 + set

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z|0,0,0)

(4) 4⁻ 0,0,z
(4_z⁻¹|0,0,0)

For 1' + set

(1) 1'
(1|0,0,0)'

(2) 2' 0,0,z
(2_z|0,0,0)'

(3) 4⁺ 0,0,z
(4_z|0,0,0)'

(4) 4⁻ 0,0,z
(4_z⁻¹|0,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); 1'

Positions

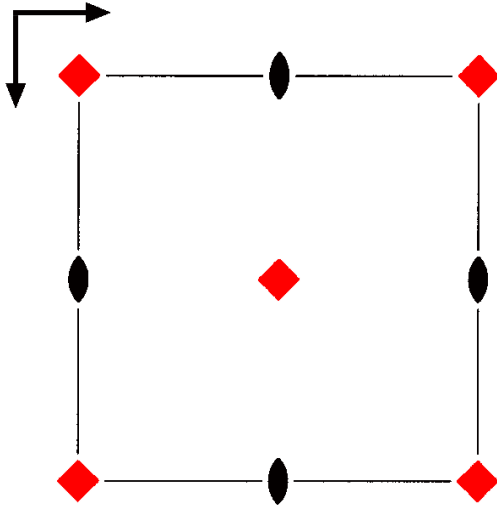
Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	1+	1' +		
4 d 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]	(3) \bar{y},x,z [0,0,0]	(4) y,\bar{x},z [0,0,0]
2 c 2..1'	$0,1/2,z$ [0,0,0]	$1/2,0,z$ [0,0,0]		
1 b 4..1'	$1/2,1/2,z$ [0,0,0]			
1 a 4..1'	$0,0,z$ [0,0,0]			

Symmetry of special projections

Along [001] $p41'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p1m11'$ $a^* = b$ Origin at x,0,0	Along [110] $p1m11'$ $a^* = (-a+b)/2$ Origin at x,x,0
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p4'

No. 49.3.356



Origin on 4'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

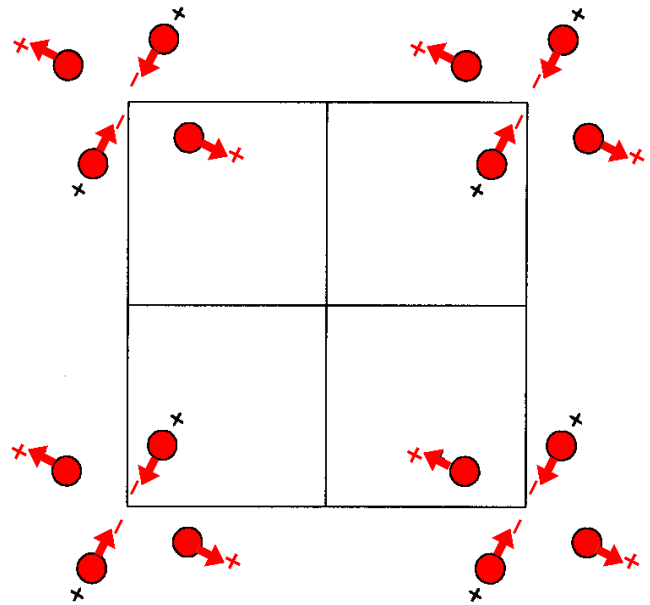
(3) 4⁺ 0,0,z
(4_z⁺|0,0,0)'

(4) 4⁻ 0,0,z
(4_z⁻|0,0,0)'

4'

p4'

Tetragonal/Square



Generators selected (1); t(1,0,0); t(0,1,0); (2); (3)

Positions

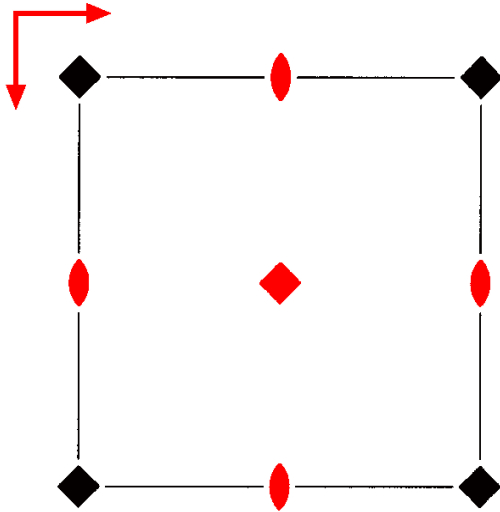
		Coordinates			
Multiplicity, Wyckoff letter, Site symmetry					
4 d 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]	
2 c 2..	0,1/2,z [0,0,w]	1/2,0,z [0,0,w]			
1 b 4'..	1/2,1/2,z [0,0,0]				
1 a 4'..	0,0,z [0,0,0]				

Symmetry of special projections

Along [001] p4' a* = a b* = b Origin at 0,0,z	Along [100] p1m1 a* = b Origin at x,0,0	Along [110] p1m1 a* = (-a+b)/2 Origin at x,x,0
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p_p4

No. 49.4.357



Origin on 4

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For (0,0,0) + set
 (1) 1 (1|0,0,0) (2) 2 0,0,z (2_z|0,0,0)

(3) 4⁺ 0,0,z (4_z|0,0,0)

(4) 4⁻ 0,0,z (4_z⁻¹|0,0,0)

For (1,0,0)['] + set
 (1) t['] (1,0,0) (1|1,0,0)['] (2) 2['] 1/2,0,z (2_z|1,0,0)[']

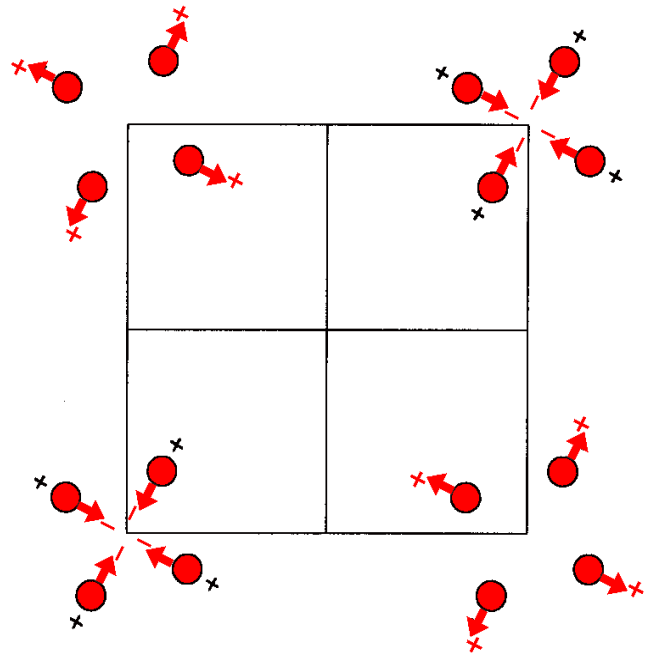
(3) 4⁺ ['] 1/2,1/2,z (4_z|1,0,0)[']

(4) 4⁻ ['] 1/2,1/2,z (4_z⁻¹|1,0,0)[']

41'

Tetragonal/Square

p_p4



Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		$(0,0,0)_+$	$(1,0,0)'$	$(1,0,0)'$ +
4 d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{y},x,z [\bar{v},u,w]$	(4) $y,\bar{x},z [v,\bar{u},w]$
2 c 2'..	$0,1/2,z [u,v,0]$	$1/2,0,z [v,\bar{u},0]$		
1 b 4'..	$1/2,1/2,z [0,0,0]$			
1 a 4..	$0,0,z [0,0,w]$			

Symmetry of special projections

Along [001] p_p -4 $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p_{2a^*}1m1$ $a^* = b$ Origin at $x,1/2,0$	Along [110] $p1m1$ $a^* = (-a+b)/2$ Origin at $x-1/4,x+1/4,0$
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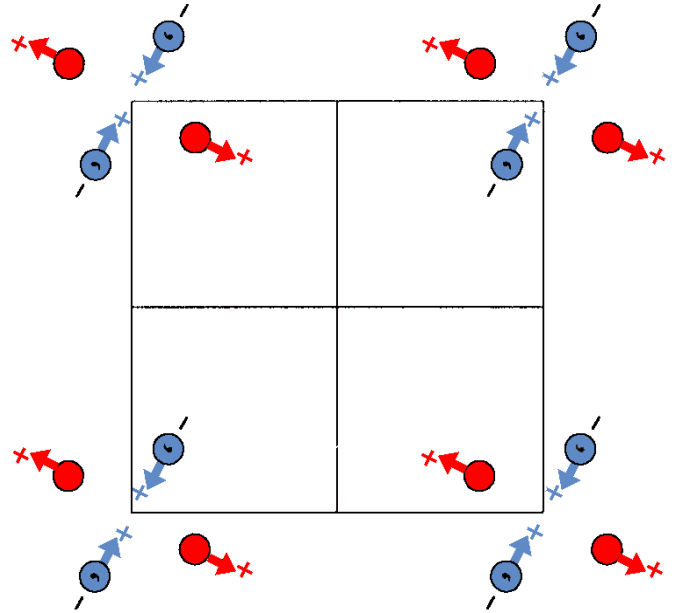
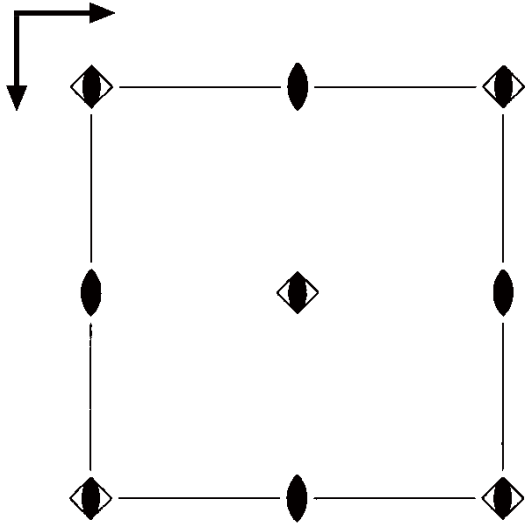
$p\bar{4}$

No. 50.1.358

$\bar{4}$

$p\bar{4}$

Tetragonal/Square



Origin at $\bar{4}$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ |0,0,0)

(4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ |0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

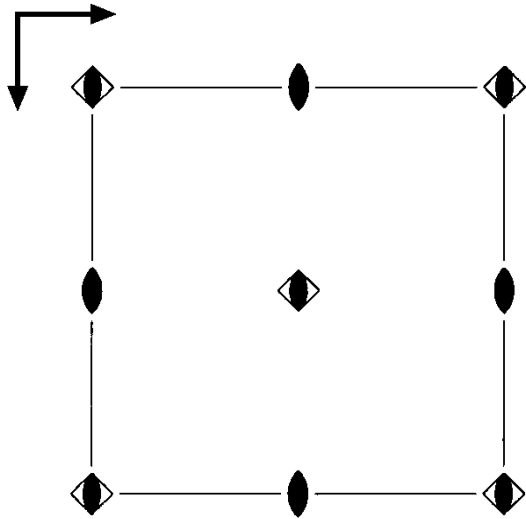
		Coordinates			
Multiplicity, Wyckoff letter, Site symmetry					
4	f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [v,\bar{u},w]
2	e 2..	$0,1/2,z$ [$0,0,w$]	$1/2,0,\bar{z}$ [$0,0,w$]		
2	d 2..	$1/2,1/2,z$ [$0,0,w$]	$1/2,1/2,\bar{z}$ [$0,0,w$]		
2	c 2..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,w$]		
1	b $\bar{4}$..	$1/2,1/2,0$ [$0,0,w$]			
1	a $\bar{4}$..	$0,0,0$ [$0,0,w$]			

Symmetry of special projections

Along [001] $p4'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p1m'1$ $a^* = b$ Origin at $x,0,0$	Along [110] $p1m'1$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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$p\bar{4}1'$

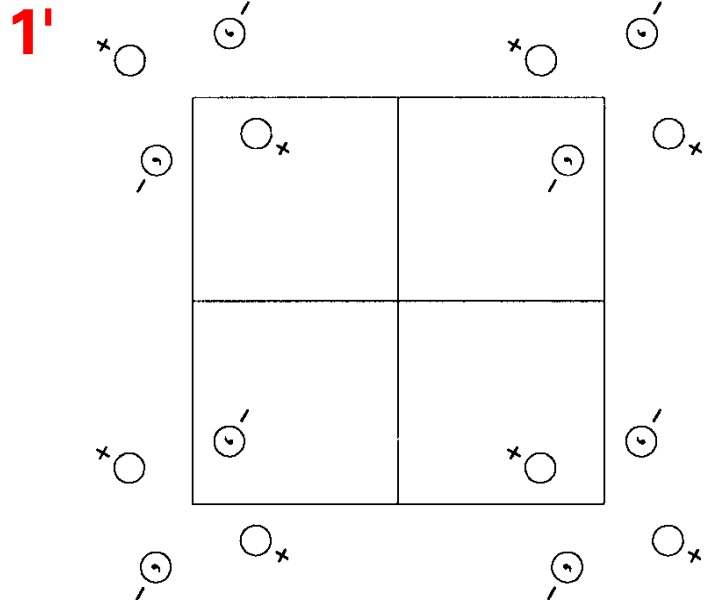
No. 50.2.359



$\bar{4}1'$

$p\bar{4}1'$

Tetragonal/Square



Origin at $\bar{4}1'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For 1 + set

(1) 1
(1|0,0,0)

(2) 2 $0,0,z$
(2_z |0,0,0)

(3) $\bar{4}^+$ $0,0,z; 0,0,0$
($\bar{4}_z$ |0,0,0)

(4) $\bar{4}^-$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ |0,0,0)

For 1' + set

(1) 1'
(1|0,0,0)'

(2) 2' $0,0,z$
(2_z |0,0,0)'

(3) $\bar{4}^{+ '}$ $0,0,z; 0,0,0$
($\bar{4}_z$ |0,0,0)'

(4) $\bar{4}^{- '}$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ |0,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); $1'$

Positions

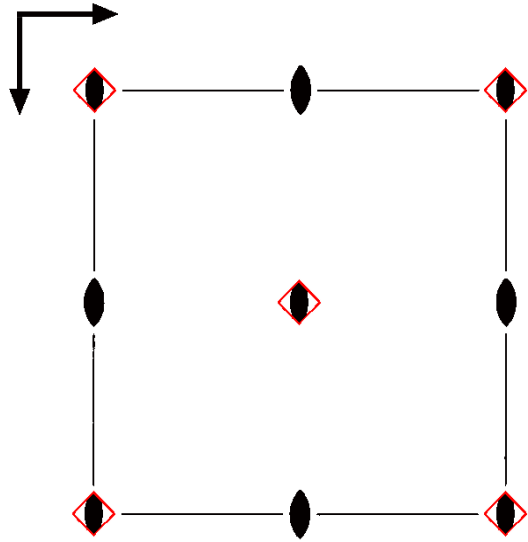
Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	$1+$	$1'+$		
4 f $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$	(3) $y,\bar{x},\bar{z} [0,0,0]$	(4) $\bar{y},x,\bar{z} [0,0,0]$
2 e $2..1'$	$0,1/2,z [0,0,0]$	$1/2,0,\bar{z} [0,0,0]$		
2 d $2..1'$	$1/2,1/2,z [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$		
2 c $2..1'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$		
1 b $\bar{4}..1'$	$1/2,1/2,0 [0,0,0]$			
1 a $\bar{4}..1'$	$0,0,0 [0,0,0]$			

Symmetry of special projections

Along $[001]$ $p41'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along $[100]$ $p1m11'$ $a^* = b$ Origin at $x,0,0$	Along $[110]$ $p1m11'$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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$p\bar{4}'$

No. 50.3.360



Origin at $\bar{4}'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

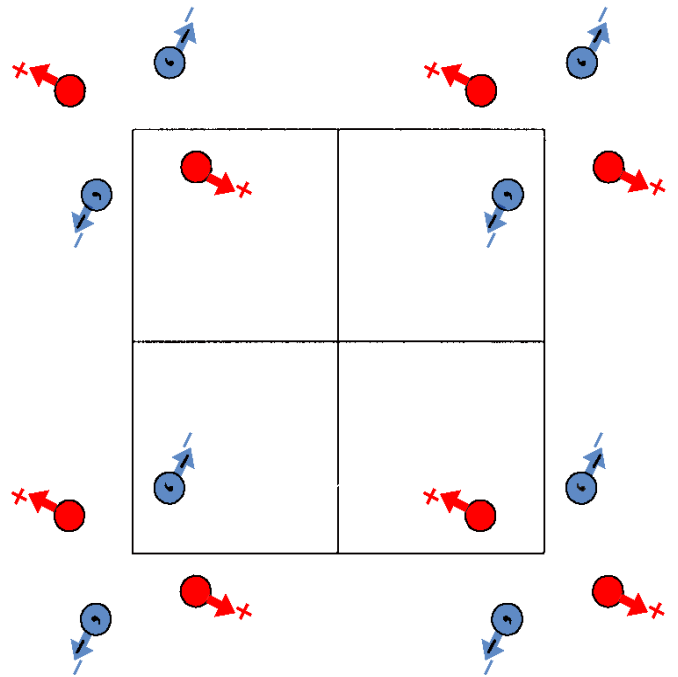
(3) $\bar{4}^+$ ' 0,0,z; 0,0,0
($\bar{4}_z$ |0,0,0)'

(4) $\bar{4}^-$ ' 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ |0,0,0)'

$\bar{4}'$

$p\bar{4}'$

Tetragonal/Square



Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3)

Positions

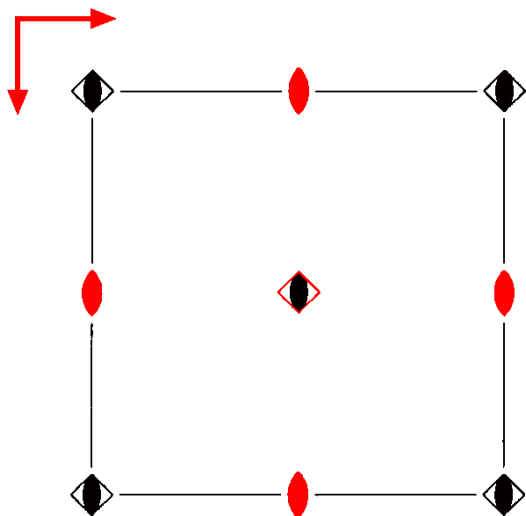
		Coordinates			
Multiplicity, Wyckoff letter, Site symmetry					
4	f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
2	e 2..	$0,1/2,z$ [$0,0,w$]	$1/2,0,\bar{z}$ [$0,0,\bar{w}$]		
2	d 2..	$1/2,1/2,z$ [$0,0,w$]	$1/2,1/2,\bar{z}$ [$0,0,\bar{w}$]		
2	c 2..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]		
1	b $\bar{4}'..$	$1/2,1/2,0$ [$0,0,0$]			
1	a $\bar{4}'..$	$0,0,0$ [$0,0,0$]			

Symmetry of special projections

Along [001] $p4$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p1m1$ $a^* = b$ Origin at $x,0,0$	Along [110] $p1m1$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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$p_p\bar{4}$

No. 50.4.361



Origin at $\bar{4}$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2$

Symmetry operations

For $(0,0,0)$ + set

- | | |
|-----------|-------------------------|
| (1) 1 | (2) $2_{0,0,z}$ |
| (1 0,0,0) | (2 _z 0,0,0) |

- | |
|--------------------------------|
| (3) $\bar{4}^+$ $0,0,z; 0,0,0$ |
| ($\bar{4}_z$ 0,0,0) |

- | |
|--------------------------------|
| (4) $\bar{4}^-$ $0,0,z; 0,0,0$ |
| ($\bar{4}_z^{-1}$ 0,0,0) |

For $(1,0,0)'$ + set

- | | |
|-----------------|----------------------------|
| (1) $t'(1,0,0)$ | (2) $2'_{1/2,0,z}$ |
| (1 1,0,0)' | (2 _z 1/2,0,0)' |

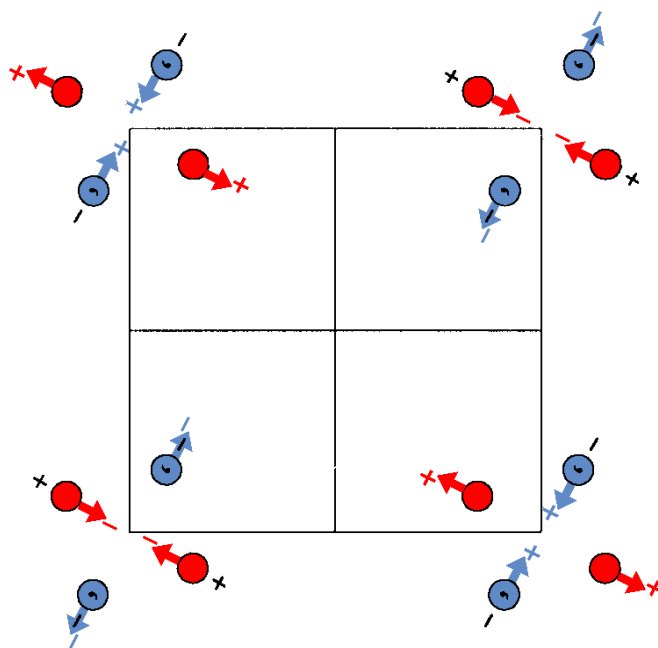
- | |
|--|
| (3) $\bar{4}^+ '_{1/2,1/2,z; 1/2,1/2,0}$ |
| ($\bar{4}_z$ 1,0,0)' |

- | |
|--|
| (4) $\bar{4}^- '_{1/2,1/2,z; 1/2,1/2,0}$ |
| ($\bar{4}_z^{-1}$ 1,0,0)' |

$\bar{4}1'$

$p_p\bar{4}$

Tetragonal/Square



Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		$(0,0,0)_+$	$(1,0,0)'$ +	
4 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $y,\bar{x},\bar{z} [\bar{v},u,w]$	(4) $\bar{y},x,\bar{z} [v,\bar{u},w]$
2 e $2'..$	$0,1/2,z [u,v,0]$	$1/2,0,\bar{z} [\bar{v},u,0]$		
2 d $2'..$	$1/2,1/2,z [0,0,w]$	$1/2,1/2,\bar{z} [0,0,w]$		
2 c $2'..$	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$		
1 b $\bar{4}'..$	$1/2,1/2,0 [0,0,0]$			
1 a $\bar{4}'..$	$0,0,0 [0,0,w]$			

Symmetry of special projections

Along [001] $p4$ $a^* = a$ $b^* = b$ Origin at $1/2,1/2,z$	Along [100] $p_{2a^*}1m1$ $a^* = b$ Origin at $x,1/2,0$	Along [110] $p_{2a^*}1m1$ $a^* = (-a+b)/2$ Origin at $x-1/4,x+1/4,0$
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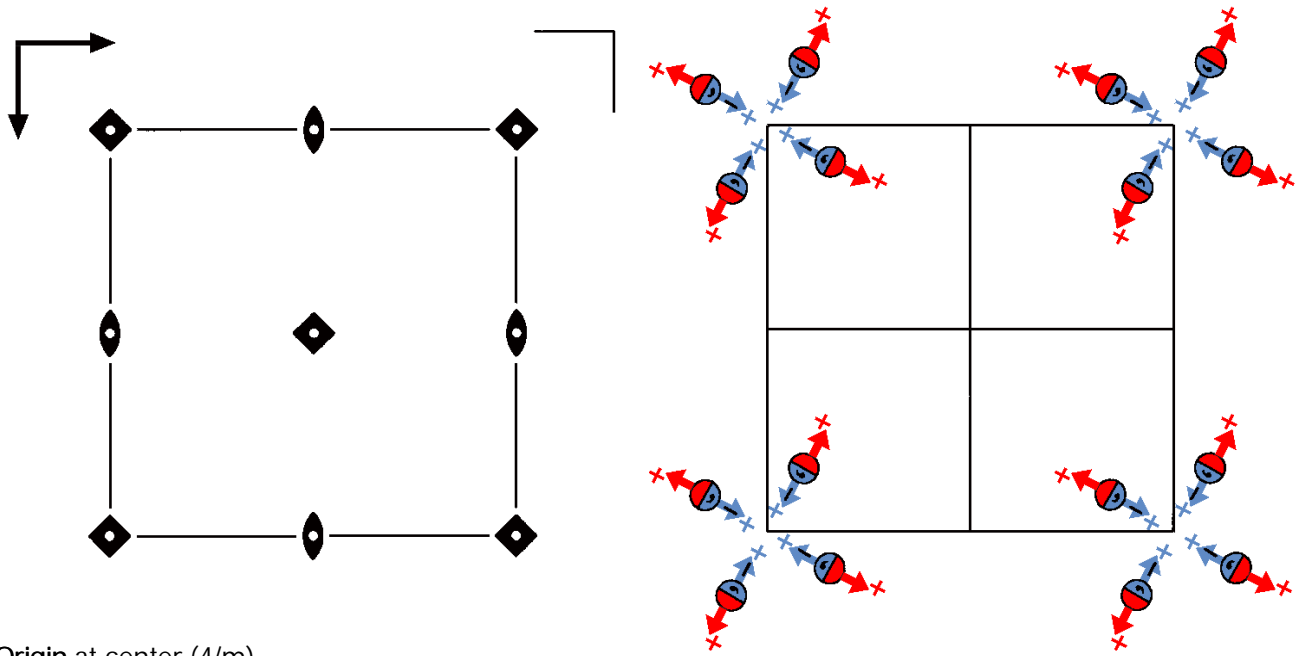
p4/m

No. 51.1.362

4/m

p4/m

Tetragonal/Square



Origin at center (4/m)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z⁺|0,0,0)

(4) 4⁻ 0,0,z
(4_z⁻|0,0,0)

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) m x,y,0
(m_z|0,0,0)

(7) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z^+$ |0,0,0)

(8) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^-$ |0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]
8 h 1	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y,\bar{z} [\bar{u},\bar{v},w]	(7) y,\bar{x},\bar{z} [\bar{v},u,w]	(8) \bar{y},x,\bar{z} [v,\bar{u},w]
4 g m..	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{y},x,0$ [0,0,w]	$y,\bar{x},0$ [0,0,w]
4 f 2..	$0,1/2,z$ [0,0,w]	[0,0,w] $1/2,0,z$	$0,1/2,\bar{z}$ [0,0,w]	$1/2,0,\bar{z}$ [0,0,w]
2 e 4..	$1/2,1/2,z$ [0,0,w]	$1/2,1/2,\bar{z}$ [0,0,w]		
2 d 4..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]		
2 c 2/m..	$0,1/2,0$ [0,0,w]	$1/2,0,0$ [0,0,w]		
1 b 4/m..	$1/2,1/2,0$ [0,0,w]			
1 a 4/m..	$0,0,0$ [0,0,w]			

Symmetry of special projections

Along [001] p41'	Along [100] p2'm'm	Along [110] p2'm'm
$a^* = a$ $b^* = b$	$a^* = b$	$a^* = (-a+b)/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

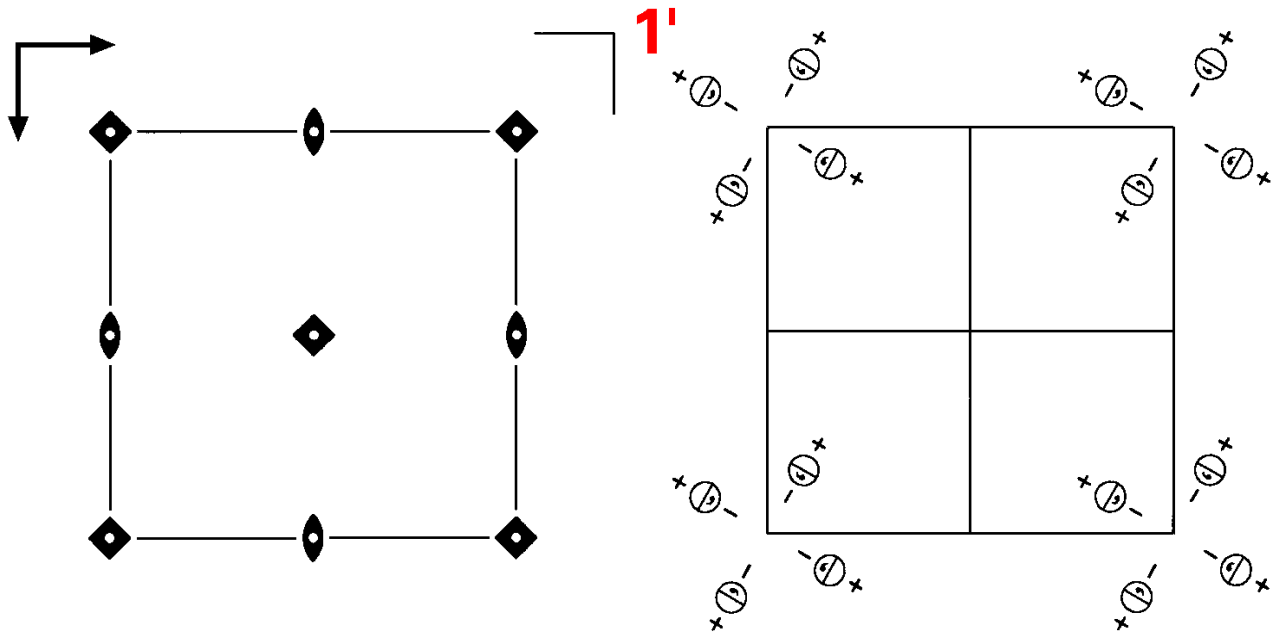
p4/m1'

4/m1'

Tetragonal/Square

No. 51.2.363

p4/m1'



Origin at center (4/m1')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|--|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (6) m _{x,y} x,y,0
(m _z 0,0,0) | (7) $\bar{4}$ ⁺ 0,0,z; 0,0,0
($\bar{4}$ _z 0,0,0) | (8) $\bar{4}$ ⁻ 0,0,z; 0,0,0
($\bar{4}$ _z ⁻¹ 0,0,0) |

For 1' + set

- | | | | |
|--|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' _z 0,0,z
(2' _z 0,0,0)' | (3) 4 ⁺ ' 0,0,z
(4' _z 0,0,0)' | (4) 4 ⁻ ' 0,0,z
(4' _z ⁻¹ 0,0,0)' |
| (5) $\bar{1}$ ' 0,0,0
($\bar{1}$ ' 0,0,0)' | (6) m' _{x,y} x,y,0
(m' _z 0,0,0)' | (7) $\bar{4}$ ⁺ ' 0,0,z; 0,0,0
($\bar{4}$ ' _z 0,0,0)' | (8) $\bar{4}$ ⁻ ' 0,0,z; 0,0,0
($\bar{4}$ ' _z ⁻¹ 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	1+	1' +		
8 h 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]	(3) \bar{y},x,z [0,0,0]	(4) y, \bar{x},z [0,0,0]
	(5) \bar{x},\bar{y},\bar{z} [0,0,0]	(6) x,y, \bar{z} [0,0,0]	(7) y, \bar{x},\bar{z} [0,0,0]	(8) \bar{y},x,\bar{z} [0,0,0]
4 g m..1'	x,y,0 [0,0,0]	$\bar{x},\bar{y},0$ [0,0,0]	$\bar{y},x,0$ [0,0,0]	y, $\bar{x},0$ [0,0,0]
4 f 2..1'	0,1/2,z [0,0,0]	1/2,0,z [0,0,0]	0,1/2, \bar{z} [0,0,0]	1/2,0, \bar{z} [0,0,0]
2 e 4..1'	1/2,1/2,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]		
2 d 4..1'	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]		
2 c 2/m..1'	0,1/2,0 [0,0,0]	1/2,0,0 [0,0,0]		
1 b 4/m..1'	1/2,1/2,0 [0,0,0]			
1 a 4/m..1'	0,0,0 [0,0,0]			

Symmetry of special projections

Along [001] p41'	Along [100] p2mm1'	Along [110] p2mm1'
$\mathbf{a}^* = \mathbf{a}$ $\mathbf{b}^* = \mathbf{b}$	$\mathbf{a}^* = \mathbf{b}$	$\mathbf{a}^* = (-\mathbf{a} + \mathbf{b})/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

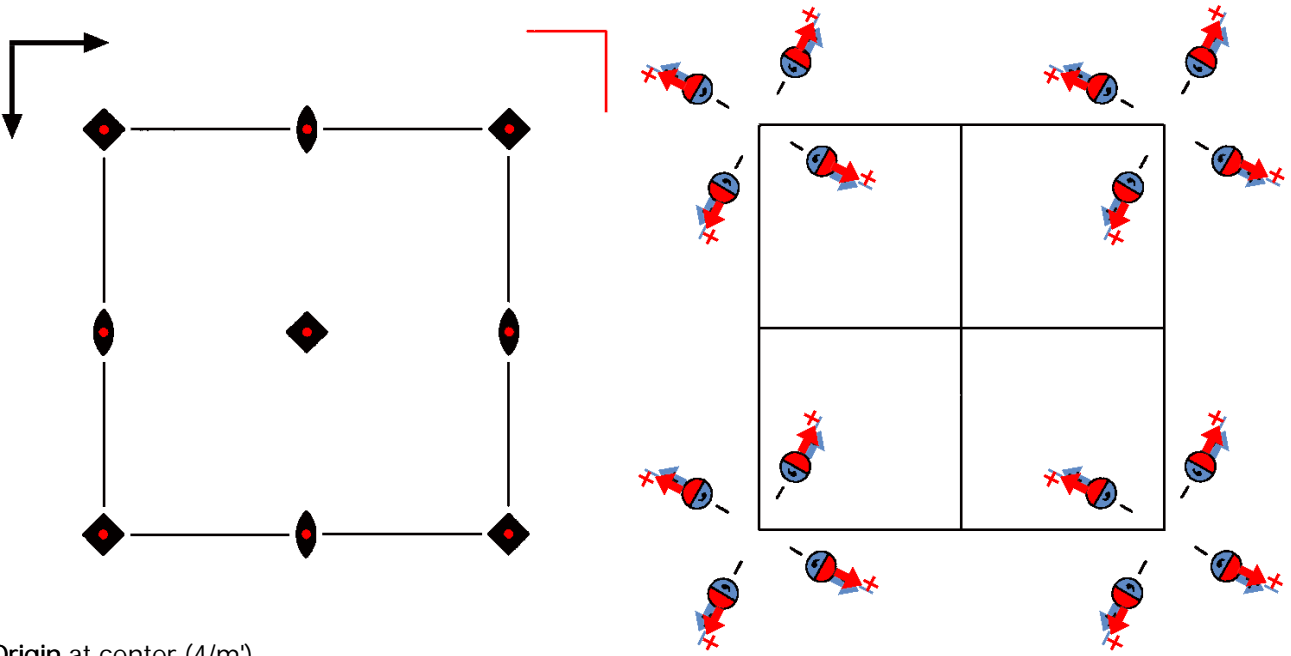
p4/m'

No. 51.3.364

4/m'

p4/m'

Tetragonal/Square



Origin at center (4/m')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z⁺|0,0,0)

(4) 4⁻ 0,0,z
(4_z⁻|0,0,0)

(5) $\bar{1}$ ' 0,0,0
($\bar{1}$ '|0,0,0)'

(6) m' x,y,0
(m'_z|0,0,0)'

(7) $\bar{4}$ ⁺' 0,0,z; 0,0,0
($\bar{4}$ _z⁺'|0,0,0)'

(8) $\bar{4}$ ⁻' 0,0,z; 0,0,0
($\bar{4}$ _z⁻'|0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]
8 h 1	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y,\bar{z} [u,v, \bar{w}]	(7) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(8) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
4 g m'..	$x,y,0$ [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$x,0$ [$\bar{v},u,0$]	$y,\bar{x},0$ [$v,\bar{u},0$]
4 f 2..	$0,1/2,z$ [0,0,w]	$1/2,0,z$ [0,0,w]	$0,1/2,\bar{z}$ [0,0, \bar{w}]	$1/2,0,\bar{z}$ [0,0, \bar{w}]
2 e 4..	$1/2,1/2,z$ [0,0,w]	$1/2,1/2,\bar{z}$ [0,0, \bar{w}]		
2 d 4..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0, \bar{w}]		
2 c 2/m'..	$0,1/2,0$ [0,0,0]	$1/2,0,0$ [0,0,0]		
1 b 4/m'..	$1/2,1/2,0$ [0,0,0]			
1 a 4/m'..	$0,0,0$ [0,0,0]			

Symmetry of special projections

Along [001] p4
 $\mathbf{a}^* = \mathbf{a}$ $\mathbf{b}^* = \mathbf{b}$
 Origin at 0,0,z

Along [100] p2m'm'
 $\mathbf{a}^* = \mathbf{b}$
 Origin at x,0,0

Along [110] p2m'm'
 $\mathbf{a}^* = (-\mathbf{a} + \mathbf{b})/2$
 Origin at x,x,0

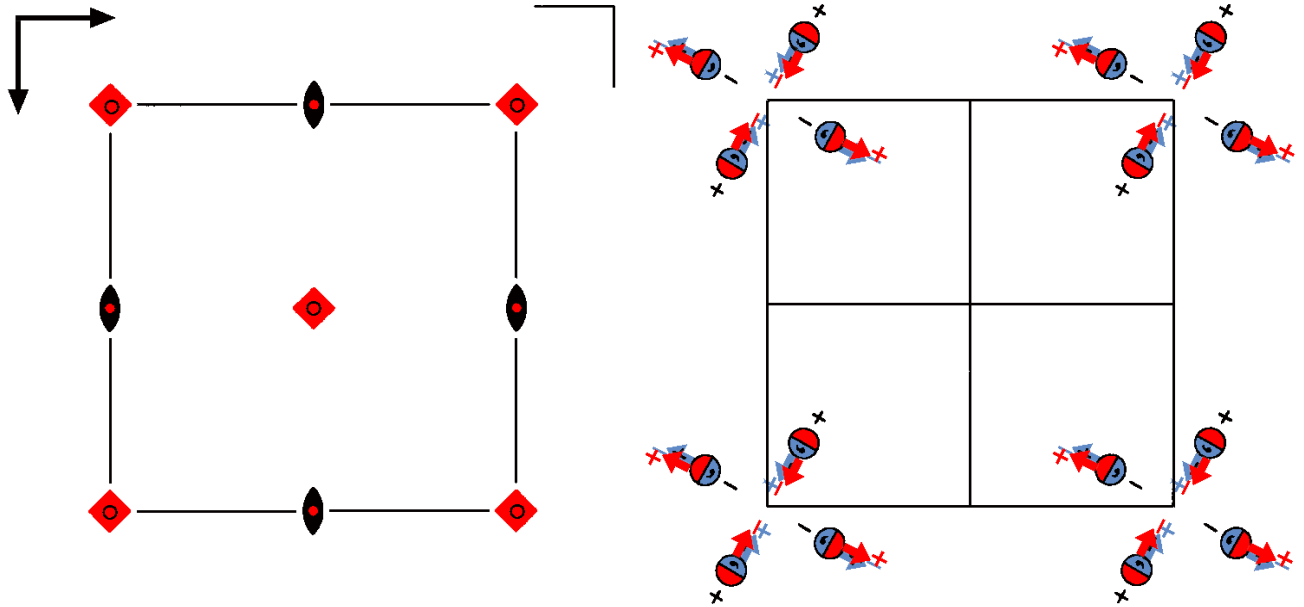
p4'/m'

No. 51.4.365

4'/m'

p4'/m'

Tetragonal/Square



Origin at center (4'/m')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z⁺|0,0,0)'

(4) 4⁻ 0,0,z
(4_z⁻|0,0,0)'

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)'

(6) m' x,y,0
(m_z'|0,0,0)'

(7) $\bar{4}$ ⁺ 0,0,z; 0,0,0
($\bar{4}$ _z⁺|0,0,0)

(8) $\bar{4}$ ⁻ 0,0,z; 0,0,0
($\bar{4}$ _z⁻|0,0,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v, \bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]
8 h 1	(5) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(6) x,y, \bar{z} [u,v, \bar{w}]	(7) y, \bar{x},\bar{z} [\bar{v},u,\bar{w}]	(8) \bar{y},x,\bar{z} [v, \bar{u},\bar{w}]
4 g m'..	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{y},x,0$ [v, $\bar{u},0$]	y, $\bar{x},0$ [$\bar{v},u,0$]
4 f 2..	0,1/2,z [0,0,w]	1/2,0,z [0,0, \bar{w}]	0,1/2, \bar{z} [0,0, \bar{w}]	1/2,0, \bar{z} [0,0,w]
2 e 4'..	1/2,1/2,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]		
2 d 4'..	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]		
2 c 2/m'..	0,1/2,0 [0,0,0]	1/2,0,0 [0,0,0]		
1 b 4'/m'..	1/2,1/2,0 [0,0,0]			
1 a 4'/m'..	0,0,0 [0,0,0]			

Symmetry of special projections

Along [001] p4'
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] p2'mm'
 $a^* = b$
 Origin at x,0,0

Along [110] p2'mm'
 $a^* = (-a+b)/2$
 Origin at x,x,0

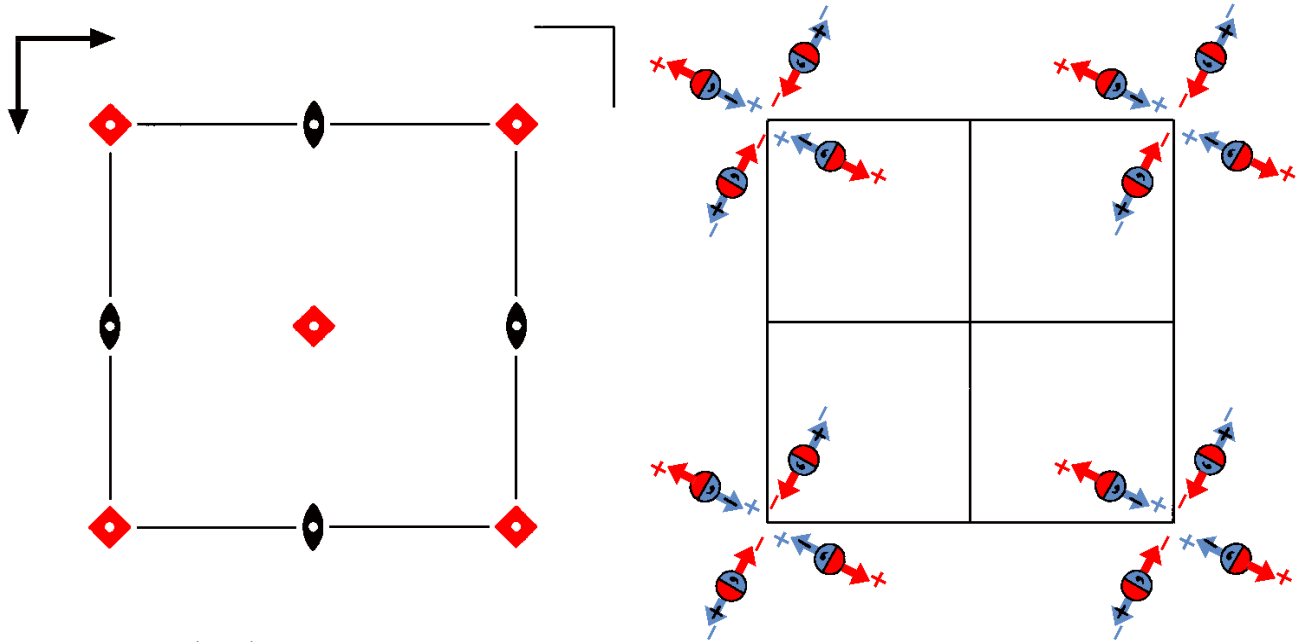
p4'/m

No. 51.5.366

4'/m

p4'/m

Tetragonal/Square



Origin at center (4'/m)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z⁺|0,0,0)'

(4) 4⁻ 0,0,z
(4_z⁻|0,0,0)'

(5) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(6) m x,y,0
(m_z|0,0,0)

(7) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z^+$ |0,0,0)'

(8) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^-$ |0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v, \bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]
8 h 1	(5) \bar{x},\bar{y},\bar{z} [u,v,w]	(6) x,y,\bar{z} [\bar{u},\bar{v},w]	(7) y,\bar{x},\bar{z} [v, \bar{u},\bar{w}]	(8) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
4 g m..	$x,y,0$ [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{y},x,0$ [0,0, \bar{w}]	$y,\bar{x},0$ [0,0, \bar{w}]
4 f 2..	$0,1/2,z$ [0,0,w]	$1/2,0,z$ [0,0, \bar{w}]	$0,1/2,\bar{z}$ [0,0,w]	$1/2,0,\bar{z}$ [0,0, \bar{w}]
2 e 4'..	$1/2,1/2,z$ [0,0,0]	$1/2,1/2,\bar{z}$ [0,0,0]		
2 d 4'..	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]		
2 c 2/m..	$0,1/2,0$ [0,0,w]	$1/2,0,0$ [0,0, \bar{w}]		
1 b 4'/m..	$1/2,1/2,0$ [0,0,0]			
1 a 4'/m..	$0,0,0$ [0,0,0]			

Symmetry of special projections

Along [001] p41'	Along [100] p2mm	Along [110] p2mm
$\mathbf{a}^* = \mathbf{a} \quad \mathbf{b}^* = \mathbf{b}$	$\mathbf{a}^* = \mathbf{b}$	$\mathbf{a}^* = (-\mathbf{a} + \mathbf{b})/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

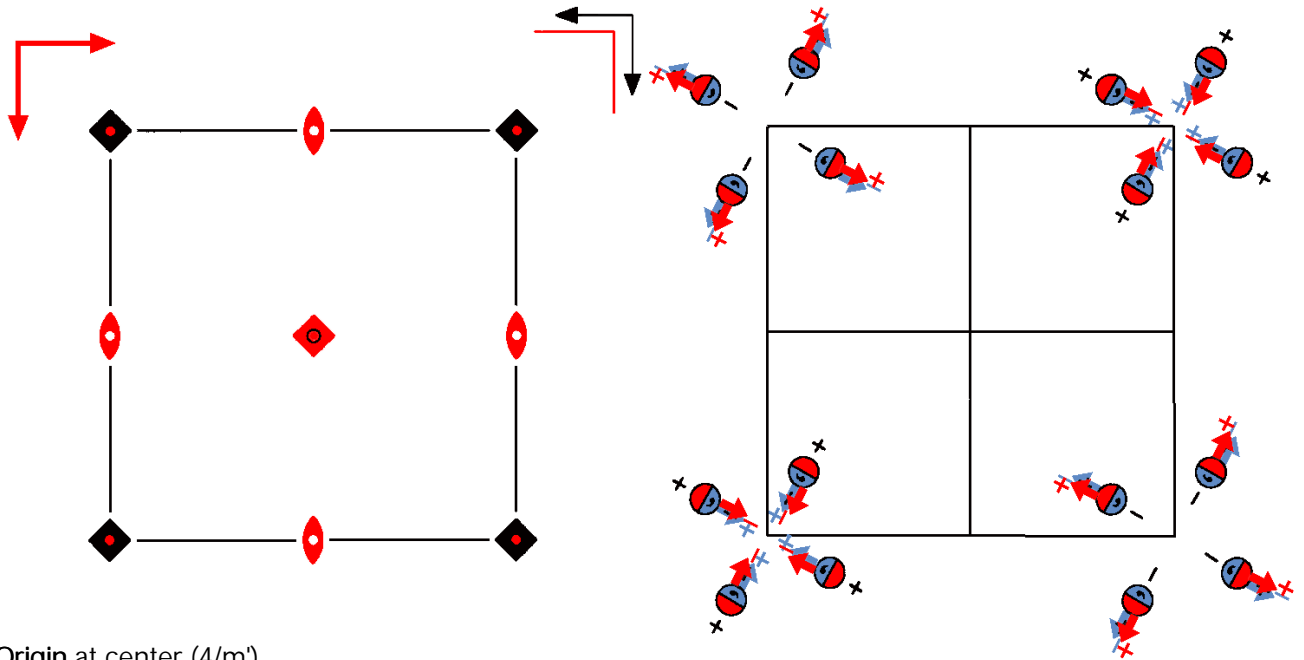
p_4/m'

No. 51.6.367

$4/m1'$

p_4/m'

Tetragonal/Square



Origin at center ($4/m'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|---|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) 4 ⁺ $0,0,z$
(4 _z 0,0,0) | (4) 4 ⁻ $0,0,z$
(4 _z ⁻¹ 0,0,0) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0)' | (6) m' $x,y,0$
(m_z 0,0,0)' | (7) $\bar{4}$ ⁺ $0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0)' | (8) $\bar{4}$ ⁻ $0,0,z; 0,0,0$
($\bar{4}_z$ ⁻¹ 0,0,0)' |

For (1,0,0)' + set

- | | | | |
|--|--|--|--|
| (1) t' (1,0,0)
(1 1,0,0)' | (2) 2' $1/2,0,z$
(2 _z 1,0,0)' | (3) 4 ⁺ ' $1/2,1/2,z$
(4 _z 1,0,0)' | (4) 4 ⁻ ' $1/2,1/2,z$
(4 _z ⁻¹ 1,0,0)' |
| (5) $\bar{1}$ $1/2,0,0$
($\bar{1}$ 1,0,0) | (6) a (1,0,0) $x,y,0$
(m_z 1,0,0) | (7) $\bar{4}$ ⁺ $1/2,1/2,z; 1/2,1/2,0$
($\bar{4}_z$ 1,0,0) | (8) $\bar{4}$ ⁻ $1/2,1/2,z; 1/2,1/2,0$
($\bar{4}_z$ ⁻¹ 1,0,0) |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	$(0,0,0)_+$	$(1,0,0)'$		
8 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{y},x,z [\bar{v},u,w]$	(4) $y,\bar{x},z [v,\bar{u},w]$
	(5) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(6) $x,y,\bar{z} [u,v,\bar{w}]$	(7) $y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]$	(8) $\bar{y},x,\bar{z} [\bar{v},u,\bar{w}]$
4 g $m'..$	$x,y,0 [u,v,0]$	$\bar{x},\bar{y},0 [\bar{u},\bar{v},0]$	$\bar{y},x,0 [\bar{v},u,0]$	$y,\bar{x},0 [v,\bar{u},0]$
4 f $2'..$	$0,1/2,z [u,v,0]$	$1/2,0,z [v,\bar{u},0]$	$0,1/2,\bar{z} [u,v,0]$	$1/2,0,\bar{z} [v,\bar{u},0]$
2 e $4'..$	$1/2,1/2,z [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$		
2 d $4..$	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,\bar{w}]$		
2 c $2'/m'..$	$0,1/2,0 [u,v,0]$	$1/2,0,0 [v,\bar{u},0]$		
1 b $4'/m'..$	$1/2,1/2,0 [0,0,0]$			
1 a $4/m'..$	$0,0,0 [0,0,0]$			

Symmetry of special projections

Along [001] $p_p 4$
 $a^* = a \quad b^* = b$
 Origin at $0,0,z$

Along [100] $p_{2a^*} 2m'm'$
 $a^* = b$
 Origin at $x,0,0$

Along [110] $p_{2a^*} 2m'm'$
 $a^* = (-a+b)/2$
 Origin at $x,x,0$

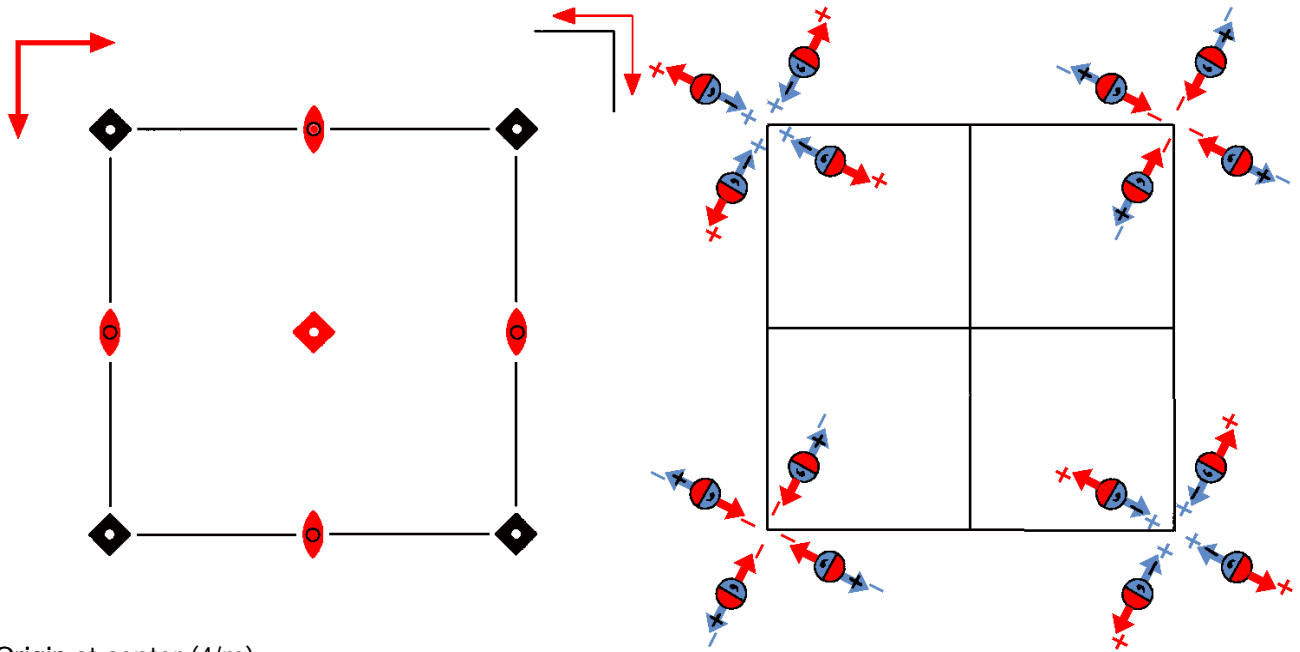
p_4/m

No. 51.7.368

$4/m1'$

p_4/m

Tetragonal/Square



Origin at center ($4/m$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) 4 ⁺ $0,0,z$
(4 _z 0,0,0) | (4) 4 ⁻ $0,0,z$
(4 _z ⁻¹ 0,0,0) |
| (5) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (6) m $x,y,0$
(m _z 0,0,0) | (7) $\bar{4}^+$ $0,0,z; 0,0,0$
($\bar{4}_z^+$ 0,0,0) | (8) $\bar{4}^-$ $0,0,z; 0,0,0$
($\bar{4}_z^-$ 0,0,0) |

For $(1,0,0)'$ + set

- | | | | |
|---|--|--|--|
| (1) t' $(1,0,0)$
(1 1,0,0)' | (2) 2' $1/2,0,z$
(2 _z 1,0,0)' | (3) 4 ⁺ ' $1/2,1/2,z$
(4 _z 1,0,0)' | (4) 4 ⁻ ' $1/2,1/2,z$
(4 _z ⁻¹ 1,0,0)' |
| (5) $\bar{1}$ ' $1/2,0,0$
($\bar{1}$ 1,0,0)' | (6) a' $(1,0,0)$ $x,y,0$
(m _z 1,0,0)' | (7) $\bar{4}^-$ ' $1/2,1/2,z; 1/2,1/2,0$
($\bar{4}_z^-$ 1,0,0)' | (8) $\bar{4}^+$ ' $1/2,1/2,z; 1/2,1/2,0$
($\bar{4}_z^+$ 1,0,0)' |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	$(0,0,0)_+$	$(1,0,0)'$	$(0,1,0)'$	$(0,0,1)'$
8 h 1	(1) $x,y,z [u,v,w]$ (5) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$ (6) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(3) $\bar{y},x,z [\bar{v},u,w]$ (7) $y,\bar{x},\bar{z} [\bar{v},u,w]$	(4) $y,\bar{x},z [u,\bar{v},w]$ (8) $\bar{y},x,\bar{z} [u,\bar{v},w]$
4 g m..	$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,w]$	$\bar{y},x,0 [0,0,w]$	$y,\bar{x},0 [0,0,w]$
4 f 2'..	$0,1/2,z [u,v,0]$	$1/2,0,z [v,\bar{u},0]$	$0,1/2,\bar{z} [\bar{u},\bar{v},0]$	$1/2,0,\bar{z} [\bar{v},u,0]$
2 e 4'..	$1/2,1/2,z [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$		
2 d 4..	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,\bar{w}]$		
2 c 2'/m..	$0,1/2,0 [0,0,0]$	$1/2,0,0 [0,0,0]$		
1 b 4'/m..	$1/2,1/2,0 [0,0,0]$			
1 a 4/m..	$0,0,0 [0,0,w]$			

Symmetry of special projections

Along [001] $p41'$	Along [100] $p_{2a^*}2m'm'$	Along [110] $p_{2a^*}2mm$
$a^* = a \quad b^* = b$	$a^* = b$	$a^* = (-a+b)/2$
Origin at $0,0,z$	Origin at $x,1/2,0$	Origin at $x-1/4,x+1/4,0$

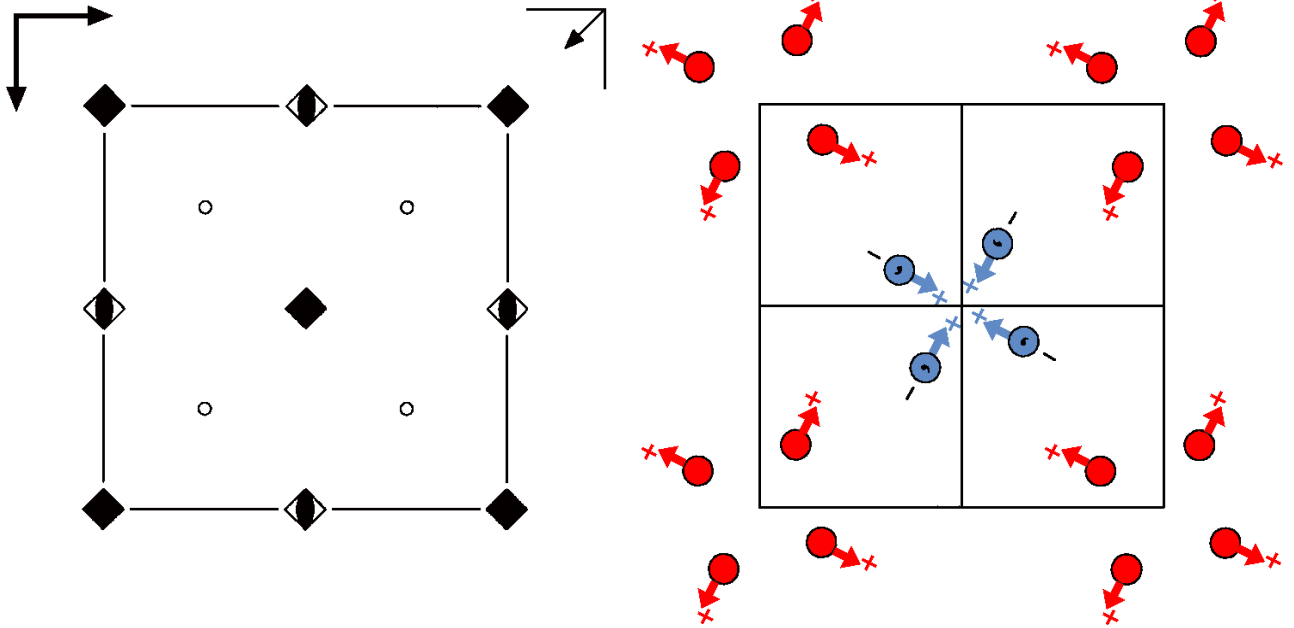
p4/n

No. 52.1.369

4/m

p4/n

Tetragonal/Square



Origin at 4 on n at $-1/4, -1/4, 0$ from $\bar{1}$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (6) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (7) $\bar{4}^+$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^+$ 1/2,1/2,0) | (8) $\bar{4}^-$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^-$ 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]
8 e 1	(5) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [u,v,w]	(6) $x+1/2,y+1/2,\bar{z}$ [\bar{u},\bar{v},w]	(7) $y+1/2,\bar{x}+1/2,\bar{z}$ [\bar{v},u,w]	(8) $\bar{y}+1/2,x+1/2,\bar{z}$ [v,\bar{u},w]
4 d 2..	$1/2,0,z$ [$0,0,w$]	$0,1/2,z$ [$0,0,w$]	$0,1/2,\bar{z}$ [$0,0,w$]	$1/2,0,\bar{z}$ [$0,0,w$]
4 c $\bar{1}$	$1/4,1/4,0$ [u,v,w]	$3/4,3/4,0$ [\bar{u},\bar{v},w]	$3/4,1/4,0$ [\bar{v},u,w]	$1/4,3/4,0$ [v,\bar{u},w]
2 b 4..	$1/2,1/2,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,w$]		
2 a $\bar{4}$..	$1/2,0,0$ [$0,0,w$]	$0,1/2,0$ [$0,0,w$]		

Symmetry of special projections

Along [001] p_4 $a^* = (a-b)/2$ $b^* = (a+b)/2$ Origin at 0,0,z	Along [100] $p2'm'g$ $a^* = b$ Origin at $x,1/4,0$	Along [110] $p2'm'm$ $a^* = (-a+b)/2$ Origin at $x,x,0$
---	--	---

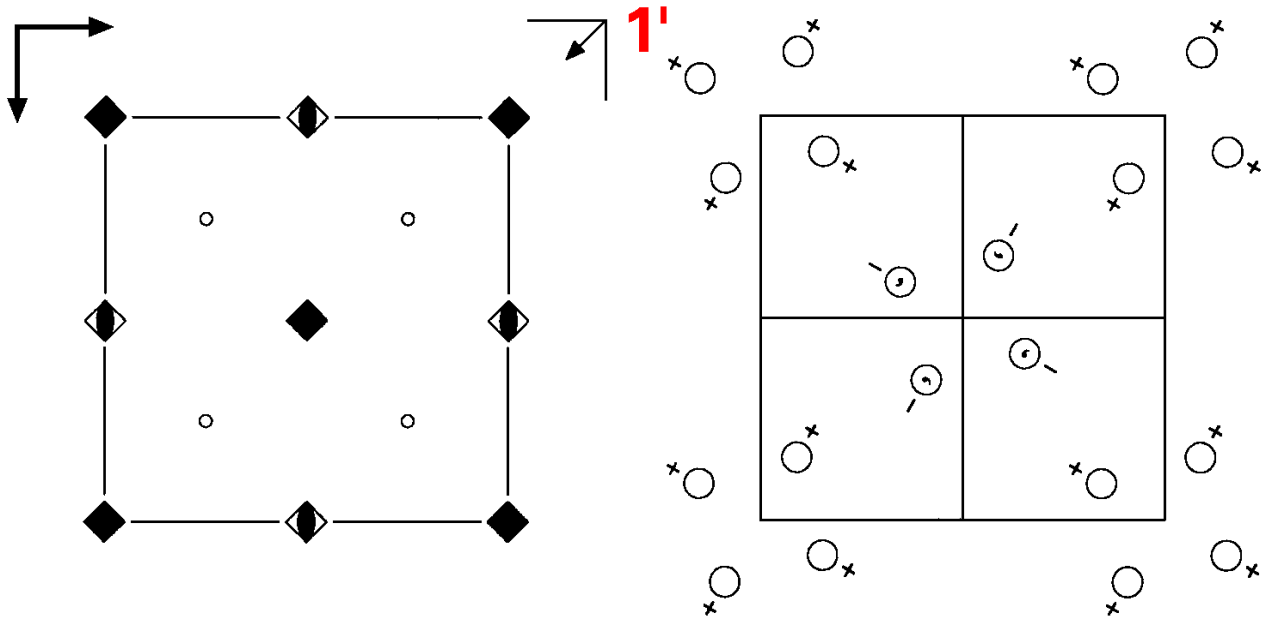
p4/n1'

4/m1'

Tetragonal/Square

No. 52.2.370

p4/n1'



Origin at 41' on n at -1/4,-1/4,0 from $\bar{1}1'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (6) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (7) $\bar{4}^+$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^+$ 1/2,1/2,0) | (8) $\bar{4}^-$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^-$ 1/2,1/2,0) |

For 1' + set

- | | | | |
|---|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 4 ⁺ ' 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ ' 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) $\bar{1}'$ 1/4,1/4,0
($\bar{1}'$ 1/2,1/2,0)' | (6) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' | (7) $\bar{4}^+$ ' 1/2,0,z; 1/2,0,0
($\bar{4}_z^+$ 1/2,1/2,0)' | (8) $\bar{4}^-$ ' 1/2,0,z; 1/2,0,0
($\bar{4}_z^-$ 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates				
	1+	1' +			
8 e 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]			
	(3) \bar{y},x,z [0,0,0]	(4) y, \bar{x},z [0,0,0]			
	(5) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [0,0,0]	(6) x+1/2,y+1/2, \bar{z} [0,0,0]			
	(7) y+1/2, $\bar{x}+1/2,\bar{z}$ [0,0,0]	(8) $\bar{y}+1/2,x+1/2,\bar{z}$ [0,0,0]			
	4 d 2..1'	1/2,0,z [0,0,0]	0,1/2,z [0,0,0]	0,1/2, \bar{z} [0,0,0]	1/2,0, \bar{z} [0,0,0]
	4 c $\bar{1}1'$	1/4,1/4,0 [0,0,0]	3/4,3/4,0 [0,0,0]	3/4,1/4,0 [0,0,0]	1/4,3/4,0 [0,0,0]
	2 b 4..1'	1/2,1/2,z [0,0,0]	0,0, \bar{z} [0,0,0]		
	2 a $\bar{4}..1'$	1/2,0,0 [0,0,0]	0,1/2,0 [0,0,0]		

Symmetry of special projections

Along [001] p41'
 $a^*=(a-b)/2$ $b^*=(a+b)/2$
 Origin at 0,0,z

Along [100] p2mg1'
 $a^* = b$
 Origin at x,1/4,0

Along [110] p2mm1'
 $a^* = (-a+b)/2$
 Origin at x,x,0

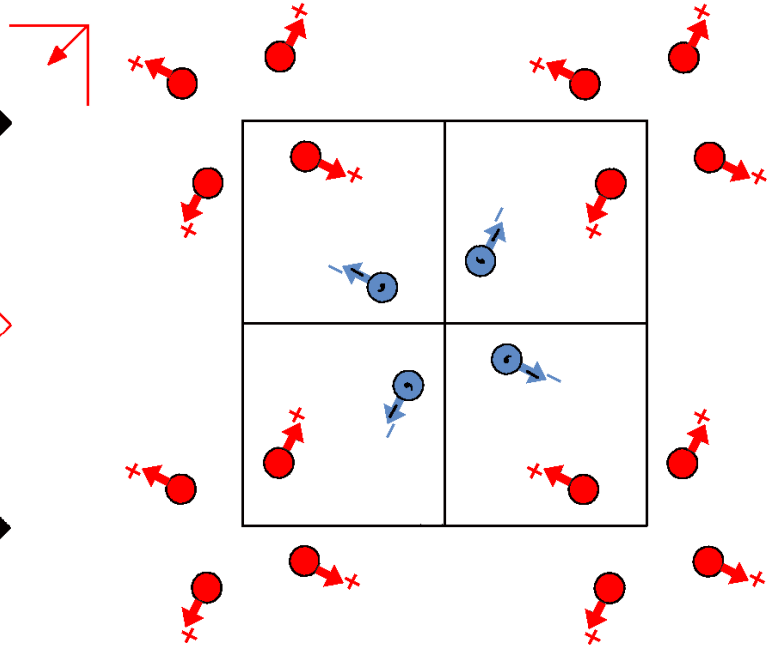
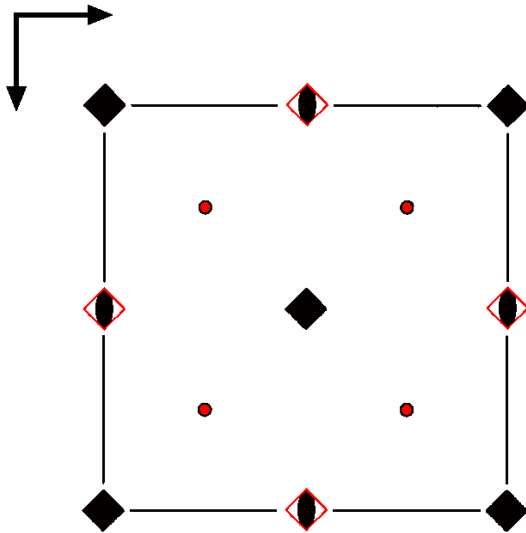
p4/n'

No. 52.3.371

4/m'

p4/n'

Tetragonal/Square



Origin at 4 on n at $-1/4, -1/4, 0$ from $\bar{1}$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|---|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z ⁺ 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻ 0,0,0) |
| (5) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0)' | (6) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' | (7) $\bar{4}$ ⁺ 1/2,0,z; 1/2,0,0
($\bar{4}$ _z ⁺ 1/2,1/2,0)' | (8) $\bar{4}$ ⁻ 1/2,0,z; 1/2,0,0
($\bar{4}$ _z ⁻ 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates				
	(1)	(2)	(3)	(4)	
8 e 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]			
	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]			
	(5) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},\bar{v},\bar{w}]	(6) x+1/2,y+1/2, \bar{z} [u,v, \bar{w}]			
	(7) y+1/2, $\bar{x}+1/2,\bar{z}$ [v, \bar{u},\bar{w}]	(8) $\bar{y}+1/2,x+1/2,\bar{z}$ [\bar{v},u,\bar{w}]			
	4 d 2..	1/2,0,z [0,0,w]	0,1/2,z [0,0,w]	0,1/2, \bar{z} [0,0, \bar{w}]	1/2,0, \bar{z} [0,0, \bar{w}]
	4 c $\bar{1}$ '	1/4,1/4,0 [0,0,0]	3/4,3/4,0 [0,0,0]	3/4,1/4,0 [0,0,0]	1/4,3/4,0 [0,0,0]
	2 b 4..	1/2,1/2,z [0,0,w]	0,0, \bar{z} [0,0, \bar{w}]		
	2 a $\bar{4}$ '..	1/2,0,0 [0,0,0]	0,1/2,0 [0,0,0]		

Symmetry of special projections

Along [001] p4

$a^* = (a-b)/2$ $b^* = (a+b)/2$

Origin at 0,0,z

Along [100] p2m'g'

$a^* = b$

Origin at x,1/4,0

Along [110] p2m'm'

$a^* = (-a+b)/2$

Origin at x,x,0

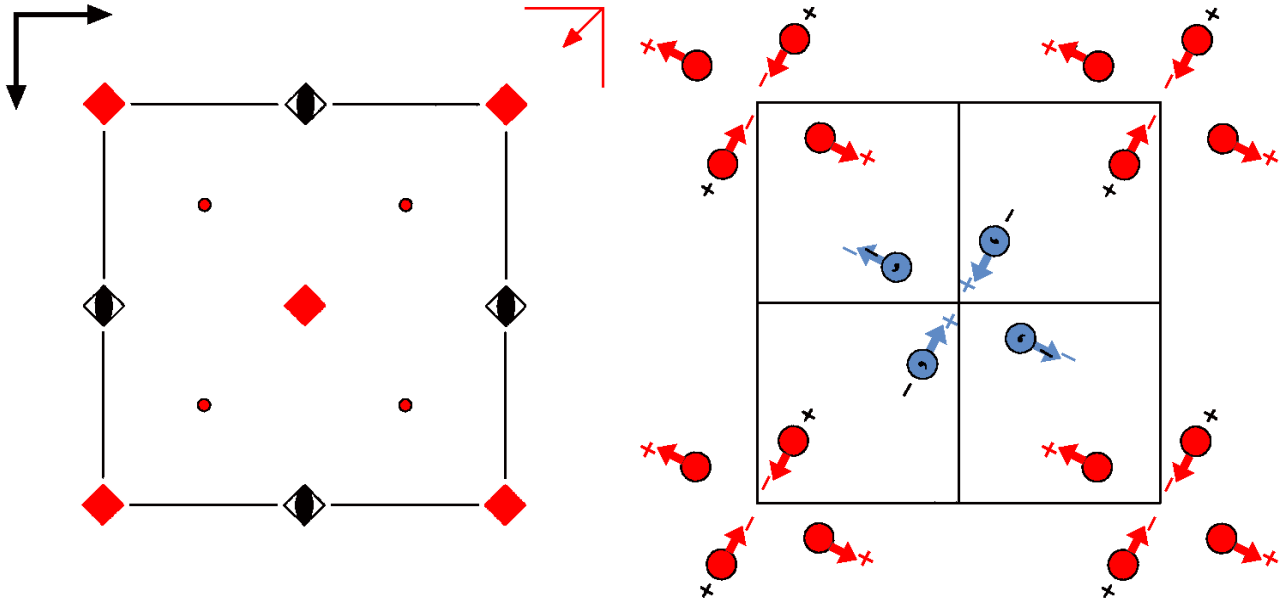
p4'/n'

No. 52.4.372

4'/m'

p4'/n'

Tetragonal/Square



Origin at 4' on n at -1/4,-1/4,0 from $\bar{1}$ '

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ ' 0,0,z
(4 _z ⁺ 0,0,0)' | (4) 4 ⁻ ' 0,0,z
(4 _z ⁻ 0,0,0)' |
| (5) $\bar{1}$ ' 1/4,1/4,0
($\bar{1}$ ' 1/2,1/2,0)' | (6) n' (1/2,1/2,0) x,y,0
(m _z ' 1/2,1/2,0)' | (7) $\bar{4}$ ⁺ 1/2,0,z; 1/2,0,0
($\bar{4}$ _z ⁺ 1/2,1/2,0) | (8) $\bar{4}$ ⁻ 1/2,0,z; 1/2,0,0
($\bar{4}$ _z ⁻ 1/2,1/2,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]
8 e 1	(5) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},\bar{v},\bar{w}]	(6) $x+1/2,y+1/2,\bar{z}$ [u,v, \bar{w}]	(7) $y+1/2,\bar{x}+1/2,\bar{z}$ [\bar{v},u,w]	(8) $\bar{y}+1/2,x+1/2,\bar{z}$ [v, \bar{u},w]
4 d 2..	1/2,0,z [0,0,w]	0,1/2,z [0,0, \bar{w}]	0,1/2, \bar{z} [0,0, \bar{w}]	1/2,0, \bar{z} [0,0,w]
4 c $\bar{1}$ '	1/4,1/4,0 [0,0,0]	3/4,3/4,0 [0,0,0]	3/4,1/4,0 [0,0,0]	1/4,3/4,0 [0,0,0]
2 b 4'..	1/2,1/2,z [0,0,0]	0,0, \bar{z} [0,0,0]		
2 a $\bar{4}$..	1/2,0,0 [0,0,w]	0,1/2,0 [0,0, \bar{w}]		

Symmetry of special projections

Along [001] p4'
 $a^*=(a-b)/2$ $b^*=(a+b)/2$
 Origin at 0,0,z

Along [100] p2mg
 $a^* = b$
 Origin at x,1/4,0

Along [110] p2mm
 $a^* = (-a+b)/2$
 Origin at x,x,0

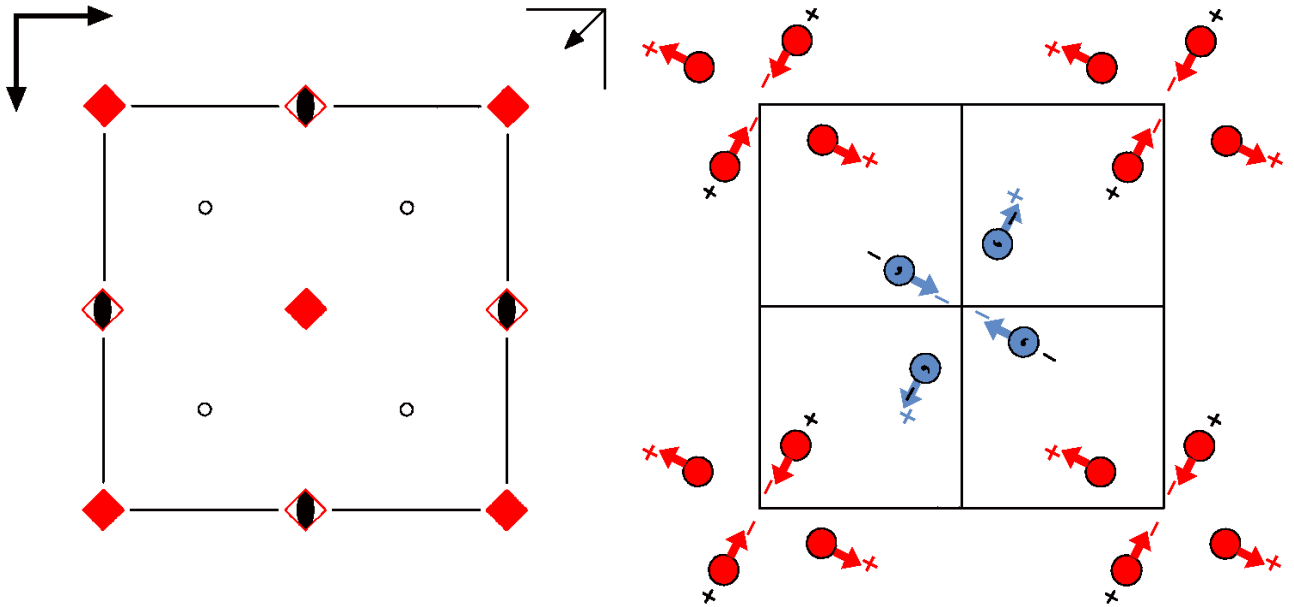
p4'/n

No. 52.5.373

4'/m

p4'/n

Tetragonal/Square



Origin at 4' on n at -1/4,-1/4,0 from $\bar{1}$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ ' 0,0,z
(4 _z ⁺ 0,0,0)' | (4) 4 ⁻ ' 0,0,z
(4 _z ⁻ 0,0,0)' |
| (5) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (6) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (7) $\bar{4}$ ⁺ ' 1/2,0,z; 1/2,0,0
($\bar{4}$ _z ⁺ 1/2,1/2,0)' | (8) $\bar{4}$ ⁻ ' 1/2,0,z; 1/2,0,0
($\bar{4}$ _z ⁻ 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

	Coordinates				
Multiplicity, Wyckoff letter, Site symmetry					
8 e 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]			
	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]			
	(5) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [u,v,w]	(6) x+1/2,y+1/2, \bar{z} [\bar{u},\bar{v},w]			
	(7) y+1/2, $\bar{x}+1/2,\bar{z}$ [v,\bar{u},\bar{w}]	(8) $\bar{y}+1/2,x+1/2,\bar{z}$ [\bar{v},u,\bar{w}]			
	4 d 2..	1/2,0,z [0,0,w]	0,1/2,z [0,0, \bar{w}]	0,1/2, \bar{z} [0,0,w]	1/2,0, \bar{z} [0,0, \bar{w}]
	4 c $\bar{1}$	1/4,1/4,0 [u,v,w]	3/4,3/4,0 [\bar{u},\bar{v},w]	3/4,1/4,0 [v, \bar{u},\bar{w}]	1/4,3/4,0 [\bar{v},u,\bar{w}]
	2 b 4'..	1/2,1/2,z [0,0,0]	0,0, \bar{z} [0,0,0]		
	2 a $\bar{4}$ '..	1/2,0,0 [0,0,0]	0,1/2,0 [0,0,0]		

Symmetry of special projections

Along [001] p_4
 $a'=(a-b)/2$ $b'=(a+b)/2$
 Origin at 1/2,0,z

Along [100] $p2mg$
 $a^* = b$
 Origin at x,1/4,0

Along [110] $p2mm$
 $a^* = (-a+b)/2$
 Origin at x,x,0

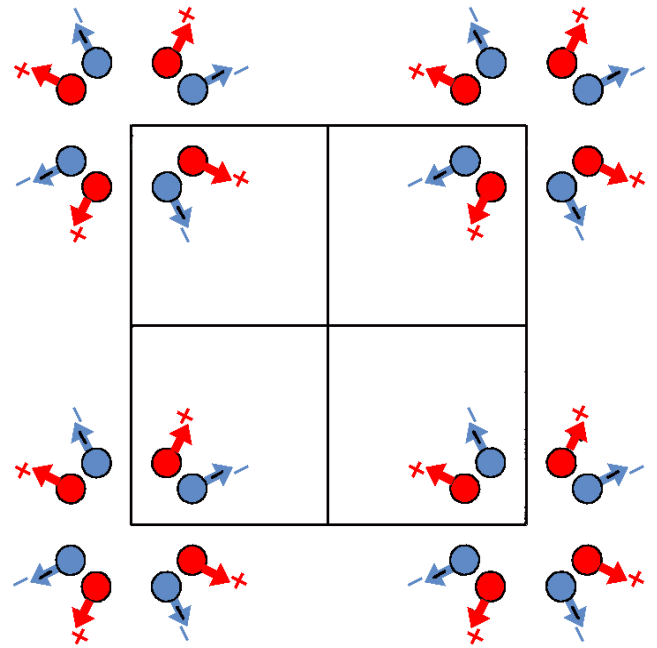
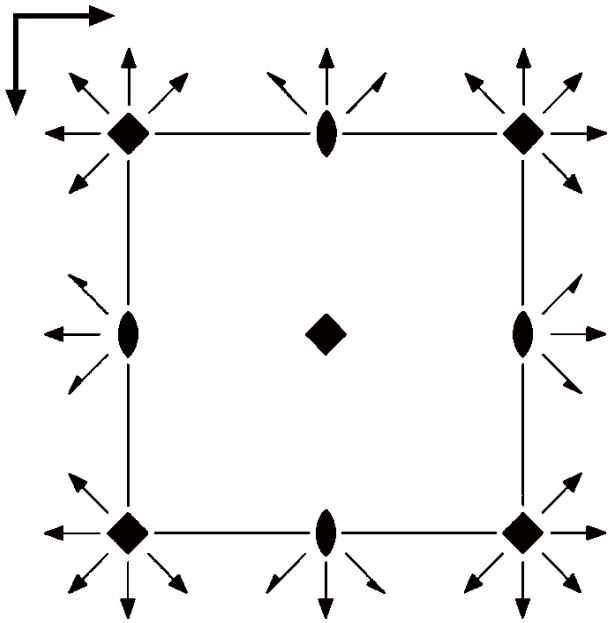
p422

422

Tetragonal/Square

No. 53.1.374

p422



Origin at 422

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x,x̄,0
(2 _{x̄y} 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]
8 j 1	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	(7) y,x,\bar{z} [v,u,\bar{w}]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]
4 i .2.	$x,1/2,0$ [u,0,0]	$\bar{x},1/2,0$ [0, \bar{u} ,0]	$1/2,x,0$ [u,0,0]	$1/2,\bar{x},0$ [0, \bar{u} ,0]
4 h .2.	$x,0,0$ [u,0,0]	$\bar{x},0,0$ [0, \bar{u} ,0]	$0,x,0$ [u,0,0]	$0,\bar{x},0$ [0, \bar{u} ,0]
4 g ..2	$x,x,0$ [u,u,0]	$\bar{x},\bar{x},0$ [\bar{u},\bar{u} ,0]	$\bar{x},x,0$ [\bar{u},u ,0]	$x,\bar{x},0$ [u, \bar{u} ,0]
4 f 2..	$0,1/2,z$ [0,0,w]	$1/2,0,z$ [0,0,w]	$0,1/2,\bar{z}$ [0,0, \bar{w}]	$1/2,0,\bar{z}$ [0,0, \bar{w}]
2 e 4..	$1/2,1/2,z$ [0,0,w]	$1/2,1/2,\bar{z}$ [0,0, \bar{w}]		
2 d 4..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0, \bar{w}]		
2 c 222.	$1/2,0,0$ [0,0,0]	$0,1/2,0$ [0,0,0]		
1 b 422	$1/2,1/2,0$ [0,0,0]			
1 a 422	$0,0,0$ [0,0,0]			

Symmetry of special projections

Along [001] $p4m'm'$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p2m'm'$
 $a^* = b$
 Origin at x,0,0

Along [110] $p2m'm'$
 $a^* = (-a+b)/2$
 Origin at x,x,0

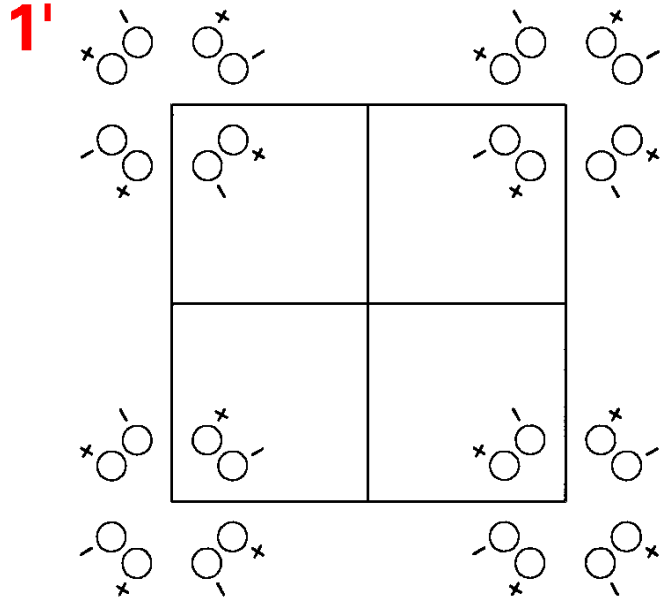
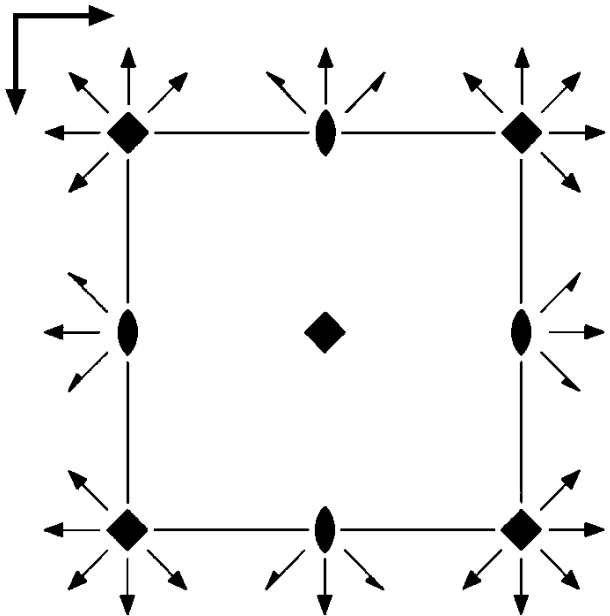
p4221'

4221'

Tetragonal/Square

No. 53.2.375

p4221'



Origin at 4221'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|---|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 _y 0,y,0
(2 _y 0,0,0) | (6) 2 _x x,0,0
(2 _x 0,0,0) | (7) 2 _{xy} x,x,0
(2 _{xy} 0,0,0) | (8) 2 _{x̄y} x,̄x,0
(2 _{x̄y} 0,0,0) |

For 1' + set

- | | | | |
|--|--|--|---|
| (1) 1'
(1 0,0,0)' | (2) 2' _z 0,0,z
(2' _z 0,0,0)' | (3) 4 ⁺ ' 0,0,z
(4' _z 0,0,0)' | (4) 4 ⁻ ' 0,0,z
(4' _z ⁻¹ 0,0,0)' |
| (5) 2' _y 0,y,0
(2' _y 0,0,0)' | (6) 2' _x x,0,0
(2' _x 0,0,0)' | (7) 2' _{xy} x,x,0
(2' _{xy} 0,0,0)' | (8) 2' _{x̄y} x,̄x,0
(2' _{x̄y} 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		1+	1'+	
8 j 11'	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$	(3) $\bar{y},x,z [0,0,0]$	(4) $y,\bar{x},z [0,0,0]$
	(5) $\bar{x},y,\bar{z} [0,0,0]$	(6) $x,\bar{y},\bar{z} [0,0,0]$	(7) $y,x,\bar{z} [0,0,0]$	(8) $\bar{y},\bar{x},\bar{z} [0,0,0]$
4 i .2.1'	$x,1/2,0 [0,0,0]$	$\bar{x},1/2,0 [0,0,0]$	$1/2,x,0 [0,0,0]$	$1/2,\bar{x},0 [0,0,0]$
4 h .2.1'	$x,0,0 [0,0,0]$	$\bar{x},0,0 [0,0,0]$	$0,x,0 [0,0,0]$	$0,\bar{x},0 [0,0,0]$
4 g ..21'	$x,x,0 [0,0,0]$	$\bar{x},\bar{x},0 [0,0,0]$	$\bar{x},x,0 [0,0,0]$	$x,\bar{x},0 [0,0,0]$
4 f 2..1'	$0,1/2,z [0,0,0]$	$1/2,0,z [0,0,0]$	$0,1/2,\bar{z} [0,0,0]$	$1/2,0,\bar{z} [0,0,0]$
2 e 4..1'	$1/2,1/2,z [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$		
2 d 4..1'	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$		
2 c 222.1'	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$		
1 b 4221'	$1/2,1/2,0 [0,0,0]$			
1 a 4221'	$0,0,0 [0,0,0]$			

Symmetry of special projections

Along [001] $p4mm1'$ $a^* = a \quad b^* = b$ Origin at $0,0,z$	Along [100] $p2mm1'$ $a^* = b$ Origin at $x,0,0$	Along [110] $p2mm1'$ $a^* = (-a+b)/2$ Origin at $x,x,0$
--	--	---

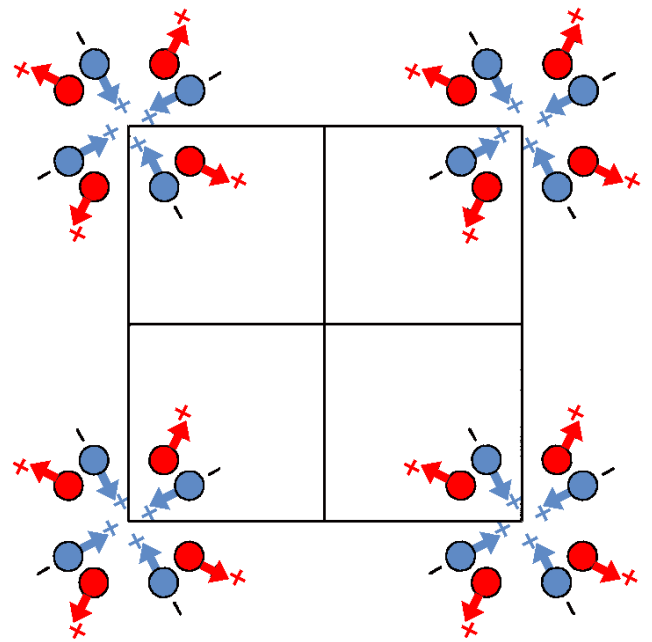
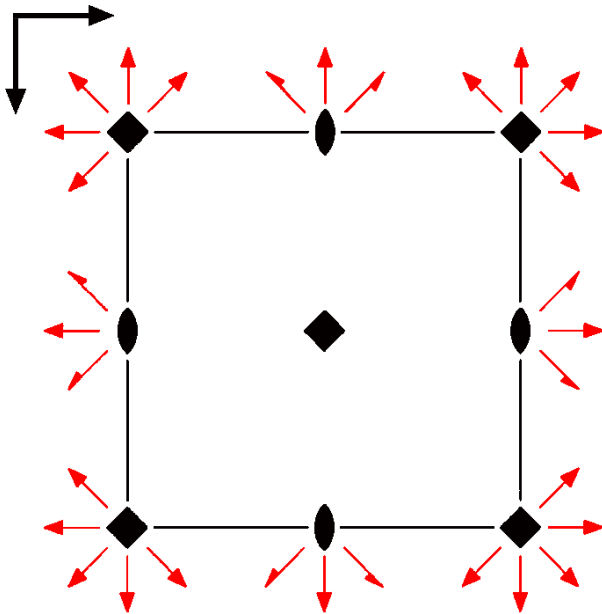
p42'2'

42'2'

Tetragonal/Square

No. 53.3.376

p42'2'



Origin at 42'2'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x, \bar{x} ,0
(2 _{\bar{xy}} 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]
8 j 1	(5) \bar{x},y,\bar{z} [u,\bar{v},w]	(6) x,\bar{y},\bar{z} [\bar{u},v,w]	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]
4 i .2'	$x,1/2,0$ [$0,v,w$]	$\bar{x},1/2,0$ [$0,\bar{v},w$]	$1/2,x,0$ [$\bar{v},0,w$]	$1/2,\bar{x},0$ [$v,0,w$]
4 h .2'	$x,0,0$ [$0,v,w$]	$\bar{x},0,0$ [$0,\bar{v},w$]	$0,x,0$ [$\bar{v},0,w$]	$0,\bar{x},0$ [$v,0,w$]
4 g ..2'	$x,x,0$ [u,\bar{u},w]	$\bar{x},\bar{x},0$ [\bar{u},u,w]	$\bar{x},x,0$ [u,u,w]	$x,\bar{x},0$ [\bar{u},\bar{u},w]
4 f 2..	$0,1/2,z$ [$0,0,w$]	$1/2,0,z$ [$0,0,w$]	$0,1/2,\bar{z}$ [$0,0,w$]	$1/2,0,\bar{z}$ [$0,0,w$]
2 e 4..	$1/2,1/2,z$ [$0,0,w$]	$1/2,1/2,\bar{z}$ [$0,0,w$]		
2 d 4..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,w$]		
2 c 22'2'	$1/2,0,0$ [$0,0,w$]	$0,1/2,0$ [$0,0,w$]		
1 b 42'2'	$1/2,1/2,0$ [$0,0,w$]			
1 a 42'2'	$0,0,0$ [$0,0,w$]			

Symmetry of special projections

Along [001] $p4mm$
 $a^* = a$ $b^* = b$
 Origin at $0,0,z$

Along [100] $p2'mm'$
 $a^* = b$
 Origin at $x,0,0$

Along [110] $p2'mm'$
 $a^* = (-a+b)/2$
 Origin at $x,x,0$

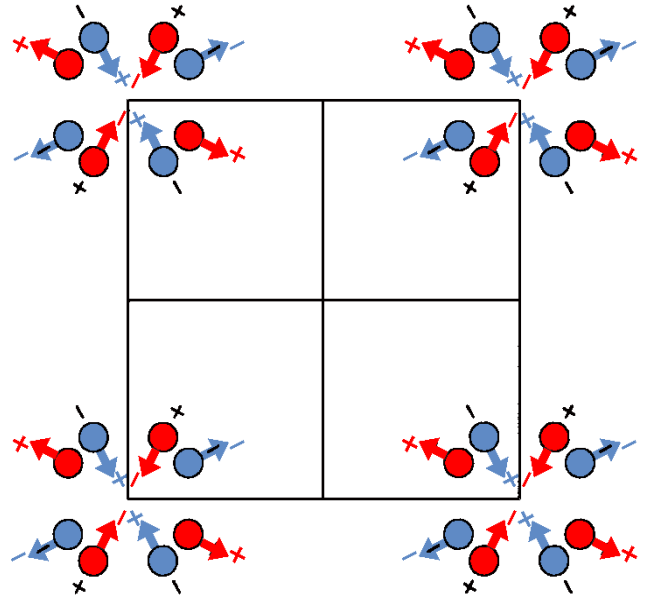
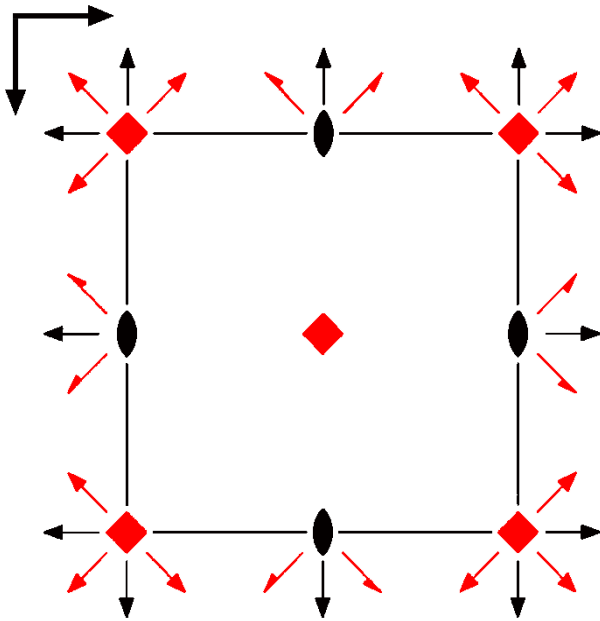
p4'22'

4'22'

Tetragonal/Square

No. 53.4.377

p4'22'



Origin at 4'22'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x, \bar{x} ,0
(2 _{\bar{xy}} 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

		Coordinates			
Multiplicity, Wyckoff letter, Site symmetry					
8 j 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]	
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]	
4 i .2.	$x,1/2,0$ [u,0,0]	$\bar{x},1/2,0$ [$\bar{u},0,0$]	$1/2,x,0$ [0, $\bar{u},0$]	$1/2,\bar{x},0$ [0,u,0]	
4 h .2.	$x,0,0$ [u,0,0]	$\bar{x},0,0$ [$\bar{u},0,0$]	$0,x,0$ [0, $\bar{u},0$]	$0,\bar{x},0$ [0,u,0]	
4 g ..2'	$x,x,0$ [u, \bar{u},w]	$\bar{x},\bar{x},0$ [\bar{u},u,w]	$\bar{x},x,0$ [\bar{u},\bar{u},\bar{w}]	$x,\bar{x},0$ [u,u, \bar{w}]	
4 f 2..	$0,1/2,z$ [0,0,w]	$1/2,0,z$ [0,0, \bar{w}]	$0,1/2,\bar{z}$ [0,0, \bar{w}]	$1/2,0,\bar{z}$ [0,0,w]	
2 e 4'..	$1/2,1/2,z$ [0,0,0]	$1/2,1/2,\bar{z}$ [0,0,0]			
2 d 4'..	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]			
2 c 222.	$1/2,0,0$ [0,0,0]	$0,1/2,0$ [0,0,0]			
1 b 4'22'	$1/2,1/2,0$ [0,0,0]				
1 a 4'22'	$0,0,0$ [0,0,0]				

Symmetry of special projections

Along [001] p4'm'm	Along [100] p2mm	Along [110] p2'mm'
$a^* = a \quad b^* = b$	$a^* = b$	$a^* = (-a+b)/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

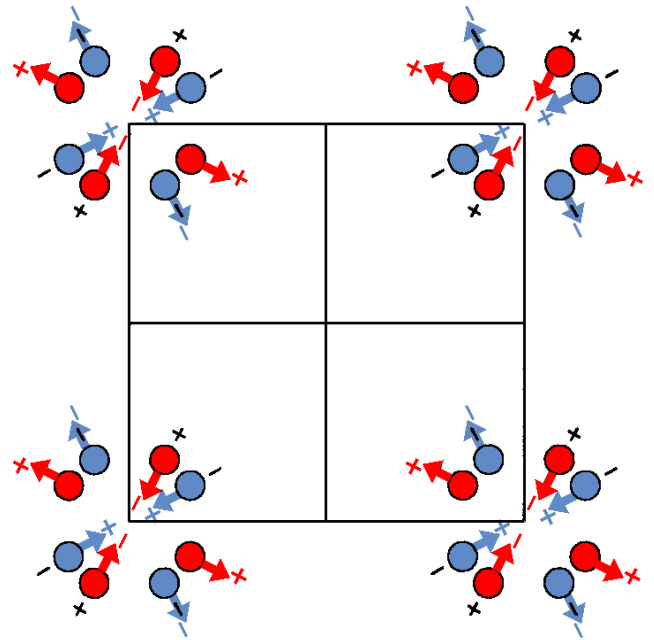
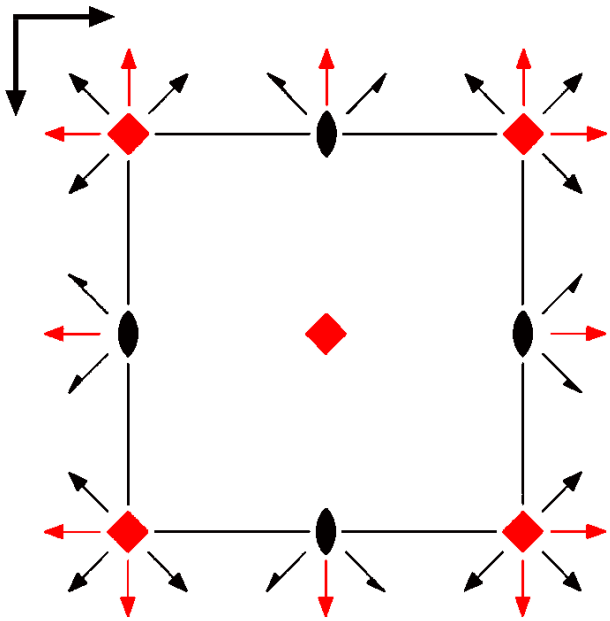
p4'2'2

4'2'2

Tetragonal/Square

No. 53.5.378

p4'2'2



Origin at 4'2'2

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z⁺|0,0,0)⁺

(4) 4⁻ 0,0,z
(4_z⁻|0,0,0)⁻

(5) 2' 0,y,0
(2_y'|0,0,0)[']

(6) 2' x,0,0
(2_x'|0,0,0)[']

(7) 2 x,x,0
(2_{xy}'|0,0,0)[']

(8) 2 x,̄x,0
(2_{̄xy}'|0,0,0)[']

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 j 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v, \bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]
	(5) \bar{x},y,\bar{z} [u, \bar{v},w]	(6) x, \bar{y},\bar{z} [\bar{u},v,w]	(7) y,x, \bar{z} [v,u, \bar{w}]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]
4 i .2'	x,1/2,0 [0,v,w]	$\bar{x},1/2,0$ [0, \bar{v},w]	1/2,x,0 [v,0, \bar{w}]	1/2, $\bar{x},0$ [$\bar{v},0,\bar{w}$]
4 h .2'	x,0,0 [0,v,w]	$\bar{x},0,0$ [0, \bar{v},w]	0,x,0 [v,0, \bar{w}]	0, $\bar{x},0$ [$\bar{v},0,\bar{w}$]
4 g ..2	x,x,0 [u,u,0]	$\bar{x},\bar{x},0$ [$\bar{u},\bar{u},0$]	$\bar{x},x,0$ [u, $\bar{u},0$]	x, $\bar{x},0$ [$\bar{u},u,0$]
4 f 2..	0,1/2,z [0,0,w]	1/2,0,z [0,0, \bar{w}]	0,1/2, \bar{z} [0,0,w]	1/2,0, \bar{z} [0,0, \bar{w}]
2 e 4'..	1/2,1/2,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]		
2 d 4'..	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]		
2 c 22'2'	1/2,0,0 [0,0,w]	0,1/2,0 [0,0, \bar{w}]		
1 b 4'2'2	1/2,1/2,0 [0,0,0]			
1 a 4'2'2	0,0,0 [0,0,0]			

Symmetry of special projections

Along [001] p4'mm'	Along [100] p2m'm'	Along [110] p2mm
$a^* = a$ $b^* = b$	$a^* = b$	$a^* = (-a+b)/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

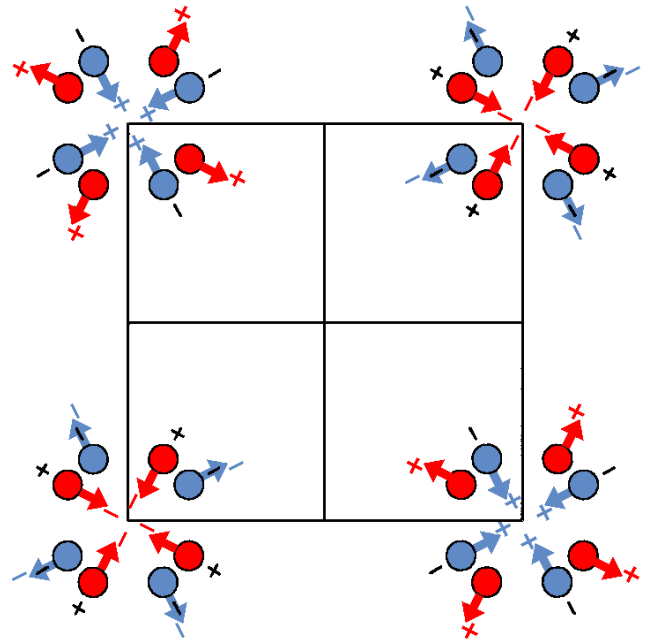
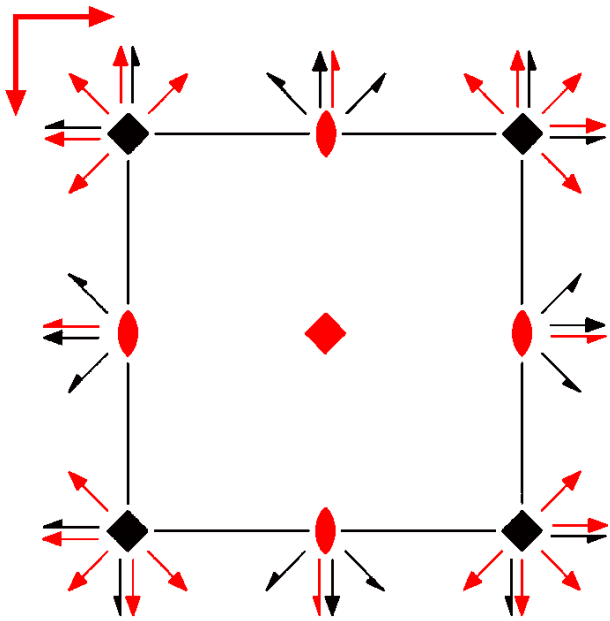
$p_p42'2'$

4221'

Tetragonal/Square

No. 53.6.379

$p_p42'2'$



Origin at $42'2'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--------------------------------------|--------------------------------------|---|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 4^+ $0,0,z$
(4_z 0,0,0) | (4) 4^- $0,0,z$
(4_z^{-1} 0,0,0) |
| (5) $2'$ $0,y,0$
(2_y 0,0,0)' | (6) $2'$ $x,0,0$
(2_x 0,0,0)' | (7) $2'$ $x,x,0$
(2_{xy} 0,0,0)' | (8) $2'$ $x,\bar{x},0$
($2_{\bar{xy}}$ 0,0,0)' |

For $(1,0,0)$ ' + set

- | | | | |
|------------------------------------|--|---|--|
| (1) t' $(1,0,0)$
(1 1,0,0)' | (2) $2'$ $1/2,0,z$
(2_z 1,0,0)' | (3) $4^{+'}$ $1/2,1/2,z$
(4_z 1,0,0)' | (4) $4^{-'}$ $1/2,1/2,z$
(4_z^{-1} 1,0,0)' |
| (5) 2 $1/2,y,0$
(2_y 1,0,0) | (6) 2 $(1,0,0) x,0,0$
(2_x 1,0,0) | (7) 2 $(1/2,1/2,0) x+1/2,x,0$
(2_{xy} 1,0,0) | (8) 2 $(1/2,-1/2,0) x+1/2,\bar{x},0$
($2_{\bar{xy}}$ 1,0,0) |

Generators selected (1); t(1,0,0)'; t(0,1,0)'; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(1,0,0)' +		
8 j 1	(1) x,y,z [u,v,w] (5) \bar{x},y,\bar{z} [u, \bar{v} ,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v} ,w] (6) x, \bar{y},\bar{z} [\bar{u} ,v,w]	(3) \bar{y},x,z [\bar{v} ,u,w] (7) y,x, \bar{z} [\bar{v},\bar{u} ,w]	(4) y, \bar{x},z [v, \bar{u} ,w] (8) \bar{y},\bar{x},\bar{z} [v,u,w]
4 i .2.	x,1/2,0 [u,0,0]	$\bar{x},1/2,0$ [\bar{u} ,0,0]	1/2,x,0 [0,u,0]	1/2, \bar{x} ,0 [0, \bar{u} ,0]
4 h .2'	x,0,0 [0,v,w]	$\bar{x},0,0$ [0, \bar{v} ,w]	0,x,0 [\bar{v} ,0,w]	0, \bar{x} ,0 [v,0,w]
4 g ..2'	x,x,0 [u, \bar{u} ,w]	$\bar{x},\bar{x},0$ [\bar{u} ,u,w]	$\bar{x},x,0$ [u,u,w]	x, $\bar{x},0$ [\bar{u},\bar{u} ,w]
4 f 2..	0,1/2,z [0,0,w]	1/2,0,z [0,0,w]	0,1/2, \bar{z} [0,0,w]	1/2,0, \bar{z} [0,0,w]
2 e 4'..	1/2,1/2,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]		
2 d 4..	0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]		
2 c 2'2'2.	1/2,0,0 [0,v,0]	0,1/2,0 [v,0,0]		
1 b 4'22'	1/2,1/2,0 [0,0,0]			
1 a 42'2'	0,0,0 [0,0,w]			

Symmetry of special projections

Along [001] p_p4mm
a* = a b* = b
Origin at 0,0,z

Along [100] p_{2a}*2mm
a* = b
Origin at x,1/2,0

Along [110] p_{2a}*2mm
a* = (-a+b)/2
Origin at x-1/4,x+1/4,0

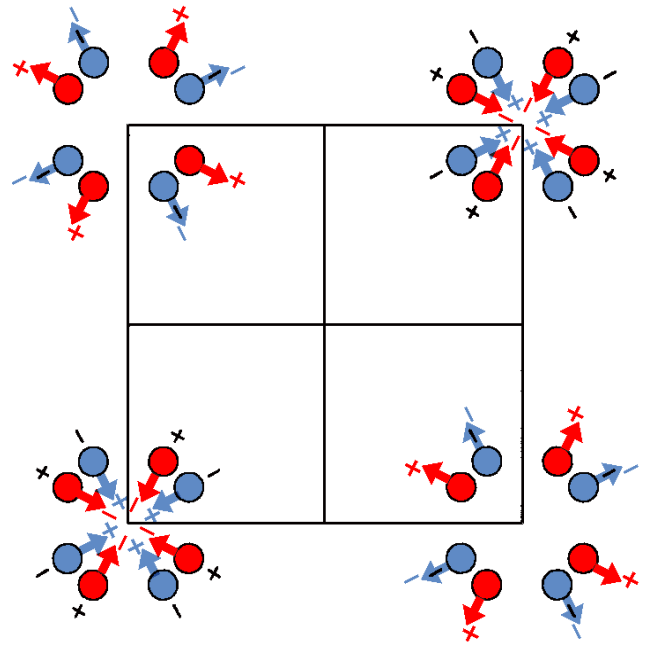
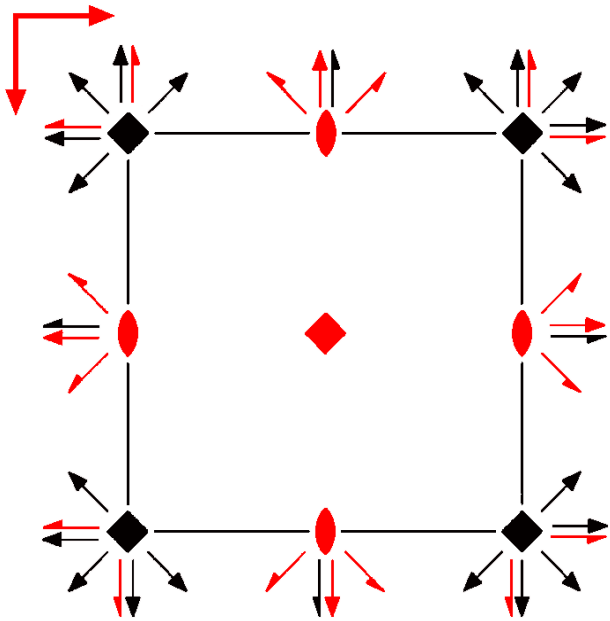
p_p422

4221'

Tetragonal/Square

No. 53.7.380

p_p422



Origin at 422

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x,̄x,0
(2 _{̄xy} 0,0,0) |

For (1,0,0)' + set

- | | | | |
|--|--|--|--|
| (1) t' (1,0,0)
(1 1,0,0)' | (2) 2' 1/2,0,z
(2 _z 1,0,0)' | (3) 4 ⁺ ' 1/2,1/2,z
(4 _z 1,0,0)' | (4) 4 ⁻ ' 1/2,1/2,z
(4 _z ⁻¹ 1,0,0)' |
| (5) 2' 1/2,y,0
(2 _y 1,0,0)' | (6) 2' (1,0,0) x,0,0
(2 _x 1,0,0)' | (7) 2' (1/2,1/2,0) x+1/2,x,0
(2 _{xy} 1,0,0)' | (8) 2' (1/2,-1/2,0) x+1/2,̄x,0
(2 _{̄xy} 1,0,0)' |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) ⁺	(1,0,0) ['] +		
8 j 1	(1) x,y,z [u,v,w] (5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w] (6) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]	(3) \bar{y},x,z [\bar{v},u,w] (7) y,x, \bar{z} [v,u, \bar{w}]	(4) y, \bar{x},z [v, \bar{u},w] (8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]
4 i .2'	x,1/2,0 [0,v,w]	$\bar{x},1/2,0$ [0,v, \bar{w}]	1/2,x,0 [v,0, \bar{w}]	1/2, $\bar{x},0$ [v,0,w]
4 h .2.	x,0,0 [u,0,0]	$\bar{x},0,0$ [$\bar{u},0,0$]	0,x,0 [0,u,0]	0, $\bar{x},0$ [0, $\bar{u},0$]
4 g ..2	x,x,0 [u,u,0]	$\bar{x},\bar{x},0$ [$\bar{u},\bar{u},0$]	$\bar{x},x,0$ [$\bar{u},u,0$]	x, $\bar{x},0$ [$\bar{u},u,0$]
4 f 2'..	0,1/2,z [u,v,0]	1/2,0,z [v, $\bar{u},0$]	0,1/2, \bar{z} [$\bar{u},v,0$]	1/2,0, \bar{z} [v,u,0]
2 e 4'..	1/2,1/2,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]		
2 d 4..	0,0,z [0,0,w]	0,0, \bar{z} [0,0, \bar{w}]		
2 c 2'22'.	1/2,0,0 [u,0,0]	0,1/2,0 [0,u,0]		
1 b 4'2'2	1/2,1/2,0 [0,0,0]			
1 a 422	0,0,0 [0,0,0]			

Symmetry of special projections

Along [001] $p_p \cdot 4m'm'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p_{2a} \cdot 2m'm'$ $a^* = b$ Origin at x,0,0	Along [110] $p_{2a} \cdot 2m'm'$ $a^* = (-a+b)/2$ Origin at x,x,0
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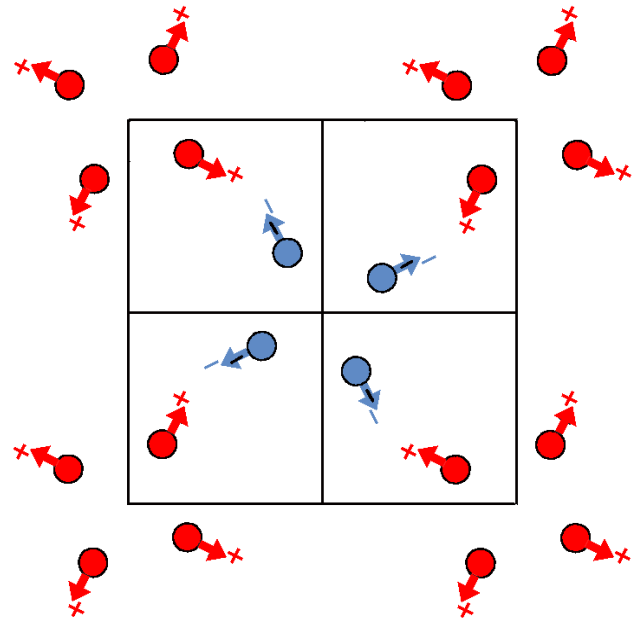
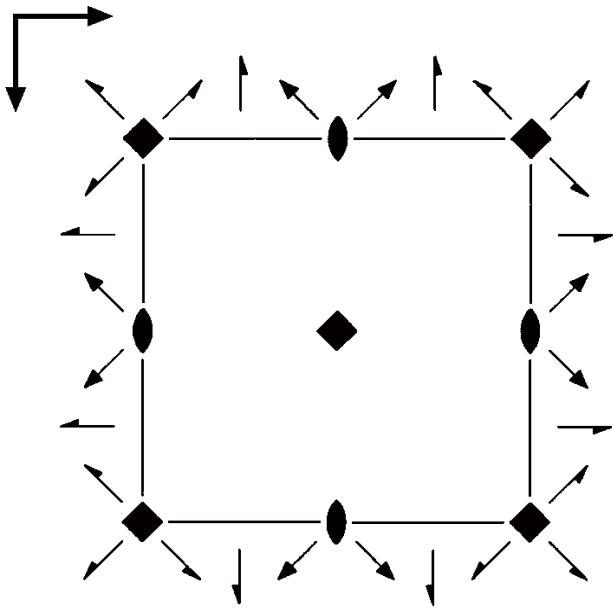
p42,2

422

Tetragonal/Square

No. 54.1.381

p42,2



Origin on 4 at $-1/2, 0, 0$ from 222 at 212

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (6) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) | (7) 2 (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0) | (8) 2 (1/2,1/2,0) x,x̄,0
(2 _{x̄y} 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]
8 e 1	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [u,\bar{v},\bar{w}]	(7) $y+1/2,x+1/2,\bar{z}$ [v,u,\bar{w}]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [\bar{v},\bar{u},\bar{w}]
4 d ..2	$x,x+1/2,0$ [$u,u,0$]	$\bar{x},\bar{x}+1/2,0$ [$\bar{u},\bar{u},0$]	$\bar{x}+1/2,x,0$ [$\bar{u},u,0$]	$x+1/2,\bar{x},0$ [$u,\bar{u},0$]
4 c 2..	$0,1/2,z$ [$0,0,w$]	$1/2,0,z$ [$0,0,w$]	$1/2,0,\bar{z}$ [$0,0,\bar{w}$]	$0,1/2,\bar{z}$ [$0,0,\bar{w}$]
2 b 4..	$0,0,z$ [$0,0,w$]	$1/2,1/2,\bar{z}$ [$0,0,\bar{w}$]		
2 a 2.22	$0,1/2,0$ [$0,0,0$]	$1/2,0,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $p4g'm'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2m'g'$ $a^* = b$ Origin at $x,1/4,0$	Along [110] $p2m'm'$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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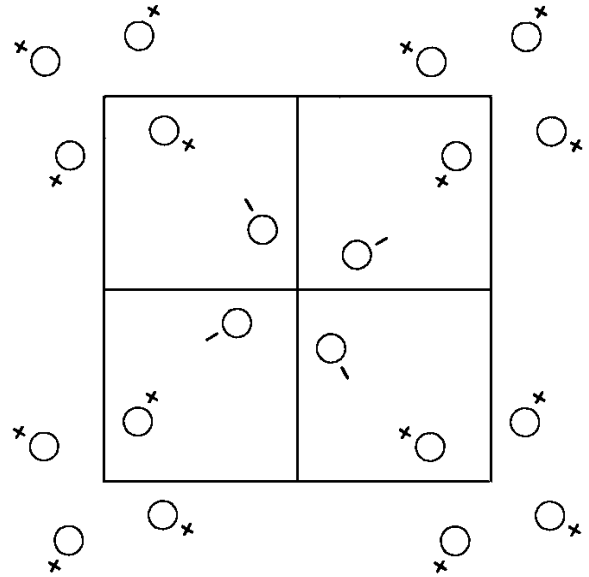
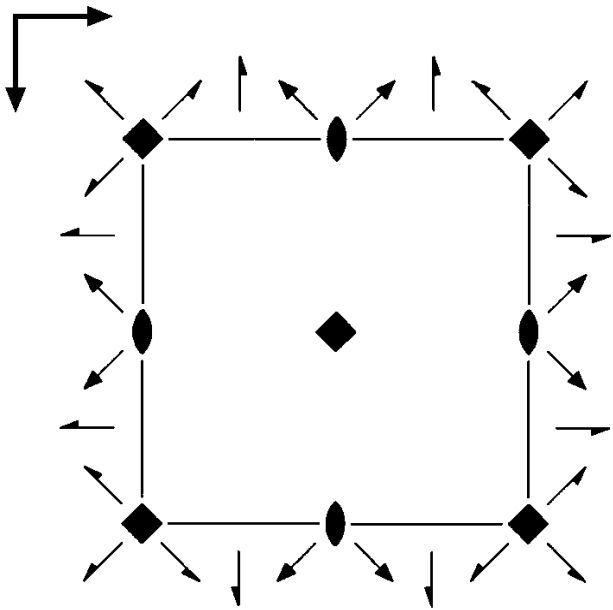
p42,21'

4221'

Tetragonal/Square

No. 54.2.382

p42,21'



Origin on 41' at -1/2,0,0 from 2221' at 2121'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (6) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) | (7) 2 (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0) | (8) 2 (1/2,1/2,0) x,x̄,0
(2 _{x̄y} 1/2,1/2,0) |

For 1' + set

- | | | | |
|--|--|---|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 4 ⁺ ' 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ ' 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (6) 2' (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0)' | (7) 2' (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0)' | (8) 2' (1/2,1/2,0) x,x̄,0
(2 _{x̄y} 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates				
	1+	1' +			
8 e 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]			
	(3) \bar{y},x,z [0,0,0]	(4) y, \bar{x},z [0,0,0]			
	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [0,0,0]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [0,0,0]			
	(7) $y+1/2,x+1/2,\bar{z}$ [0,0,0]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [0,0,0]			
	4 d ..21'	x,x+1/2,0 [0,0,0]	$\bar{x},\bar{x}+1/2,0$ [0,0,0]	$\bar{x}+1/2,x,0$ [0,0,0]	x+1/2, $\bar{x},0$ [0,0,0]
	4 c 2..1'	0,1/2,z [0,0,0]	1/2,0,z [0,0,0]	1/2,0, \bar{z} [0,0,0]	0,1/2, \bar{z} [0,0,0]
	2 b 4..1'	0,0,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]		
	2 a 2.221'	0,1/2,0 [0,0,0]	1/2,0,0 [0,0,0]		

Symmetry of special projections

Along [001] p4gm1' a* = a b* = b Origin at 0,0,z	Along [100] p2mg1' a* = b Origin at x,1/4,0	Along [110] p2mm1' a* = (-a+b)/2 Origin at x,x,0
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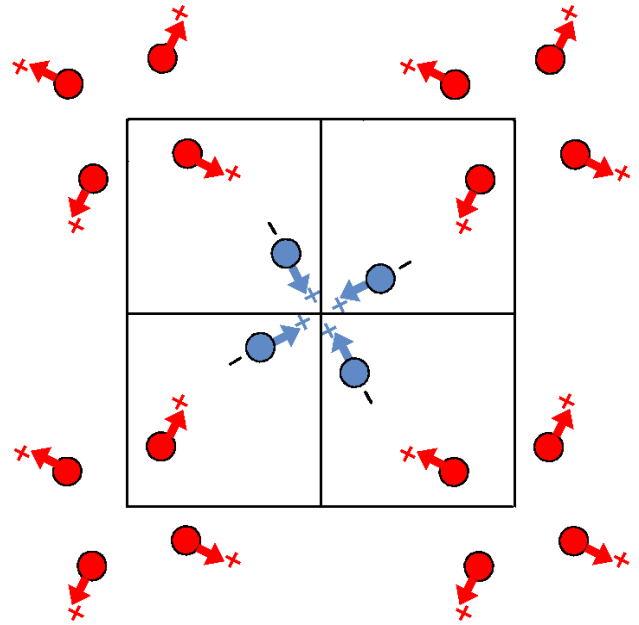
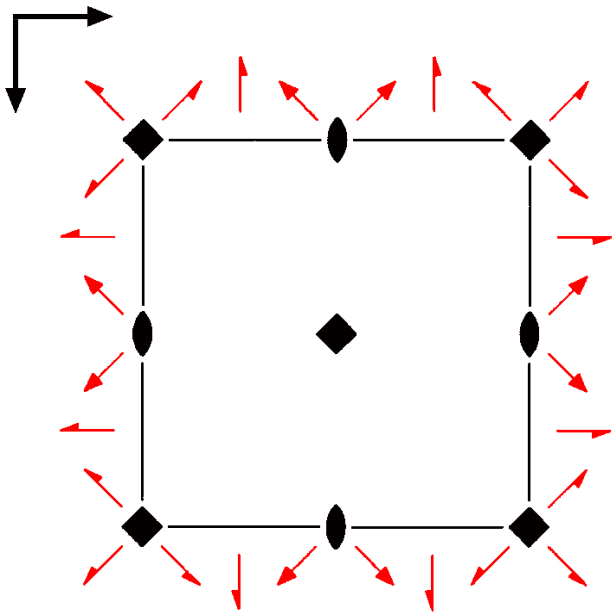
p42₁'2'

42'2'

Tetragonal/Square

No. 54.3.383

p42₁'2'



Origin on 4 at $-1/2, 0, 0$ from 22'2' at 212'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (6) 2' (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0)' | (7) 2' (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0)' | (8) 2' (1/2,1/2,0) x,x̄,0
(2 _{xy} ̄ 1/2,1/2,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]
8 e 1	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [u,\bar{v},w]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]	(7) $y+1/2,x+1/2,\bar{z}$ [\bar{v},\bar{u},w]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [v,u,w]
4 d ..2'	$x,x+1/2,0$ [u,\bar{u},w]	$\bar{x},\bar{x}+1/2,0$ [\bar{u},u,w]	$\bar{x}+1/2,x,0$ [u,u,w]	$x+1/2,\bar{x},0$ [\bar{u},\bar{u},w]
4 c 2..	$0,1/2,z$ [$0,0,w$]	$1/2,0,z$ [$0,0,w$]	$1/2,0,\bar{z}$ [$0,0,w$]	$0,1/2,\bar{z}$ [$0,0,w$]
2 b 4..	$0,0,z$ [$0,0,w$]	$1/2,1/2,\bar{z}$ [$0,0,w$]		
2 a 2.2'2'	$0,1/2,0$ [$0,0,w$]	$1/2,0,0$ [$0,0,w$]		

Symmetry of special projections

Along [001] $p4gm$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2'm'g$ $a^* = b$ Origin at $x,1/4,0$	Along [110] $p2'm'm$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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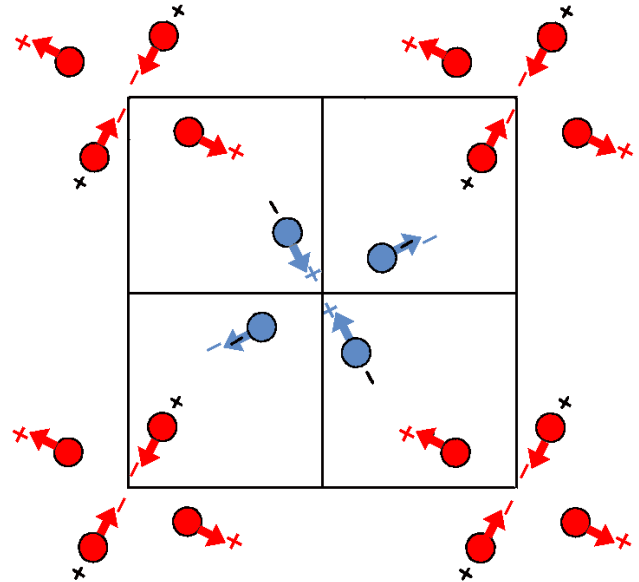
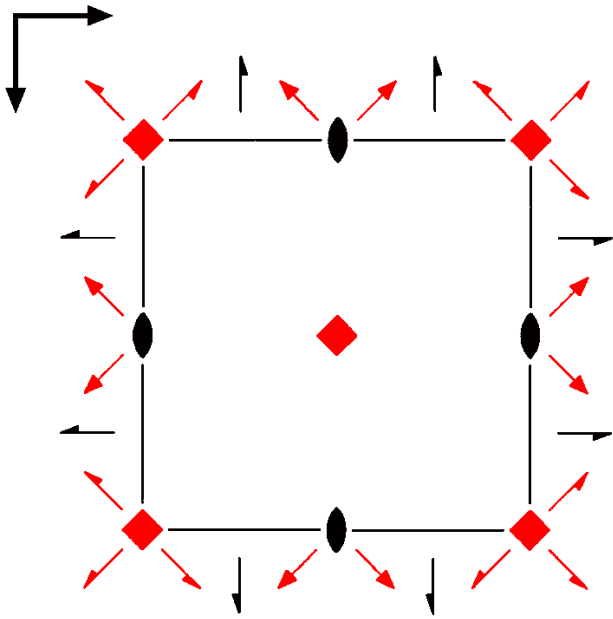
p4'2₁2'

4'22'

Tetragonal/Square

No. 54.4.384

p4'2₁2'



Origin on 4' at -1/2,0,0 from 22'2' at 212'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z|0,0,0)'

(4) 4⁻ 0,0,z
(4_z⁻¹|0,0,0)'

(5) 2 (0,1/2,0) 1/4,y,0
(2_y|1/2,1/2,0)

(6) 2 (1/2,0,0) x,1/4,0
(2_x|1/2,1/2,0)

(7) 2' (1/2,1/2,0) x,x,0
(2_{xy}|1/2,1/2,0)'

(8) 2' (1/2,1/2,0) x,x̄,0
(2_{x̄y}|1/2,1/2,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]
8 e 1	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [u,\bar{v},\bar{w}]	(7) $y+1/2,x+1/2,\bar{z}$ [\bar{v},\bar{u},w]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [v,u,w]
4 d ..2'	x,x+1/2,0 [u, \bar{u} ,w]	$\bar{x},\bar{x}+1/2,0$ [\bar{u},u,w]	$\bar{x}+1/2,x,0$ [\bar{u},\bar{u},\bar{w}]	$x+1/2,\bar{x},0$ [u,u, \bar{w}]
4 c 2..	0,1/2,z [0,0,w]	1/2,0,z [0,0, \bar{w}]	1/2,0, \bar{z} [0,0, \bar{w}]	0,1/2, \bar{z} [0,0,w]
2 b 4'..	0,0,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]		
2 a 2.2'2'	0,1/2,0 [0,0,w]	1/2,0,0 [0,0, \bar{w}]		

Symmetry of special projections

Along [001] p4'gm'	Along [100] p2mg	Along [110] p2'mm'
$a^* = a$ $b^* = b$	$a^* = b$	$a^* = (-a+b)/2$
Origin at 0,0,z	Origin at x,1/4,0	Origin at x,x,0

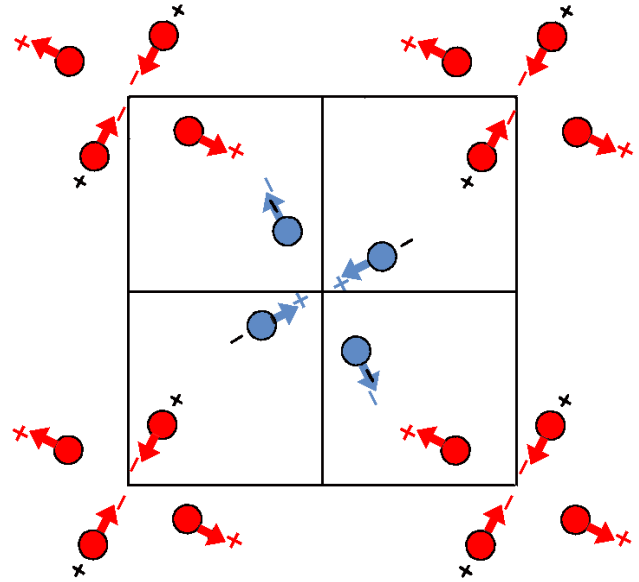
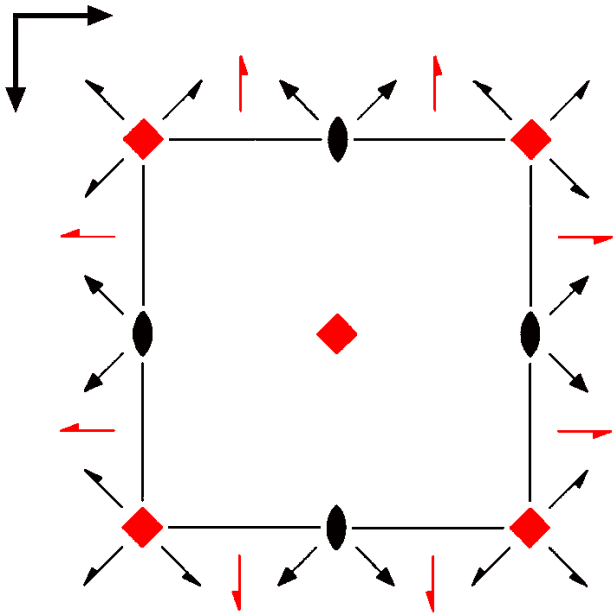
p4'2₁'2

4'2'2

Tetragonal/Square

No. 54.5.385

p4'2₁'2



Origin on 4' at -1/2,0,0 from 222 at 212

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z⁺|0,0,0)⁺

(4) 4⁻ 0,0,z
(4_z⁻|0,0,0)⁻

(5) 2' (0,1/2,0) 1/4,y,0 (2_y'|1/2,1/2,0)[']

(6) 2' (1/2,0,0) x,1/4,0 (2_x'|1/2,1/2,0)[']

(7) 2 (1/2,1/2,0) x,x,0 (2_{xy}|1/2,1/2,0)

(8) 2 (1/2,1/2,0) x,x̄,0 (2_{x̄y}|1/2,1/2,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

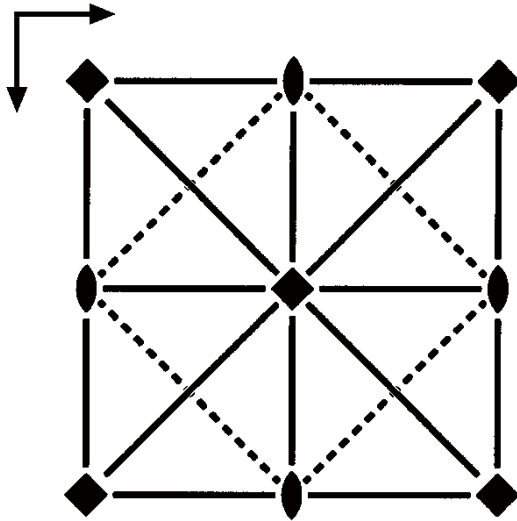
Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]
8 e 1	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [u,\bar{v},w]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]	(7) $y+1/2,x+1/2,\bar{z}$ [v,u,\bar{w}]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [\bar{v},\bar{u},\bar{w}]
4 d ..2	x,x+1/2,0 [u,u,0]	$\bar{x},\bar{x}+1/2,0$ [$\bar{u},\bar{u},0$]	$\bar{x}+1/2,x,0$ [u, $\bar{u},0$]	x+1/2, $\bar{x},0$ [$\bar{u},u,0$]
4 c 2..	0,1/2,z [0,0,w]	1/2,0,z [0,0, \bar{w}]	1/2,0, \bar{z} [0,0,w]	0,1/2, \bar{z} [0,0, \bar{w}]
2 b 4'..	0,0,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]		
2 a 2.22	0,1/2,0 [0,0,0]	1/2,0,0 [0,0,0]		

Symmetry of special projections

Along [001] p4'g'm $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p2'mg' $a^* = b$ Origin at x,1/4,0	Along [110] p2mm $a^* = (-a+b)/2$ Origin at x,x,0
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p4mm

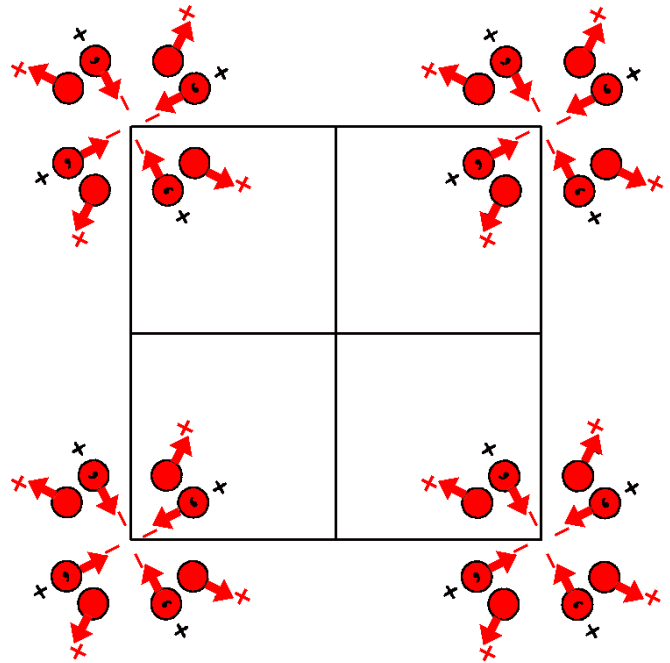
No. 55.1.386



4mm

p4mm

Tetragonal/Square



Origin on 4mm

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z⁺|0,0,0)

(4) 4⁻ 0,0,z
(4_z⁻|0,0,0)

(5) m x,0,z
(m_y|0,0,0)

(6) m 0,y,z
(m_x|0,0,0)

(7) m x,x̄,z
(m_{xy}|0,0,0)

(8) m x,x,z
(m_{x̄y}|0,0,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

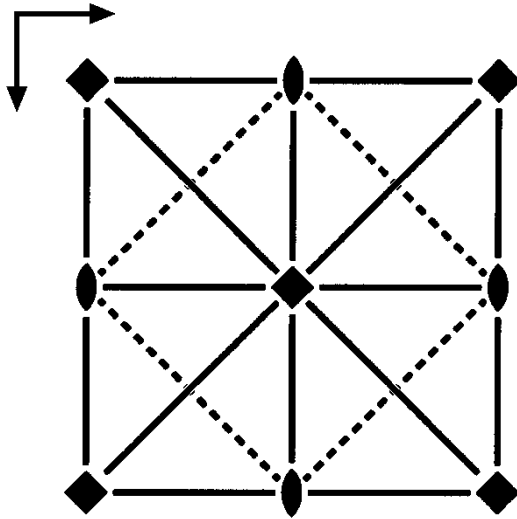
Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]
8 g 1	(5) x,\bar{y},z [\bar{u},v,\bar{w}]	(6) \bar{x},y,z [u,\bar{v},\bar{w}]	(7) \bar{y},\bar{x},z [v,u,\bar{w}]	(8) y,x,z [\bar{v},\bar{u},\bar{w}]
4 f .m.	$x,1/2,z$ [0,v,0]	$\bar{x},1/2,z$ [0, \bar{v} ,0]	$1/2,x,z$ [$\bar{v},0,0$]	$1/2,\bar{x},z$ [v,0,0]
4 e .m.	$x,0,z$ [0,v,0]	$\bar{x},0,z$ [0, \bar{v} ,0]	$0,x,z$ [$\bar{v},0,0$]	$0,\bar{x},z$ [v,0,0]
4 d ..m	x,x,z [$\bar{u},u,0$]	\bar{x},\bar{x},z [$u,\bar{u},0$]	\bar{x},x,z [$\bar{u},\bar{u},0$]	x,\bar{x},z [u,u,0]
2 c 2mm.	$1/2,0,z$ [0,0,0]	$0,1/2,z$ [0,0,0]		
1 b 4mm	$1/2,1/2,z$ [0,0,0]			
1 a 4mm	$0,0,z$ [0,0,0]			

Symmetry of special projections

Along [001] p4mm $\mathbf{a}^* = \mathbf{a}$ $\mathbf{b}^* = \mathbf{b}$ Origin at 0,0,z	Along [100] p1m1' $\mathbf{a}^* = \mathbf{b}$ Origin at x,0,0	Along [110] p1m1' $\mathbf{a}^* = (-\mathbf{a} + \mathbf{b})/2$ Origin at x,x,0
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p4mm1'

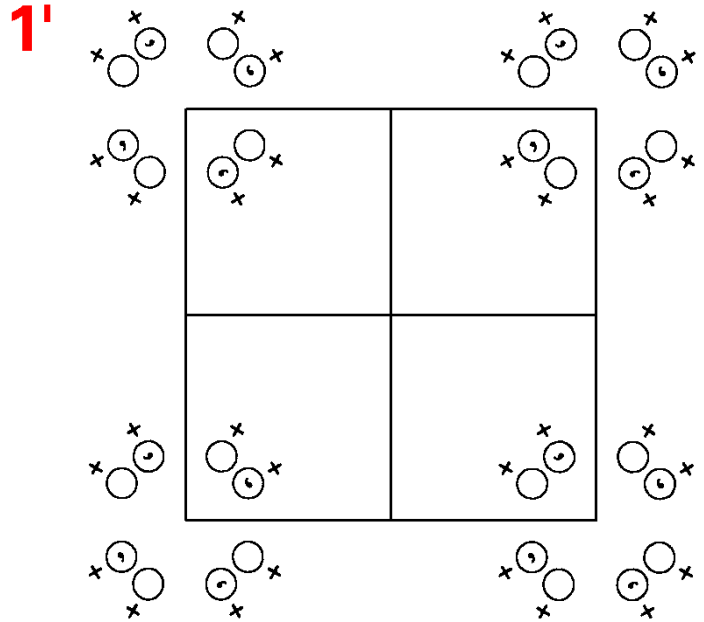
No. 55.2.287



4mm1'

p4mm1'

Tetragonal/Square



Origin on 4mm1'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y$

Symmetry operations

For 1 + set

- | | | | |
|---|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ _z 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ _z 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) m _y x,0,z
(m _y 0,0,0) | (6) m _x 0,y,z
(m _x 0,0,0) | (7) m _{xy} x,x̄,z
(m _{xy} 0,0,0) | (8) m _{xy} x,x,z
(m _{xy} 0,0,0) |

For 1' + set

- | | | | |
|---|---|---|---|
| (1) 1'
(1 0,0,0)' | (2) 2' _z 0,0,z
(2 _z 0,0,0)' | (3) 4 ⁺ ' _z 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ ' _z 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) m' _y x,0,z
(m _y 0,0,0)' | (6) m' _x 0,y,z
(m _x 0,0,0)' | (7) m' _{xy} x,x̄,z
(m _{xy} 0,0,0)' | (8) m' _{xy} x,x,z
(m _{xy} 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); 1'

Positions

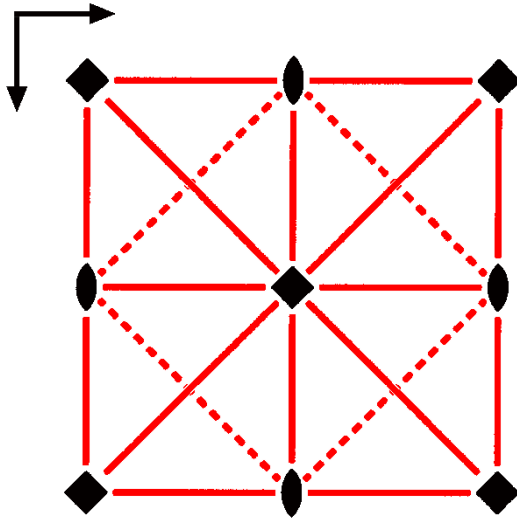
Wyckoff letter, Site symmetry	Coordinates			
	1+	1' +		
8 g 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]	(3) \bar{y},x,z [0,0,0]	(4) y, \bar{x},z [0,0,0]
	(5) x, \bar{y},z [0,0,0]	(6) \bar{x},y,z [0,0,0]	(7) \bar{y},\bar{x},z [0,0,0]	(8) y,x,z [0,0,0]
4 f .m.1'	x,1/2,z [0,0,0]	$\bar{x},1/2,z$ [0,0,0]	1/2,x,z [0,0,0]	1/2, \bar{x},z [0,0,0]
4 e .m.1'	x,0,z [0,0,0]	$\bar{x},0,z$ [0,0,0]	0,x,z [0,0,0]	0, \bar{x},z [0,0,0]
4 d ..m1'	x,x,z [0,0,0]	\bar{x},\bar{x},z [0,0,0]	\bar{x},x,z [0,0,0]	x, \bar{x},z [0,0,0]
2 c 2mm.1'	1/2,0,z [0,0,0]	0,1/2,z [0,0,0]		
1 b 4mm1'	1/2,1/2,z [0,0,0]			
1 a 4mm1'	0,0,z [0,0,0]			

Symmetry of special projections

Along [001] p4mm1'	Along [100] p1m1'	Along [110] p1m1'
$\mathbf{a}^* = \mathbf{a}$ $\mathbf{b}^* = \mathbf{b}$	$\mathbf{a}^* = \mathbf{b}$	$\mathbf{a}^* = (-\mathbf{a} + \mathbf{b})/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

p4m'm'

No. 55.3.388



Origin on 4m'm'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z⁺|0,0,0)

(4) 4⁻ 0,0,z
(4_z⁻|0,0,0)

(5) m' x,0,z
(m_y'|0,0,0)'

(6) m' 0,y,z
(m_x'|0,0,0)'

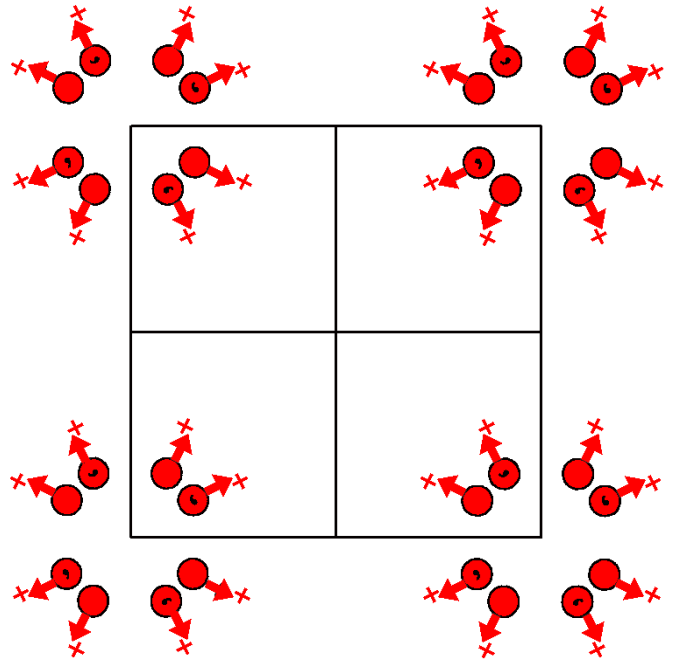
(7) m' x, \bar{x} ,z
(m_{xy}'|0,0,0)'

(8) m' x,x,z
(m _{$\bar{x}y$} '|0,0,0)'

4m'm'

p4m'm'

Tetragonal/Square



Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

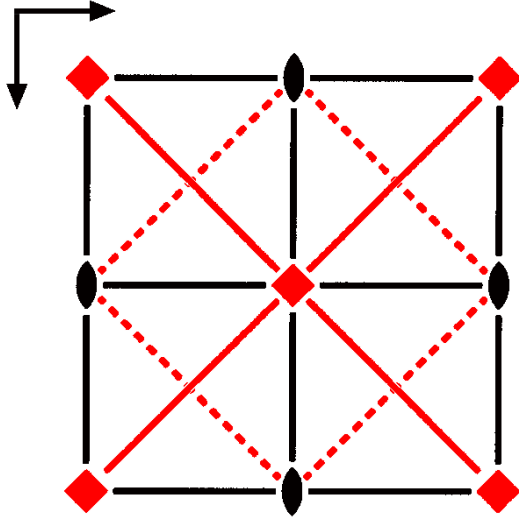
	Coordinates			
Wyckoff letter, Site symmetry				
8 g 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]
	(5) x, \bar{y},z [u, \bar{v},w]	(6) \bar{x},y,z [\bar{u},v,w]	(7) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(8) y,x,z [v,u,w]
4 f .m'	x,1/2,z [u,0,w]	$\bar{x},1/2,z$ [$\bar{u},0,w$]	1/2,x,z [0,u,w]	1/2, \bar{x},z [0, \bar{u},w]
4 e .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	0,x,z [0,u,w]	0, \bar{x},z [0, \bar{u},w]
4 d ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	\bar{x},x,z [\bar{u},u,w]	x, \bar{x},z [u, \bar{u},w]
2 c 2mm'	1/2,0,z [0,0,w]	0,1/2,z [0,0,w]		
1 b 4m'm'	1/2,1/2,z [0,0,w]			
1 a 4m'm'	0,0,z [0,0,w]			

Symmetry of special projections

Along [001] p4m'm' $\mathbf{a}^* = \mathbf{a}$ $\mathbf{b}^* = \mathbf{b}$ Origin at 0,0,z	Along [100] p1m'1 $\mathbf{a}^* = \mathbf{b}$ Origin at x,0,0	Along [110] p1m'1 $\mathbf{a}^* = (-\mathbf{a} + \mathbf{b})/2$ Origin at x,x,0
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p4'mm'

No. 55.4.389



Origin on 4mm

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z⁺|0,0,0)'

(4) 4⁻ 0,0,z
(4_z⁻|0,0,0)'

(5) m x,0,z
(m_y|0,0,0)

(6) m 0,y,z
(m_x|0,0,0)

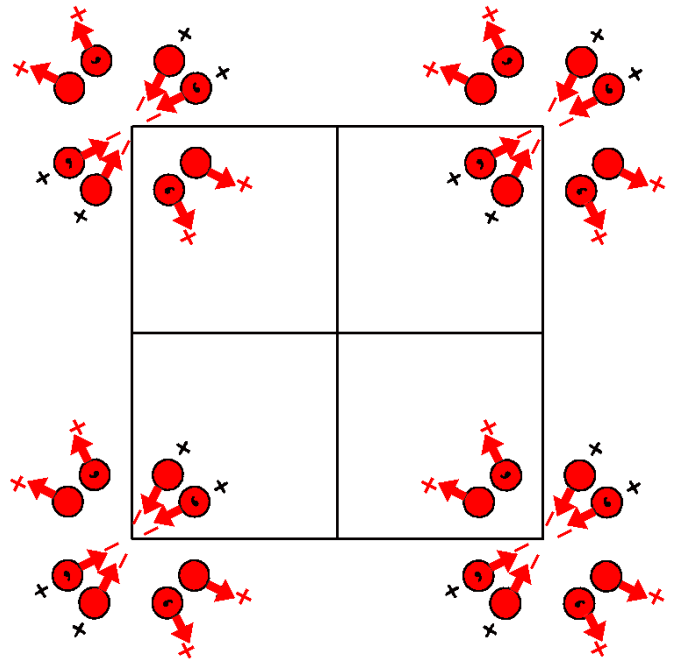
(7) m' x, \bar{x} ,z
(m_{xy}|0,0,0)'

(8) m' x,x,z
(m _{$\bar{x}y$} |0,0,0)'

4'mm'

p4'mm'

Tetragonal/Square



Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

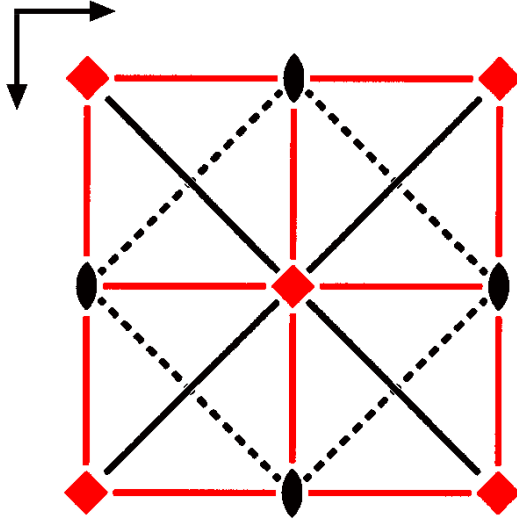
Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]
8 g 1	(5) x, \bar{y},z [\bar{u},v,\bar{w}]	(6) \bar{x},y,z [u,\bar{v},\bar{w}]	(7) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(8) y,x,z [v,u,w]
4 f .m.	x,1/2,z [0,v,0]	$\bar{x},1/2,z$ [0, \bar{v} ,0]	1/2,x,z [v,0,0]	1/2, \bar{x},z [\bar{v} ,0,0]
4 e .m.	x,0,z [0,v,0]	$\bar{x},0,z$ [0, \bar{v} ,0]	0,x,z [v,0,0]	0, \bar{x},z [\bar{v} ,0,0]
4 d ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	\bar{x},x,z [u, \bar{u},\bar{w}]	x, \bar{x},z [\bar{u},u,\bar{w}]
2 c 2mm.	1/2,0,z [0,0,0]	0,1/2,z [0,0,0]		
1 b 4'mm'	1/2,1/2,z [0,0,0]			
1 a 4'mm'	0,0,z [0,0,0]			

Symmetry of special projections

Along [001] p4'mm'	Along [100] p1m11'	Along [110] p1m1
$\mathbf{a}^* = \mathbf{a}$ $\mathbf{b}^* = \mathbf{b}$	$\mathbf{a}^* = \mathbf{b}$	$\mathbf{a}^* = (-\mathbf{a} + \mathbf{b})/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

p4'm'm

No. 55.5.390



Origin on 4'm'm

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z⁺|0,0,0)⁺

(4) 4⁻ 0,0,z
(4_z⁻|0,0,0)⁻

(5) m' x,0,z
(m_y'|0,0,0)[']

(6) m' 0,y,z
(m_x'|0,0,0)[']

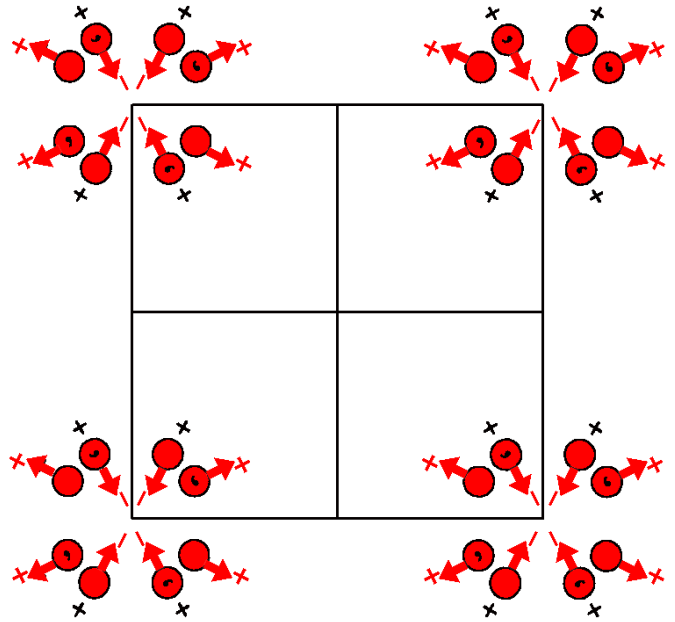
(7) m x,x̄,z
(m_{xy}|0,0,0)

(8) m x,x,z
(m_{x̄y}|0,0,0)

4'm'm

p4'm'm

Tetragonal/Square



Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

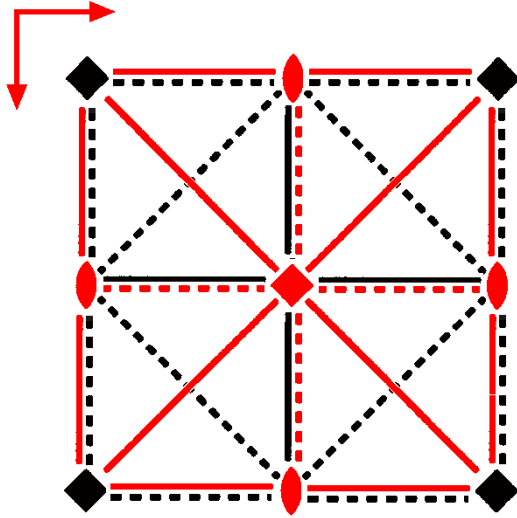
Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v, \bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]
8 g 1	(5) x, \bar{y},z [u, \bar{v},w]	(6) \bar{x},y,z [\bar{u},v,w]	(7) \bar{y},\bar{x},z [v,u, \bar{w}]	(8) y,x,z [\bar{v},\bar{u},\bar{w}]
4 f .m'	x,1/2,z [u,0,w]	$\bar{x},1/2,z$ [$\bar{u},0,w$]	1/2,x,z [0, \bar{u},\bar{w}]	1/2, \bar{x},z [0,u, \bar{w}]
4 e .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	0,x,z [0, \bar{u},\bar{w}]	0, \bar{x},z [0,u, \bar{w}]
4 d ..m	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	\bar{x},x,z [u, \bar{u},\bar{w}]	x, \bar{x},z [\bar{u},u,\bar{w}]
2 c 2m'm'	1/2,0,z [0,0,w]	0,1/2,z [0,0, \bar{w}]		
1 b 4'm'm	1/2,1/2,z [0,0,0]			
1 a 4'm'm	0,0,z [0,0,0]			

Symmetry of special projections

Along [001] p4'm'm	Along [100] p1m1	Along [110] p1m11'
$a^* = a \quad b^* = b$	$a^* = b$	$a^* = (-a+b)/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

$p_p4m'm'$

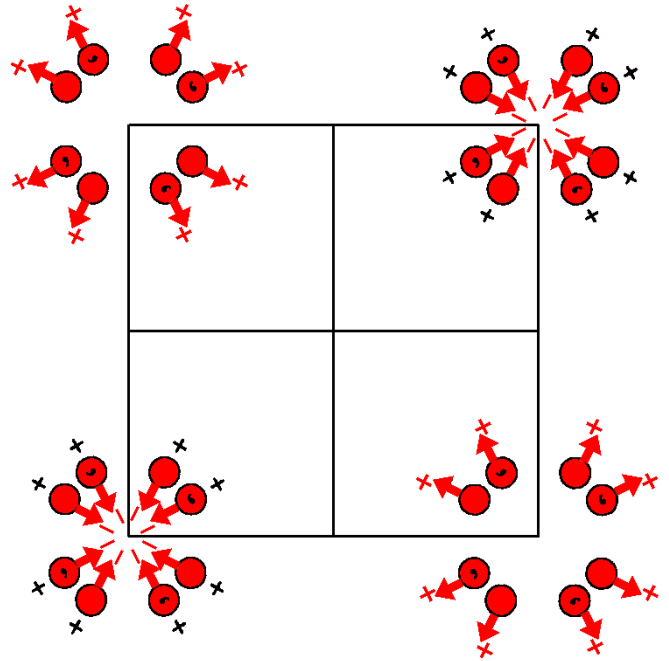
No. 55.6.391



$4mm1'$

$p_p4m'm'$

Tetragonal/Square



Origin on $4m'm'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2 _z 0,0,0) | (3) 4 ⁺ $0,0,z$
(4 _z 0,0,0) | (4) 4 ⁻ $0,0,z$
(4 _z ⁻¹ 0,0,0) |
| (5) m' $x,0,z$
(m _y 0,0,0)' | (6) m' $0,y,z$
(m _x 0,0,0)' | (7) m' x,\bar{x},z
(m _{xy} 0,0,0)' | (8) m' x,x,z
(m _{xy} 0,0,0)' |

For $(1,0,0)$ ' + set

- | | | | |
|--|--|--|--|
| (1) t' $(1,0,0)$
(1 1,0,0)' | (2) 2' $1/2,0,z$
(2 _z 1,0,0)' | (3) 4 ⁺ ' $1/2,1/2,z$
(4 _z 1,0,0)' | (4) 4 ⁻ ' $1/2,1/2,z$
(4 _z ⁻¹ 1,0,0)' |
| (5) a $(1,0,0)$ $x,0,z$
(m _y 1,0,0) | (6) m $1/2,y,z$
(m _x 1,0,0) | (7) g $(1/2,-1/2,0)$ $x+1/2,\bar{x},z$
(m _{xy} 1,0,0) | (8) g $(1/2,1/2,0)$ $x+1/2,x,z$
(m _{xy} 1,0,0) |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3); (5)

Positions

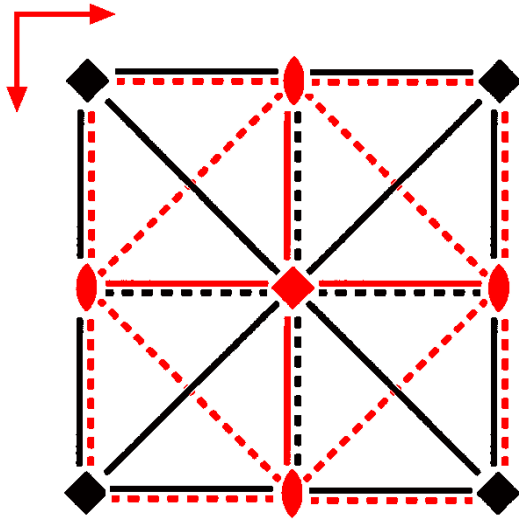
Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(1,0,0)'		
8 g 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $\bar{y},x,z [\bar{v},u,w]$	(4) $y,\bar{x},z [v,\bar{u},w]$
	(5) $x,\bar{y},z [u,\bar{v},w]$	(6) $\bar{x},y,z [\bar{u},v,w]$	(7) $\bar{y},\bar{x},z [\bar{v},\bar{u},w]$	(8) $y,x,z [v,u,w]$
4 f .m.	$x,1/2,z [0,v,0]$	$\bar{x},1/2,z [0,v,0]$	$1/2,x,z [v,0,0]$	$1/2,\bar{x},z [v,0,0]$
4 e .m'	$x,0,z [u,0,w]$	$\bar{x},0,z [\bar{u},0,w]$	$0,x,z [0,u,w]$	$0,\bar{x},z [0,\bar{u},w]$
4 d ..m'	$x,x,z [u,u,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$	$\bar{x},x,z [\bar{u},u,w]$	$x,\bar{x},z [u,\bar{u},w]$
2 c 2'mm'	$1/2,0,z [u,0,0]$	$0,1/2,z [0,u,0]$		
1 b 4'm'm	$1/2,1/2,z [0,0,0]$			
1 a 4m'm'	$0,0,z [0,0,w]$			

Symmetry of special projections

Along [001] $p_p 4m'm'$ $\mathbf{a}^* = \mathbf{a} \quad \mathbf{b}^* = \mathbf{b}$ Origin at 0,0,z	Along [100] $p_{2a^*} 1m1$ $\mathbf{a}^* = \mathbf{b}$ Origin at $x, 1/2, 0$	Along [110] $p_{2a^*} 1m1$ $\mathbf{a}^* = (-\mathbf{a} + \mathbf{b})/2$ Origin at $x-1/4, x+1/4, 0$
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p_4mm

No. 55.7.392



Origin on 4mm

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) m x,0,z
(m _y 0,0,0) | (6) m 0,y,z
(m _x 0,0,0) | (7) m x, \bar{x} ,z
(m _{xy} 0,0,0) | (8) m x,x,z
(m _{\bar{xy}} 0,0,0) |

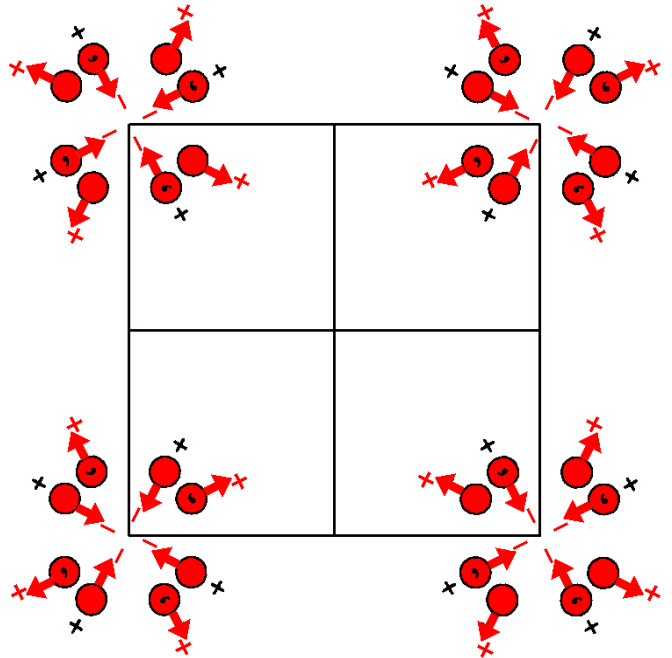
For (1,0,0)['] + set

- | | | | |
|--|--|--|--|
| (1) t ['] (1,0,0)
(1 1,0,0) ['] | (2) 2 ['] 1/2,0,z
(2 _z 1,0,0) ['] | (3) 4 ⁺ 1/2,1/2,z
(4 _z 1,0,0) ['] | (4) 4 ⁻ 1/2,1/2,z
(4 _z ⁻¹ 1,0,0) ['] |
| (5) a ['] (1,0,0) x,0,z
(m _y 1,0,0) ['] | (6) m ['] 1/2,y,z
(m _x 1,0,0) ['] | (7) g ['] (1/2,-1/2,0) x+1/2, \bar{x} ,z
(m _{xy} 1,0,0) ['] | (8) g ['] (1/2,1/2,0) x+1/2,x,z
(m _{\bar{xy}} 1,0,0) ['] |

4mm1'

p_4mm

Tetragonal/Square



Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3); (5)

Positions

Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(1,0,0)' +		
8 g 1	(1) $x,y,z [u,v,w]$ (5) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$ (6) $\bar{x},y,z [u,\bar{v},\bar{w}]$	(3) $\bar{y},x,z [\bar{v},u,w]$ (7) $\bar{y},\bar{x},z [v,u,\bar{w}]$	(4) $y,\bar{x},z [v,\bar{u},w]$ (8) $y,x,z [\bar{v},\bar{u},\bar{w}]$
4 f .m'	$x,1/2,z [u,0,w]$	$\bar{x},1/2,z [u,0,\bar{w}]$	$1/2,x,z [0,\bar{u},\bar{w}]$	$1/2,\bar{x},z [0,\bar{u},w]$
4 e .m.	$x,0,z [0,v,0]$	$\bar{x},0,z [0,\bar{v},0]$	$0,x,z [\bar{v},0,0]$	$0,\bar{x},z [v,0,0]$
4 d ..m	$x,x,z [\bar{u},u,0]$	$\bar{x},\bar{x},z [u,\bar{u},0]$	$\bar{x},x,z [\bar{u},\bar{u},0]$	$x,\bar{x},z [u,u,0]$
2 c 2'm'm.	$1/2,0,z [0,v,0]$	$0,1/2,z [\bar{v},0,0]$		
1 b 4'm'm	$1/2,1/2,z [0,0,0]$			
1 a 4mm	$0,0,z [0,0,0]$			

Symmetry of special projections

Along [001] $p_p 4mm$ $a^* = a \quad b^* = b$ Origin at 0,0,z	Along [100] $p1m11'$ $a^* = b$ Origin at x,0,0	Along [110] $p1m11'$ $a^* = (-a+b)/2$ Origin at x,x,0
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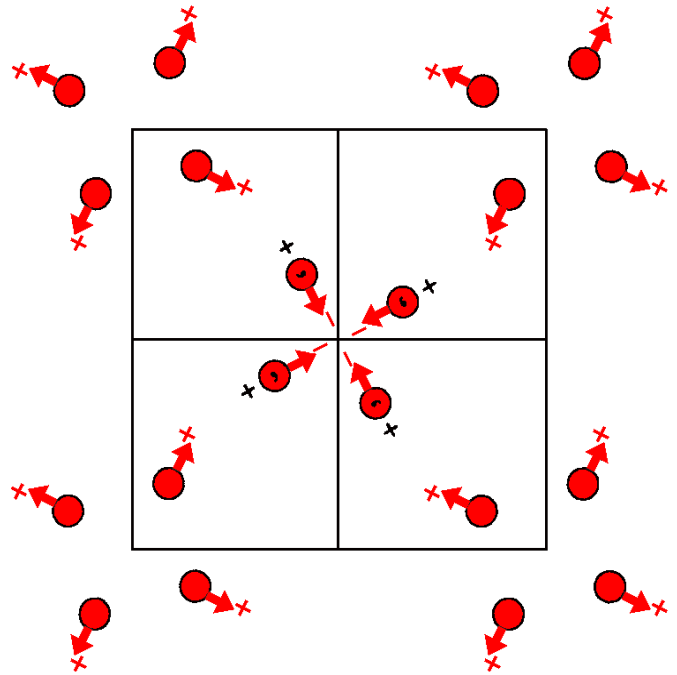
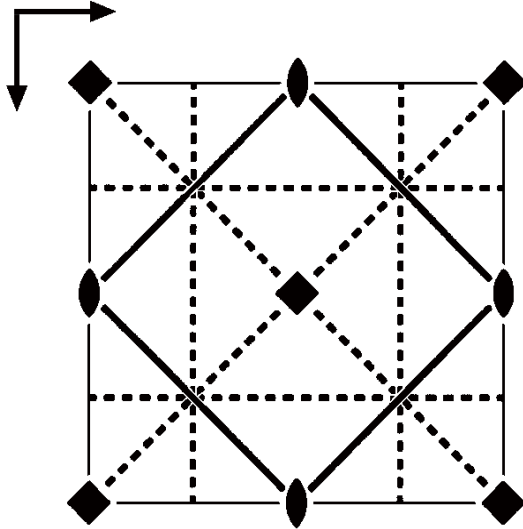
p4bm

No. 56.1.393

4mm

p4bm

Tetragonal/Square



Origin on 41g

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z⁺|0,0,0)

(4) 4⁻ 0,0,z
(4_z⁻|0,0,0)

(5) a x,1/4,z
(m_y|1/2,1/2,0)

(6) b 1/4,y,z
(m_x|1/2,1/2,0)

(7) m x+1/2,x̄,z
(m_{xy}|1/2,1/2,0)

(8) g (1/2,1/2,0) x,x,z
(m_{x̄y}|1/2,1/2,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

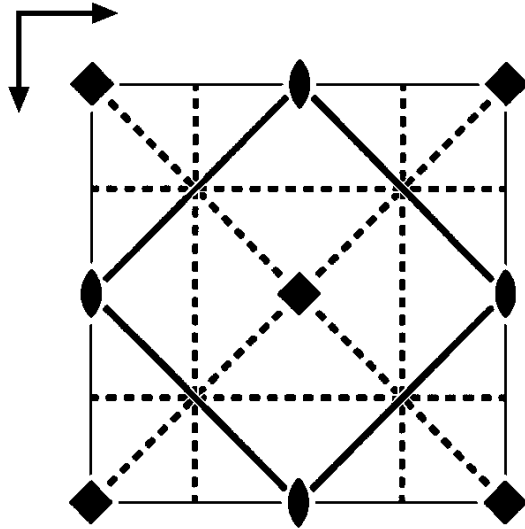
	Coordinates				
Multiplicity, Wyckoff letter, Site symmetry					
8 d 1	(1) x,y,z [u,v,w]		(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]		
	(3) \bar{y},x,z [\bar{v},u,w]		(4) y,\bar{x},z [v,\bar{u},w]		
	(5) $x+1/2,\bar{y}+1/2,z$ [\bar{u},v,\bar{w}]		(6) $\bar{x}+1/2,y+1/2,z$ [u,\bar{v},\bar{w}]		
	(7) $\bar{y}+1/2,\bar{x}+1/2,z$ [v,u,\bar{w}]		(8) $y+1/2,x+1/2,z$ [\bar{v},\bar{u},\bar{w}]		
	4 c ..m	$x,x+1/2,z$ [$\bar{u},u,0$]	$\bar{x},\bar{x}+1/2,z$ [$u,\bar{u},0$]	$\bar{x}+1/2,x,z$ [$\bar{u},\bar{u},0$]	$x+1/2,\bar{x},z$ [$u,u,0$]
	2 b 2.mm	$1/2,0,z$ [$0,0,0$]	$0,1/2,z$ [$0,0,0$]		
	2 a 4..	$0,0,z$ [$0,0,w$]	$1/2,1/2,z$ [$0,0,\bar{w}$]		

Symmetry of special projections

Along [001] p4gm $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p_{2a^*}1m1$ $a^* = b/2$ Origin at $x,1/2,0$	Along [110] $p1m11'$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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p4bm1'

No. 56.2.394



Origin on 41g1'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x$

Symmetry operations

For 1 + set

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) a x,1/4,z
(m _y 1/2,1/2,0) | (6) b 1/4,y,z
(m _x 1/2,1/2,0) | (7) m x+1/2,x̄,z
(m _{xy} 1/2,1/2,0) | (8) g (1/2,1/2,0) x,x,z
(m _{xy} 1/2,1/2,0) |

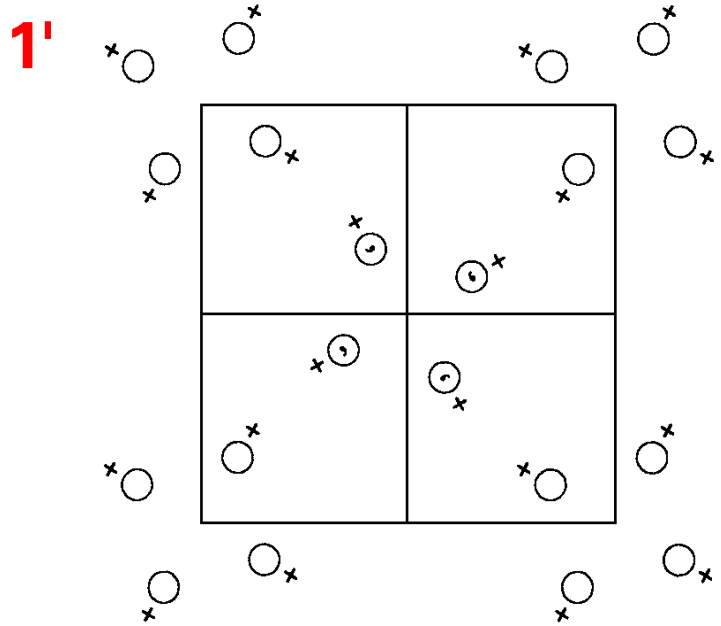
For 1' + set

- | | | | |
|--|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 4 ⁺ ' 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ ' 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) a' x,1/4,z
(m _y 1/2,1/2,0)' | (6) b' 1/4,y,z
(m _x 1/2,1/2,0)' | (7) m' x+1/2,x̄,z
(m _{xy} 1/2,1/2,0)' | (8) g' (1/2,1/2,0) x,x,z
(m _{xy} 1/2,1/2,0)' |

4mm1'

p4bm1'

Tetragonal/Square



Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); 1'

Positions

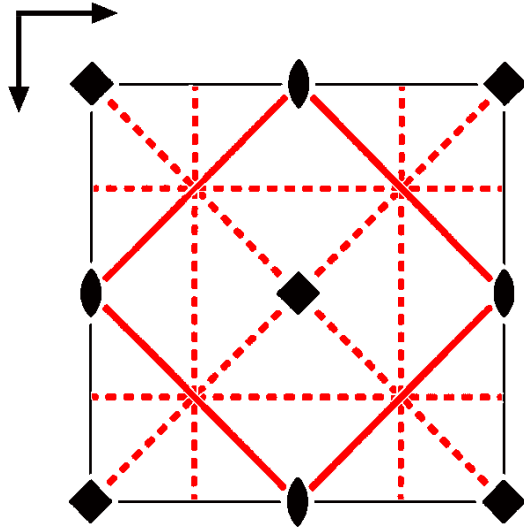
		Coordinates						
Multiplicity, Wyckoff letter, Site symmetry		1+		1' +				
		8 d 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]	(3) \bar{y},x,z [0,0,0]	(4) y, \bar{x},z [0,0,0]	(5) x+1/2, \bar{y} +1/2,z [0,0,0]	(6) \bar{x} +1/2,y+1/2,z [0,0,0]
4 c ..m1'	x,x+1/2,z [0,0,0]	\bar{x},\bar{x} +1/2,z [0,0,0]	\bar{x} +1/2,x,z [0,0,0]	x+1/2, \bar{x},z [0,0,0]				
2 b 2.mm1'	1/2,0,z [0,0,0]	0,1/2,z [0,0,0]						
2 a 4..1'	0,0,z [0,0,0]	1/2,1/2,z [0,0,0]						

Symmetry of special projections

Along [001] p4gm1'	Along [100] p1m11'	Along [110] p1m11'
a* = a b* = b	a* = b/2	a* = (-a+b)/2
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

p4b'm'

No. 56.3.395



Origin on 41g'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z⁺|0,0,0)

(4) 4⁻ 0,0,z
(4_z⁻|0,0,0)

(5) a' x,1/4,z
(m_y|1/2,1/2,0)'

(6) b' 1/4,y,z
(m_x|1/2,1/2,0)'

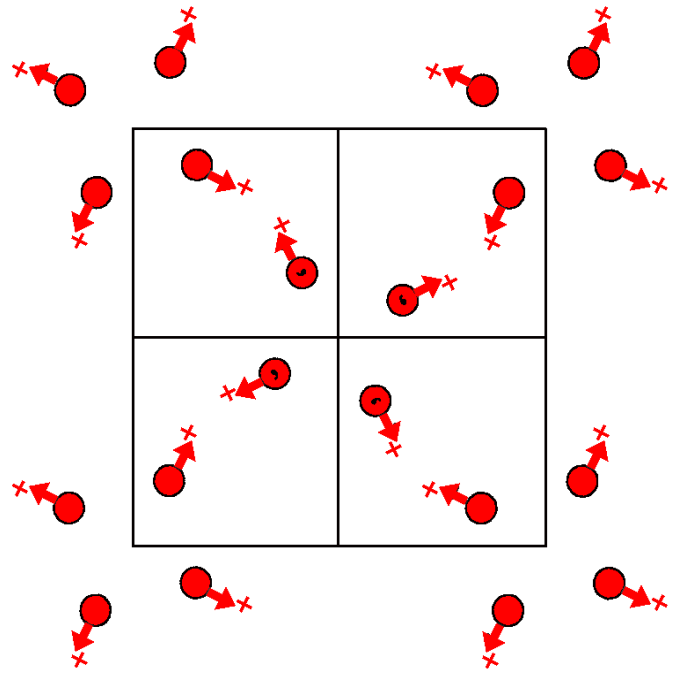
(7) m' x+1/2,̄x,z
(m_{xy}|1/2,1/2,0)'

(8) g' (1/2,1/2,0) x,x,z
(m_{̄xy}|1/2,1/2,0)'

4m'm'

p4b'm'

Tetragonal/Square



Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

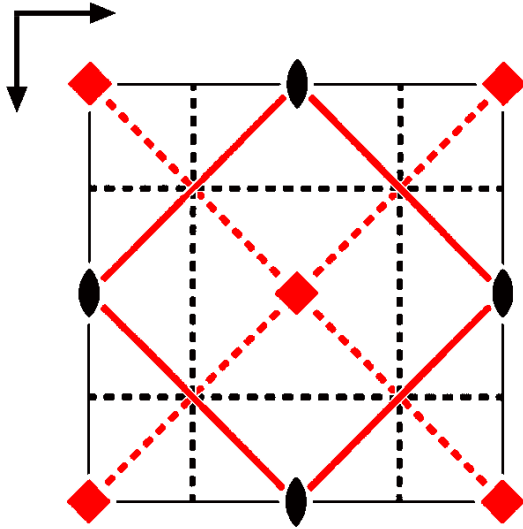
	Coordinates				
Multiplicity, Wyckoff letter, Site symmetry					
8 d 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]			
	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]			
	(5) $x+1/2,\bar{y}+1/2,z$ [u, \bar{v},w]	(6) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]			
	(7) $\bar{y}+1/2,\bar{x}+1/2,z$ [\bar{v},\bar{u},w]	(8) $y+1/2,x+1/2,z$ [v,u,w]			
	4 c ..m'	x, $x+1/2,z$ [u,u,w]	$\bar{x},\bar{x}+1/2,z$ [\bar{u},\bar{u},w]	$\bar{x}+1/2,x,z$ [\bar{u},u,w]	$x+1/2,\bar{x},z$ [u, \bar{u},w]
	2 b 2.m'm'	1/2,0,z [0,0,w]	0,1/2,z [0,0,w]		
	2 a 4..	0,0,z [0,0,w]	1/2,1/2,z [0,0,w]		

Symmetry of special projections

Along [001] p4g'm'	Along [100] p1m'1	Along [110] p1m'1
$a^* = a$ $b^* = b$	$a^* = b/2$	$a^* = (-a+b)/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

p4'bm'

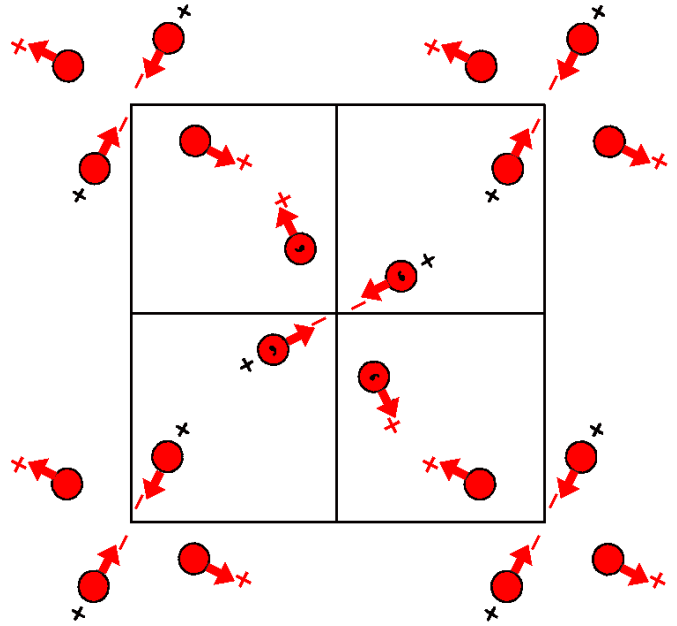
No. 56.4.396



4'mm'

Tetragonal/Square

p4'bm'



Origin on 4'1g'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z⁺|0,0,0)'

(4) 4⁻ 0,0,z
(4_z⁻|0,0,0)'

(5) a x,1/4,z
(m_y|1/2,1/2,0)

(6) b 1/4,y,z
(m_x|1/2,1/2,0)

(7) m' x+1/2,̄x,z
(m_{xy}|1/2,1/2,0)'

(8) g' (1/2,1/2,0) x,x,z
(m_{̄xy}|1/2,1/2,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

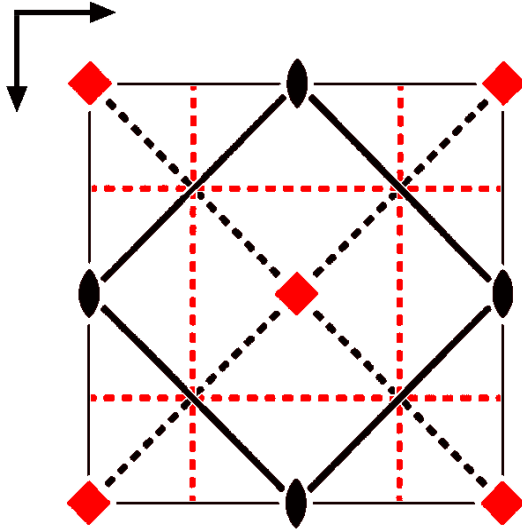
Multiplicity, Wyckoff letter, Site symmetry	Coordinates				
8 d 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]			
	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]			
	(5) $x+1/2,\bar{y}+1/2,z$ [\bar{u},v,\bar{w}]	(6) $\bar{x}+1/2,y+1/2,z$ [u,\bar{v},\bar{w}]			
	(7) $\bar{y}+1/2,\bar{x}+1/2,z$ [\bar{v},\bar{u},w]	(8) $y+1/2,x+1/2,z$ [v,u,w]			
	4 c ..m'	x, $x+1/2,z$ [u,u,w]	$\bar{x},\bar{x}+1/2,z$ [\bar{u},\bar{u},w]	$\bar{x}+1/2,x,z$ [u, \bar{u},\bar{w}]	$x+1/2,\bar{x},z$ [\bar{u},u,\bar{w}]
	2 b 2.mm	1/2,0,z [0,0,0]	0,1/2,z [0,0,0]		
	2 a 4'..	0,0,z [0,0,0]	1/2,1/2,z [0,0,0]		

Symmetry of special projections

Along [001] p4'gm' $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p_{2a^*}1m1$ $a^* = b/2$ Origin at x,0,0	Along [110] $p1m1$ $a^* = (-a+b)/2$ Origin at x,x,0
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p4'b'm

No. 56.5.397



Origin on 4'1g

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 2 0,0,z
(2_z|0,0,0)

(3) 4⁺ 0,0,z
(4_z|0,0,0)⁺

(4) 4⁻ 0,0,z
(4_z⁻¹|0,0,0)⁻

(5) a' x,1/4,z
(m_y|1/2,1/2,0)⁻

(6) b' 1/4,y,z
(m_x|1/2,1/2,0)⁻

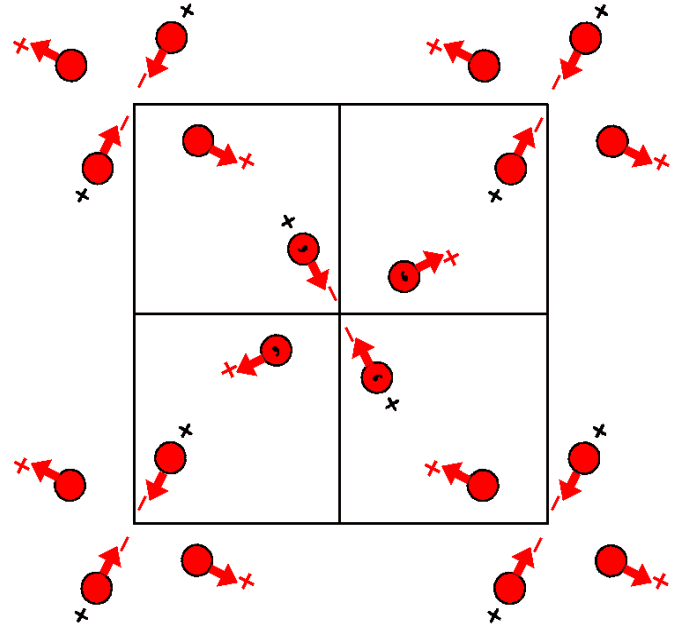
(7) m x+1/2,x̄,z
(m_{xy}|1/2,1/2,0)

(8) g (1/2,1/2,0) x,x,z
(m_{x̄y}|1/2,1/2,0)

4'm'm

Tetragonal/Square

p4'b'm



Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5)

Positions

	Coordinates				
Multiplicity, Wyckoff letter, Site symmetry					
8 d 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]			
	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]			
	(5) $x+1/2,\bar{y}+1/2,z$ [u, \bar{v},w]	(6) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]			
	(7) $\bar{y}+1/2,\bar{x}+1/2,z$ [v,u,\bar{w}]	(8) $y+1/2,x+1/2,z$ [\bar{v},\bar{u},\bar{w}]			
	4 c ..m	x, $x+1/2,z$ [$\bar{u},u,0$]	$\bar{x},\bar{x}+1/2,z$ [$u,\bar{u},0$]	$\bar{x}+1/2,x,z$ [u,u,0]	$x+1/2,\bar{x},z$ [$\bar{u},\bar{u},0$]
	2 b 2.mm	1/2,0,z [0,0,0]	0,1/2,z [0,0,0]		
	2 a 4'..	0,0,z [0,0,0]	1/2,1/2,z [0,0,0]		

Symmetry of special projections

Along [001] p4'g'm $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p1m1 $a^* = b/2$ Origin at x,0,0	Along [110] p1m11' $a^* = (-a+b)/2$ Origin at x,x,0
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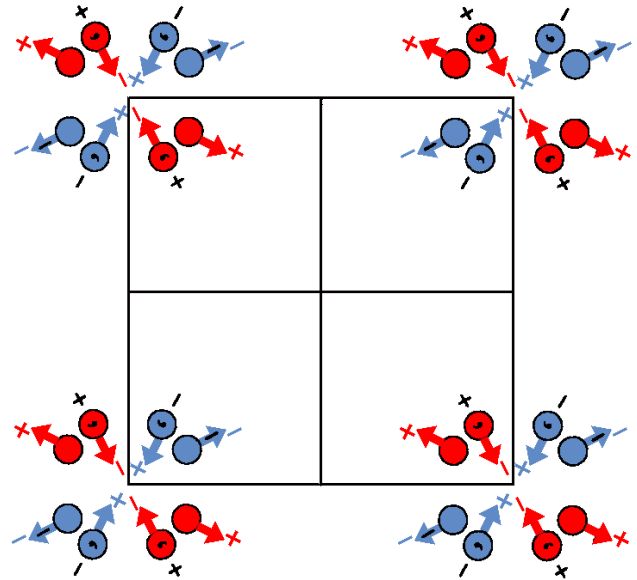
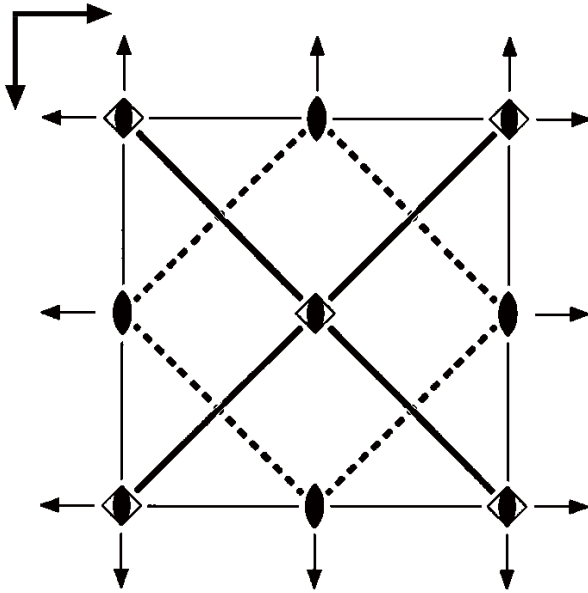
$p\bar{4}2m$

No. 57.1.398

$\bar{4}2m$

$p\bar{4}2m$

Tetragonal/Square



Origin at $\bar{4}2m$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
(4 _z ⁺ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
(4 _z ⁻ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) m x, \bar{x} ,z
(m _{xy} 0,0,0) | (8) m x,x,z
(m _{$\bar{x}y$} 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
8 j 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $y,\bar{x},\bar{z} [\bar{v},u,w]$	(4) $\bar{y},x,\bar{z} [v,\bar{u},w]$
	(5) $\bar{x},y,\bar{z} [\bar{u},v,\bar{w}]$	(6) $x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]$	(7) $\bar{y},\bar{x},z [v,u,\bar{w}]$	(8) $y,x,z [\bar{v},\bar{u},\bar{w}]$
4 i ..m	$x,x,z [\bar{u},u,0]$	$\bar{x},\bar{x},z [u,\bar{u},0]$	$x,\bar{x},\bar{z} [\bar{u},\bar{u},0]$	$\bar{x},x,\bar{z} [u,u,0]$
4 h 2..	$0,1/2,z [0,0,w]$	$1/2,0,\bar{z} [0,0,w]$	$0,1/2,\bar{z} [0,0,\bar{w}]$	$1/2,0,z [0,0,\bar{w}]$
4 g .2.	$x,1/2,0 [u,0,0]$	$\bar{x},1/2,0 [\bar{u},0,0]$	$1/2,\bar{x},0 [0,u,0]$	$1/2,x,0 [0,\bar{u},0]$
4 f .2.	$x,0,0 [u,0,0]$	$\bar{x},0,0 [\bar{u},0,0]$	$0,\bar{x},0 [0,u,0]$	$0,x,0 [0,\bar{u},0]$
2 e 2.mm	$1/2,1/2,z [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$		
2 d 2.mm	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$		
2 c 222.	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$		
1 b $\bar{4}2m$	$1/2,1/2,0 [0,0,0]$			
1 a $\bar{4}2m$	$0,0,0 [0,0,0]$			

Symmetry of special projections

Along [001] $p4'm'm$
 $a^* = a \quad b^* = b$
 Origin at $0,0,z$

Along [100] $p2m'm'$
 $a^* = b$
 Origin at $x,0,0$

Along [110] $p1m11'$
 $a^* = (-a+b)/2$
 Origin at $x,x,0$

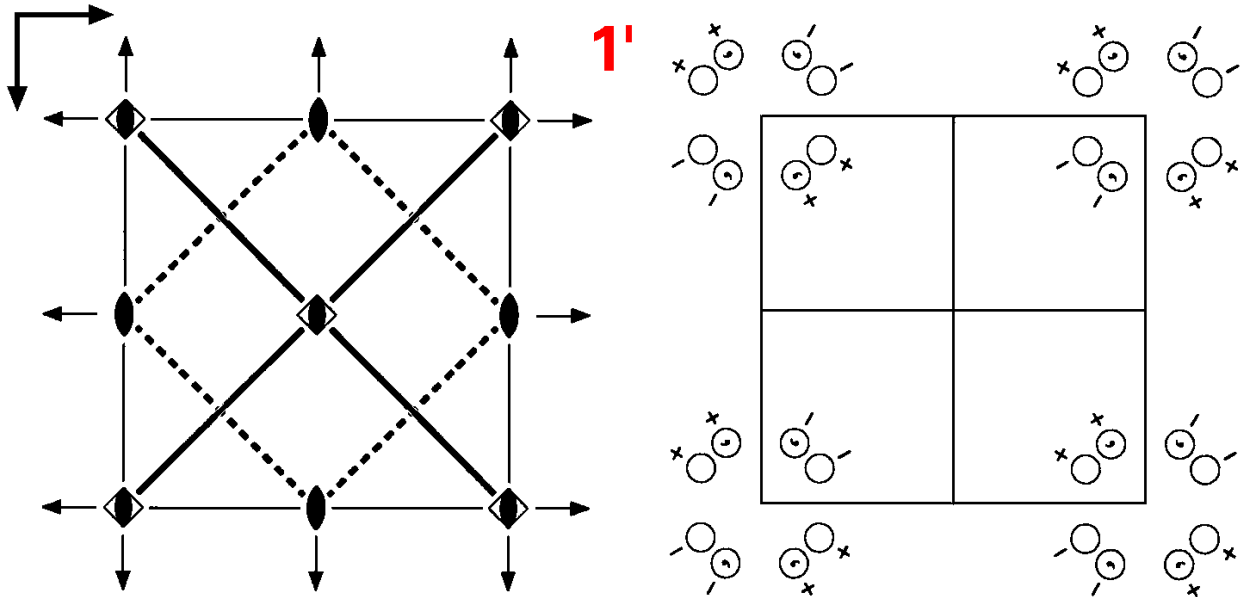
$p\bar{4}2m1'$

No. 57.2.399

$\bar{4}2m1'$

$p\bar{4}2m1'$

Tetragonal/Square



Origin at $\bar{4}2m1'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y$

Symmetry operations

For 1 + set

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) m x, \bar{x} ,z
(m _{xy} 0,0,0) | (8) m x,x,z
(m _{\bar{xy}} 0,0,0) |

For 1' + set

- | | | | |
|--|--|--|---|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) $\bar{4}^+$ ' 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0)' | (4) $\bar{4}^-$ ' 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0)' |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) m' x, \bar{x} ,z
(m _{xy} 0,0,0)' | (8) m' x,x,z
(m _{\bar{xy}} 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	$1+$	$1'+$		
8 j $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$	(3) $y,\bar{x},\bar{z} [0,0,0]$	(4) $\bar{y},x,\bar{z} [0,0,0]$
	(5) $\bar{x},y,\bar{z} [0,0,0]$	(6) $x,\bar{y},\bar{z} [0,0,0]$	(7) $\bar{y},\bar{x},z [0,0,0]$	(8) $y,x,z [0,0,0]$
4 i $\dots m1'$	$x,x,z [0,0,0]$	$\bar{x},\bar{x},z [0,0,0]$	$x,\bar{x},\bar{z} [0,0,0]$	$\bar{x},x,\bar{z} [0,0,0]$
4 h $2..1'$	$0,1/2,z [0,0,0]$	$1/2,0,\bar{z} [0,0,0]$	$0,1/2,\bar{z} [0,0,0]$	$1/2,0,z [0,0,0]$
4 g $.2.1'$	$x,1/2,0 [0,0,0]$	$\bar{x},1/2,0 [0,0,0]$	$1/2,\bar{x},0 [0,0,0]$	$1/2,x,0 [0,0,0]$
4 f $.2.1'$	$x,0,0 [0,0,0]$	$\bar{x},0,0 [0,0,0]$	$0,\bar{x},0 [0,0,0]$	$0,x,0 [0,0,0]$
2 e $2.mm1'$	$1/2,1/2,z [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$		
2 d $2.mm1'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$		
2 c $222.1'$	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$		
1 b $\overline{4}2m1'$	$1/2,1/2,0 [0,0,0]$			
1 a $\overline{4}2m1'$	$0,0,0 [0,0,0]$			

Symmetry of special projections

Along [001] $p4mm1'$ $a^* = a \quad b^* = b$ Origin at $0,0,z$	Along [100] $p2mm1'$ $a^* = b$ Origin at $x,0,0$	Along [110] $p1m11'$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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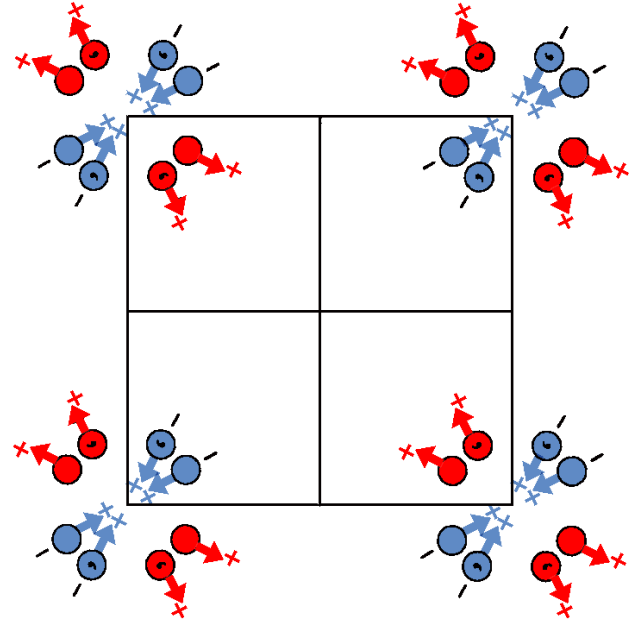
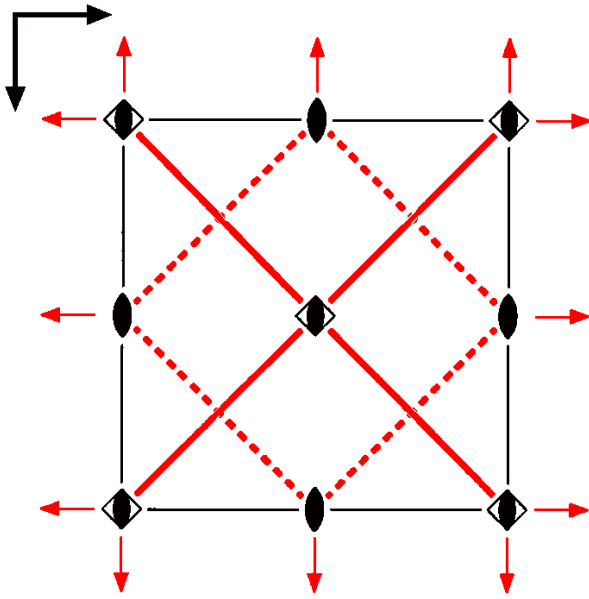
$p\bar{4}2'm'$

$\bar{4}2'm'$

Tetragonal/Square

No. 57.3.400

$p\bar{4}2'm'$



Origin at $\bar{4}2'm'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y$

Symmetry operations

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) m' x, \bar{x} ,z
(m _{xy} 0,0,0)' | (8) m' x,x,z
(m _{$\bar{x}y$} 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

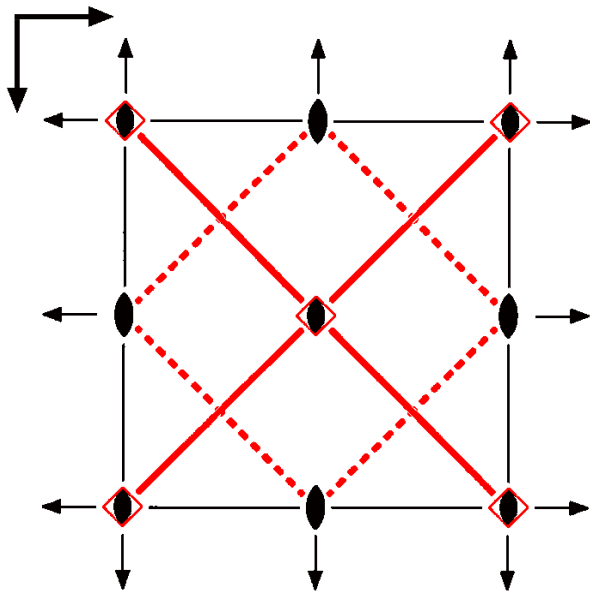
	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 j 1		(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [v,\bar{u},w]
		(5) \bar{x},y,\bar{z} [u,\bar{v},w]	(6) x,\bar{y},\bar{z} [\bar{u},v,w]	(7) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(8) y,x,z [v,u,w]
4 i ..m'		x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	x,\bar{x},\bar{z} [\bar{u},u,w]	\bar{x},x,\bar{z} [u,\bar{u},w]
4 h 2..		$0,1/2,z$ [$0,0,w$]	$1/2,0,\bar{z}$ [$0,0,w$]	$0,1/2,\bar{z}$ [$0,0,w$]	$1/2,0,z$ [$0,0,w$]
4 g .2'		$x,1/2,0$ [$0,v,w$]	$\bar{x},1/2,0$ [$0,\bar{v},w$]	$1/2,\bar{x},0$ [$\bar{v},0,w$]	$1/2,x,0$ [$v,0,w$]
4 f .2'		$x,0,0$ [$0,v,w$]	$\bar{x},0,0$ [$0,\bar{v},w$]	$0,\bar{x},0$ [$\bar{v},0,w$]	$0,x,0$ [$v,0,w$]
2 e 2.m'm'		$1/2,1/2,z$ [$0,0,w$]	$1/2,1/2,\bar{z}$ [$0,0,w$]		
2 d 2.m'm'		$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,w$]		
2 c 22'2'		$1/2,0,0$ [$0,0,w$]	$0,1/2,0$ [$0,0,w$]		
1 b $\bar{4}2'm'$		$1/2,1/2,0$ [$0,0,w$]			
1 a $\bar{4}2'm'$		$0,0,0$ [$0,0,w$]			

Symmetry of special projections

Along [001] $p4'mm'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2'm'm$ $a^* = b$ Origin at $x,0,0$	Along [110] $p1m'1$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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$p\bar{4}'2m'$

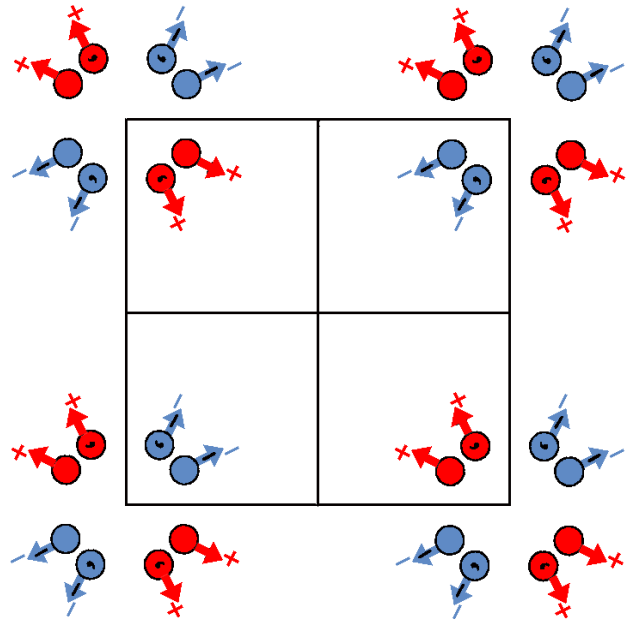
No. 57.4.401



$\bar{4}'2m'$

$p\bar{4}'2m'$

Tetragonal/Square



Origin at $\bar{4}'2m'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y$

Symmetry operations

- | | | | |
|--|--|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ ' 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0)' | (4) $\bar{4}^-$ ' 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0)' |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) m' x, \bar{x} ,z
(m _{xy} 0,0,0)' | (8) m' x,x,z
(m _{$\bar{x}y$} 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 j 1		(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
		(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	(7) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(8) y,x,z [v,u,w]
4 i ..m'		x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	x,\bar{x},\bar{z} [u,\bar{u},\bar{w}]	\bar{x},x,\bar{z} [\bar{u},u,\bar{w}]
4 h 2..		$0,1/2,z$ [$0,0,w$]	$1/2,0,\bar{z}$ [$0,0,w$]	$0,1/2,\bar{z}$ [$0,0,\bar{w}$]	$1/2,0,z$ [$0,0,\bar{w}$]
4 g .2.		$x,1/2,0$ [$u,0,0$]	$\bar{x},1/2,0$ [$\bar{u},0,0$]	$1/2,\bar{x},0$ [$0,\bar{u},0$]	$1/2,x,0$ [$0,u,0$]
4 f .2.		$x,0,0$ [$u,0,0$]	$\bar{x},0,0$ [$\bar{u},0,0$]	$0,\bar{x},0$ [$0,\bar{u},0$]	$0,x,0$ [$0,u,0$]
2 e 2.m'm'		$1/2,1/2,z$ [$0,0,w$]	$1/2,1/2,\bar{z}$ [$0,0,\bar{w}$]		
2 d 2.m'm'		$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]		
2 c 222.		$1/2,0,0$ [$0,0,0$]	$0,1/2,0$ [$0,0,0$]		
1 b $\bar{4}2m'$		$1/2,1/2,0$ [$0,0,0$]			
1 a $\bar{4}2m'$		$0,0,0$ [$0,0,0$]			

Symmetry of special projections

Along [001] $p4m'm'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2mm$ $a^* = b$ Origin at $x,0,0$	Along [110] $p1m1$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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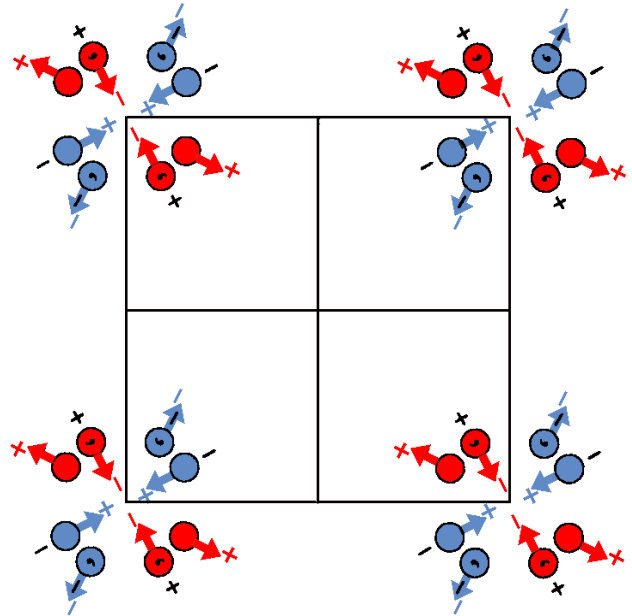
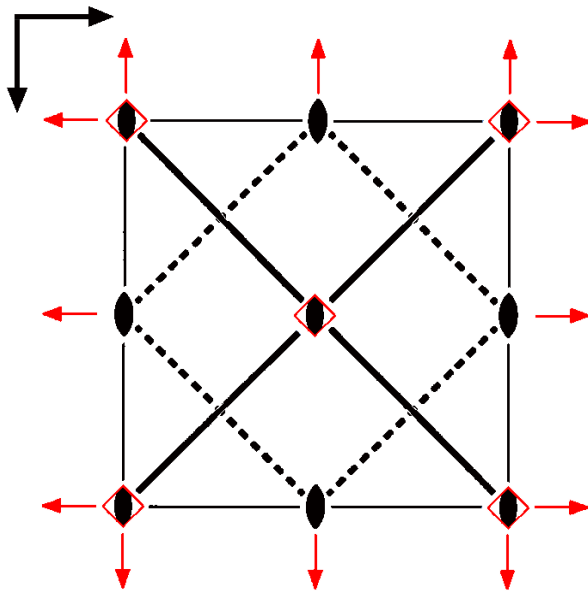
$p\bar{4}2'm$

No. 57.5.402

$\bar{4}2'm$

$p\bar{4}2'm$

Tetragonal/Square



Origin at $\bar{4}2m$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y$

Symmetry operations

- | | | | |
|--|--|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ ' 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0)' | (4) $\bar{4}^-$ ' 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0)' |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) m x, \bar{x} ,z
(m _{xy} 0,0,0) | (8) m x,x,z
(m _{$\bar{x}y$} 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
8 j 1		(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [v, \bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
		(5) \bar{x},y,\bar{z} [u, \bar{v},w]	(6) x,\bar{y},\bar{z} [\bar{u},v,w]	(7) \bar{y},\bar{x},z [v,u, \bar{w}]	(8) y,x,z [\bar{v},\bar{u},\bar{w}]
4 i ..m		x,x,z [u,u,0]	\bar{x},\bar{x},z [$\bar{u},\bar{u},0$]	x,\bar{x},\bar{z} [u, $\bar{u},0$]	\bar{x},x,\bar{z} [$\bar{u},u,0$]
4 h 2..		$0,1/2,z$ [0,0,w]	$1/2,0,\bar{z}$ [0,0, \bar{w}]	$0,1/2,\bar{z}$ [0,0,w]	$1/2,0,z$ [0,0, \bar{w}]
4 g .2'		$x,1/2,0$ [0,v,w]	$\bar{x},1/2,0$ [0, \bar{v},w]	$1/2,\bar{x},0$ [v,0, \bar{w}]	$1/2,x,0$ [$\bar{v},0,\bar{w}$]
4 f .2'		$x,0,0$ [0,v,w]	$\bar{x},0,0$ [0, \bar{v},w]	$0,\bar{x},0$ [v,0, \bar{w}]	$0,x,0$ [$\bar{v},0,\bar{w}$]
2 e 2.mm		$1/2,1/2,z$ [0,0,0]	$1/2,1/2,\bar{z}$ [0,0,0]		
2 d 2.mm		$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]		
2 c 22'2'		$1/2,0,0$ [0,0,w]	$0,1/2,0$ [0,0, \bar{w}]		
1 b $\bar{4}'2'm$		$1/2,1/2,0$ [0,0,0]			
1 a $\bar{4}'2'm$		$0,0,0$ [0,0,0]			

Symmetry of special projections

Along [001] $p4mm$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p2'mm'$
 $a^* = b$
 Origin at x,0,0

Along [110] $p1m1'$
 $a^* = (-a+b)/2$
 Origin at x,x,0

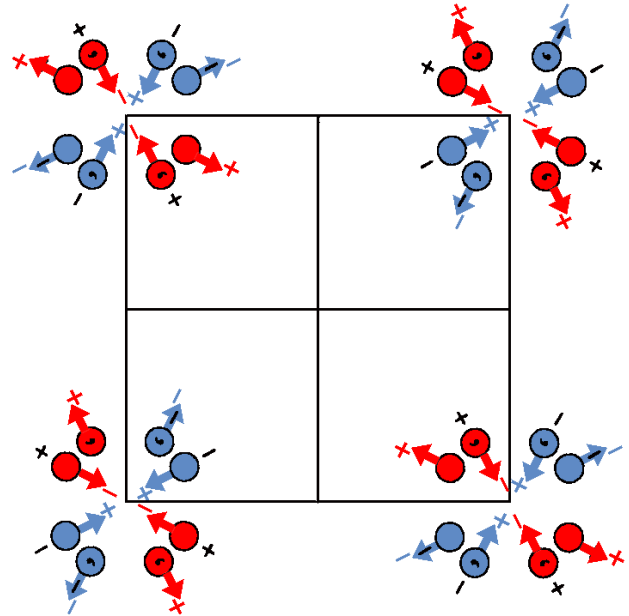
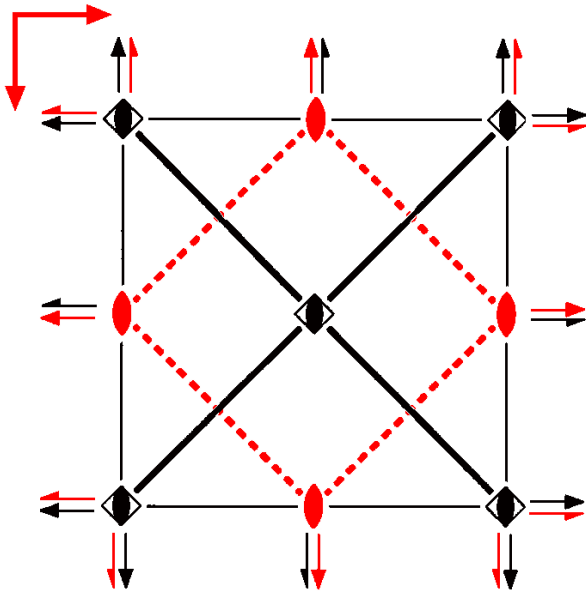
$p_p\bar{4}2m$

No. 57.6.403

$\bar{4}2m1'$

$p_p\bar{4}2m$

Tetragonal/Square



Origin at $\bar{4}2m$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) m x, \bar{x} ,z
(m _{xy} 0,0,0) | (8) m x,x,z
(m _{xy} 0,0,0) |

For (1,0,0)' + set

- | | | | |
|--|--|--|---|
| (1) t' (1,0,0)
(1 1,0,0)' | (2) 2' 1/2,0,z
(2 _z 1,0,0)' | (3) $\bar{4}^+$ ' 1/2,1/2,z; 1/2,1/2,0
($\bar{4}_z$ 1,0,0)' | (4) $\bar{4}^-$ ' 1/2,1/2,z; 1/2,1/2,0
($\bar{4}_z^{-1}$ 1,0,0)' |
| (5) 2' 1/2,y,0
(2 _y 1,0,0)' | (6) 2' (1,0,0) x,0,0
(2 _x 1,0,0)' | (7) g' (1/2,-1/2,0) x+1/2, \bar{x} ,z
(m _{xy} 1,0,0)' | (8) g' (1/2,1/2,0) x+1/2,x,z
(m _{xy} 1,0,0)' |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
		$(0,0,0)_+$	$(1,0,0)'$ +	
8 j 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [v,\bar{u},w]
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	(7) \bar{y},\bar{x},z [v,u,\bar{w}]	(8) y,x,z [\bar{v},\bar{u},\bar{w}]
4 i ..m	x,x,z [$\bar{u},u,0$]	\bar{x},\bar{x},z [$u,\bar{u},0$]	x,\bar{x},\bar{z} [$\bar{u},\bar{u},0$]	\bar{x},x,\bar{z} [$u,u,0$]
4 h 2'..	$0,1/2,z$ [$u,v,0$]	$1/2,0,\bar{z}$ [$\bar{v},u,0$]	$0,1/2,\bar{z}$ [$\bar{u},v,0$]	$1/2,0,z$ [$\bar{v},\bar{u},0$]
4 g .2'.	$x,1/2,0$ [$0,v,w$]	$\bar{x},1/2,0$ [$0,v,\bar{w}$]	$1/2,\bar{x},0$ [$\bar{v},0,w$]	$1/2,x,0$ [$\bar{v},0,\bar{w}$]
4 f .2.	$x,0,0$ [$u,0,0$]	$\bar{x},0,0$ [$\bar{u},0,0$]	$0,\bar{x},0$ [$0,u,0$]	$0,x,0$ [$0,\bar{u},0$]
2 e 2.mm	$1/2,1/2,z$ [$0,0,0$]	$1/2,1/2,\bar{z}$ [$0,0,0$]		
2 d 2.mm	$0,0,z$ [$0,0,0$]	$0,0,\bar{z}$ [$0,0,0$]		
2 c 2'22'.	$1/2,0,0$ [$u,0,0$]	$0,1/2,0$ [$0,\bar{u},0$]		
1 b $\bar{4}2'm$	$1/2,1/2,0$ [$0,0,0$]			
1 a $\bar{4}2m$	$0,0,0$ [$0,0,0$]			

Symmetry of special projections

Along [001] $p_p 4mm$ $a^* = a$ $b^* = b$ Origin at $1/2,1/2,z$	Along [100] $p_{2a} 2m'm'$ $a^* = b$ Origin at $x,0,0$	Along [110] $p1m11'$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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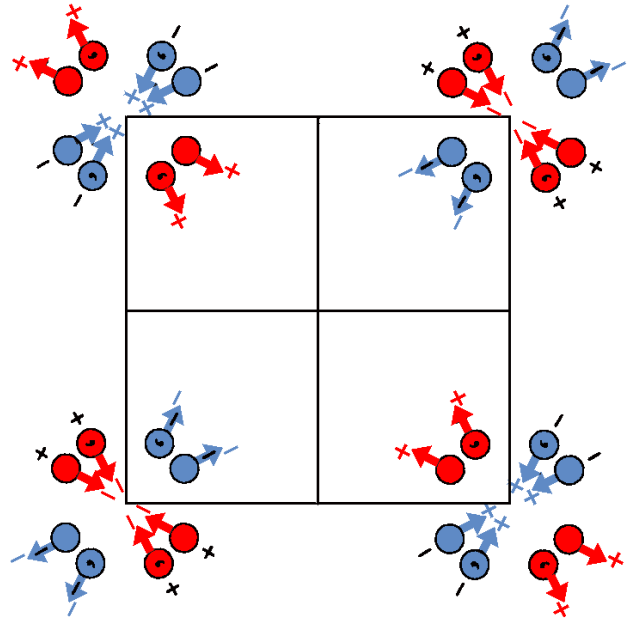
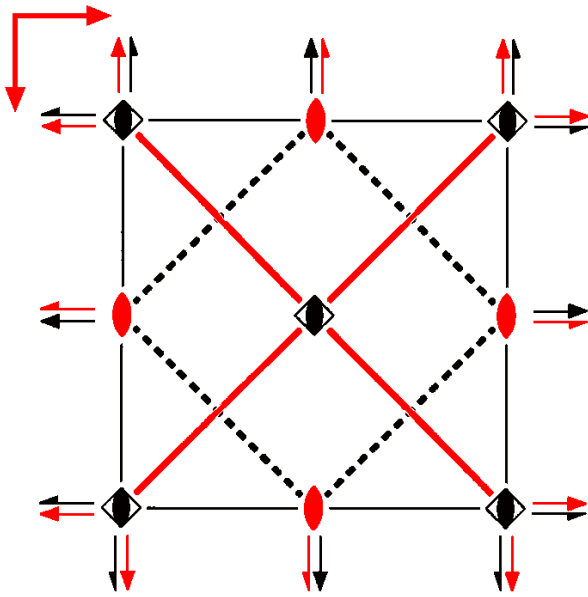
$p_p\bar{4}2'm'$

$\bar{4}2m1'$

Tetragonal/Square

No. 57.7.404

$p_p\bar{4}2'm'$



Origin at $\bar{4}2m'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) m' x, \bar{x} ,z
(m _{xy} 0,0,0)' | (8) m' x,x,z
(m _{xy} 0,0,0)' |

For (1,0,0)' + set

- | | | | |
|--|--|--|---|
| (1) t' (1,0,0)
(1 1,0,0)' | (2) 2' 1/2,0,z
(2 _z 1,0,0)' | (3) $\bar{4}^+$ ' 1/2,1/2,z; 1/2,1/2,0
($\bar{4}_z$ 1,0,0)' | (4) $\bar{4}^-$ ' 1/2,1/2,z; 1/2,1/2,0
($\bar{4}_z^{-1}$ 1,0,0)' |
| (5) 2 1/2,y,0
(2 _y 1,0,0) | (6) 2 (1,0,0) x,0,0
(2 _x 1,0,0) | (7) g (1/2,-1/2,0) x+1/2, \bar{x} ,z
(m _{xy} 1,0,0) | (8) g (1/2,1/2,0) x+1/2,x,z
(m _{xy} 1,0,0) |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(1,0,0)'		
8 j 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y, \bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [v,\bar{u},w]
	(5) \bar{x},y,\bar{z} [u,\bar{v},w]	(6) x, \bar{y},\bar{z} [\bar{u},v,w]	(7) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(8) y,x,z [v,u,w]
4 i ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	x, \bar{x},\bar{z} [\bar{u},u,w]	\bar{x},x,\bar{z} [u, \bar{u},w]
4 h 2'..	0,1/2,z [u,v,0]	1/2,0, \bar{z} [$\bar{v},u,0$]	0,1/2, \bar{z} [u, $\bar{v},0$]	1/2,0,z [v,u,0]
4 g .2.	x,1/2,0 [u,0,0]	$\bar{x},1/2,0$ [u,0,0]	1/2, $\bar{x},0$ [0,u,0]	1/2,x,0 [0,u,0]
4 f .2'.	x,0,0 [0,v,w]	$\bar{x},0,0$ [0, \bar{v},w]	0, $\bar{x},0$ [$\bar{v},0,w$]	0,x,0 [v,0,w]
2 e 2.m'm'	1/2,1/2,z [0,0,w]	1/2,1/2, \bar{z} [0,0,w]		
2 d 2.m'm'	0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]		
2 c 2'2'2.	1/2,0,0 [0,v,0]	0,1/2,0 [v,0,0]		
1 b $\bar{4}2m'$	1/2,1/2,0 [0,0,0]			
1 a $\bar{4}2m'$	0,0,0 [0,0,w]			

Symmetry of special projections

Along [001] $p_p \cdot 4m'm'$ $a^* = a$ $b^* = b$ Origin at 1/2,1/2,z	Along [100] $p_{2a} \cdot 2mm$ $a^* = b$ Origin at x,1/2,0	Along [110] $p_{2a} \cdot 1m1$ $a^* = (-a+b)/2$ Origin at x-1/4,x+1/4,0
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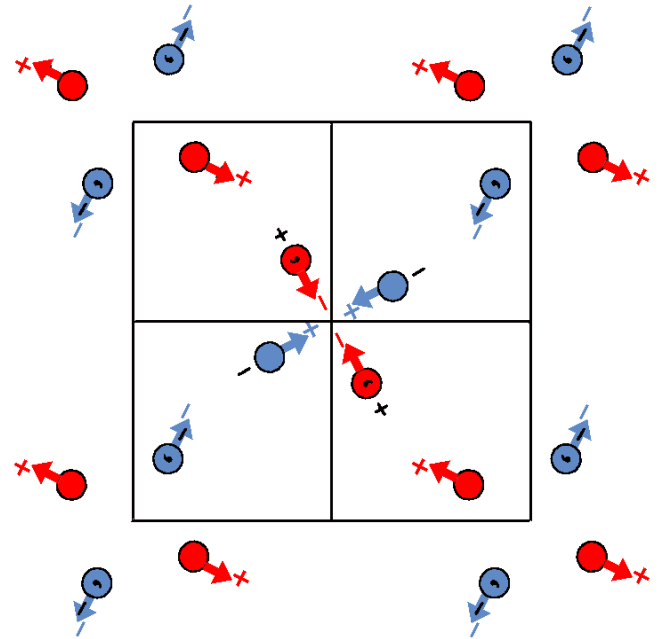
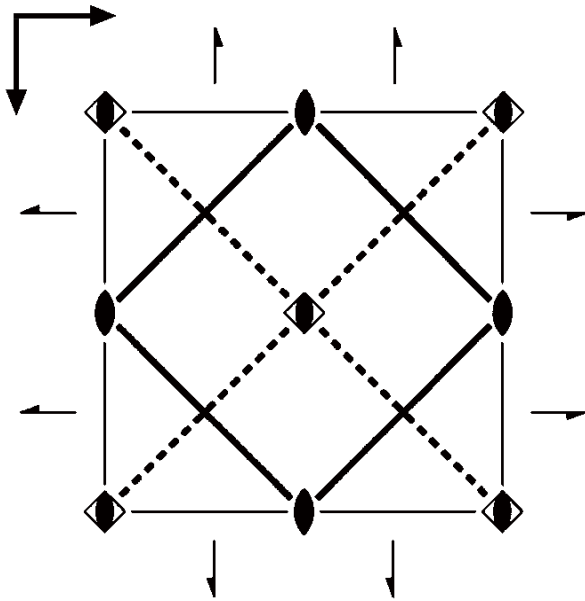
$p\bar{4}2_1m$

No. 58.1.405

$\bar{4}2m$

$p\bar{4}2_1m$

Tetragonal/Square



Origin at $\bar{4}1g$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
(4 _z ⁺ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
(4 _z ⁻ 0,0,0) |
| (5) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (6) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) | (7) m x+1/2, \bar{x} ,z
(m _{xy} 1/2,1/2,0) | (8) g (1/2,1/2,0) x,x,0
(m _{xy} 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates				
8 e 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]			
	(3) y,\bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [v,\bar{u},w]			
	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [u,\bar{v},\bar{w}]			
	(7) $\bar{y}+1/2,\bar{x}+1/2,z$ [v,u,\bar{w}]	(8) [\bar{v},\bar{u},\bar{w}]			
	4 d ..m	$x,x+1/2,z$ [$\bar{u},u,0$]	$\bar{x},\bar{x}+1/2,z$ [$u,\bar{u},0$]	$x+1/2,\bar{x},\bar{z}$ [$\bar{u},\bar{u},0$]	$\bar{x}+1/2,x,\bar{z}$ [$u,u,0$]
	4 c 2..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]	$1/2,1/2,\bar{z}$ [0,0, \bar{w}]	$1/2,1/2,z$ [0,0, \bar{w}]
	2 b 2.mm	$0,1/2,z$ [0,0,0]	$1/2,0,\bar{z}$ [0,0,0]		
	2 a $\bar{4}$..	$0,0,0$ [0,0,w]	$1/2,1/2,0$ [0,0, \bar{w}]		

Symmetry of special projections

Along [001] $p4_2'g'm$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p2m'g'$ $a^* = b$ Origin at $x,1/4,0$	Along [110] $p1m11'$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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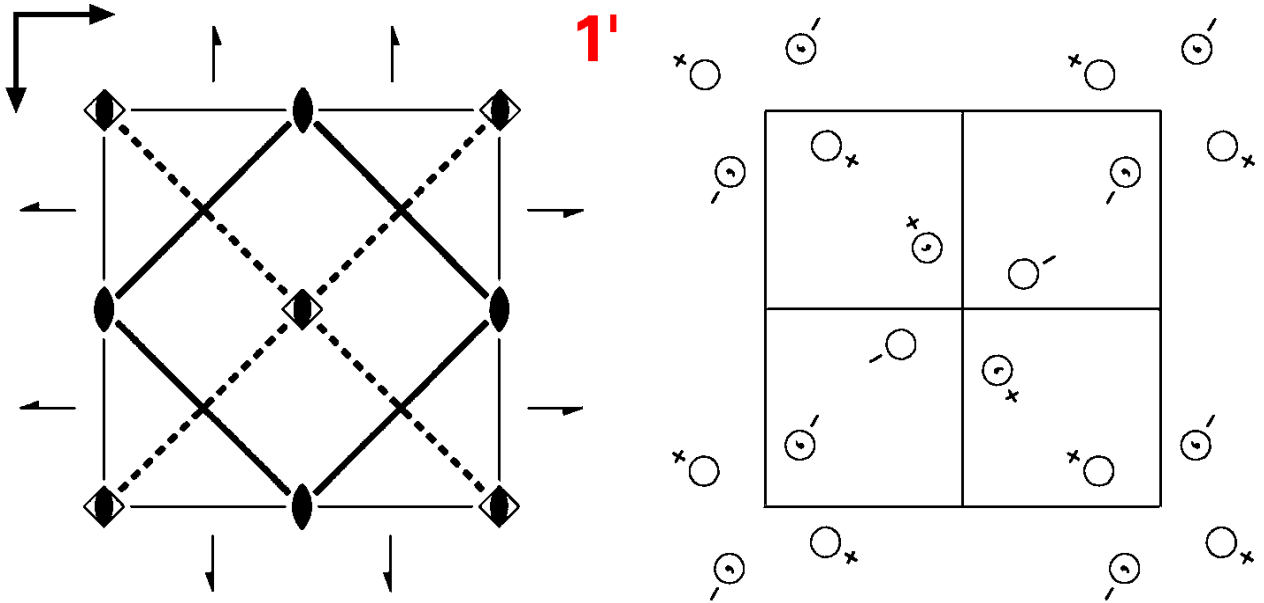
$p\bar{4}2_1m1'$

No. 58.2.406

$\bar{4}2m1'$

$p\bar{4}2_1m1'$

Tetragonal/Square



Origin at $\bar{4}1g1'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x$

Symmetry operations

For 1 + set

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (6) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) | (7) m x+1/2, \bar{x} ,z
(m _{xy} 1/2,1/2,0) | (8) g (1/2,1/2,0) x,x,0
(m _{xy} 1/2,1/2,0) |

For 1' + set

- | | | | |
|--|--|---|---|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) $\bar{4}^+$ ' 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0)' | (4) $\bar{4}^-$ ' 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0)' |
| (5) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (6) 2' (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0)' | (7) m' x+1/2, \bar{x} ,z
(m _{xy} 1/2,1/2,0)' | (8) g' (1/2,1/2,0) x,x,0
(m _{xy} 1/2,1/2,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	$1+$	$1'+$		
8 e $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$		
	(3) $y,\bar{x},\bar{z} [0,0,0]$	(4) $\bar{y},x,\bar{z} [0,0,0]$		
	(5) $\bar{x}+1/2,y+1/2,\bar{z} [0,0,0]$	(6) $x+1/2,\bar{y}+1/2,\bar{z} [0,0,0]$		
	(7) $\bar{y}+1/2,\bar{x}+1/2,z [0,0,0]$	(8) $y+1/2,x+1/2,z [0,0,0]$		
4 d $\bar{4}m1'$	$x,x+1/2,z [0,0,0]$	$\bar{x},\bar{x}+1/2,z [0,0,0]$	$x+1/2,\bar{x},\bar{z} [0,0,0]$	$\bar{x}+1/2,x,\bar{z} [0,0,0]$
4 c $2..1'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$	$1/2,1/2,z [0,0,0]$
2 b $2.mm1'$	$0,1/2,z [0,0,0]$	$1/2,0,\bar{z} [0,0,0]$		
2 a $\bar{4}..1'$	$0,0,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p4gm1'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2mg1'$ $a^* = b$ Origin at $x,1/4,0$	Along [110] $p1m11'$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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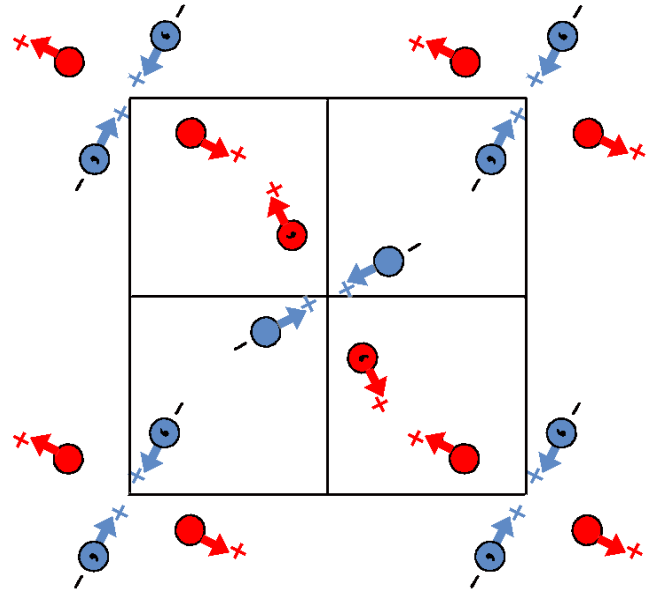
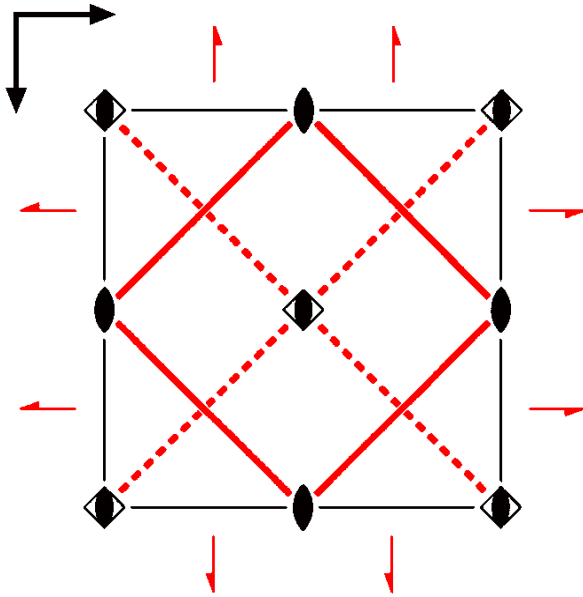
$p\bar{4}2_1m'$

No. 58.3.407

$\bar{4}2'm'$

$p\bar{4}2_1m'$

Tetragonal/Square



Origin at $\bar{4}1g'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x$

Symmetry operations

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
(4 _z 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
(4 _z ⁻¹ 0,0,0) |
| (5) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (6) 2' (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0)' | (7) m' x+1/2, \bar{x} ,z
(m _{xy} 1/2,1/2,0)' | (8) g' (1/2,1/2,0) x,x,0
(m _{$\bar{x}y$} 1/2,1/2,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [v,\bar{u},w]
8 e 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [v,\bar{u},w]
	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [u,\bar{v},w]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]	(7) $\bar{y}+1/2,\bar{x}+1/2,z$ [\bar{v},\bar{u},w]	(8) $y+1/2,x+1/2,z$ [v,u,w]
4 d $..m'$	$x,x+1/2,z$ [u,u,w]	$\bar{x},\bar{x}+1/2,z$ [\bar{u},\bar{u},w]	$x+1/2,\bar{x},\bar{z}$ [\bar{u},u,w]	$\bar{x}+1/2,x,\bar{z}$ [u,\bar{u},w]
4 c $2..$	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,w$]	$1/2,1/2,\bar{z}$ [$0,0,w$]	$1/2,1/2,z$ [$0,0,w$]
2 b $2.mm$	$0,1/2,z$ [$0,0,0$]	$1/2,0,\bar{z}$ [$0,0,0$]		
2 a $\bar{4}..$	$0,0,0$ [$0,0,w$]	$1/2,1/2,0$ [$0,0,w$]		

Symmetry of special projections

Along [001] $p4'gm'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2'm'g$ $a^* = b$ Origin at $x,1/4,0$	Along [110] $p1m'1$ $a^* = (-a+b)/2$ Origin at $x,x,0$
--	--	--

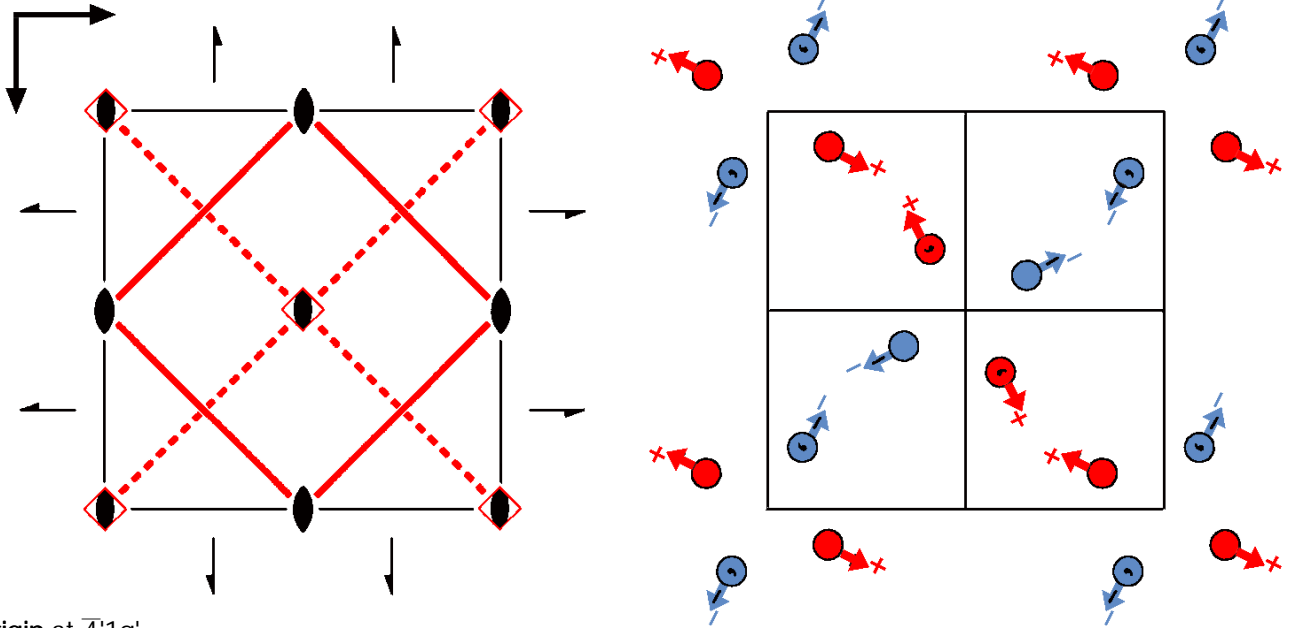
$p\bar{4}'2_1m'$

No. 58.4.408

$\bar{4}'2m'$

$p\bar{4}'2_1m'$

Tetragonal/Square



Origin at $\bar{4}'1g'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}'^+$ 0,0,z; 0,0,0
(4 _z 0,0,0)' | (4) $\bar{4}'^-$ 0,0,z; 0,0,0
(4 _z ⁻¹ 0,0,0)' |
| (5) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (6) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) | (7) m' x+1/2, \bar{x} ,z
(m _{xy} 1/2,1/2,0)' | (8) g' (1/2,1/2,0) x,x,0
(m _{xy} 1/2,1/2,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
8 e 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [u,\bar{v},\bar{w}]	(7) $\bar{y}+1/2,\bar{x}+1/2,z$ [\bar{v},\bar{u},w]	(8) $y+1/2,x+1/2,z$ [v,u,w]
4 d ..m'	$x,x+1/2,z$ [u,u,w]	$\bar{x},\bar{x}+1/2,z$ [\bar{u},\bar{u},w]	$x+1/2,\bar{x},\bar{z}$ [u,\bar{u},\bar{w}]	$\bar{x}+1/2,x,\bar{z}$ [\bar{u},u,\bar{w}]
4 c 2..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]	$1/2,1/2,\bar{z}$ [$0,0,\bar{w}$]	$1/2,1/2,z$ [$0,0,w$]
2 b 2.m'm'	$0,1/2,z$ [$0,0,w$]	$1/2,0,\bar{z}$ [$0,0,\bar{w}$]		
2 a $\bar{4}'..$	$0,0,0$ [$0,0,0$]	$1/2,1/2,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $p4g'm'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2mg$ $a^* = b$ Origin at $x,1/4,0$	Along [110] $p1m1$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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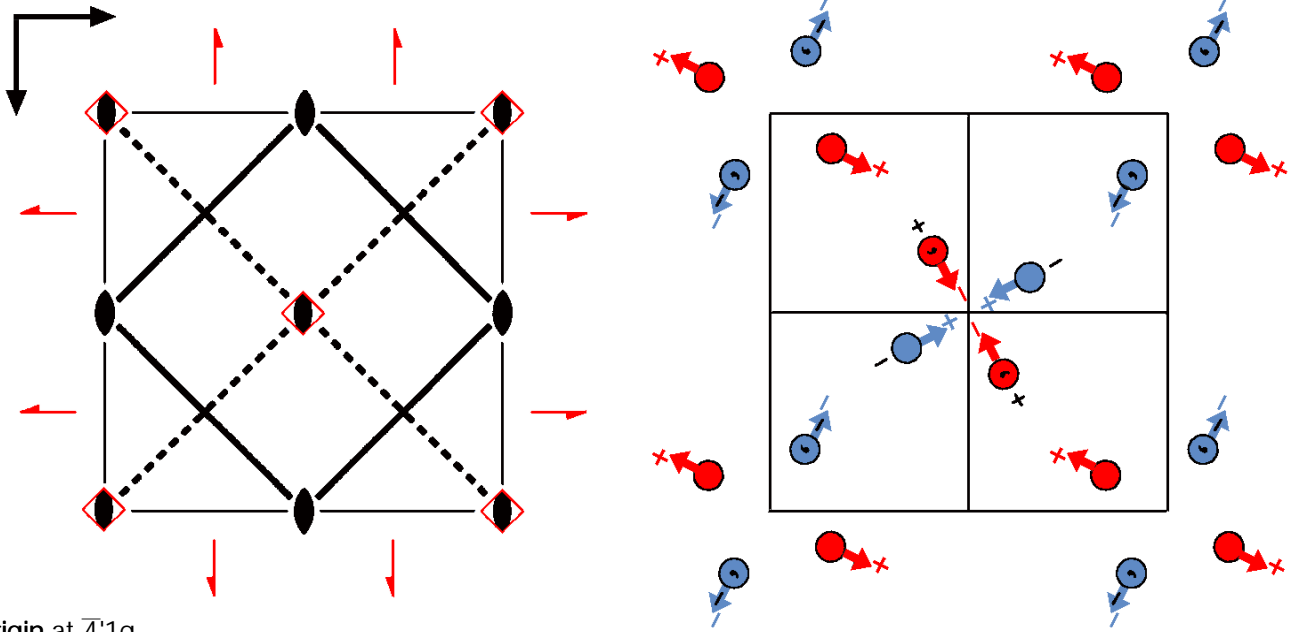
$p\bar{4}2_1'm$

No. 58.5.409

$\bar{4}2'm$

$p\bar{4}2_1'm$

Tetragonal/Square



Origin at $\bar{4}1g$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x$

Symmetry operations

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
(4 _z 0,0,0)' | (4) $\bar{4}^-$ 0,0,z; 0,0,0
(4 _z ⁻¹ 0,0,0)' |
| (5) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (6) 2' (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0)' | (7) m x+1/2, \bar{x} ,z
(m _{xy} 1/2,1/2,0) | (8) g (1/2,1/2,0) x,x,0
(m _{$\bar{x}y$} 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
8 e 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [u,\bar{v},w]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]	(7) $\bar{y}+1/2,\bar{x}+1/2,z$ [v,u,\bar{w}]	(8) $y+1/2,x+1/2,z$ [\bar{v},\bar{u},\bar{w}]
4 d ..m	$x,x+1/2,z$ [$\bar{u},u,0$]	$\bar{x},\bar{x}+1/2,z$ [$u,\bar{u},0$]	$x+1/2,\bar{x},\bar{z}$ [$u,u,0$]	$\bar{x}+1/2,x,\bar{z}$ [$\bar{u},\bar{u},0$]
4 c 2..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]	$1/2,1/2,\bar{z}$ [$0,0,w$]	$1/2,1/2,z$ [$0,0,\bar{w}$]
2 b 2.mm	$0,1/2,z$ [$0,0,0$]	$1/2,0,\bar{z}$ [$0,0,0$]		
2 a $\bar{4}'..$	$0,0,0$ [$0,0,0$]	$1/2,1/2,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $p4gm$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2'mg'$ $a^* = b$ Origin at $x,1/4,0$	Along [110] $p1m11'$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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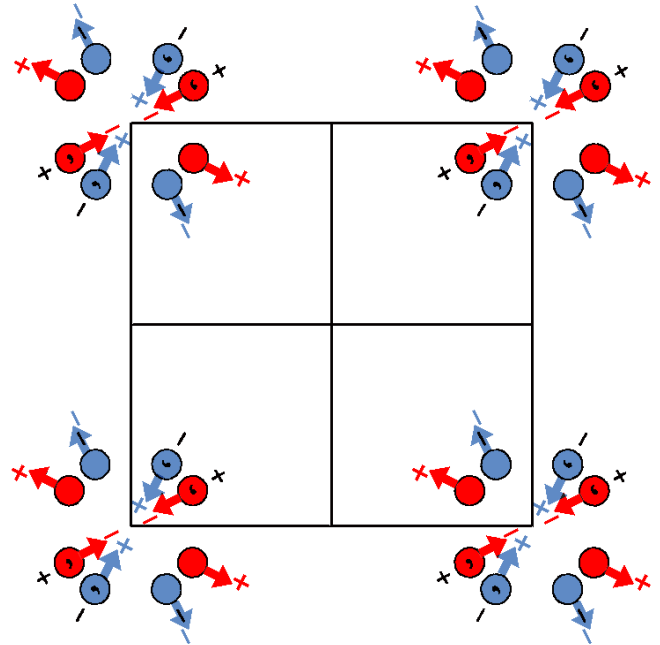
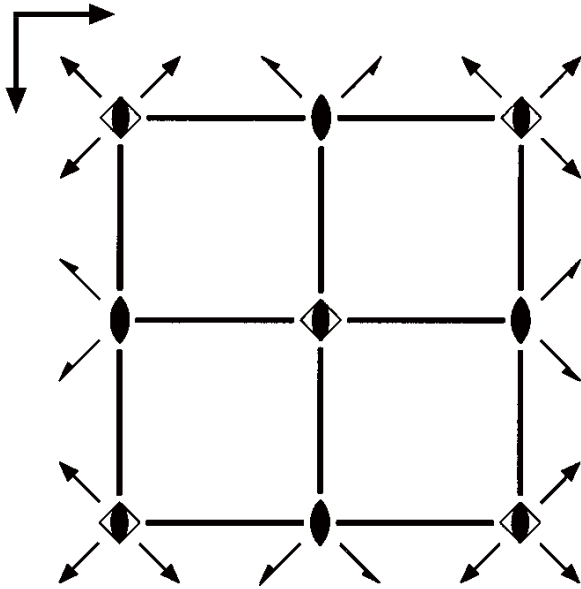
$p\bar{4}m2$

$\bar{4}m2$

Tetragonal/Square

No. 59.1.410

$p\bar{4}m2$



Origin at $\bar{4}m2$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
(4 _z ⁺ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
(4 _z ⁻ 0,0,0) |
| (5) m x,0,z
(m _y 0,0,0) | (6) m 0,y,z
(m _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x, \bar{x} ,0
(2 _{\bar{xy}} 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [v,\bar{u},w]
8 i 1	(5) x,\bar{y},z [\bar{u},v,\bar{w}]	(6) \bar{x},y,z [u,\bar{v},\bar{w}]	(7) y,x,\bar{z} [v,u,\bar{w}]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]
4 h .m.	$x,1/2,z$ [$0,v,0$]	$\bar{x},1/2,z$ [$0,\bar{v},0$]	$1/2,\bar{x},\bar{z}$ [$\bar{v},0,0$]	$1/2,x,\bar{z}$ [$v,0,0$]
4 g .m.	$x,0,z$ [$0,v,0$]	$\bar{x},0,z$ [$0,\bar{v},0$]	$0,\bar{x},\bar{z}$ [$\bar{v},0,0$]	$0,x,\bar{z}$ [$v,0,0$]
4 f ..2	$x,x,0$ [$u,u,0$]	$\bar{x},\bar{x},0$ [$\bar{u},\bar{u},0$]	$x,\bar{x},0$ [$u,u,0$]	$\bar{x},x,0$ [$u,\bar{u},0$]
2 e 2mm.	$0,1/2,z$ [$0,0,0$]	$1/2,0,\bar{z}$ [$0,0,0$]		
2 d 2mm.	$1/2,1/2,z$ [$0,0,0$]	$1/2,1/2,\bar{z}$ [$0,0,0$]		
2 c 2mm.	$0,0,z$ [$0,0,0$]	$0,0,\bar{z}$ [$0,0,0$]		
1 b $\bar{4}m2$	$1/2,1/2,0$ [$0,0,0$]			
1 a $\bar{4}m2$	$0,0,0$ [$0,0,0$]			

Symmetry of special projections

Along [001] $p4'mm'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p1m11'$ $a^* = b$ Origin at $x,0,0$	Along [110] $p2m'm'$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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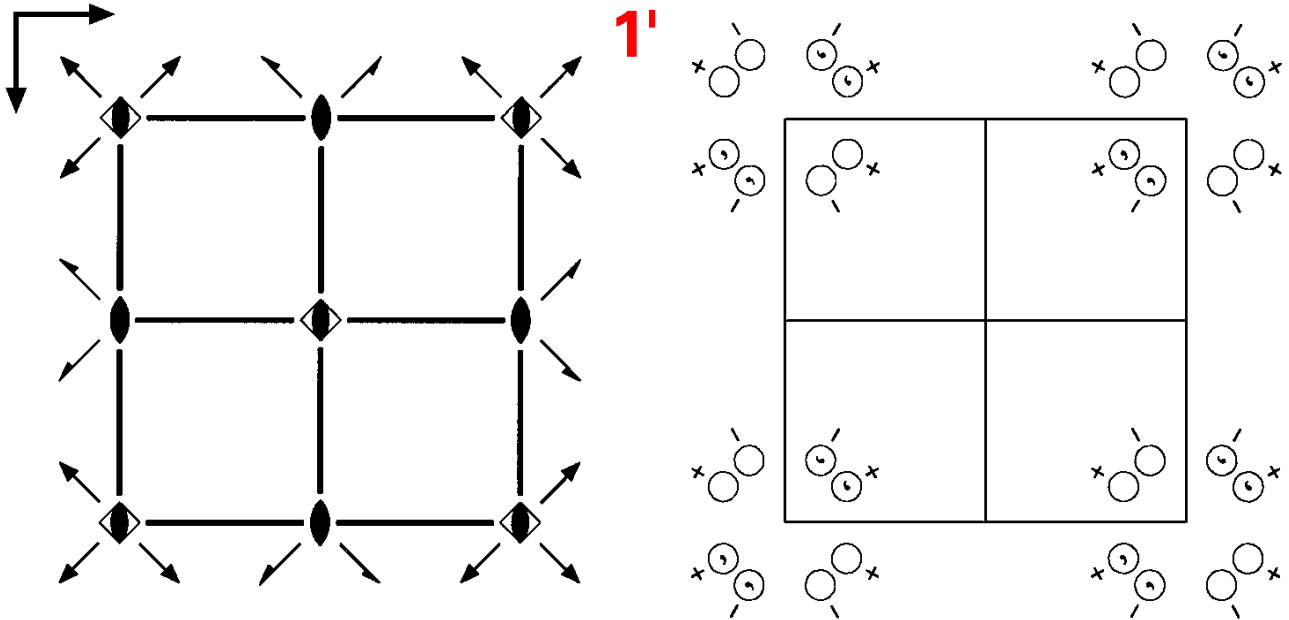
$p\bar{4}m21'$

$\bar{4}m21'$

Tetragonal/Square

No. 59.2.411

$p\bar{4}m21'$



Origin at $\bar{4}m21'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) m x,0,z
(m _y 0,0,0) | (6) m 0,y,z
(m _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x, \bar{x} ,0
(2 _{\bar{xy}} 0,0,0) |

For 1' + set

- | | | | |
|--|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) $\bar{4}^+$ ' 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0)' | (4) $\bar{4}^-$ ' 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0)' |
| (5) m' x,0,z
(m _y 0,0,0)' | (6) m' 0,y,z
(m _x 0,0,0)' | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x, \bar{x} ,0
(2 _{\bar{xy}} 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	$1+$	$1'+$		
8 i $11'$	(1) $x,y,z [0,0,0]$ (5) $x,\bar{y},z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$ (6) $\bar{x},y,z [0,0,0]$	(3) $y,\bar{x},\bar{z} [0,0,0]$ (7) $y,x,\bar{z} [0,0,0]$	(4) $\bar{y},x,\bar{z} [0,0,0]$ (8) $\bar{y},\bar{x},\bar{z} [0,0,0]$
4 h $.m.1'$	$x,1/2,z [0,0,0]$	$\bar{x},1/2,z [0,0,0]$	$1/2,\bar{x},\bar{z} [0,0,0]$	$1/2,x,\bar{z} [0,0,0]$
4 g $.m.1'$	$x,0,z [0,0,0]$	$\bar{x},0,z [0,0,0]$	$0,\bar{x},\bar{z} [0,0,0]$	$0,x,\bar{z} [0,0,0]$
4 f $..21'$	$x,x,0 [0,0,0]$	$\bar{x},\bar{x},0 [0,0,0]$	$x,\bar{x},0 [0,0,0]$	$\bar{x},x,0 [0,0,0]$
2 e $2mm.1'$	$0,1/2,z [0,0,0]$	$1/2,0,\bar{z} [0,0,0]$		
2 d $2mm.1'$	$1/2,1/2,z [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$		
2 c $2mm.1'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$		
1 b $\bar{4}m21'$	$1/2,1/2,0 [0,0,0]$			
1 a $\bar{4}m21'$	$0,0,0 [0,0,0]$			

Symmetry of special projections

Along [001] $p4mm1'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p1m11'$ $a^* = b$ Origin at $x,0,0$	Along [110] $p2mm1'$ $a^* = (-a+b)/2$ Origin at $x,x,0$
--	--	---

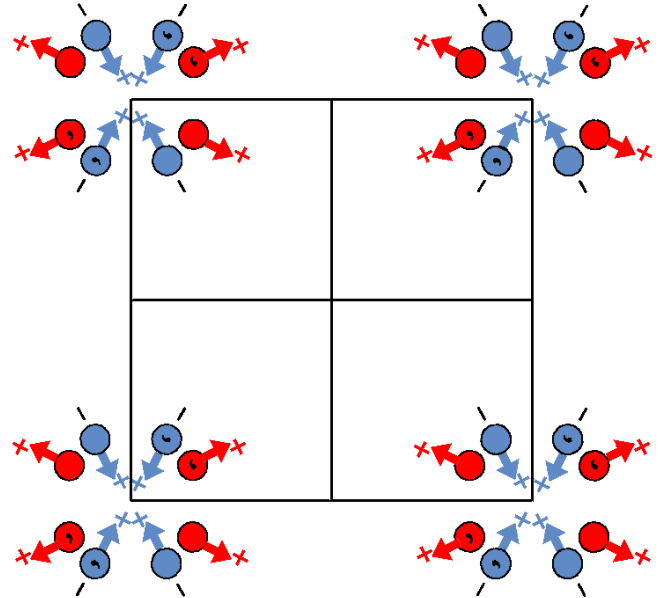
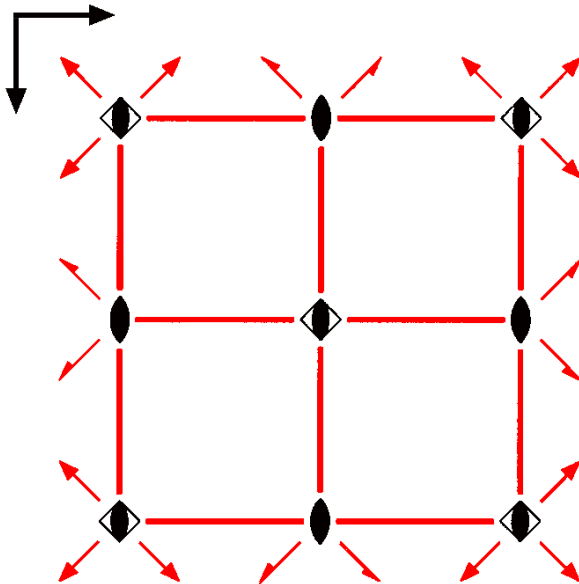
$p\bar{4}m'2'$

$\bar{4}m'2'$

Tetragonal/Square

No. 59.3.412

$p\bar{4}m'2'$



Origin at $\bar{4}m'2'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
(4 _z 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
(4 _z ⁻¹ 0,0,0) |
| (5) m' x,0,z
(m _y 0,0,0)' | (6) m' 0,y,z
(m _x 0,0,0)' | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x, \bar{x} ,0
(2 _{$\bar{x}y$} 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [u, \bar{v},w]
8 i 1	(5) x,\bar{y},z [u, \bar{v},w]	(6) \bar{x},y,z [\bar{u},v,w]	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]
4 h .m'	$x,1/2,z$ [u,0,w]	$\bar{x},1/2,z$ [$\bar{u},0,w$]	$1/2,\bar{x},\bar{z}$ [0,u,w]	$1/2,x,\bar{z}$ [0, \bar{u},w]
4 g .m'	$x,0,z$ [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	$0,\bar{x},\bar{z}$ [0,u,w]	$0,x,\bar{z}$ [0, \bar{u},w]
4 f ..2'	$x,x,0$ [\bar{u},u,w]	$\bar{x},\bar{x},0$ [u, \bar{u},w]	$x,\bar{x},0$ [\bar{u},\bar{u},w]	$\bar{x},x,0$ [u,u,w]
2 e 2m'm'	$0,1/2,z$ [0,0,w]	$1/2,0,\bar{z}$ [0,0,w]		
2 d 2m'm'	$1/2,1/2,z$ [0,0,w]	$1/2,1/2,\bar{z}$ [0,0,w]		
2 c 2m'm'	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]		
1 b $\bar{4}m'2'$	$1/2,1/2,0$ [0,0,w]			
1 a $\bar{4}m'2$	$0,0,0$ [0,0,w]			

Symmetry of special projections

Along [001] $p4m'm'$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p1m'1$
 $a^* = b$
 Origin at x,0,0

Along [110] $p2'm'm$
 $a^* = (-a+b)/2$
 Origin at x,x,0

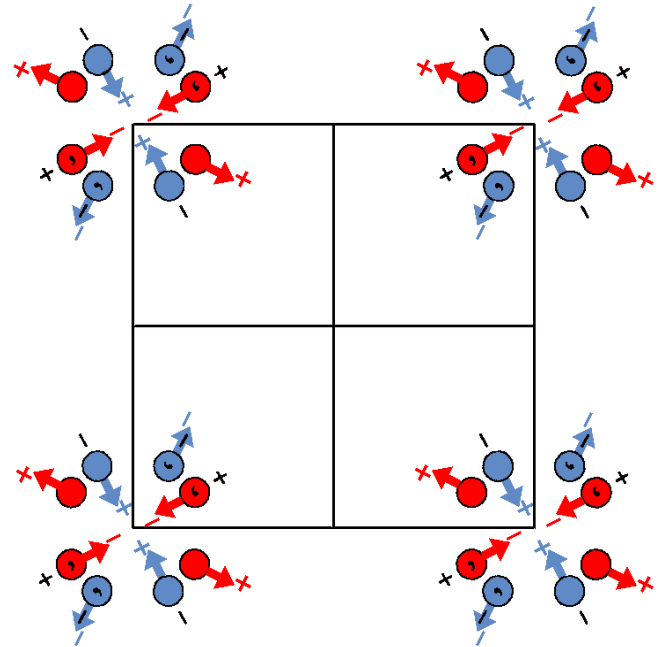
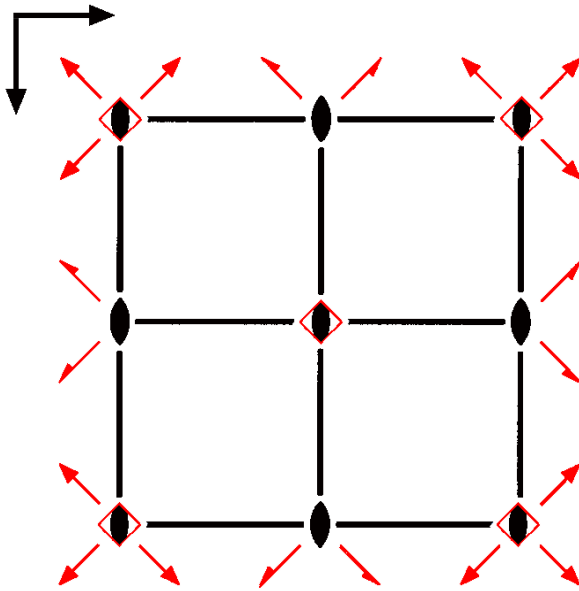
$p\bar{4}'m2'$

No. 59.4.413

$\bar{4}'m2'$

$p\bar{4}'m2'$

Tetragonal/Square



Origin at $\bar{4}'m2'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ ' 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0)' | (4) $\bar{4}^-$ ' 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0)' |
| (5) m x,0,z
(m _y 0,0,0) | (6) m 0,y,z
(m _x 0,0,0) | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x, \bar{x} ,0
(2 _{$\bar{x}y$} 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
8 i 1	(5) x,\bar{y},z [\bar{u},v,\bar{w}]	(6) \bar{x},y,z [u,\bar{v},\bar{w}]	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]
4 h .m.	$x,1/2,z$ [$0,v,0$]	$\bar{x},1/2,z$ [$0,\bar{v},0$]	$1/2,\bar{x},\bar{z}$ [$v,0,0$]	$1/2,x,\bar{z}$ [$\bar{v},0,0$]
4 g .m.	$x,0,z$ [$0,v,0$]	$\bar{x},0,z$ [$0,\bar{v},0$]	$0,\bar{x},\bar{z}$ [$v,0,0$]	$0,x,\bar{z}$ [$\bar{v},0,0$]
4 f ..2'	$x,x,0$ [\bar{u},u,w]	$\bar{x},\bar{x},0$ [u,\bar{u},w]	$x,\bar{x},0$ [u,u,\bar{w}]	$\bar{x},x,0$ [\bar{u},\bar{u},\bar{w}]
2 e 2mm.	$0,1/2,z$ [$0,0,0$]	$1/2,0,\bar{z}$ [$0,0,0$]		
2 d 2mm.	$1/2,1/2,z$ [$0,0,0$]	$1/2,1/2,\bar{z}$ [$0,0,0$]		
2 c 2mm.	$0,0,z$ [$0,0,0$]	$0,0,\bar{z}$ [$0,0,0$]		
1 b $\bar{4}'m2'$	$1/2,1/2,0$ [$0,0,0$]			
1 a $\bar{4}'m2'$	$0,0,0$ [$0,0,0$]			

Symmetry of special projections

Along [001] $p4mm$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p1m11'$ $a^* = b$ Origin at $x,0,0$	Along [110] $p2'mm'$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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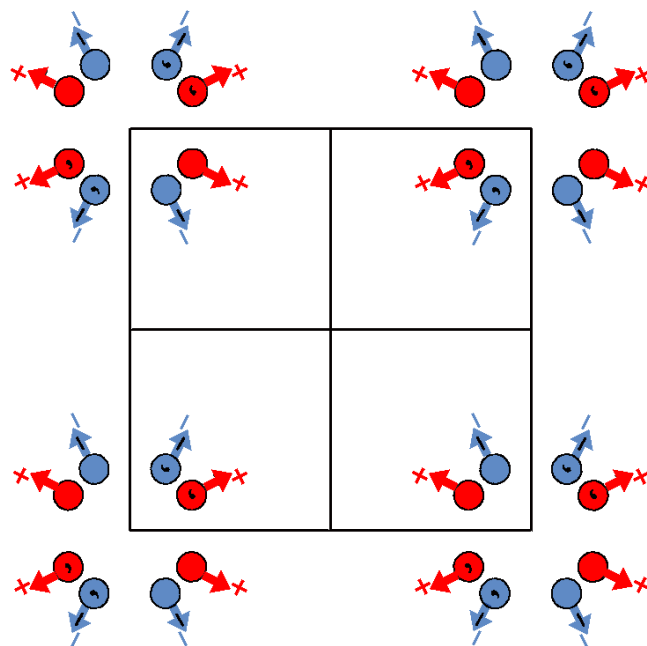
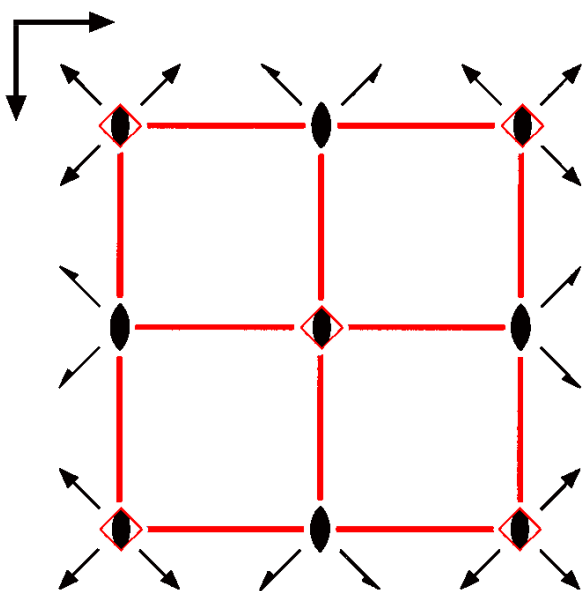
$p\bar{4}m'2$

No. 59.5.414

$\bar{4}m'2$

$p\bar{4}m'2$

Tetragonal/Square



Origin at $\bar{4}m'2$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
(4 _z 0,0,0)' | (4) $\bar{4}^-$ 0,0,z; 0,0,0
(4 _z ⁻¹ 0,0,0)' |
| (5) m' x,0,z
(m _y 0,0,0)' | (6) m' 0,y,z
(m _x 0,0,0)' | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x, \bar{x} ,0
(2 _{$\bar{x}y$} 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [v, \bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
8 i 1	(5) x,\bar{y},z [u, \bar{v},w]	(6) \bar{x},y,z [\bar{u},v,w]	(7) y,x,\bar{z} [v,u, \bar{w}]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]
4 h .m'	$x,1/2,z$ [u,0,w]	$\bar{x},1/2,z$ [$\bar{u},0,w$]	$1/2,\bar{x},\bar{z}$ [0, \bar{u},\bar{w}]	$1/2,x,\bar{z}$ [0,u, \bar{w}]
4 g .m'	$x,0,z$ [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	$0,\bar{x},\bar{z}$ [0, \bar{u},\bar{w}]	$0,x,\bar{z}$ [0,u, \bar{w}]
4 f ..2	$x,x,0$ [u,u,0]	$\bar{x},\bar{x},0$ [$\bar{u},\bar{u},0$]	$x,\bar{x},0$ [u, $\bar{u},0$]	$\bar{x},x,0$ [$\bar{u},u,0$]
2 e 2m'm'	$0,1/2,z$ [0,0,w]	$1/2,0,\bar{z}$ [0,0, \bar{w}]		
2 d 2m'm'	$1/2,1/2,z$ [0,0,w]	$1/2,1/2,\bar{z}$ [0,0, \bar{w}]		
2 c 2m'm'	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0, \bar{w}]		
1 b $\bar{4}'m'2$	$1/2,1/2,0$ [0,0,0]			
1 a $\bar{4}'m'2$	$0,0,0$ [0,0,0]			

Symmetry of special projections

Along [001] $p4m'm'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p1m1$ $a^* = b$ Origin at x,0,0	Along [110] $p2mm$ $a^* = (-a+b)/2$ Origin at x,x,0
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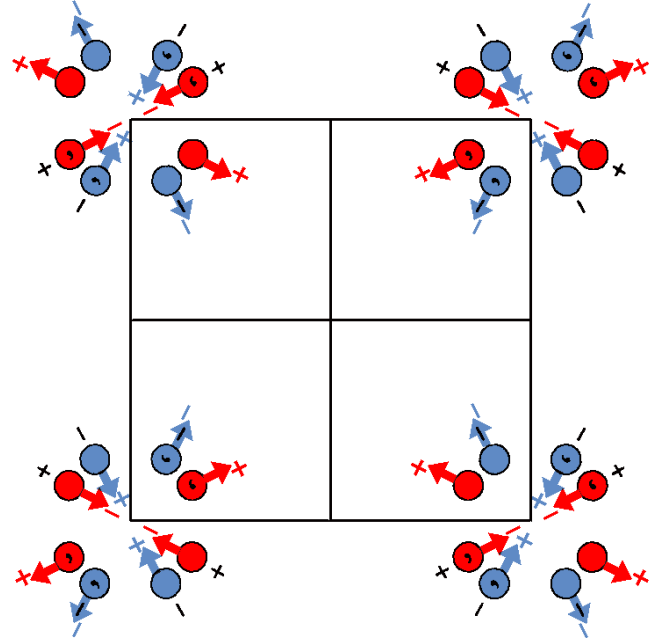
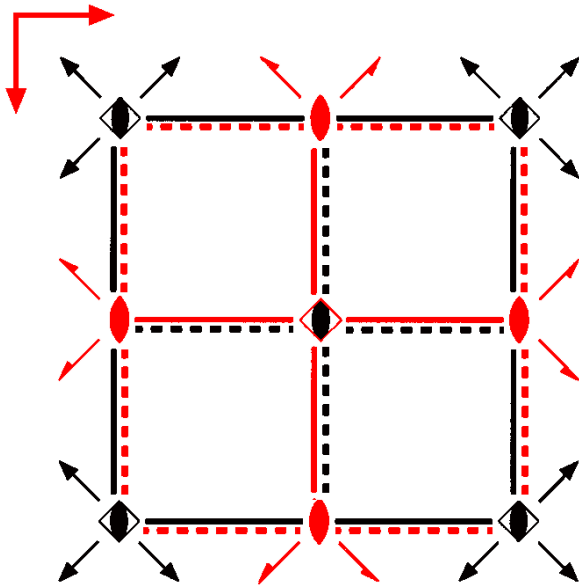
$p_p\bar{4}m2$

No. 59.6.415

$\bar{4}m21'$

$p_p\bar{4}m2$

Tetragonal/Square



Origin at $\bar{4}m2$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) m x,0,z
(m _y 0,0,0) | (6) m 0,y,z
(m _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x, \bar{x} ,0
(2 _{xy} 0,0,0) |

For (1,0,0)' + set

- | | | | |
|--|--|--|---|
| (1) t' (1,0,0)
(1 1,0,0)' | (2) 2' 1/2,0,z
(2 _z 1,0,0)' | (3) $\bar{4}^+$ ' 1/2,1/2,z; 1/2,1/2,0
($\bar{4}_z$ 1,0,0)' | (4) $\bar{4}^-$ ' 1/2,1/2,z; 1/2,1/2,0
($\bar{4}_z^{-1}$ 1,0,0)' |
| (5) a' (1,0,0) x,0,z
(m _y 1,0,0)' | (6) m' 1/2,y,z
(m _x 1,0,0)' | (7) 2' (1/2,1/2,0) x+1/2,x,0
(2 _{xy} 1,0,0)' | (8) 2' (1/2,-1/2,0) x+1/2, \bar{x} ,0
(2 _{xy} 1,0,0)' |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	$(0,0,0)_+$	$(1,0,0)'$	$(0,1,0)'$	$(0,0,1)'$
8 i 1	(1) $x,y,z [u,v,w]$ (5) $x,\bar{y},z [\bar{u},v,\bar{w}]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$ (6) $\bar{x},y,z [u,\bar{v},\bar{w}]$	(3) $y,\bar{x},\bar{z} [\bar{v},u,w]$ (7) $y,x,\bar{z} [v,u,\bar{w}]$	(4) $\bar{y},x,\bar{z} [v,\bar{u},w]$ (8) $\bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]$
4 h $\bar{4}m'$	$x,1/2,z [u,0,w]$	$\bar{x},1/2,z [u,0,\bar{w}]$	$1/2,\bar{x},\bar{z} [0,u,w]$	$1/2,x,\bar{z} [0,u,\bar{w}]$
4 g $\bar{4}m$	$x,0,z [0,v,0]$	$\bar{x},0,z [0,\bar{v},0]$	$0,\bar{x},\bar{z} [\bar{v},0,0]$	$0,x,\bar{z} [v,0,0]$
4 f $\bar{2}$	$x,x,0 [u,u,0]$	$\bar{x},\bar{x},0 [\bar{u},\bar{u},0]$	$x,\bar{x},0 [u,u,0]$	$\bar{x},x,0 [u,\bar{u},0]$
2 e $2'mm'$	$0,1/2,z [u,0,0]$	$1/2,0,\bar{z} [0,u,0]$		
2 d $2m'm'$	$1/2,1/2,z [0,0,w]$	$1/2,1/2,\bar{z} [0,0,\bar{w}]$		
2 c $2mm$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$		
1 b $\bar{4}'m'2$	$1/2,1/2,0 [0,0,0]$			
1 a $\bar{4}m2$	$0,0,0 [0,0,0]$			

Symmetry of special projections

Along [001] $p_p \bar{4}m'm'$	Along [100] $p1m11'$	Along [110] $p_{2a^*}2m'm'$
$a^* = a \quad b^* = b$	$a^* = b$	$a^* = (-a+b)/2$
Origin at $1/2,1/2,z$	Origin at $x,0,0$	Origin at $x,x,0$

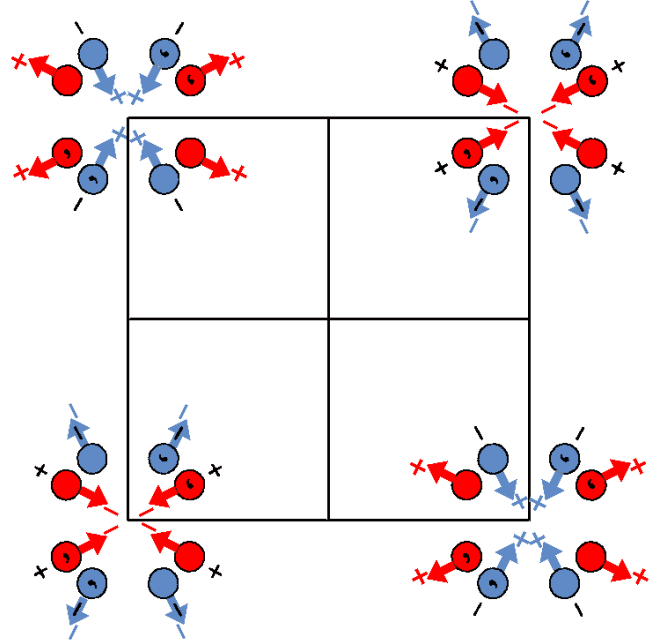
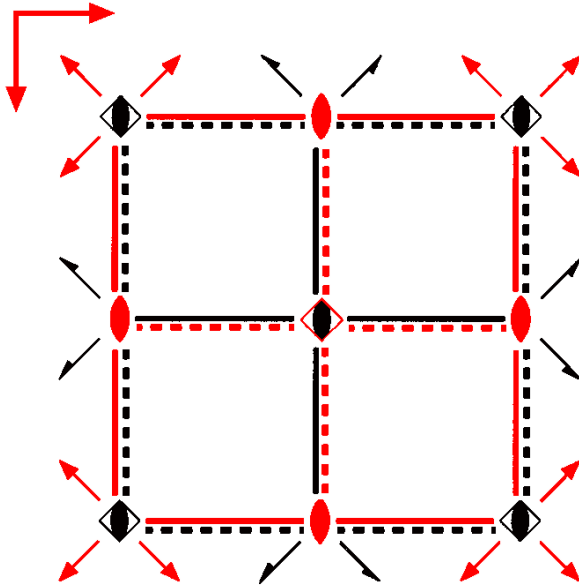
$p_p\bar{4}m'2'$

No. 59.7.416

$\bar{4}m21'$

$p_p\bar{4}m'2'$

Tetragonal/Square



Origin at $\bar{4}m'2'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|------------------------------------|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) m' x,0,z
(m_y 0,0,0)' | (6) m' 0,y,z
(m_x 0,0,0)' | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x, \bar{x} ,0
(2 _{xy} 0,0,0)' |

For (1,0,0)' + set

- | | | | |
|--|--|--|---|
| (1) t' (1,0,0)
(1 1,0,0)' | (2) 2' 1/2,0,z
(2 _z 1,0,0)' | (3) $\bar{4}^+$ ' 1/2,1/2,z; 1/2,1/2,0
($\bar{4}_z$ 1,0,0)' | (4) $\bar{4}^-$ ' 1/2,1/2,z; 1/2,1/2,0
($\bar{4}_z^{-1}$ 1,0,0)' |
| (5) a (1,0,0) x,0,z
(m_y 1,0,0) | (6) m 1/2,y,z
(m_x 1,0,0) | (7) 2 (1/2,1/2,0) x+1/2,x,0
(2 _{xy} 1,0,0) | (8) 2 (1/2,-1/2,0) x+1/2, \bar{x} ,0
(2 _{xy} 1,0,0) |

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(1,0,0)'		
8 i 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(3) $y,\bar{x},\bar{z} [\bar{v},u,w]$	(4) $\bar{y},x,\bar{z} [v,\bar{u},w]$
	(5) $x,\bar{y},z [u,\bar{v},w]$	(6) $\bar{x},y,z [\bar{u},v,w]$	(7) $y,x,\bar{z} [\bar{v},\bar{u},w]$	(8) $\bar{y},\bar{x},\bar{z} [v,u,w]$
4 h .m.	$x,1/2,z [0,v,0]$	$\bar{x},1/2,z [0,v,0]$	$1/2,\bar{x},\bar{z} [\bar{v},0,0]$	$1/2,x,\bar{z} [\bar{v},0,0]$
4 g .m'.	$x,0,z [u,0,w]$	$\bar{x},0,z [\bar{u},0,w]$	$0,\bar{x},\bar{z} [0,u,w]$	$0,x,\bar{z} [0,\bar{u},w]$
4 f ..2'	$x,x,0 [\bar{u},u,w]$	$\bar{x},\bar{x},0 [u,\bar{u},w]$	$x,\bar{x},0 [\bar{u},\bar{u},w]$	$\bar{x},x,0 [u,u,w]$
2 e 2'm'm.	$0,1/2,z [0,v,0]$	$1/2,0,\bar{z} [\bar{v},0,0]$		
2 d 2mm.	$1/2,1/2,z [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$		
2 c 2m'm'.	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$		
1 b $\bar{4}'m'2'$	$1/2,1/2,0 [0,0,0]$			
1 a $\bar{4}m'2'$	$0,0,0 [0,0,w]$			

Symmetry of special projections

Along [001] $p_p \bar{4}mm$ $a^* = a \quad b^* = b$ Origin at $1/2,1/2,z$	Along [100] $p_{2a^*} 1m1$ $a^* = b$ Origin at $x,1/2,0$	Along [110] $p_{2a^*} 2mm$ $a^* = (-a+b)/2$ Origin at $x-1/4, x+1/4, 0$
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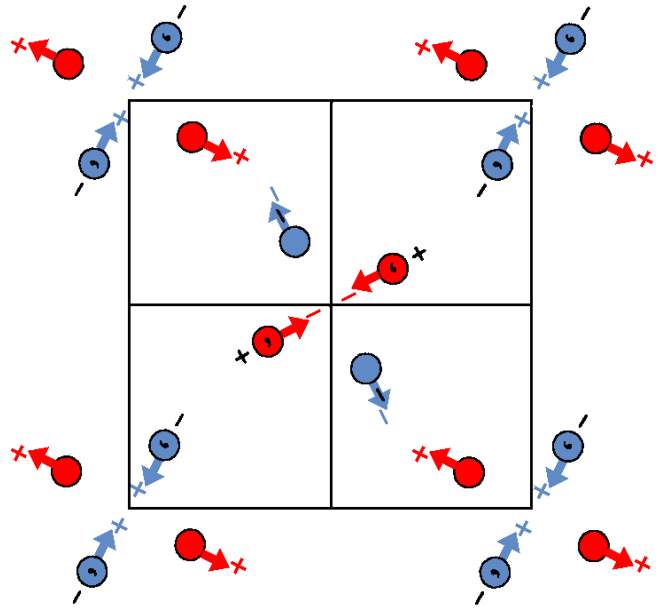
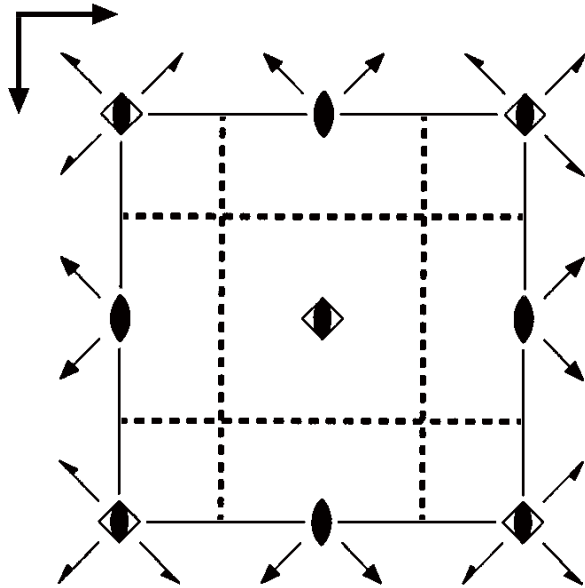
$p\bar{4}b2$

$\bar{4}m2$

Tetragonal/Square

No. 60.1.417

$p\bar{4}b2$



Origin at $\bar{4}12_1$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (6) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (7) 2 (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0) | (8) 2 x, \bar{x} +1/2,0
(2 _{xy} 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

	Coordinates				
Multiplicity, Wyckoff letter, Site symmetry					
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]			
	(3) y,\bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [v,\bar{u},w]			
	(5) $x+1/2,\bar{y}+1/2,z$ [\bar{u},v,\bar{w}]	(6) $\bar{x}+1/2,y+1/2,z$ [u,\bar{v},\bar{w}]			
	(7) $y+1/2,x+1/2,\bar{z}$ [v,u,\bar{w}]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [\bar{v},\bar{u},\bar{w}]			
	4 e ..2	$x,x+1/2,0$ [u,u,0]	$\bar{x},\bar{x}+1/2,0$ [$\bar{u},\bar{u},0$]	$x+1/2,\bar{x},0$ [$\bar{u},u,0$]	$\bar{x}+1/2,x,0$ [$u,\bar{u},0$]
	4 d 2..	$0,1/2,z$ [0,0,w]	$1/2,0,\bar{z}$ [0,0,w]	$1/2,0,z$ [0,0, \bar{w}]	$0,1/2,\bar{z}$ [0,0, \bar{w}]
	4 c 2..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]	$1/2,1/2,z$ [0,0, \bar{w}]	$1/2,1/2,\bar{z}$ [0,0, \bar{w}]
	2 b 2.22	$0,1/2,0$ [0,0,0]	$1/2,0,0$ [0,0,0]		
2 a $\bar{4}$..	$0,0,0$ [0,0,w]	$1/2,1/2,0$ [0,0, \bar{w}]			

Symmetry of special projections

Along [001] $p4'gm'$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p_{2a}1m1$
 $a^* = b/2$
 Origin at $x,1/4,0$

Along [110] $p2m'm'$
 $a^* = (-a+b)/2$
 Origin at $x,x,0$

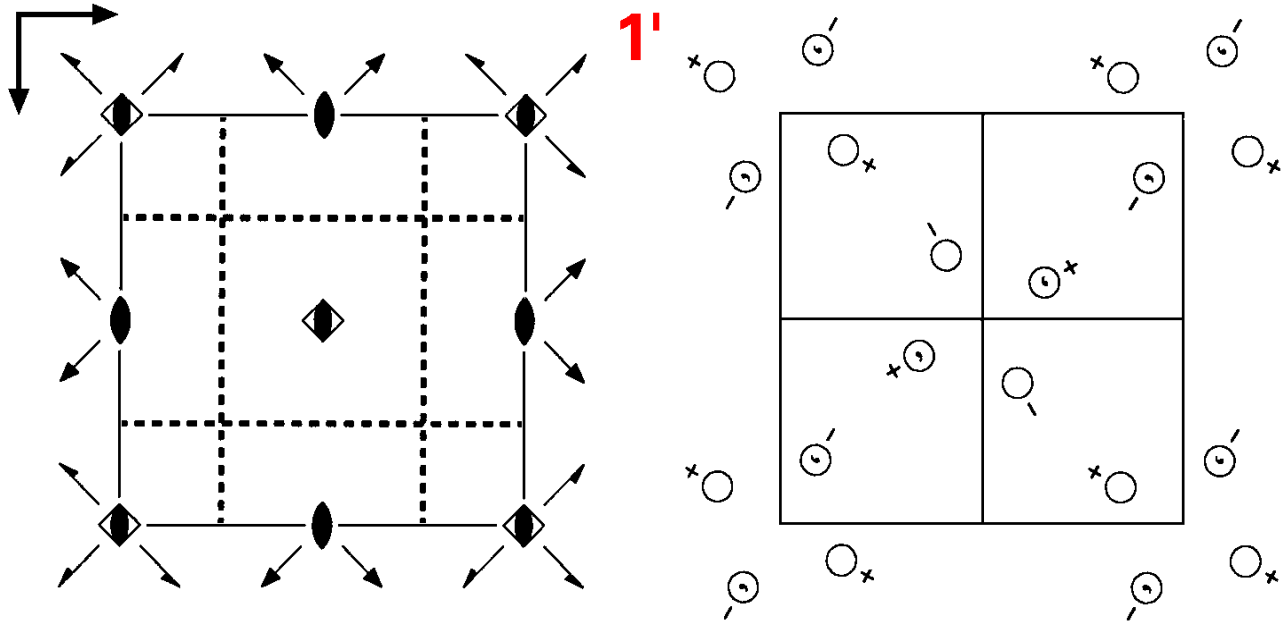
$p\bar{4}b21'$

$\bar{4}m21'$

Tetragonal/Square

No. 60.2.418

$p\bar{4}b21'$



Origin at $\bar{4}12, 1'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (5) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (6) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (7) 2 (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0) | (8) 2 x, \bar{x} +1/2,0
(2 _{xy} 1/2,1/2,0) |

For 1' + set

- | | | | |
|--|--|---|---|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) $\bar{4}^+$ ' 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0)' | (4) $\bar{4}^-$ ' 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0)' |
| (5) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (6) b' (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0)' | (7) 2' (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0)' | (8) 2' x, \bar{x} +1/2,0
(2 _{xy} 1/2,1/2,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	$1+$	$1'+$		
8 f $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{x},\bar{y},z [0,0,0]$		
	(3) $y,\bar{x},\bar{z} [0,0,0]$	(4) $\bar{y},x,\bar{z} [0,0,0]$		
	(5) $x+1/2,\bar{y}+1/2,z [0,0,0]$	(6) $\bar{x}+1/2,y+1/2,z [0,0,0]$		
	(7) $y+1/2,x+1/2,\bar{z} [0,0,0]$	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z} [0,0,0]$		
4 e $..21'$	$x,x+1/2,0 [0,0,0]$	$\bar{x},\bar{x}+1/2,0 [0,0,0]$	$x+1/2,\bar{x},0 [0,0,0]$	$\bar{x}+1/2,x,0 [0,0,0]$
4 d $2..1'$	$0,1/2,z [0,0,0]$	$1/2,0,\bar{z} [0,0,0]$	$1/2,0,z [0,0,0]$	$0,1/2,\bar{z} [0,0,0]$
4 c $2..1'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	$1/2,1/2,z [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$
2 b $2.221'$	$0,1/2,0 [0,0,0]$	$1/2,0,0 [0,0,0]$		
2 a $\bar{4}..1'$	$0,0,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		

Symmetry of special projections

Along $[001]$ $p4gm1'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along $[100]$ $p1m11'$ $a^* = b/2$ Origin at $x,0,0$	Along $[110]$ $p2mm1'$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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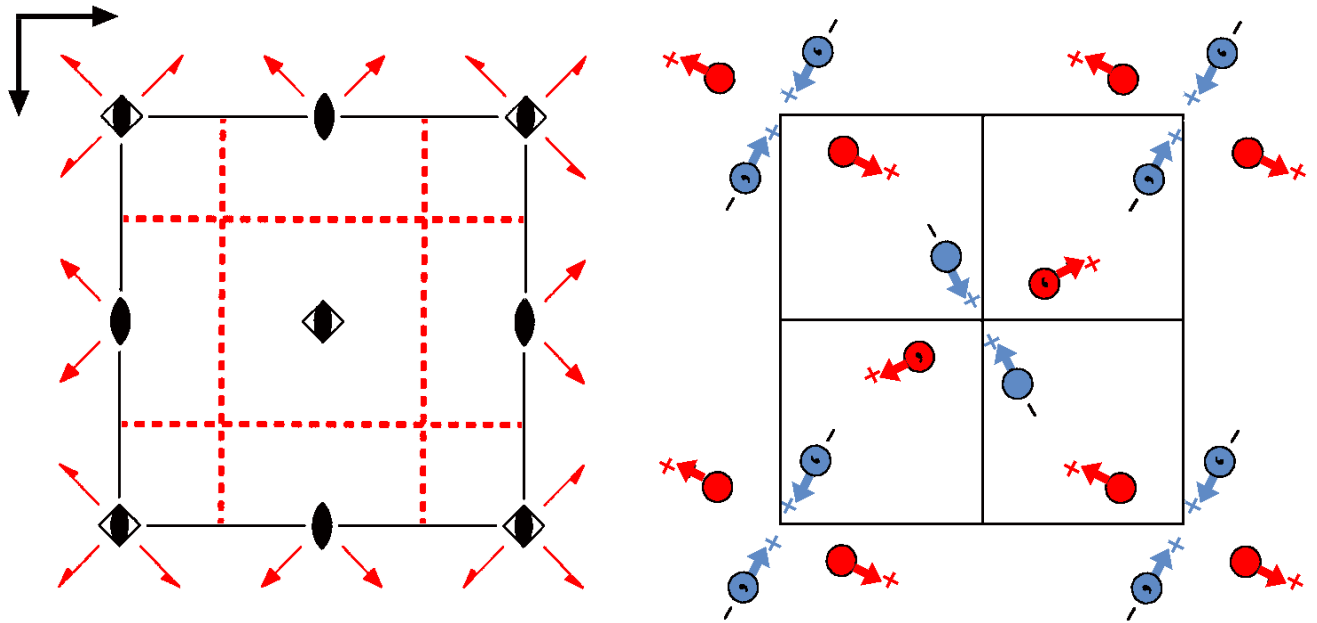
$p\bar{4}b'2'$

$\bar{4}m'2'$

Tetragonal/Square

No. 60.3.419

$p\bar{4}b'2'$



Origin at $\bar{4}12_1'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+$ 0,0,z; 0,0,0
(4 _z 0,0,0) | (4) $\bar{4}^-$ 0,0,z; 0,0,0
(4 _z ⁻¹ 0,0,0) |
| (5) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (6) b' (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0)' | (7) 2' (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0)' | (8) 2' x, $\bar{x}+1/2,0$
(2 _{xy} 1/2,1/2,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates				
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]			
	(3) y,\bar{x},\bar{z} [\bar{v},u,w]	(4) \bar{y},x,\bar{z} [v,\bar{u},w]			
	(5) $x+1/2,\bar{y}+1/2,z$ [u, \bar{v},w]	(6) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]			
	(7) $y+1/2,x+1/2,\bar{z}$ [\bar{v},\bar{u},w]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [v,u,w]			
	4 e ..2'	$x,x+1/2,0$ [\bar{u},u,w]	$\bar{x},\bar{x}+1/2,0$ [u,\bar{u},w]	$x+1/2,\bar{x},0$ [\bar{u},\bar{u},w]	$\bar{x}+1/2,x,0$ [u,u,w]
	4 d 2..	$0,1/2,z$ [0,0,w]	$1/2,0,\bar{z}$ [0,0,w]	$1/2,0,z$ [0,0,w]	$0,1/2,\bar{z}$ [0,0,w]
	4 c 2..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]	$1/2,1/2,z$ [0,0,w]	$1/2,1/2,\bar{z}$ [0,0,w]
	2 b 2.2'2'	$0,1/2,0$ [0,0,w]	$1/2,0,0$ [0,0,w]		
2 a $\bar{4}$..	$0,0,0$ [0,0,w]	$1/2,1/2,0$ [0,0,w]			

Symmetry of special projections

Along [001] $p4'g'm$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p1m'1$
 $a^* = b/2$
 Origin at x,0,0

Along [110] $p2'm'm$
 $a^* = (-a+b)/2$
 Origin at x,x,0

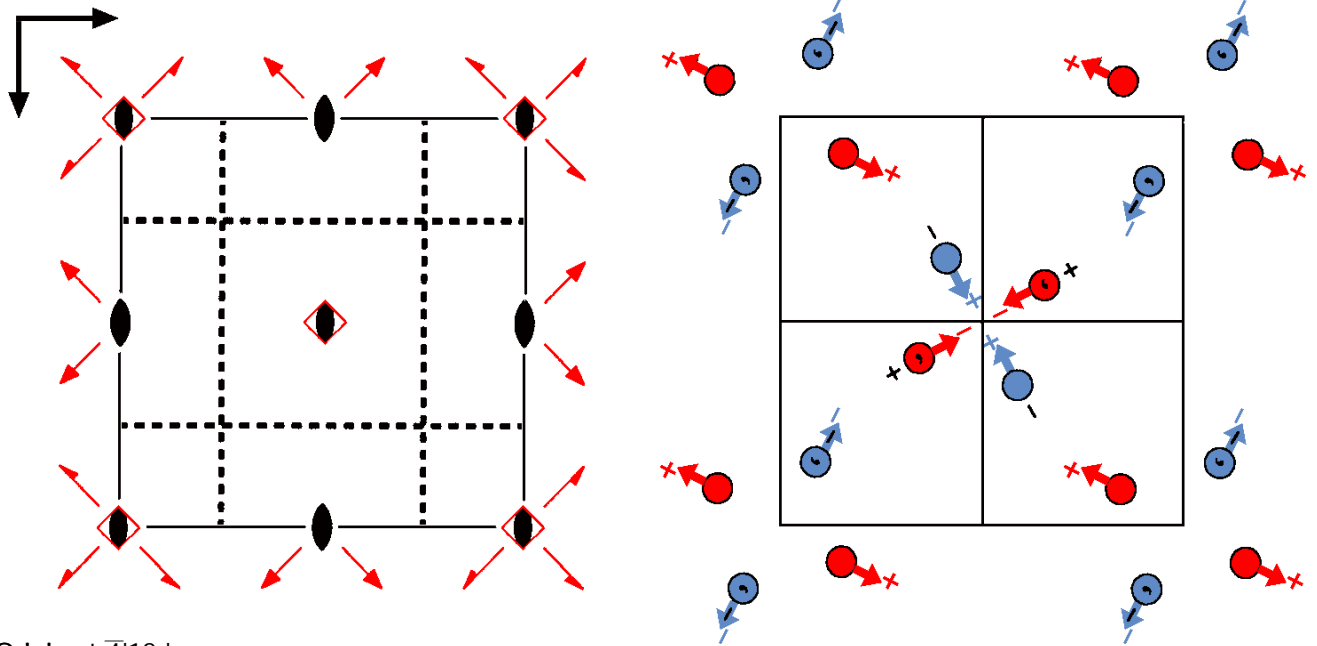
$p\bar{4}'b2'$

$\bar{4}'m2'$

Tetragonal/Square

No. 60.4.420

$p\bar{4}'b2'$



Origin at $\bar{4}'12_1'$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}^+ ' 0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0)' | (4) $\bar{4}^- ' 0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ 0,0,0)' |
| (5) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (6) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (7) 2' (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0)' | (8) 2' x, $\bar{x}+1/2,0$
(2 _{xy} 1/2,1/2,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
	(5) $x+1/2,\bar{y}+1/2,z$ [\bar{u},v,\bar{w}]	(6) $\bar{x}+1/2,y+1/2,z$ [u,\bar{v},\bar{w}]	(7) $y+1/2,x+1/2,\bar{z}$ [\bar{v},\bar{u},w]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [v,u,w]
4 e ..2'	$x,x+1/2,0$ [\bar{u},u,w]	$\bar{x},\bar{x}+1/2,0$ [u,\bar{u},w]	$x+1/2,\bar{x},0$ [u,u,\bar{w}]	$\bar{x}+1/2,x,0$ [\bar{u},\bar{u},\bar{w}]
4 d 2..	$0,1/2,z$ [$0,0,w$]	$1/2,0,\bar{z}$ [$0,0,\bar{w}$]	$1/2,0,z$ [$0,0,\bar{w}$]	$0,1/2,\bar{z}$ [$0,0,w$]
4 c 2..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]	$1/2,1/2,z$ [$0,0,\bar{w}$]	$1/2,1/2,\bar{z}$ [$0,0,w$]
2 b 2.2'2'	$0,1/2,0$ [$0,0,w$]	$1/2,0,0$ [$0,0,\bar{w}$]		
2 a $\bar{4}'..$	$0,0,0$ [$0,0,0$]	$1/2,1/2,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $p4gm$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p_{2a^*}1m1$ $a^* = b/2$ Origin at $x,1/4,0$	Along [110] $p2'm'm$ $a^* = (-a+b)/2$ Origin at $x,x,0$
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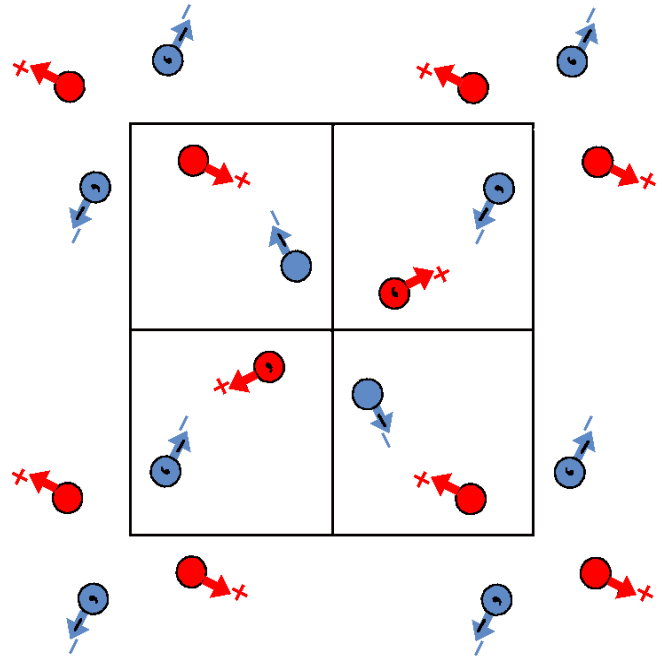
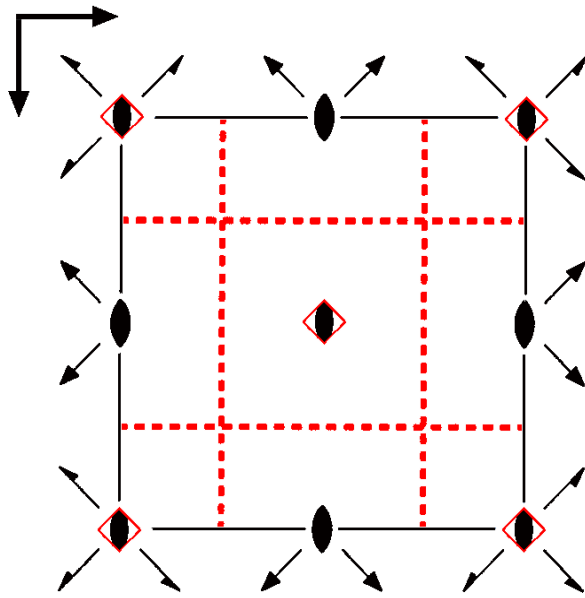
$p\bar{4}'b'2$

$\bar{4}'m'2$

Tetragonal/Square

No. 60.5.421

$p\bar{4}'b'2$



Origin at $\bar{4}'12_1$

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) $\bar{4}'^+$ 0,0,z; 0,0,0
($\bar{4}'_z$ 0,0,0)' | (4) $\bar{4}'^-$ 0,0,z; 0,0,0
($\bar{4}'_z^{-1}$ 0,0,0)' |
| (5) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (6) b' (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0)' | (7) 2 (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0) | (8) 2 x, \bar{x} +1/2,0
(2 _{xy} 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5)

Positions

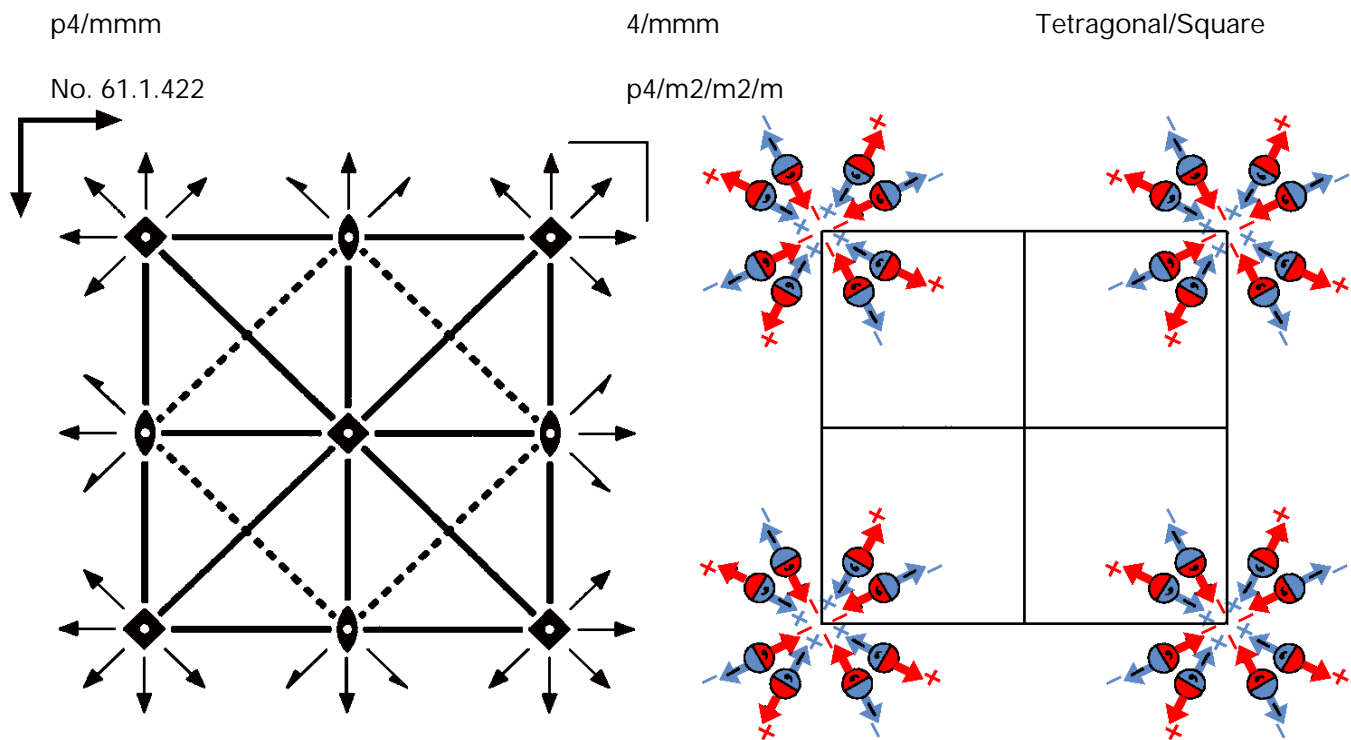
Multiplicity, Wyckoff letter, Site symmetry	Coordinates				
8 f 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]			
	(3) y,\bar{x},\bar{z} [v, \bar{u},\bar{w}]	(4) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]			
	(5) $x+1/2,\bar{y}+1/2,z$ [u, \bar{v},w]	(6) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]			
	(7) $y+1/2,x+1/2,\bar{z}$ [v,u, \bar{w}]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [\bar{v},\bar{u},\bar{w}]			
	4 e ..2	$x,x+1/2,0$ [u,u,0]	$\bar{x},\bar{x}+1/2,0$ [$\bar{u},\bar{u},0$]	$x+1/2,\bar{x},0$ [u, $\bar{u},0$]	$\bar{x}+1/2,x,0$ [$\bar{u},u,0$]
	4 d 2..	$0,1/2,z$ [0,0,w]	$1/2,0,\bar{z}$ [0,0, \bar{w}]	$1/2,0,z$ [0,0,w]	$0,1/2,\bar{z}$ [0,0, \bar{w}]
	4 c 2..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0, \bar{w}]	$1/2,1/2,z$ [0,0,w]	$1/2,1/2,\bar{z}$ [0,0, \bar{w}]
	2 b 2.22	$0,1/2,0$ [0,0,0]	$1/2,0,0$ [0,0,0]		
2 a $\bar{4}'..$	$0,0,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]			

Symmetry of special projections

Along [001] $p4g'm'$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p1m1$
 $a^* = b/2$
 Origin at x,0,0

Along [110] $p2mm$
 $a^* = (-a+b)/2$
 Origin at x,x,0



Origin at center (4/mmm)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y; 0 \leq z$

Symmetry operations

- | | | | |
|--|---|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x,̄x,0
(2 _{̄xy} 0,0,0) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z^+$ 0,0,0) | (12) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^-$ 0,0,0) |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) m x,̄x,z
(m _{xy} 0,0,0) | (16) m x,x,z
(m _{̄xy} 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
16 n 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]	(7) y,x, \bar{z} [v,u, \bar{w}]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]
	(9) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(10) x,y, \bar{z} [u,v, \bar{w}]	(11) y, \bar{x},\bar{z} [\bar{v},u,\bar{w}]	(12) \bar{y},x,\bar{z} [v, \bar{u},\bar{w}]
	(13) x, \bar{y},z [u,v, \bar{w}]	(14) \bar{x},y,z [\bar{u},\bar{v},\bar{w}]	(15) \bar{y},\bar{x},z [v,u, \bar{w}]	(16) y,x,z [\bar{v},\bar{u},\bar{w}]
8 m .m.	x,1/2,z [0,v,0]	$\bar{x},1/2,z$ [0, $\bar{v},0$]	1/2,x,z [$\bar{v},0,0$]	1/2, \bar{x},z [v,0,0]
	$\bar{x},1/2,\bar{z}$ [0,v,0]	x,1/2, \bar{z} [0, $\bar{v},0$]	1/2,x, \bar{z} [v,0,0]	1/2, \bar{x},\bar{z} [$\bar{v},0,0$]
8 l .m.	x,0,z [0,v,0]	$\bar{x},0,z$ [0, $\bar{v},0$]	0,x,z [$\bar{v},0,0$]	0, \bar{x},z [v,0,0]
	$\bar{x},0,\bar{z}$ [0,v,0]	x,0, \bar{z} [0, $\bar{v},0$]	0,x, \bar{z} [v,0,0]	0, \bar{x},\bar{z} [$\bar{v},0,0$]
8 k ..m	x,x,z [$\bar{u},u,0$]	\bar{x},\bar{x},z [u, $\bar{u},0$]	\bar{x},x,z [$\bar{u},\bar{u},0$]	x, \bar{x},z [u,u,0]
	\bar{x},x,\bar{z} [u,u,0]	x, \bar{x},\bar{z} [$\bar{u},\bar{u},0$]	x,x, \bar{z} [u, $\bar{u},0$]	\bar{x},\bar{x},\bar{z} [$\bar{u},u,0$]
8 j m..	x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{y},x,0$ [0,0,w]	y, $\bar{x},0$ [0,0,w]
	$\bar{x},y,0$ [0,0, \bar{w}]	x, $\bar{y},0$ [0,0, \bar{w}]	y,x,0 [0,0, \bar{w}]	$\bar{y},\bar{x},0$ [0,0, \bar{w}]
4 i m2m.	x,1/2,0 [0,0,0]	$\bar{x},1/2,0$ [0,0,0]	1/2,x,0 [0,0,0]	1/2, $\bar{x},0$ [0,0,0]
4 h m2m.	x,0,0 [0,0,0]	$\bar{x},0,0$ [0,0,0]	0,x,0 [0,0,0]	0, $\bar{x},0$ [0,0,0]
4 g m.2m	x,x,0 [0,0,0]	$\bar{x},\bar{x},0$ [0,0,0]	$\bar{x},x,0$ [0,0,0]	x, $\bar{x},0$ [0,0,0]
4 f 2mm.	0,1/2,z [0,0,0]	1/2,0,z [0,0,0]	0,1/2, \bar{z} [0,0,0]	1/2,0, \bar{z} [0,0,0]

Continued

No. 61.1.422

p4/mmm

2 e 4mm $1/2, 1/2, z$ [0,0,0] $1/2, 1/2, \bar{z}$ [0,0,0]

2 d 4mm $0, 0, z$ [0,0,0] $0, 0, \bar{z}$ [0,0,0]

2 c mmm. $0, 1/2, 0$ [0,0,0] $1/2, 0, 0$ [0,0,0]

1 b 4/mmm $1/2, 1/2, 0$ [0,0,0]

1 a 4/mmm $0, 0, 0$ [0,0,0]

Symmetry of special projections

Along [001] p4mm1'
 $a^* = a$ $b^* = b$
Origin at 0,0,z

Along [100] p2mm1'
 $a^* = b$
Origin at x,0,0

Along [110] p2mm1'
 $a^* = (-a + b)/2$
Origin at x,x,0

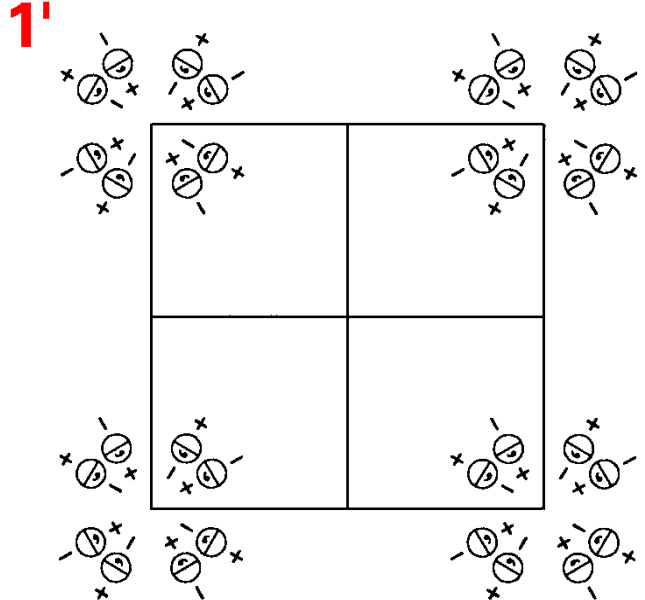
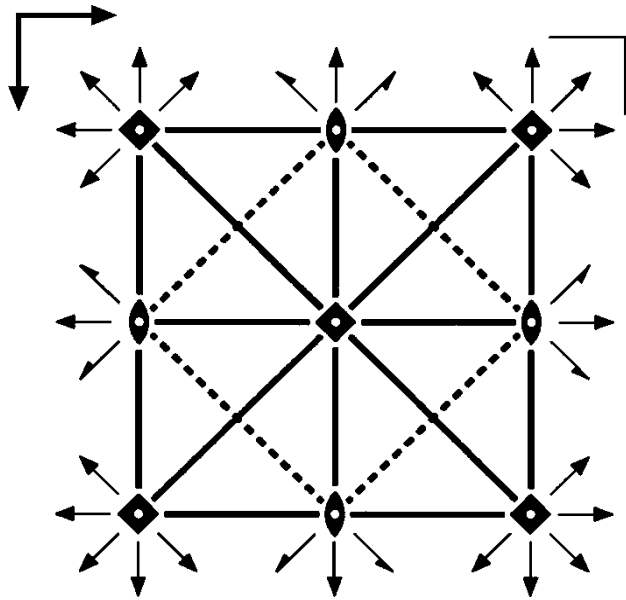
p4/mmm1'

4/mmm1'

Tetragonal/Square

No. 61.2.423

p4/m2/m2/m1'



Origin at center (4/mmm1')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|--|---|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x,x̄,0
(2 _{xy} 0,0,0) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (12) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) m x,x̄,z
(m _{xy} 0,0,0) | (16) m x,x,z
(m _{xy} 0,0,0) |

For 1' + set

- | | | | |
|--|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 4 ⁺ ' 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ ' 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x,x̄,0
(2 _{xy} 0,0,0)' |

(9) $\bar{1}'$ 0,0,0 ($\bar{1}$ 0,0,0)'	(10) m' x,y,0 (m_z 0,0,0)'	(11) $\bar{4}^{+1}$ 0,0,z; 0,0,0 ($\bar{4}_z$ 0,0,0)'	(12) $\bar{4}^{-1}$ 0,0,z; 0,0,0 ($\bar{4}_z^{-1}$ 0,0,0)'
(13) m' x,0,z (m_y 0,0,0)'	(14) m' 0,y,z (m_x 0,0,0)'	(15) m' x, \bar{x} ,z (m_{xy} 0,0,0)'	(16) m' x,x,z ($m_{\bar{xy}}$ 0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9); 1'

Positions

	Coordinates			
	1+		1'+	
Multiplicity, Wyckoff letter, Site symmetry				
16 n 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]	(3) \bar{y},x,z [0,0,0]	(4) y, \bar{x},z [0,0,0]
	(5) \bar{x},y,\bar{z} [0,0,0]	(6) x, \bar{y},\bar{z} [0,0,0]	(7) y,x, \bar{z} [0,0,0]	(8) \bar{y},\bar{x},\bar{z} [0,0,0]
	(9) \bar{x},\bar{y},\bar{z} [0,0,0]	(10) x,y, \bar{z} [0,0,0]	(11) y, \bar{x},\bar{z} [0,0,0]	(12) \bar{y},x,\bar{z} [0,0,0]
	(13) x, \bar{y},z [0,0,0]	(14) \bar{x},y,z [0,0,0]	(15) \bar{y},\bar{x},z [0,0,0]	(16) y,x,z [0,0,0]
8 m .m.1'	x,1/2,z [0,0,0]	$\bar{x},1/2,z$ [0,0,0]	1/2,x,z [0,0,0]	1/2, \bar{x},z [0,0,0]
	$\bar{x},1/2,\bar{z}$ [0,0,0]	x,1/2, \bar{z} [0,0,0]	1/2,x, \bar{z} [0,0,0]	1/2, \bar{x},\bar{z} [0,0,0]
8 l .m.1'	x,0,z [0,0,0]	$\bar{x},0,z$ [0,0,0]	0,x,z [0,0,0]	0, \bar{x},z [0,0,0]
	$\bar{x},0,\bar{z}$ [0,0,0]	x,0, \bar{z} [0,0,0]	0,x, \bar{z} [0,0,0]	0, \bar{x},\bar{z} [0,0,0]
8 k ..m1'	x,x,z [0,0,0]	\bar{x},\bar{x},z [0,0,0]	\bar{x},x,z [0,0,0]	x, \bar{x},z [0,0,0]
	\bar{x},x,\bar{z} [0,0,0]	x, \bar{x},\bar{z} [0,0,0]	x,x, \bar{z} [0,0,0]	\bar{x},\bar{x},\bar{z} [0,0,0]
8 j m..1'	x,y,0 [0,0,0]	$\bar{x},\bar{y},0$ [0,0,0]	$\bar{y},x,0$ [0,0,0]	y, $\bar{x},0$ [0,0,0]
	$\bar{x},y,0$ [0,0,0]	x, $\bar{y},0$ [0,0,0]	y,x,0 [0,0,0]	$\bar{y},\bar{x},0$ [0,0,0]
4 i m2m.1'	x,1/2,0 [0,0,0]	$\bar{x},1/2,0$ [0,0,0]	1/2,x,0 [0,0,0]	1/2, $\bar{x},0$ [0,0,0]
4 h m2m.1'	x,0,0 [0,0,0]	$\bar{x},0,0$ [0,0,0]	0,x,0 [0,0,0]	0, $\bar{x},0$ [0,0,0]

Continued

No. 61.2.423

p4/mmm1'

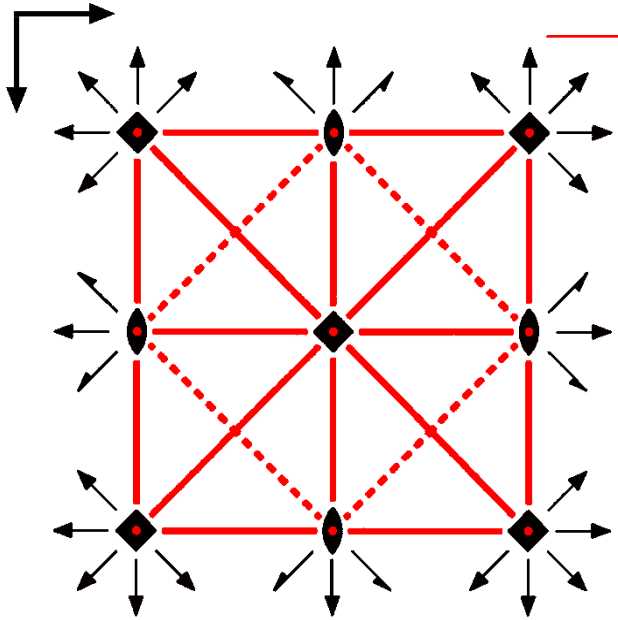
4	g	m.2m1'	x,x,0 [0,0,0]	$\bar{x},\bar{x},0$ [0,0,0]	$\bar{x},x,0$ [0,0,0]	x, $\bar{x},0$ [0,0,0]
4	f	2mm.1'	0,1/2,z [0,0,0]	1/2,0,z [0,0,0]	0,1/2, \bar{z} [0,0,0]	1/2,0, \bar{z} [0,0,0]
2	e	4mm1'	1/2,1/2,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]		
2	d	4mm1'	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]		
2	c	mmm.1'	0,1/2,0 [0,0,0]	1/2,0,0 [0,0,0]		
1	b	4/mmm1'	1/2,1/2,0 [0,0,0]			
1	a	4/mmm1'	0,0,0 [0,0,0]			

Symmetry of special projections

Along [001] p4mm1'	Along [100] p2mm1'	Along [110] p2mm1'
$a^* = a$ $b^* = b$	$a^* = b$	$a^* = (-a+b)/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

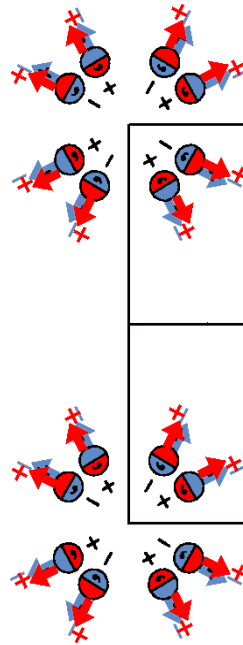
p4/m'm'm'

No. 61.3.424

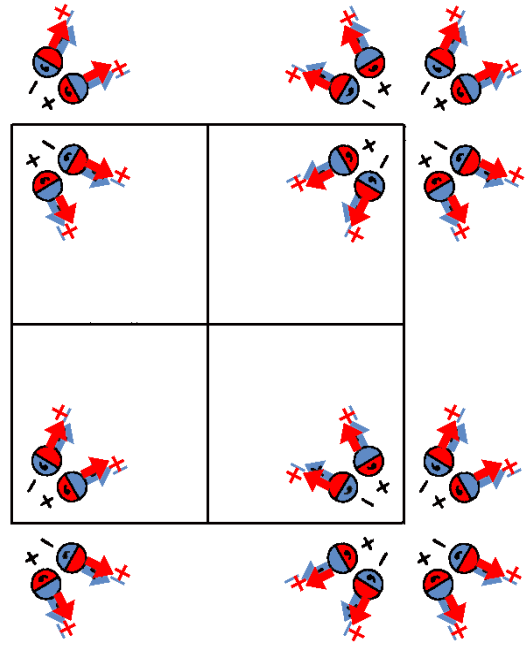


4/m'm'm'

p4/m'2/m'2/m'



Tetragonal/Square



Origin at center (4/m'm'm')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y; 0 \leq z$

Symmetry operations

- | | | | |
|---|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x,x̄,0
(2 _{x̄y} 0,0,0) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (10) m' x,y,0
(m _z 0,0,0)' | (11) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z^+$ 0,0,0)' | (12) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^-$ 0,0,0)' |
| (13) m' x,0,z
(m _y 0,0,0)' | (14) m' 0,y,z
(m _x 0,0,0)' | (15) m' x,x̄,z
(m _{xy} 0,0,0)' | (16) m' x,x,z
(m _{x̄y} 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]
16 n 1	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]	(7) y,x, \bar{z} [v,u, \bar{w}]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]
	(9) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(10) x,y, \bar{z} [u,v, \bar{w}]	(11) y, \bar{x},z [v, \bar{u},w]	(12) \bar{y},x,z [\bar{v},u,w]
	(13) x, \bar{y},z [u, \bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]	(15) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(16) y,x,z [v,u,w]
8 m .m'	x,1/2,z [u,0,w]	$\bar{x},1/2,z$ [$\bar{u},0,w$]	1/2,x,z [0,u,w]	1/2, \bar{x},z [0, \bar{u},w]
	$\bar{x},1/2,\bar{z}$ [$\bar{u},0,\bar{w}$]	x,1/2, \bar{z} [u,0, \bar{w}]	1/2,x, \bar{z} [0,u, \bar{w}]	1/2, \bar{x},\bar{z} [0, \bar{u},\bar{w}]
8 l .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	0,x,z [0,u,w]	0, \bar{x},z [0, \bar{u},w]
	$\bar{x},0,\bar{z}$ [$\bar{u},0,\bar{w}$]	x,0, \bar{z} [u,0, \bar{w}]	0,x, \bar{z} [0,u, \bar{w}]	0, \bar{x},\bar{z} [0, \bar{u},\bar{w}]
8 k ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	\bar{x},x,z [\bar{u},u,w]	x, \bar{x},z [u, \bar{u},w]
	\bar{x},x,\bar{z} [\bar{u},u,\bar{w}]	x, \bar{x},\bar{z} [u, \bar{u},\bar{w}]	x,x, \bar{z} [u,u, \bar{w}]	\bar{x},\bar{x},\bar{z} [\bar{u},\bar{u},\bar{w}]
8 j m'..	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{y},x,0$ [$\bar{v},u,0$]	y, $\bar{x},0$ [v, $\bar{u},0$]
	$\bar{x},y,0$ [$\bar{u},v,0$]	x, $\bar{y},0$ [u, $\bar{v},0$]	y,x,0 [v,u,0]	$\bar{y},\bar{x},0$ [$\bar{v},\bar{u},0$]
4 i m'2m'	x,1/2,0 [u,0,0]	$\bar{x},1/2,0$ [$\bar{u},0,0$]	1/2,x,0 [0,u,0]	1/2, $\bar{x},0$ [0, $\bar{u},0$]
4 h m'2m'	x,0,0 [u,0,0]	$\bar{x},0,0$ [$\bar{u},0,0$]	0,x,0 [0,u,0]	0, $\bar{x},0$ [0, $\bar{u},0$]
4 g m'.2m'	x,x,0 [u,u,0]	$\bar{x},\bar{x},0$ [$\bar{u},\bar{u},0$]	$\bar{x},x,0$ [$\bar{u},u,0$]	x, $\bar{x},0$ [u, $\bar{u},0$]
4 f 2m'm'	0,1/2,z [0,0,w]	1/2,0,z [0,0,w]	0,1/2, \bar{z} [0,0, \bar{w}]	1/2,0, \bar{z} [0,0, \bar{w}]

Continued

No. 61.3.424

$p4/m'm'm'$

2 e $4m'm'$ $1/2, 1/2, z$ $[0, 0, w]$ $1/2, 1/2, \bar{z}$ $[0, 0, \bar{w}]$

2 d $4m'm'$ $0, 0, z$ $[0, 0, w]$ $0, 0, \bar{z}$ $[0, 0, \bar{w}]$

2 c $m'm'm'$. $0, 1/2, 0$ $[0, 0, 0]$ $1/2, 0, 0$ $[0, 0, 0]$

1 b $4/m'm'm'$ $1/2, 1/2, 0$ $[0, 0, 0]$

1 a $4/m'm'm'$ $0, 0, 0$ $[0, 0, 0]$

Symmetry of special projections

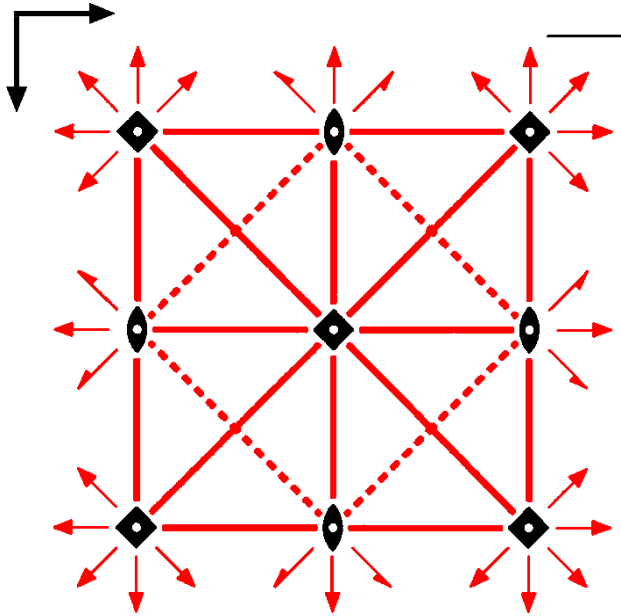
Along $[001]$ $p4m'm'$
 $a^* = a$ $b^* = b$
Origin at $0, 0, z$

Along $[100]$ $p2m'm'$
 $a^* = b$
Origin at $x, 0, 0$

Along $[110]$ $p2m'm'$
 $a^* = (-a + b)/2$
Origin at $x, x, 0$

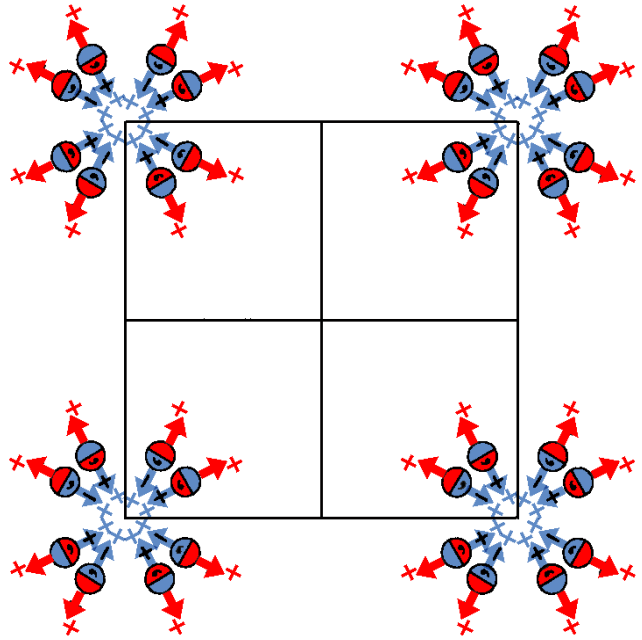
p4/mm'm'

No. 61.4.425



4/mm'm'

p4/m2'/m2'/m'



Tetragonal/Square

Origin at center (4/mm'm')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y; 0 \leq z$

Symmetry operations

- | | | | |
|--|---|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x,x̄,0
(2 _{xy} 0,0,0)' |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (12) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (13) m' x,0,z
(m _y 0,0,0)' | (14) m' 0,y,z
(m _x 0,0,0)' | (15) m' x,x̄,z
(m _{xy} 0,0,0)' | (16) m' x,x,z
(m _{xy} 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]
16 n 1	(5) \bar{x},y,\bar{z} [\bar{u},\bar{v},w]	(6) x, \bar{y},\bar{z} [\bar{u},v,w]	(7) y,x, \bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]
	(9) \bar{x},\bar{y},\bar{z} [u,v,w]	(10) x,y, \bar{z} [\bar{u},\bar{v},w]	(11) y, \bar{x},\bar{z} [\bar{v},u,w]	(12) \bar{y},x,\bar{z} [v, \bar{u},w]
	(13) x, \bar{y},z [u, \bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]	(15) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(16) y,x,z [v,u,w]
8 m .m'	x,1/2,z [u,0,w]	$\bar{x},1/2,z$ [$\bar{u},0,w$]	1/2,x,z [0,u,w]	1/2, \bar{x},z [0, \bar{u},w]
	$\bar{x},1/2,\bar{z}$ [u,0,w]	x,1/2, \bar{z} [$\bar{u},0,w$]	1/2,x, \bar{z} [0, \bar{u},w]	1/2, \bar{x},\bar{z} [0,u,w]
8 l .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	0,x,z [0,u,w]	0, \bar{x},z [0, \bar{u},w]
	$\bar{x},0,\bar{z}$ [u,0,w]	x,0, \bar{z} [$\bar{u},0,w$]	0,x, \bar{z} [0, \bar{u},w]	0, \bar{x},\bar{z} [0,u,w]
8 k ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	\bar{x},x,z [\bar{u},u,w]	x, \bar{x},z [u, \bar{u},w]
	\bar{x},x,\bar{z} [u, \bar{u},w]	x, \bar{x},\bar{z} [\bar{u},u,w]	x,x, \bar{z} [\bar{u},\bar{u},w]	\bar{x},\bar{x},\bar{z} [u,u,w]
8 j m..	x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{y},x,0$ [0,0,w]	y, $\bar{x},0$ [0,0,w]
	$\bar{x},y,0$ [0,0,w]	x, $\bar{y},0$ [0,0,w]	y,x,0 [0,0,w]	$\bar{y},\bar{x},0$ [0,0,w]
4 i m2'm'	x,1/2,0 [0,0,w]	$\bar{x},1/2,0$ [0,0,w]	1/2,x,0 [0,0,w]	1/2, $\bar{x},0$ [0,0,w]
4 h m2'm'	x,0,0 [0,0,w]	$\bar{x},0,0$ [0,0,w]	0,x,0 [0,0,w]	0, $\bar{x},0$ [0,0,w]
4 g m.2'm'	x,x,0 [0,0,w]	$\bar{x},\bar{x},0$ [0,0,w]	$\bar{x},x,0$ [0,0,w]	x, $\bar{x},0$ [0,0,w]
4 f 2m'm'	0,1/2,z [0,0,w]	1/2,0,z [0,0,w]	0,1/2, \bar{z} [0,0,w]	1/2,0, \bar{z} [0,0,w]

Continued

No. 61.4.425

$p4/mm'm'$

2 e $4m'm'$ $1/2, 1/2, z$ $[0, 0, w]$ $1/2, 1/2, \bar{z}$ $[0, 0, w]$

2 d $4m'm'$ $0, 0, z$ $[0, 0, w]$ $0, 0, \bar{z}$ $[0, 0, w]$

2 c $mm'm'$. $0, 1/2, 0$ $[0, 0, w]$ $1/2, 0, 0$ $[0, 0, w]$

1 b $4/mm'm'$ $1/2, 1/2, 0$ $[0, 0, w]$

1 a $4/mm'm'$ $0, 0, 0$ $[0, 0, w]$

Symmetry of special projections

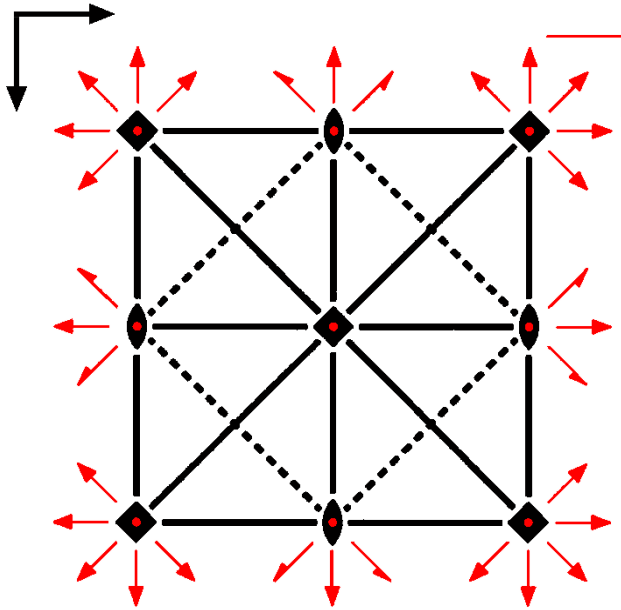
Along $[001]$ $p4mm1'$
 $a^* = a$ $b^* = b$
Origin at $0, 0, z$

Along $[100]$ $p2'm'm$
 $a^* = b$
Origin at $x, 0, 0$

Along $[110]$ $p2'm'm$
 $a^* = (-a + b)/2$
Origin at $x, x, 0$

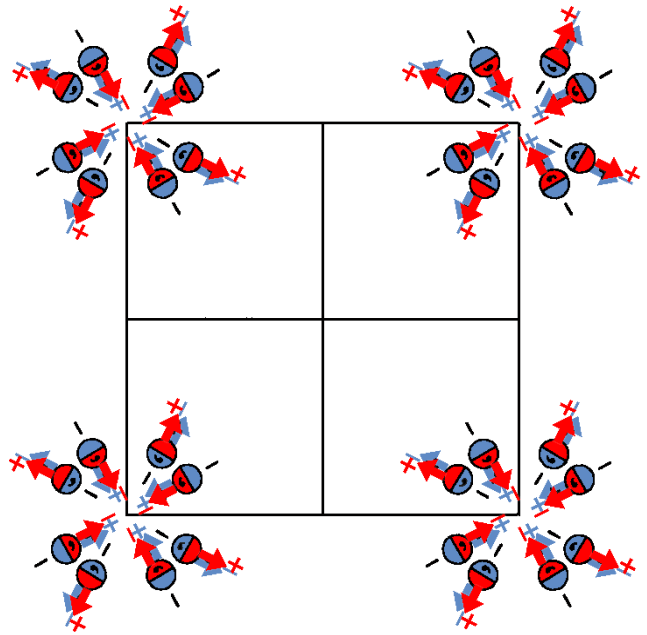
p4/m'mm

No. 61.5.426



4/m'mm

p4/m'2'/m2'/m



Tetragonal/Square

Origin at center (4/m'mm)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y; 0 \leq z$

Symmetry operations

- | | | | |
|--|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x,̄x,0
(2 _{̄xy} 0,0,0)' |
| (9) ̄1' 0,0,0
(̄1 0,0,0)' | (10) m' x,y,0
(m _z 0,0,0)' | (11) ̄4 ⁺ ' 0,0,z; 0,0,0
(̄4 _z 0,0,0)' | (12) ̄4 ⁻ ' 0,0,z; 0,0,0
(̄4 _z ⁻¹ 0,0,0)' |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) m x,̄x,z
(m _{xy} 0,0,0) | (16) m x,x,z
(m _{̄xy} 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v, \bar{u},w]
16 n 1	(5) \bar{x},y,\bar{z} [\bar{u},\bar{v},w]	(6) x,\bar{y},\bar{z} [\bar{u},v,w]	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]
	(9) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(10) x,y,\bar{z} [u,v, \bar{w}]	(11) y,\bar{x},\bar{z} [v, \bar{u},\bar{w}]	(12) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
	(13) x,\bar{y},z [\bar{u},v,\bar{w}]	(14) \bar{x},y,z [u, \bar{v},\bar{w}]	(15) \bar{y},\bar{x},z [v,u, \bar{w}]	(16) y,x,z [\bar{v},\bar{u},\bar{w}]
8 m .m.	$x,1/2,z$ [0,v,0]	$\bar{x},1/2,z$ [0, $\bar{v},0$]	$1/2,x,z$ [$\bar{v},0,0$]	$1/2,\bar{x},z$ [v,0,0]
	$\bar{x},1/2,\bar{z}$ [0, $\bar{v},0$]	$x,1/2,\bar{z}$ [0,v,0]	$1/2,x,\bar{z}$ [$\bar{v},0,0$]	$1/2,\bar{x},\bar{z}$ [v,0,0]
8 l .m.	$x,0,z$ [0,v,0]	$\bar{x},0,z$ [0, $\bar{v},0$]	$0,x,z$ [$\bar{v},0,0$]	$0,\bar{x},z$ [v,0,0]
	$\bar{x},0,\bar{z}$ [0, $\bar{v},0$]	$x,0,\bar{z}$ [0,v,0]	$0,x,\bar{z}$ [$\bar{v},0,0$]	$0,\bar{x},\bar{z}$ [v,0,0]
8 k ..m	x,x,z [$\bar{u},u,0$]	\bar{x},\bar{x},z [u, $\bar{u},0$]	\bar{x},x,z [$\bar{u},\bar{u},0$]	x,\bar{x},z [u,u,0]
	\bar{x},x,\bar{z} [$\bar{u},\bar{u},0$]	x,\bar{x},\bar{z} [u,u,0]	x,x,\bar{z} [$\bar{u},u,0$]	\bar{x},\bar{x},\bar{z} [u, $\bar{u},0$]
8 j m'..	$x,y,0$ [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{y},x,0$ [$\bar{v},u,0$]	$y,\bar{x},0$ [v, $\bar{u},0$]
	$\bar{x},y,0$ [u, $\bar{v},0$]	$x,\bar{y},0$ [$\bar{u},v,0$]	$y,x,0$ [$\bar{v},\bar{u},0$]	$\bar{y},\bar{x},0$ [v,u,0]
4 i m'2'm.	$x,1/2,0$ [0,v,0]	$\bar{x},1/2,0$ [0, $\bar{v},0$]	$1/2,x,0$ [$\bar{v},0,0$]	$1/2,\bar{x},0$ [v,0,0]
4 h m'2'm.	$x,0,0$ [0,v,0]	$\bar{x},0,0$ [0, $\bar{v},0$]	$0,x,0$ [$\bar{v},0,0$]	$0,\bar{x},0$ [v,0,0]
4 g m'.2'm	$x,x,0$ [$\bar{u},u,0$]	$\bar{x},\bar{x},0$ [u, $\bar{u},0$]	$\bar{x},x,0$ [$\bar{u},\bar{u},0$]	$x,\bar{x},0$ [u,u,0]
4 f 2mm.	$0,1/2,z$ [0,0,0]	$1/2,0,z$ [0,0,0]	$0,1/2,\bar{z}$ [0,0,0]	$1/2,0,\bar{z}$ [0,0,0]

Continued

No. 61.5.426

$p4/m'mm$

2 e 4mm $1/2, 1/2, z$ [0,0,0] $1/2, 1/2, \bar{z}$ [0,0,0]

2 d 4mm $0, 0, z$ [0,0,0] $0, 0, \bar{z}$ [0,0,0]

2 c $m'mm$. $0, 1/2, 0$ [0,0,0] $1/2, 0, 0$ [0,0,0]

1 b $4/m'mm$ $1/2, 1/2, 0$ [0,0,0]

1 a $4/m'mm$ $0, 0, 0$ [0,0,0]

Symmetry of special projections

Along [001] $p4mm$

$a^* = a$ $b^* = b$

Origin at $0, 0, z$

Along [100] $p2mm1'$

$a^* = b$

Origin at $x, 0, 0$

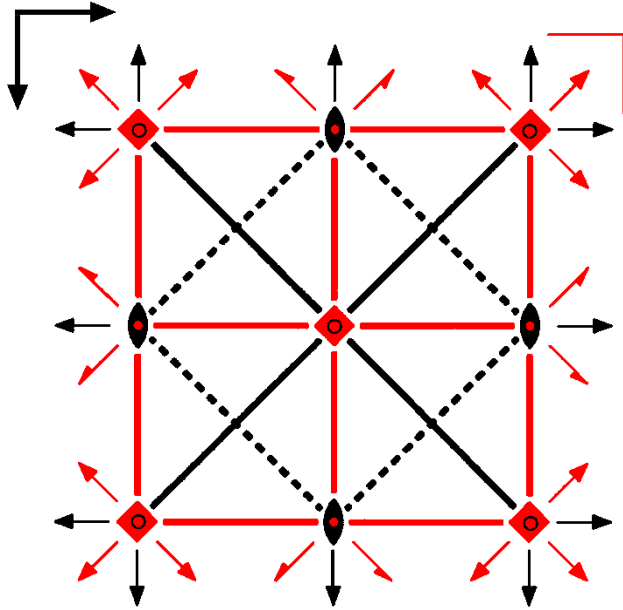
Along [110] $p2mm1'$

$a^* = (-a + b)/2$

Origin at $x, x, 0$

p4'/m'm'm

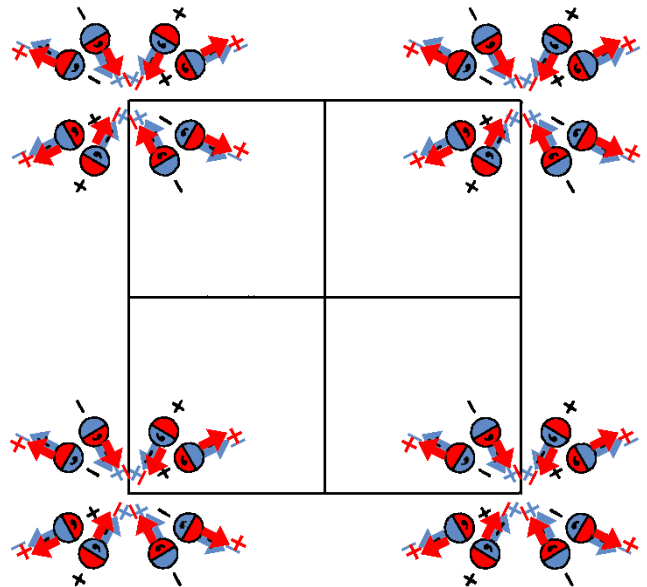
No. 61.6.427



4'/m'm'm

p4'/m'2'/m'2'/m

Tetragonal/Square



Origin at center (4'/m'm'm)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y; 0 \leq z$

Symmetry operations

- | | | | |
|---|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) ⁺ | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) ⁻ |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2' x,x,0
(2 _{xy} 0,0,0) ['] | (8) 2' x,̄x,0
(2 _{̄xy} 0,0,0) ['] |
| (9) ̄1 0,0,0
(̄1 0,0,0) ['] | (10) m' x,y,0
(m _z 0,0,0) ['] | (11) ̄4 ⁺ 0,0,z; 0,0,0
(̄4 _z 0,0,0) ⁺ | (12) ̄4 ⁻ 0,0,z; 0,0,0
(̄4 _z ⁻¹ 0,0,0) ⁻ |
| (13) m' x,0,z
(m _y 0,0,0) ['] | (14) m' 0,y,z
(m _x 0,0,0) ['] | (15) m x,̄x,z
(m _{xy} 0,0,0) | (16) m x,x,z
(m _{̄xy} 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]
16 n 1	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x, \bar{y},\bar{z} [u,\bar{v},\bar{w}]	(7) y,x, \bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]
	(9) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(10) x,y, \bar{z} [u,v,\bar{w}]	(11) y, \bar{x},\bar{z} [\bar{v},u,w]	(12) \bar{y},x,\bar{z} [v,\bar{u},w]
	(13) x, \bar{y},z [u,\bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]	(15) \bar{y},\bar{x},z [v,u,\bar{w}]	(16) y,x,z [\bar{v},\bar{u},\bar{w}]
8 m .m'	x,1/2,z [u,0,w]	$\bar{x},1/2,z$ [$\bar{u},0,w$]	1/2,x,z [0, \bar{u},\bar{w}]	1/2, \bar{x},z [0,u, \bar{w}]
	$\bar{x},1/2,\bar{z}$ [$\bar{u},0,\bar{w}$]	x,1/2, \bar{z} [$u,0,\bar{w}$]	1/2,x, \bar{z} [0, \bar{u},w]	1/2, \bar{x},\bar{z} [0,u,w]
8 l .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	0,x,z [0, \bar{u},\bar{w}]	0, \bar{x},z [0,u, \bar{w}]
	$\bar{x},0,\bar{z}$ [$\bar{u},0,\bar{w}$]	x,0, \bar{z} [$u,0,\bar{w}$]	0,x, \bar{z} [0, \bar{u},\bar{w}]	0, \bar{x},\bar{z} [0,u, \bar{w}]
8 k ..m	x,x,z [$\bar{u},u,0$]	\bar{x},\bar{x},z [$u,\bar{u},0$]	\bar{x},x,z [$u,u,0$]	x, \bar{x},z [$\bar{u},\bar{u},0$]
	\bar{x},x,\bar{z} [$u,u,0$]	x, \bar{x},\bar{z} [$\bar{u},\bar{u},0$]	x,x, \bar{z} [$\bar{u},u,0$]	\bar{x},\bar{x},\bar{z} [$u,\bar{u},0$]
8 j m'..	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{y},x,0$ [$v,\bar{u},0$]	y, $\bar{x},0$ [$\bar{v},u,0$]
	$\bar{x},y,0$ [$\bar{u},v,0$]	x, $\bar{y},0$ [$u,\bar{v},0$]	y,x,0 [$\bar{v},\bar{u},0$]	$\bar{y},\bar{x},0$ [$v,u,0$]
4 i m'2m'	x,1/2,0 [u,0,0]	$\bar{x},1/2,0$ [$\bar{u},0,0$]	1/2,x,0 [0, $\bar{u},0$]	1/2, $\bar{x},0$ [0,u,0]
4 h m'2m'	x,0,0 [u,0,0]	$\bar{x},0,0$ [$\bar{u},0,0$]	0,x,0 [0, $\bar{u},0$]	0, $\bar{x},0$ [0,u,0]
4 g m'.2'm	x,x,0 [$\bar{u},u,0$]	$\bar{x},\bar{x},0$ [$u,\bar{u},0$]	$\bar{x},x,0$ [$u,u,0$]	x, $\bar{x},0$ [$\bar{u},\bar{u},0$]
4 f 2m'm'	0,1/2,z [0,0,w]	1/2,0,z [0,0, \bar{w}]	0,1/2, \bar{z} [0,0, \bar{w}]	1/2,0, \bar{z} [0,0,w]

Continued

No. 61.6.427

$p4'/m'm'm$

2 e $4'm'm$ $1/2, 1/2, z$ [0,0,0] $1/2, 1/2, \bar{z}$ [0,0,0]

2 d $4'm'm$ $0, 0, z$ [0,0,0] $0, 0, \bar{z}$ [0,0,0]

2 c $m'm'm'$. $0, 1/2, 0$ [0,0,0] $1/2, 0, 0$ [0,0,0]

1 b $4'/m'm'm$ $1/2, 1/2, 0$ [0,0,0]

1 a $4'/m'm'm$ $0, 0, 0$ [0,0,0]

Symmetry of special projections

Along [001] $p4'm'm$

$a^* = a$ $b^* = b$

Origin at $0, 0, z$

Along [100] $p2'mm'$

$a^* = b$

Origin at $x, 0, 0$

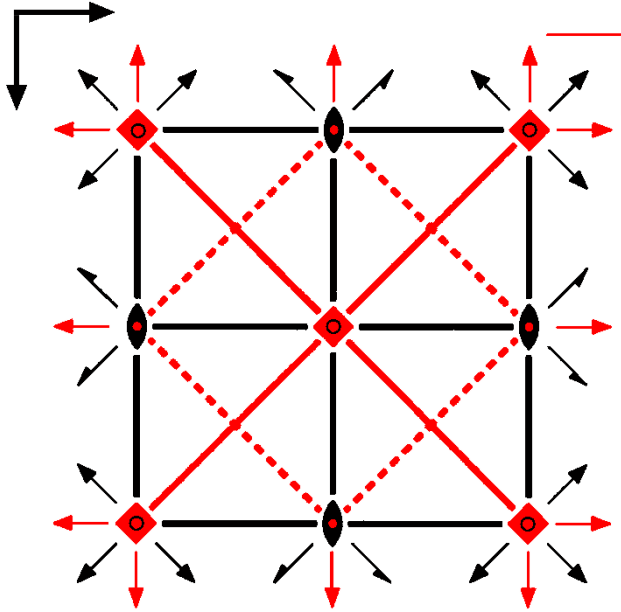
Along [110] $p2mm1'$

$a^* = (-a + b)/2$

Origin at $x, x, 0$

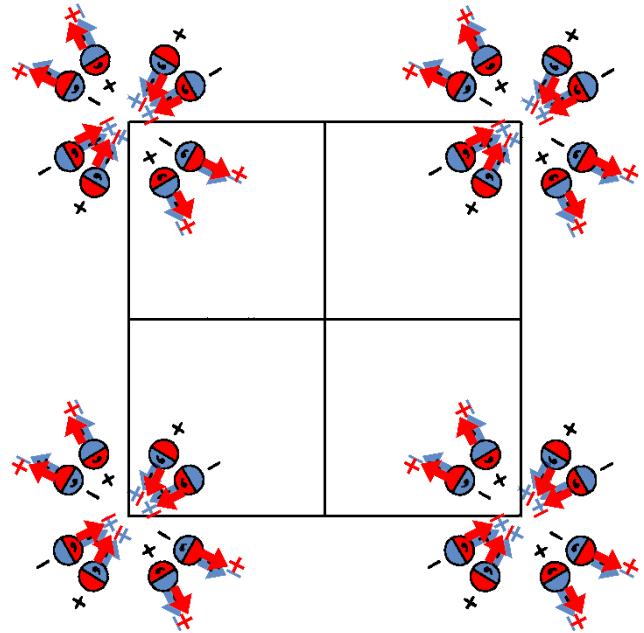
p4'/m'mm'

No. 61.7.428



4'/m'mm'

p4'/m'2'/m2'/m'



Tetragonal/Square

Origin at center (4'/m'mm')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y; 0 \leq z$

Symmetry operations

- | | | | |
|--|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) ⁺ | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) ⁻ |
| (5) 2' 0,y,0
(2 _y 0,0,0) ['] | (6) 2' x,0,0
(2 _x 0,0,0) ['] | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x,x̄,0
(2 _{xy} ⁻ 0,0,0) |
| (9) 1̄ 0,0,0
(1̄ 0,0,0) ['] | (10) m' x,y,0
(m _z 0,0,0) ['] | (11) 4̄ ⁺ 0,0,z; 0,0,0
(4̄ _z 0,0,0) ⁺ | (12) 4̄ ⁻ 0,0,z; 0,0,0
(4̄ _z ⁻¹ 0,0,0) ⁻ |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) m' x,x̄,z
(m _{xy} 0,0,0) ['] | (16) m' x,x,z
(m _{xy} ⁻ 0,0,0) ['] |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v, \bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]
16 n 1	(5) \bar{x},y,\bar{z} [u, \bar{v},w]	(6) x,\bar{y},\bar{z} [\bar{u},v,w]	(7) y,x,\bar{z} [v,u, \bar{w}]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]
	(9) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(10) x,y,\bar{z} [u,v, \bar{w}]	(11) y,\bar{x},z [\bar{v},u,w]	(12) \bar{y},x,\bar{z} [v, \bar{u},w]
	(13) x,\bar{y},z [\bar{u},v,w]	(14) \bar{x},y,z [u, \bar{v},w]	(15) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(16) y,x,z [v,u,w]
8 m .m.	$x,1/2,z$ [0,v,0]	$\bar{x},1/2,z$ [0, $\bar{v},0$]	$1/2,x,z$ [v,0,0]	$1/2,\bar{x},z$ [$\bar{v},0,0$]
	$\bar{x},1/2,\bar{z}$ [0, $\bar{v},0$]	$x,1/2,\bar{z}$ [0,v,0]	$1/2,x,\bar{z}$ [v,0,0]	$1/2,\bar{x},\bar{z}$ [$\bar{v},0,0$]
8 l .m.	$x,0,z$ [0,v,0]	$\bar{x},0,z$ [0, $\bar{v},0$]	$0,x,z$ [v,0,0]	$0,\bar{x},z$ [$\bar{v},0,0$]
	$\bar{x},0,\bar{z}$ [0, $\bar{v},0$]	$x,0,\bar{z}$ [0,v,0]	$0,x,\bar{z}$ [v,0,0]	$0,\bar{x},\bar{z}$ [$\bar{v},0,0$]
8 k ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	\bar{x},x,z [u, \bar{u},\bar{w}]	x,\bar{x},z [\bar{u},u,\bar{w}]
	\bar{x},x,\bar{z} [u, \bar{u},w]	x,\bar{x},\bar{z} [\bar{u},u,w]	x,x,\bar{z} [u,u, \bar{w}]	\bar{x},\bar{x},\bar{z} [\bar{u},\bar{u},\bar{w}]
8 j m'..	$x,y,0$ [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{y},x,0$ [v, $\bar{u},0$]	$y,\bar{x},0$ [$\bar{v},u,0$]
	$\bar{x},y,0$ [u, $\bar{v},0$]	$x,\bar{y},0$ [$\bar{u},v,0$]	$y,x,0$ [v,u,0]	$\bar{y},\bar{x},0$ [$\bar{v},\bar{u},0$]
4 i m'2'm.	$x,1/2,0$ [0,v,0]	$\bar{x},1/2,0$ [0, $\bar{v},0$]	$1/2,x,0$ [v,0,0]	$1/2,\bar{x},0$ [$\bar{v},0,0$]
4 h m'2'm.	$x,0,0$ [0,v,0]	$\bar{x},0,0$ [0, $\bar{v},0$]	$0,x,0$ [v,0,0]	$0,\bar{x},0$ [$\bar{v},0,0$]
4 g m'.2m'	$x,x,0$ [u,u,0]	$\bar{x},\bar{x},0$ [$\bar{u},\bar{u},0$]	$\bar{x},x,0$ [u, $\bar{u},0$]	$x,\bar{x},0$ [$\bar{u},u,0$]
4 f 2mm.	$0,1/2,z$ [0,0,0]	$1/2,0,z$ [0,0,0]	$0,1/2,\bar{z}$ [0,0,0]	$1/2,0,\bar{z}$ [0,0,0]

Continued

No. 61.7.428

$p4'/m'mm'$

2 e $4'mm'$ $1/2, 1/2, z$ [0,0,0] $1/2, 1/2, \bar{z}$ [0,0,0]

2 d $4'mm'$ $0, 0, z$ [0,0,0] $0, 0, \bar{z}$ [0,0,0]

2 c $m'mm'$ $0, 1/2, 0$ [0,0,0] $1/2, 0, 0$ [0,0,0]

1 b $4'/m'mm'$ $1/2, 1/2, 0$ [0,0,0]

1 a $4'/m'mm'$ $0, 0, 0$ [0,0,0]

Symmetry of special projections

Along [001] $p4'mm'$

$a^* = a$ $b^* = b$

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = b$

Origin at x,0,0

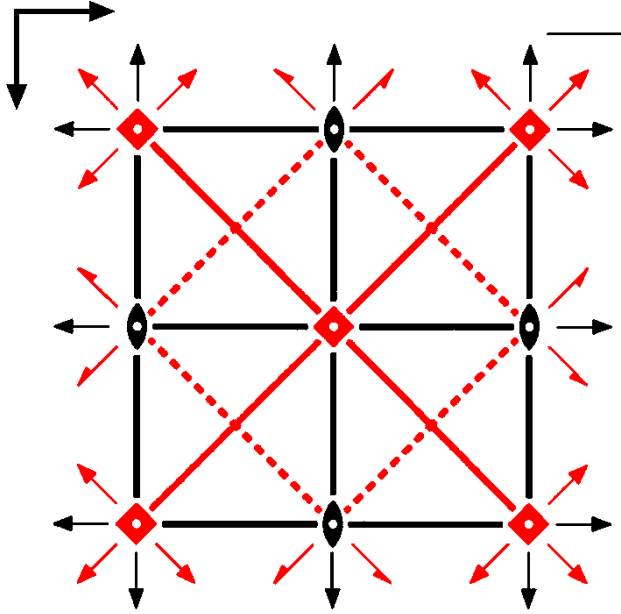
Along [110] $p2'mm'$

$a^* = (-a+b)/2$

Origin at x,x,0

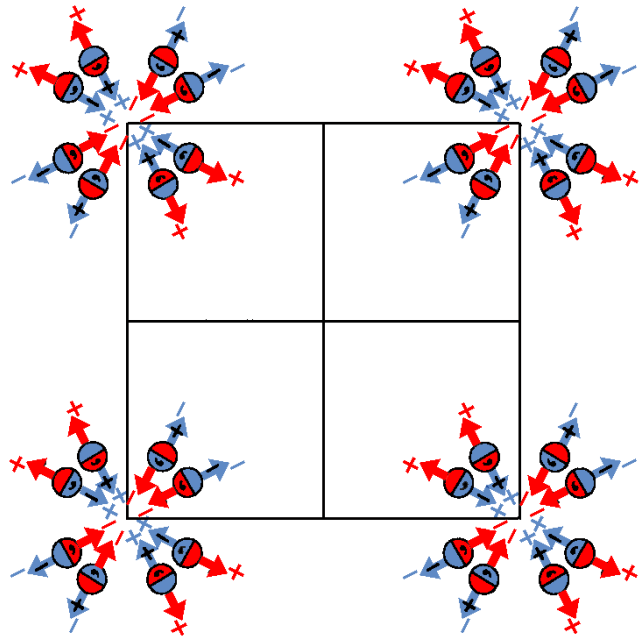
p4'/mmm'

No. 61.8.429



4'/mmm'

p4'/m2/m2'/m'



Tetragonal/Square

Origin at center (4'/mmm')

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1/2$; $x \leq y$; $0 \leq z$

Symmetry operations

- | | | | |
|--|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x,x̄,0
(2 _{x̄y} 0,0,0)' |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}$ ⁺ 0,0,z; 0,0,0
($\bar{4}$ _z 0,0,0)' | (12) $\bar{4}$ ⁻ 0,0,z; 0,0,0
($\bar{4}$ _z ⁻¹ 0,0,0)' |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) m' x,x̄,z
(m _{xy} 0,0,0)' | (16) m' x,x,z
(m _{x̄y} 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v, \bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]
16 n 1	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]	(7) y,x, \bar{z} [v, \bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},u,w]
	(9) \bar{x},\bar{y},z [u,v,w]	(10) x,y, \bar{z} [\bar{u},\bar{v},w]	(11) y, \bar{x},z [v, \bar{u},\bar{w}]	(12) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
	(13) x, \bar{y},z [\bar{u},v,\bar{w}]	(14) \bar{x},y,z [u, \bar{v},\bar{w}]	(15) \bar{y},\bar{x},z [v, \bar{u},w]	(16) y,x,z [v,u,w]
8 m .m.	x,1/2,z [0,v,0]	$\bar{x},1/2,z$ [0, $\bar{v},0$]	1/2,x,z [v,0,0]	1/2, \bar{x},z [$\bar{v},0,0$]
	$\bar{x},1/2,\bar{z}$ [0,v,0]	x,1/2, \bar{z} [0, $\bar{v},0$]	1/2,x, \bar{z} [$\bar{v},0,0$]	1/2, \bar{x},\bar{z} [v,0,0]
8 l .m.	x,0,z [0,v,0]	$\bar{x},0,z$ [0, $\bar{v},0$]	0,x,z [v,0,0]	0, \bar{x},z [$\bar{v},0,0$]
	$\bar{x},0,\bar{z}$ [0,v,0]	x,0, \bar{z} [0, $\bar{v},0$]	0,x, \bar{z} [$\bar{v},0,0$]	0, \bar{x},\bar{z} [v,0,0]
8 k ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	\bar{x},x,z [u, \bar{u},\bar{w}]	x, \bar{x},z [\bar{u},u,\bar{w}]
	\bar{x},x,\bar{z} [\bar{u},u,\bar{w}]	x, \bar{x},\bar{z} [u, \bar{u},\bar{w}]	x,x, \bar{z} [\bar{u},\bar{u},w]	\bar{x},\bar{x},\bar{z} [u,u,w]
8 j m..	x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{y},x,0$ [0,0, \bar{w}]	y, $\bar{x},0$ [0,0, \bar{w}]
	$\bar{x},y,0$ [0,0, \bar{w}]	x, $\bar{y},0$ [0,0, \bar{w}]	y,x,0 [0,0,w]	$\bar{y},\bar{x},0$ [0,0,w]
4 i m2m.	x,1/2,0 [0,0,0]	$\bar{x},1/2,0$ [0,0,0]	1/2,x,0 [0,0,0]	1/2, $\bar{x},0$ [0,0,0]
4 h m2m.	x,0,0 [0,0,0]	$\bar{x},0,0$ [0,0,0]	0,x,0 [0,0,0]	0, $\bar{x},0$ [0,0,0]
4 g m.2'm'	x,x,0 [0,0,w]	$\bar{x},\bar{x},0$ [0,0,w]	$\bar{x},x,0$ [0,0, \bar{w}]	x, $\bar{x},0$ [0,0, \bar{w}]
4 f 2mm.	0,1/2,z [0,0,0]	1/2,0,z [0,0,0]	0,1/2, \bar{z} [0,0,0]	1/2,0, \bar{z} [0,0,0]

Continued

No. 61.8.429

$p4'/mmm'$

2 e $4'mm'$ $1/2, 1/2, z$ [0,0,0] $1/2, 1/2, \bar{z}$ [0,0,0]

2 d $4'mm'$ $0, 0, z$ [0,0,0] $0, 0, \bar{z}$ [0,0,0]

2 c $mmm.$ $0, 1/2, 0$ [0,0,0] $1/2, 0, 0$ [0,0,0]

1 b $4'/mmm'$ $1/2, 1/2, 0$ [0,0,0]

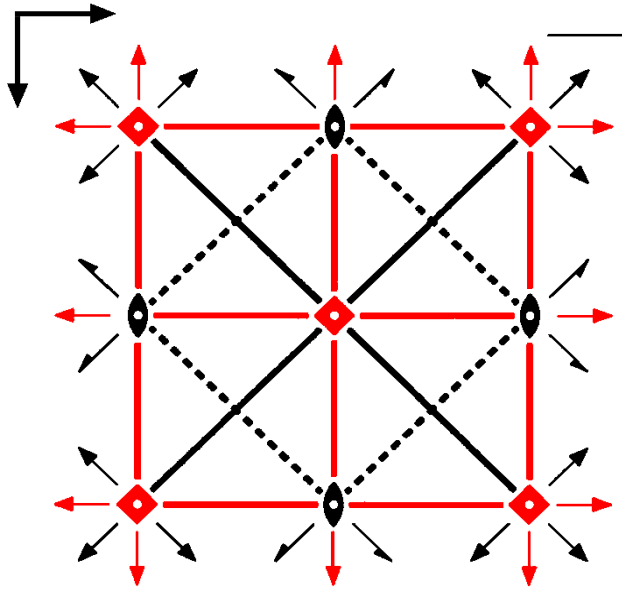
1 a $4'/mmm'$ $0, 0, 0$ [0,0,0]

Symmetry of special projections

Along [001] $p4mm1'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p2mm1'$ $a^* = b$ Origin at x,0,0	Along [110] $p2mm$ $a^* = (-a+b)/2$ Origin at x,x,0
--	--	---

p4'/mm'm

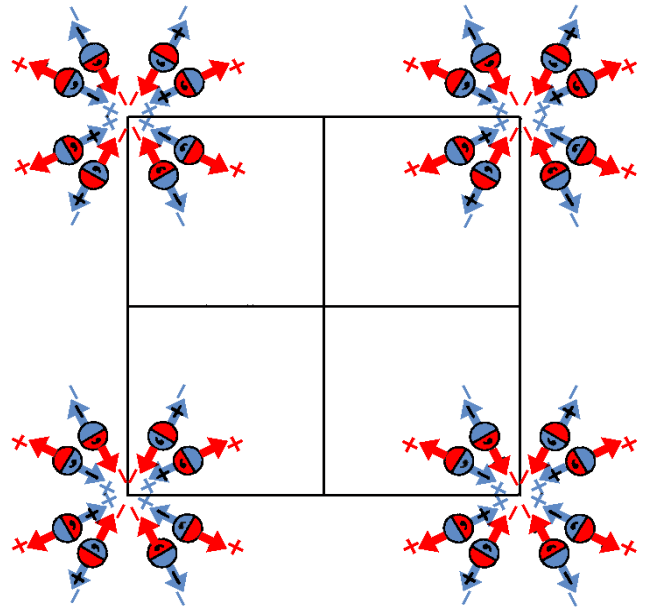
No. 61.9.430



4'/mm'm

p4'/m2'/m2'/m

Tetragonal/Square



Origin at center (4'/mm'm)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y; 0 \leq z$

Symmetry operations

- | | | | |
|---|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) ⁺ | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) ⁻ |
| (5) 2' 0,y,0
(2 _y 0,0,0) ['] | (6) 2' x,0,0
(2 _x 0,0,0) ['] | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x,x̄,0
(2 _{x̄y} 0,0,0) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}$ ⁺ 0,0,z; 0,0,0
($\bar{4}$ _z 0,0,0) ⁺ | (12) $\bar{4}$ ⁻ 0,0,z; 0,0,0
($\bar{4}$ _z ⁻¹ 0,0,0) ⁻ |
| (13) m' x,0,z
(m _y 0,0,0) ['] | (14) m' 0,y,z
(m _x 0,0,0) ['] | (15) m x,x̄,z
(m _{xy} 0,0,0) | (16) m x,x,z
(m _{x̄y} 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [v, \bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]
16 n 1	(5) \bar{x},y,\bar{z} [u, \bar{v},w]	(6) x, \bar{y},\bar{z} [\bar{u},v,w]	(7) y,x, \bar{z} [v,u, \bar{w}]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]
	(9) \bar{x},\bar{y},\bar{z} [u,v,w]	(10) x,y, \bar{z} [\bar{u},\bar{v},w]	(11) y, \bar{x},\bar{z} [v, \bar{u},\bar{w}]	(12) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
	(13) x, \bar{y},z [u, \bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]	(15) \bar{y},\bar{x},z [v,u, \bar{w}]	(16) y,x,z [\bar{v},\bar{u},\bar{w}]
8 m .m'	x,1/2,z [u,0,w]	$\bar{x},1/2,z$ [$\bar{u},0,w$]	1/2,x,z [0, \bar{u},\bar{w}]	1/2, \bar{x},z [0,u, \bar{w}]
	$\bar{x},1/2,\bar{z}$ [u,0,w]	x,1/2, \bar{z} [$\bar{u},0,w$]	1/2,x, \bar{z} [0,u, \bar{w}]	1/2, \bar{x},\bar{z} [0, \bar{u},\bar{w}]
8 l .m'	x,0,z [u,0,w]	$\bar{x},0,z$ [$\bar{u},0,w$]	0,x,z [0, \bar{u},\bar{w}]	0, \bar{x},z [0,u, \bar{w}]
	$\bar{x},0,\bar{z}$ [u,0,w]	x,0, \bar{z} [$\bar{u},0,w$]	0,x, \bar{z} [0,u, \bar{w}]	0, \bar{x},\bar{z} [0, \bar{u},\bar{w}]
8 k ..m	x,x,z [$\bar{u},u,0$]	\bar{x},\bar{x},z [u, $\bar{u},0$]	\bar{x},x,z [u,u,0]	x, \bar{x},z [$\bar{u},\bar{u},0$]
	\bar{x},x,\bar{z} [$\bar{u},\bar{u},0$]	x, \bar{x},\bar{z} [u,u,0]	x,x, \bar{z} [u, $\bar{u},0$]	\bar{x},\bar{x},\bar{z} [$\bar{u},u,0$]
8 j m..	x,y,0 [0,0,w]	$\bar{x},\bar{y},0$ [0,0,w]	$\bar{y},x,0$ [0,0, \bar{w}]	y, $\bar{x},0$ [0,0, \bar{w}]
	$\bar{x},y,0$ [0,0,w]	x, $\bar{y},0$ [0,0,w]	y,x,0 [0,0, \bar{w}]	$\bar{y},\bar{x},0$ [0,0, \bar{w}]
4 i m2'm'	x,1/2,0 [0,0,w]	$\bar{x},1/2,0$ [0,0,w]	1/2,x,0 [0,0, \bar{w}]	1/2, $\bar{x},0$ [0,0, \bar{w}]
4 h m2'm'	x,0,0 [0,0,w]	$\bar{x},0,0$ [0,0,w]	0,x,0 [0,0, \bar{w}]	0, $\bar{x},0$ [0,0, \bar{w}]
4 g m.2m	x,x,0 [0,0,0]	$\bar{x},\bar{x},0$ [0,0,0]	$\bar{x},x,0$ [0,0,0]	x, $\bar{x},0$ [0,0,0]
4 f 2m'm'	0,1/2,z [0,0,w]	1/2,0,z [0,0, \bar{w}]	0,1/2, \bar{z} [0,0,w]	1/2,0, \bar{z} [0,0, \bar{w}]

Continued

No. 61.9.430

$p4'/mm'm$

2 e $4'm'm'$ $1/2, 1/2, z$ $[0, 0, 0]$ $1/2, 1/2, \bar{z}$ $[0, 0, 0]$

2 d $4'm'm'$ $0, 0, z$ $[0, 0, 0]$ $0, 0, \bar{z}$ $[0, 0, 0]$

2 c $mm'm'$. $0, 1/2, 0$ $[0, 0, w]$ $1/2, 0, 0$ $[0, 0, \bar{w}]$

1 b $4'/mm'm$ $1/2, 1/2, 0$ $[0, 0, 0]$

1 a $4'/mm'm$ $0, 0, 0$ $[0, 0, 0]$

Symmetry of special projections

Along $[001]$ $p4mm1'$

$a^* = a$ $b^* = b$

Origin at $0, 0, z$

Along $[100]$ $p2mm$

$a^* = b$

Origin at $x, 0, 0$

Along $[110]$ $p2mm1'$

$a^* = (-a + b)/2$

Origin at $x, x, 0$

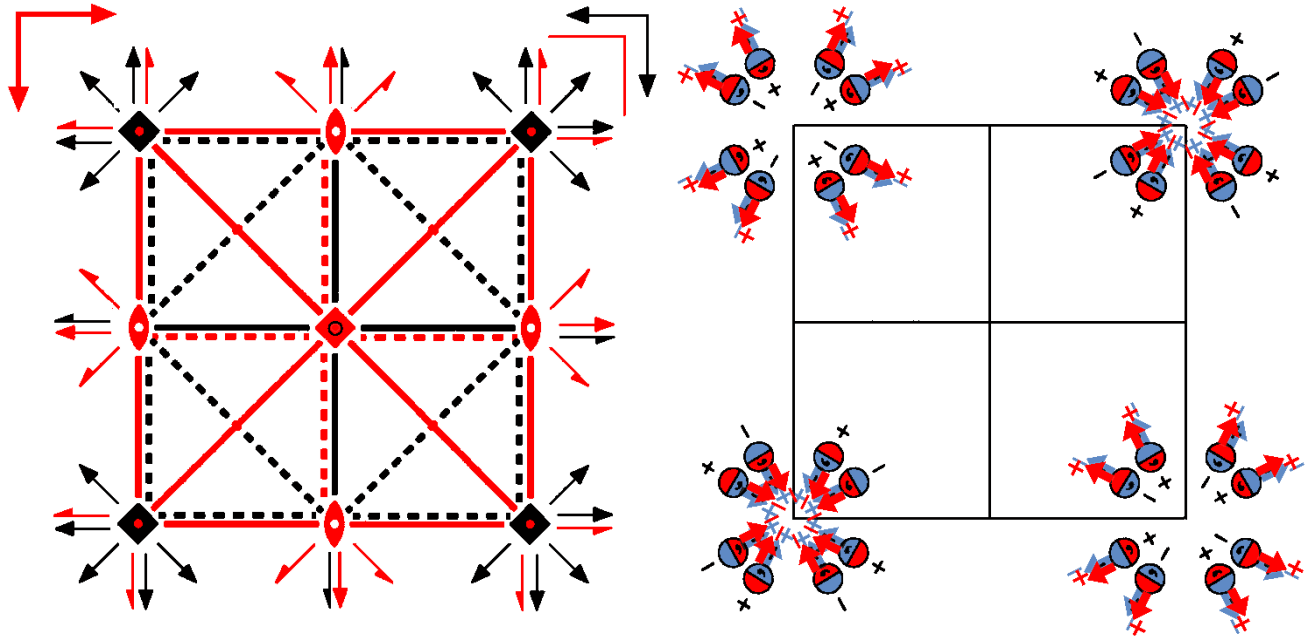
$p_4/m'm'm'$

$4/mmm1'$

Tetragonal/Square

No. 61.10.431

$p_4/m'2/m'2/m'$



Origin at center ($4/m'm'm'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y; 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|---|---------------------------------------|---|--|
| (1) 1
(1 0,0,0) | (2) 2 $0,0,z$
(2_z 0,0,0) | (3) 4^+ $0,0,z$
(4_z 0,0,0) | (4) 4^- $0,0,z$
(4_z^{-1} 0,0,0) |
| (5) 2 $0,y,0$
(2_y 0,0,0) | (6) 2 $x,0,0$
(2_x 0,0,0) | (7) 2 $x,x,0$
(2_{xy} 0,0,0) | (8) 2 $x,\bar{x},0$
($2_{\bar{xy}}$ 0,0,0) |
| (9) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0)' | (10) m' $x,y,0$
(m_z 0,0,0)' | (11) $\bar{4}^+$ $0,0,z; 0,0,0$
($\bar{4}_z$ 0,0,0)' | (12) $\bar{4}^-$ $0,0,z; 0,0,0$
($\bar{4}_z^{-1}$ 0,0,0)' |
| (13) m' $x,0,z$
(m_y 0,0,0)' | (14) m' $0,y,z$
(m_x 0,0,0)' | (15) m' x,\bar{x},z
(m_{xy} 0,0,0)' | (16) m' x,x,z
($m_{\bar{xy}}$ 0,0,0)' |

For (1,0,0)' + set

- | | | | |
|--|--|---|--|
| (1) t' (1,0,0)
(1 1,0,0)' | (2) $2'$ $1/2,0,z$
(2_z 1,0,0)' | (3) 4^+ $1/2,1/2,z$
(4_z 1,0,0)' | (4) 4^- $1/2,1/2,z$
(4_z^{-1} 1,0,0)' |
| (5) $2'$ $1/2,y,0$
(2_y 1,0,0)' | (6) $2'$ (1,0,0) $x,0,0$
(2_x 1,0,0)' | (7) $2'$ (1/2,1/2,0) $x+1/2,x,0$
(2_{xy} 1,0,0)' | (8) $2'$ (1/2,-1/2,0) $x+1/2,\bar{x},0$
($2_{\bar{xy}}$ 0,0,0)' |

Continued

No. 61.10.431

 $\rho_p 4/m'm'm'$

(9) $\bar{1}$ $1/2,0,0$ ($\bar{1} 1,0,0$)	(10) a $(1,0,0)$ $x,y,0$ ($m_z 1,0,0$)	(11) $\bar{4}^+$ $1/2,1/2,z;$ $1/2,1/2,0$ ($\bar{4}_z 1,0,0$)	(12) $\bar{4}^-$ $1/2,1/2,z;$ $1/2,1/2,0$ ($\bar{4}_z^{-1} 1,0,0$)
(13) a $(1,0,0)$ $x,0,z$ ($m_y 1,0,0$)	(14) m $1/2,y,z$ ($m_x 1,0,0$)	(15) g $(1/2,-1/2,0)$ $x+1/2,\bar{x},z$ ($m_{xy} 1,0,0$)	(16) g $(1/2,1/2,0)$ $x+1/2,x,z$ ($m_{\bar{xy}} 1,0,0$)

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0) +		(1,0,0)' +	
16 n 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]	(7) y,x,\bar{z} [v,u,\bar{w}]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]
	(9) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(10) x,y,\bar{z} [u,v,\bar{w}]	(11) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(12) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
	(13) x,\bar{y},z [u,\bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]	(15) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(16) y,x,z [v,u,w]
8 m .m.	$x,1/2,z$ [$0,v,0$]	$\bar{x},1/2,z$ [$0,v,0$]	$1/2,x,z$ [$v,0,0$]	$1/2,\bar{x},z$ [$v,0,0$]
	$\bar{x},1/2,\bar{z}$ [$0,v,0$]	$x,1/2,\bar{z}$ [$0,v,0$]	$1/2,x,\bar{z}$ [$v,0,0$]	$1/2,\bar{x},\bar{z}$ [$v,0,0$]
8 l .m'	$x,0,z$ [$u,0,w$]	$\bar{x},0,z$ [$\bar{u},0,w$]	$0,x,z$ [$0,u,w$]	$0,\bar{x},z$ [$0,\bar{u},w$]
	$\bar{x},0,\bar{z}$ [$\bar{u},0,\bar{w}$]	$x,0,\bar{z}$ [$u,0,\bar{w}$]	$0,x,\bar{z}$ [$0,u,\bar{w}$]	$0,\bar{x},\bar{z}$ [$0,\bar{u},\bar{w}$]
8 k ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	\bar{x},x,z [\bar{u},u,w]	x,\bar{x},z [u,\bar{u},w]
	\bar{x},x,\bar{z} [\bar{u},u,\bar{w}]	x,\bar{x},\bar{z} [u,\bar{u},\bar{w}]	x,x,\bar{z} [u,u,\bar{w}]	\bar{x},\bar{x},\bar{z} [\bar{u},\bar{u},\bar{w}]
8 j m'..	$x,y,0$ [$u,v,0$]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{y},x,0$ [$\bar{v},u,0$]	$y,\bar{x},0$ [$v,\bar{u},0$]
	$\bar{x},y,0$ [$\bar{u},v,0$]	$x,\bar{y},0$ [$u,\bar{v},0$]	$y,x,0$ [$v,u,0$]	$\bar{y},\bar{x},0$ [$\bar{v},\bar{u},0$]
4 i m'2'm.	$x,1/2,0$ [$0,v,0$]	$\bar{x},1/2,0$ [$0,v,0$]	$1/2,x,0$ [$v,0,0$]	$1/2,\bar{x},0$ [$v,0,0$]
4 h m'2m'	$x,0,0$ [$u,0,0$]	$\bar{x},0,0$ [$\bar{u},0,0$]	$0,x,0$ [$0,u,0$]	$0,\bar{x},0$ [$0,\bar{u},0$]

Continued

No. 61.10.431

$p_p 4/m'm'm'$

4	g	$m'.2m'$	$x,x,0 [u,u,0]$	$\bar{x},\bar{x},0 [\bar{u},\bar{u},0]$	$\bar{x},x,0 [\bar{u},u,0]$	$x,\bar{x},0 [u,\bar{u},0]$
4	f	$2'm'm.$	$0,1/2,z [0,v,0]$	$1/2,0,z [v,0,0]$	$0,1/2,\bar{z} [0,v,0]$	$1/2,0,\bar{z} [v,0,0]$
2	e	4mm	$1/2,1/2,z [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$		
2	d	$4m'm'$	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,\bar{w}]$		
2	c	$m'm'm.$	$0,1/2,0 [0,v,0]$	$1/2,0,0 [v,0,0]$		
1	b	$4'/m'm'm$	$1/2,1/2,0 [0,0,0]$			
1	a	$4/m'm'm'$	$0,0,0 [0,0,0]$			

Symmetry of special projections

Along [001] $p_p 4m'm'$	Along [100] $p_{2a^*} 2m'm'$	Along [110] $p_{2a^*} 2m'm'$
$a^* = a \quad b^* = b$	$a^* = b$	$a^* = (-a + b)/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x,0

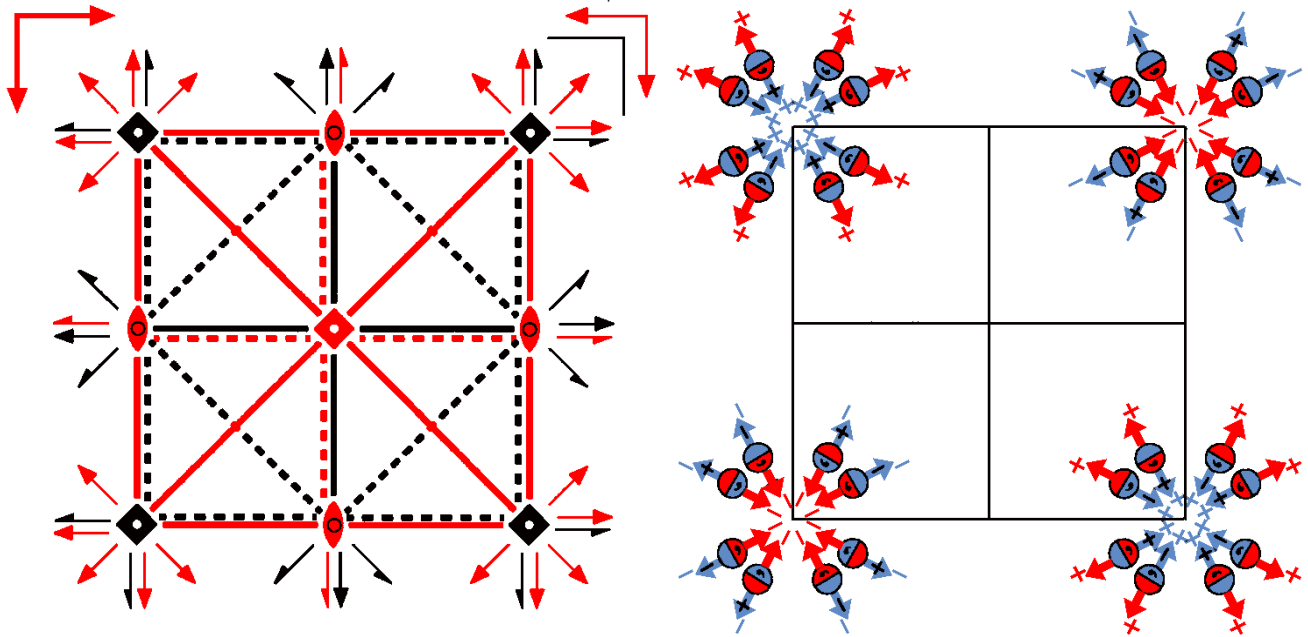
$p_p4/mm'm'$

$4/mmm1'$

Tetragonal/Square

No. 61.11.432

$p_p4/m2'/m'2'/m'$



Origin at center ($4/mmm'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y; 0 \leq z$

Symmetry operations

For (0,0,0) + set

- | | | | |
|--|--|---|---|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 _y ' 0,y,0
(2 _y ' 0,0,0)' | (6) 2 _x ' x,0,0
(2 _x ' 0,0,0)' | (7) 2 _{xy} ' x,x,0
(2 _{xy} ' 0,0,0)' | (8) 2 _{xy} ' x,x̄,0
(2 _{xy} ' 0,0,0)' |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m _z x,y,0
(m _z 0,0,0) | (11) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z^+$ 0,0,0) | (12) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^-$ 0,0,0) |
| (13) m _y ' x,0,z
(m _y ' 0,0,0)' | (14) m _x ' 0,y,z
(m _x ' 0,0,0)' | (15) m _{xy} ' x,x̄,z
(m _{xy} ' 0,0,0)' | (16) m _{xy} ' x,x,z
(m _{xy} ' 0,0,0)' |

For (1,0,0)' + set

- | | | | |
|---|---|---|---|
| (1) t' (1,0,0)
(1 1,0,0)' | (2) 2 _z ' 1/2,0,z
(2 _z ' 1,0,0)' | (3) 4 ⁺ ' 1/2,1/2,z
(4 _z ' 1,0,0)' | (4) 4 ⁻ ' 1/2,1/2,z
(4 _z ' ⁻¹ 1,0,0)' |
| (5) 2 _y ' 1/2,y,0
(2 _y ' 1,0,0)' | (6) 2 _x ' (1,0,0) x,0,0
(2 _x ' 1,0,0)' | (7) 2 _{xy} ' (1/2,1/2,0) x+1/2,x,0
(2 _{xy} ' 1,0,0)' | (8) 2 _{xy} ' (1/2,-1/2,0) x+1/2,x̄,0
(2 _{xy} ' 1,0,0)' |

(9) $\bar{1}$ $1/2,0,0$ ($\bar{1} 1,0,0$)'	(10) a' $(1,0,0)$ $x,y,0$ ($m_z 1,0,0$)'	(11) $\bar{4}^+$ $1/2,1/2,z$; $1/2,1/2,0$ ($\bar{4}_z 1,0,0$)'	(12) $\bar{4}^-$ $1/2,1/2,z$; $1/2,1/2,0$ ($\bar{4}_z^{-1} 1,0,0$)'
(13) a $(1,0,0)$ $x,0,z$ ($m_y 1,0,0$)	(14) m $1/2,y,z$ ($m_x 1,0,0$)	(15) g $(1/2,-1/2,0)$ $x+1/2,\bar{x},z$ ($m_{xy} 1,0,0$)	(16) g $(1/2,1/2,0)$ $x+1/2,x,z$ ($m_{\bar{xy}} 1,0,0$)

Generators selected (1); $t(1,0,0)'$; $t(0,1,0)'$; (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(1,0,0)'		
16 n 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y,\bar{x},z [v,\bar{u},w]
	(5) \bar{x},y,\bar{z} [u,\bar{v},w]	(6) x,\bar{y},\bar{z} [\bar{u},v,w]	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]
	(9) \bar{x},\bar{y},\bar{z} [u,v,w]	(10) x,y,\bar{z} [\bar{u},\bar{v},w]	(11) y,\bar{x},\bar{z} [\bar{v},u,w]	(12) \bar{y},x,\bar{z} [v,\bar{u},w]
	(13) x,\bar{y},z [u,\bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]	(15) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(16) y,x,z [v,u,w]
8 m .m.	$x,1/2,z$ [$0,v,0$]	$\bar{x},1/2,z$ [$0,v,0$]	$1/2,x,z$ [$v,0,0$]	$1/2,\bar{x},z$ [$v,0,0$]
	$\bar{x},1/2,\bar{z}$ [$0,\bar{v},0$]	$x,1/2,\bar{z}$ [$0,\bar{v},0$]	$1/2,x,\bar{z}$ [$\bar{v},0,0$]	$1/2,\bar{x},\bar{z}$ [$\bar{v},0,0$]
8 l .m'	$x,0,z$ [$u,0,w$]	$\bar{x},0,z$ [$\bar{u},0,w$]	$0,x,z$ [$0,u,w$]	$0,\bar{x},z$ [$0,\bar{u},w$]
	$\bar{x},0,\bar{z}$ [$u,0,w$]	$x,0,\bar{z}$ [$\bar{u},0,w$]	$0,x,\bar{z}$ [$0,\bar{u},w$]	$0,\bar{x},\bar{z}$ [$0,u,w$]
8 k ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	\bar{x},x,z [\bar{u},u,w]	x,\bar{x},z [u,\bar{u},w]
	\bar{x},x,\bar{z} [u,\bar{u},w]	x,\bar{x},\bar{z} [\bar{u},u,w]	x,x,\bar{z} [\bar{u},\bar{u},w]	\bar{x},\bar{x},\bar{z} [u,u,w]
8 j m..	$x,y,0$ [$0,0,w$]	$\bar{x},\bar{y},0$ [$0,0,w$]	$\bar{y},x,0$ [$0,0,w$]	$y,\bar{x},0$ [$0,0,w$]
	$\bar{x},y,0$ [$0,0,w$]	$x,\bar{y},0$ [$0,0,w$]	$y,x,0$ [$0,0,w$]	$\bar{y},\bar{x},0$ [$0,0,w$]
4 i m2m.	$x,1/2,0$ [$0,0,0$]	$\bar{x},1/2,0$ [$0,0,0$]	$1/2,x,0$ [$0,0,0$]	$1/2,\bar{x},0$ [$0,0,0$]
4 h m2'm'	$x,0,0$ [$0,0,w$]	$\bar{x},0,0$ [$0,0,w$]	$0,x,0$ [$0,0,w$]	$0,\bar{x},0$ [$0,0,w$]

Continued

No. 61.11.432

 $p_p 4/mm'm'$

4	g	$m.2'm'$	$x,x,0 [0,0,w]$	$\bar{x},\bar{x},0 [0,0,w]$	$\bar{x},x,0 [0,0,w]$	$x,\bar{x},0 [0,0,w]$
4	f	$2'm'm'$	$0,1/2,z [0,v,0]$	$1/2,0,z [v,0,0]$	$0,1/2,\bar{z} [0,\bar{v},0]$	$1/2,0,\bar{z} [\bar{v},0,0]$
2	e	$4'mm'$	$1/2,1/2,z [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$		
2	d	$4m'm'$	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$		
2	c	mmm'	$0,1/2,0 [0,0,0]$	$1/2,0,0 [0,0,0]$		
1	b	$4'/mm'm'$	$1/2,1/2,0 [0,0,0]$			
1	a	$4/mm'm'$	$0,0,0 [0,0,w]$			

Symmetry of special projectionsAlong [001] $p4mm1'$ $\mathbf{a}^* = \mathbf{a} \quad \mathbf{b}^* = \mathbf{b}$ Origin at $0,0,z$ Along [100] $p_{2a^*}2mm$ $\mathbf{a}^* = \mathbf{b}$ Origin at $x,1/2,0$ Along [110] $p_{2a^*}2mm$ $\mathbf{a}^* = (-\mathbf{a} + \mathbf{b})/2$ Origin at $x-1/4, x+1/4, 0$

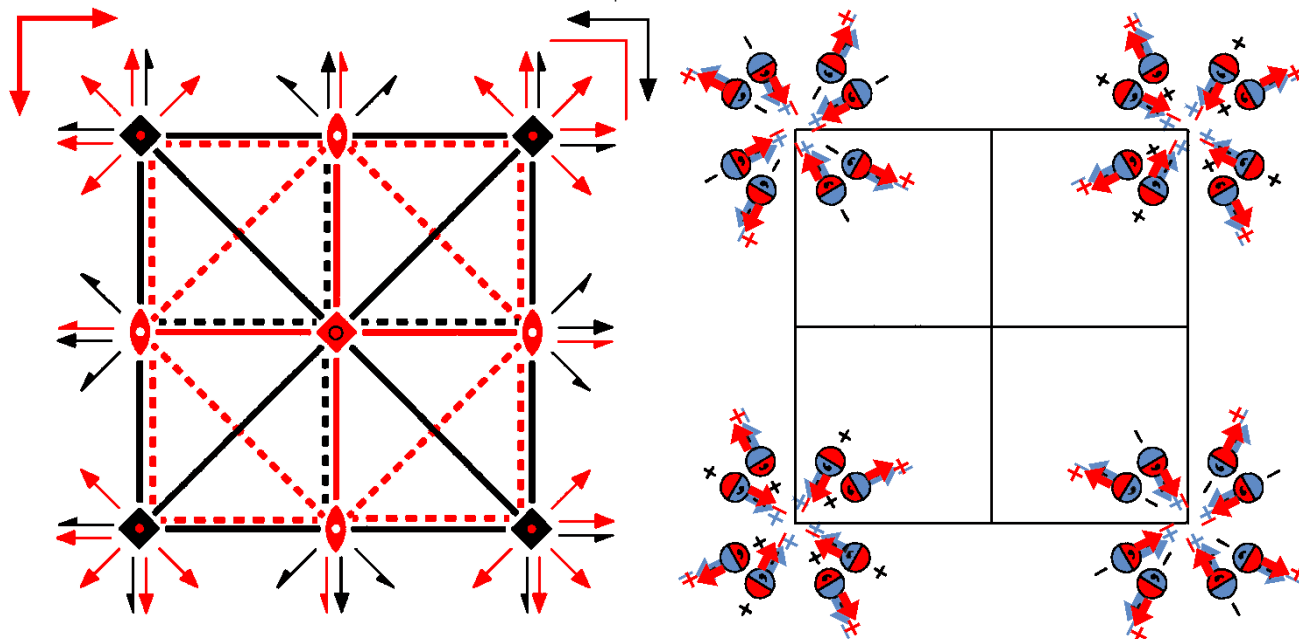
$p_4/m'mm$

$4/mmm1'$

Tetragonal/Square

No. 61.12.433

$p_4/m'2'/m2'/m$



Origin at center ($4/m'mm$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y; 0 \leq z$

Symmetry operations

For $(0,0,0)$ + set

- | | | | |
|---|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 _y ' 0,y,0
(2 _y ' 0,0,0)' | (6) 2 _x ' x,0,0
(2 _x ' 0,0,0)' | (7) 2 _{xy} ' x,x,0
(2 _{xy} ' 0,0,0)' | (8) 2 _{xy} ' x,x̄,0
(2 _{xy} ' 0,0,0)' |
| (9) 1̄ 0,0,0
(1̄ 0,0,0)' | (10) m _z ' x,y,0
(m _z ' 0,0,0)' | (11) 4 ⁺ 0,0,z; 0,0,0
(4 _z ⁺ 0,0,0)' | (12) 4 ⁻ 0,0,z; 0,0,0
(4 _z ⁻¹ 0,0,0)' |
| (13) m _y x,0,z
(m _y 0,0,0) | (14) m _x 0,y,z
(m _x 0,0,0) | (15) m _{xy} x,x̄,z
(m _{xy} 0,0,0) | (16) m _{xy} x,x,z
(m _{xy} 0,0,0) |

For $(1,0,0)$ ' + set

- | | | | |
|--|--|--|--|
| (1) t' (1,0,0)
(1 1,0,0)' | (2) 2 _z ' 1/2,0,z
(2 _z ' 1,0,0)' | (3) 4 ⁺ 1/2,1/2,z
(4 _z ⁺ 1,0,0)' | (4) 4 ⁻ 1/2,1/2,z
(4 _z ⁻¹ 1,0,0)' |
| (5) 2 _y ' 1/2,y,0
(2 _y ' 1,0,0) | (6) 2 _x ' (1,0,0) x,0,0
(2 _x ' 1,0,0) | (7) 2 _{xy} ' (1/2,1/2,0) x+1/2,x,0
(2 _{xy} ' 1,0,0) | (8) 2 _{xy} ' (1/2,-1/2,0) x+1/2,x̄,0
(2 _{xy} ' 1,0,0) |

(9) $\bar{1}$ 1/2,0,0 ($\bar{1}$ 1,0,0)	(10) a (1,0,0) x,y,0 (m_z 1,0,0)	(11) $\bar{4}^+$ 1/2,1/2,z; 1/2,1/2,0 ($\bar{4}_z$ 1,0,0)	(12) $\bar{4}^-$ 1/2,1/2,z; 1/2,1/2,0 ($\bar{4}_z^{-1}$ 1,0,0)
(13) a' (1,0,0) x,0,z (m_y 1,0,0)'	(14) m' 1/2,y,z (m_x 1,0,0)'	(15) g' (1/2,-1/2,0) x+1/2, \bar{x} ,z (m_{xy} 1,0,0)'	(16) g' (1/2,1/2,0) x+1/2,x,z ($m_{\bar{xy}}$ 1,0,0)'

Generators selected (1); t(1,0,0)'; t(0,1,0)'; (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(1,0,0)'		
16 n 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]
	(5) \bar{x},y,\bar{z} [\bar{u},\bar{v},w]	(6) x, \bar{y},\bar{z} [\bar{u},v,w]	(7) y,x, \bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]
	(9) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(10) x,y, \bar{z} [u,v, \bar{w}]	(11) y, \bar{x},\bar{z} [v, \bar{u},\bar{w}]	(12) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]
	(13) x, \bar{y},z [\bar{u},v,\bar{w}]	(14) \bar{x},y,z [u, \bar{v},\bar{w}]	(15) \bar{y},\bar{x},z [v,u, \bar{w}]	(16) y,x,z [\bar{v},\bar{u},\bar{w}]
8 m .m'	x,1/2,z [u,0,w]	$\bar{x},1/2,z$ [u,0, \bar{w}]	1/2,x,z [0, \bar{u},\bar{w}]	1/2, \bar{x},z [0, \bar{u},w]
	$\bar{x},1/2,\bar{z}$ [u,0,w]	x,1/2, \bar{z} [u,0, \bar{w}]	1/2,x, \bar{z} [0, \bar{u},w]	1/2, \bar{x},\bar{z} [0, \bar{u},\bar{w}]
8 l .m.	x,0,z [0,v,0]	$\bar{x},0,z$ [0, $\bar{v},0$]	0,x,z [$\bar{v},0,0$]	0, \bar{x},z [v,0,0]
	$\bar{x},0,\bar{z}$ [0, $\bar{v},0$]	x,0, \bar{z} [0,v,0]	0,x, \bar{z} [$\bar{v},0,0$]	0, \bar{x},\bar{z} [v,0,0]
8 k ..m	x,x,z [$\bar{u},u,0$]	\bar{x},\bar{x},z [u, $\bar{u},0$]	\bar{x},x,z [$\bar{u},\bar{u},0$]	x, \bar{x},z [u,u,0]
	\bar{x},x,\bar{z} [$\bar{u},\bar{u},0$]	x, \bar{x},\bar{z} [u,u,0]	x,x, \bar{z} [$\bar{u},u,0$]	\bar{x},\bar{x},\bar{z} [u, $\bar{u},0$]
8 j m'..	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{y},x,0$ [$\bar{v},u,0$]	y, $\bar{x},0$ [v, $\bar{u},0$]
	$\bar{x},y,0$ [u, $\bar{v},0$]	x, $\bar{y},0$ [$\bar{u},v,0$]	y,x,0 [$\bar{v},\bar{u},0$]	$\bar{y},\bar{x},0$ [v,u,0]
4 i m'2m'	x,1/2,0 [u,0,0]	$\bar{x},1/2,0$ [u,0,0]	1/2,x,0 [0, $\bar{u},0$]	1/2, $\bar{x},0$ [0, $\bar{u},0$]
4 h m'2'm.	x,0,0 [0,v,0]	$\bar{x},0,0$ [0, $\bar{v},0$]	0,x,0 [$\bar{v},0,0$]	0, $\bar{x},0$ [v,0,0]

4	g	$m'.2'm$	$x,x,0 [\bar{u},u,0]$	$\bar{x},\bar{x},0 [u,\bar{u},0]$	$\bar{x},x,0 [\bar{u},\bar{u},0]$	$x,\bar{x},0 [u,u,0]$
4	f	$2'mm'$	$0,1/2,z [u,0,0]$	$1/2,0,z [0,\bar{u},0]$	$0,1/2,\bar{z} [u,0,0]$	$1/2,0,\bar{z} [0,\bar{u},0]$
2	e	$4'm'm$	$1/2,1/2,z [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$		
2	d	$4mm$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$		
2	c	$m'mm'$	$0,1/2,0 [u,0,0]$	$1/2,0,0 [0,\bar{u},0]$		
1	b	$4'/m'm'm$	$1/2,1/2,0 [0,0,0]$			
1	a	$4/m'mm$	$0,0,0 [0,0,0]$			

Symmetry of special projections

Along [001] $p_p 4mm$	Along [100] $p2mm1'$	Along [110] $p2mm1'$
$\mathbf{a}^* = \mathbf{a} \quad \mathbf{b}^* = \mathbf{b}$	$\mathbf{a}^* = \mathbf{b}$	$\mathbf{a}^* = (-\mathbf{a} + \mathbf{b})/2$
Origin at $0,0,z$	Origin at $x,0,0$	Origin at $x,x,0$

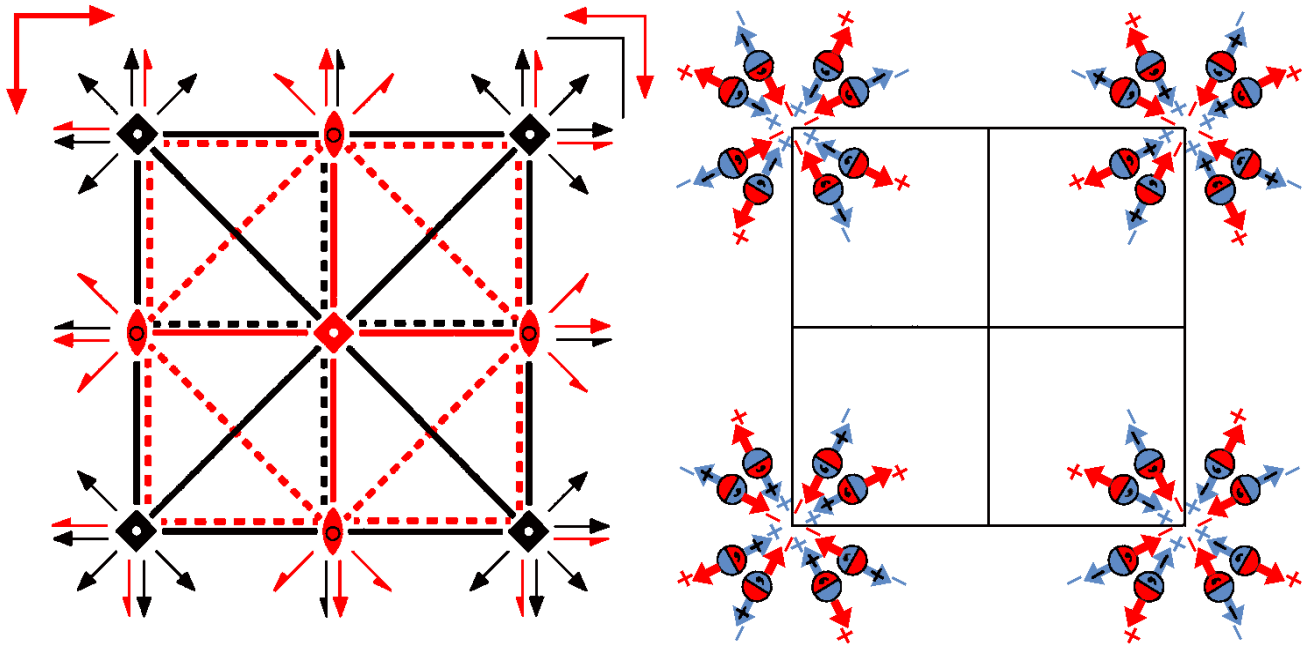
p_p4/mmm

$4/mmm1'$

Tetragonal/Square

No. 61.13.434

$p_p4/m2/m2/m$



Origin at center ($4/mmm$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; x \leq y; 0 \leq z$

Symmetry operations

For (0,0,0) +set

- | | | | |
|--|--|--|---|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 _y 0,y,0
(2 _y 0,0,0) | (6) 2 _x x,0,0
(2 _x 0,0,0) | (7) 2 _{xy} x,x,0
(2 _{xy} 0,0,0) | (8) 2 _{x̄y} x,x̄,0
(2 _{x̄y} 0,0,0) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m _z x,y,0
(m _z 0,0,0) | (11) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z^+$ 0,0,0) | (12) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^-$ 0,0,0) |
| (13) m _y x,0,z
(m _y 0,0,0) | (14) m _x 0,y,z
(m _x 0,0,0) | (15) m _{xy} x,x̄,z
(m _{xy} 0,0,0) | (16) m _{x̄y} x,x,z
(m _{x̄y} 0,0,0) |

For (1,0,0)' + set

- | | | | |
|--|--|--|--|
| (1) t' (1,0,0)
(1 1,0,0)' | (2) 2' _z 1/2,0,z
(2' _z 1,0,0)' | (3) 4 ⁺ ' 1/2,1/2,z
(4' _z 1,0,0)' | (4) 4 ⁻ ' 1/2,1/2,z
(4' _z ⁻¹ 1,0,0)' |
| (5) 2' _y 1/2,y,0
(2' _y 1,0,0)' | (6) 2' _x (1,0,0) x,0,0
(2' _x 1,0,0)' | (7) 2' _{xy} (1/2,1/2,0) x+1/2,x,0
(2' _{xy} 1,0,0)' | (8) 2' _{x̄y} (1/2,-1/2,0) x+1/2,x̄,0
(2' _{x̄y} 1,0,0)' |

(9) $\bar{1}$ ' 1/2,0,0 ($\bar{1}$ 1,0,0)'	(10) a' (1,0,0) x,y,0 (m _z 1,0,0)'	(11) $\bar{4}^+$ ' 1/2,1/2,z ; 1/2,1/2,0 ($\bar{4}_z$ 1,0,0)'	(12) $\bar{4}^-$ ' 1/2,1/2,z; 1/2,1/2,0 ($\bar{4}_z^{-1}$ 1,0,0)'
(13) a' (1,0,0) x,0,z (m _y 1,0,0)'	(14) m' 1/2,y,z (m _x 1,0,0)'	(15) g' (1/2,-1/2,0) x+1/2,x̄,z (m _{xy} 1,0,0)'	(16) g' (1/2,1/2,0) x+1/2,x,z (m _{xy} 1,0,0)'

Generators selected (1); t(1,0,0)'; t(0,1,0)'; (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	(0,0,0)+	(1,0,0)'		
16 n 1	(1) x,y,z [u,v,w] (5) x̄,y,z̄ [ū,v,w̄] (9) x̄,y,z̄ [u,v,w] (13) x,y,z̄ [ū,v,w̄]	(2) x̄,y,z [ū,v,w] (6) x,y,z̄ [u,v,w̄] (10) x,y,z̄ [ū,v,w] (14) x̄,y,z [u,v,w̄]	(3) y,x,z [v̄,u,w] (7) y,x,z̄ [v,u,w̄] (11) y,x,z̄ [v̄,u,w] (15) ȳ,x̄,z [v,u,w̄]	(4) y,x̄,z [v,ū,w] (8) ȳ,x̄,z̄ [v̄,ū,w̄] (12) ȳ,x,z̄ [v,ū,w] (16) y,x,z [v̄,ū,w̄]
8 m .m'	x,1/2,z [u,0,w] x̄,1/2,z̄ [ū,0,w̄]	x̄,1/2,z [u,0,w̄] x,1/2,z̄ [ū,0,w̄]	1/2,x,z [0,ū,w̄] 1/2,x,z̄ [0,u,w̄]	1/2,x̄,z [0,ū,w] 1/2,x̄,z̄ [0,u,w]
8 l .m.	x,0,z [0,v,0] x̄,0,z̄ [0,v,0]	x̄,0,z [0,v̄,0] x,0,z̄ [0,v̄,0]	0,x,z [v̄,0,0] 0,x,z̄ [v,0,0]	0,x̄,z [v,0,0] 0,x̄,z̄ [v̄,0,0]
8 k ..m	x,x,z [ū,u,0] x̄,x,z̄ [u,u,0]	x̄,x,z [u,ū,0] x,x,z̄ [ū,ū,0]	x̄,x,z [ū,ū,0] x,x,z̄ [u,ū,0]	x,x,z [u,u,0] x̄,x,z̄ [ū,u,0]
8 j m..	x,y,0 [0,0,w] x̄,y,0 [0,0,w̄]	x̄,y,0 [0,0,w] x,y,0 [0,0,w̄]	ȳ,x,0 [0,0,w] y,x,0 [0,0,w̄]	y,x̄,0 [0,0,w] ȳ,x̄,0 [0,0,w̄]
4 i m2'm'	x,1/2,0 [0,0,w] x̄,1/2,0 [0,0,w̄]	x̄,1/2,0 [0,0,w̄] 1/2,x,0 [0,0,w̄]	1/2,x,0 [0,0,w̄] 1/2,x̄,0 [0,0,w]	1/2,x̄,0 [0,0,w] 0,x̄,0 [0,0,0]
4 h m2m.	x,0,0 [0,0,0] x̄,0,0 [0,0,0]	x̄,0,0 [0,0,0] 0,x,0 [0,0,0]	0,x,0 [0,0,0] 0,x̄,0 [0,0,0]	0,x̄,0 [0,0,0]

4	g	m.2m	$x, x, 0 [0, 0, 0]$	$\bar{x}, \bar{x}, 0 [0, 0, 0]$	$\bar{x}, x, 0 [0, 0, 0]$	$x, \bar{x}, 0 [0, 0, 0]$
4	f	2'mm'	$0, 1/2, z [u, 0, 0]$	$1/2, 0, z [0, \bar{u}, 0]$	$0, 1/2, \bar{z} [\bar{u}, 0, 0]$	$1/2, 0, \bar{z} [0, u, 0]$
2	e	4'm'm	$1/2, 1/2, z [0, 0, 0]$	$1/2, 1/2, \bar{z} [0, 0, 0]$		
2	d	4mm	$0, 0, z [0, 0, 0]$	$0, 0, \bar{z} [0, 0, 0]$		
2	c	mmm'	$0, 1/2, 0 [0, 0, 0]$	$1/2, 0, 0 [0, 0, 0]$		
1	b	4'/mm'm	$1/2, 1/2, 0 [0, 0, 0]$			
1	a	4/mmm	$0, 0, 0 [0, 0, 0]$			

Symmetry of special projections

Along [001] $p4mm1'$	Along [100] $p2mm1'$	Along [110] $p2mm1'$
$\mathbf{a}^* = \mathbf{a} \quad \mathbf{b}^* = \mathbf{b}$	$\mathbf{a}^* = \mathbf{b}$	$\mathbf{a}^* = (-\mathbf{a} + \mathbf{b})/2$
Origin at $0, 0, z$	Origin at $x, 0, 0$	Origin at $x, x, 0$

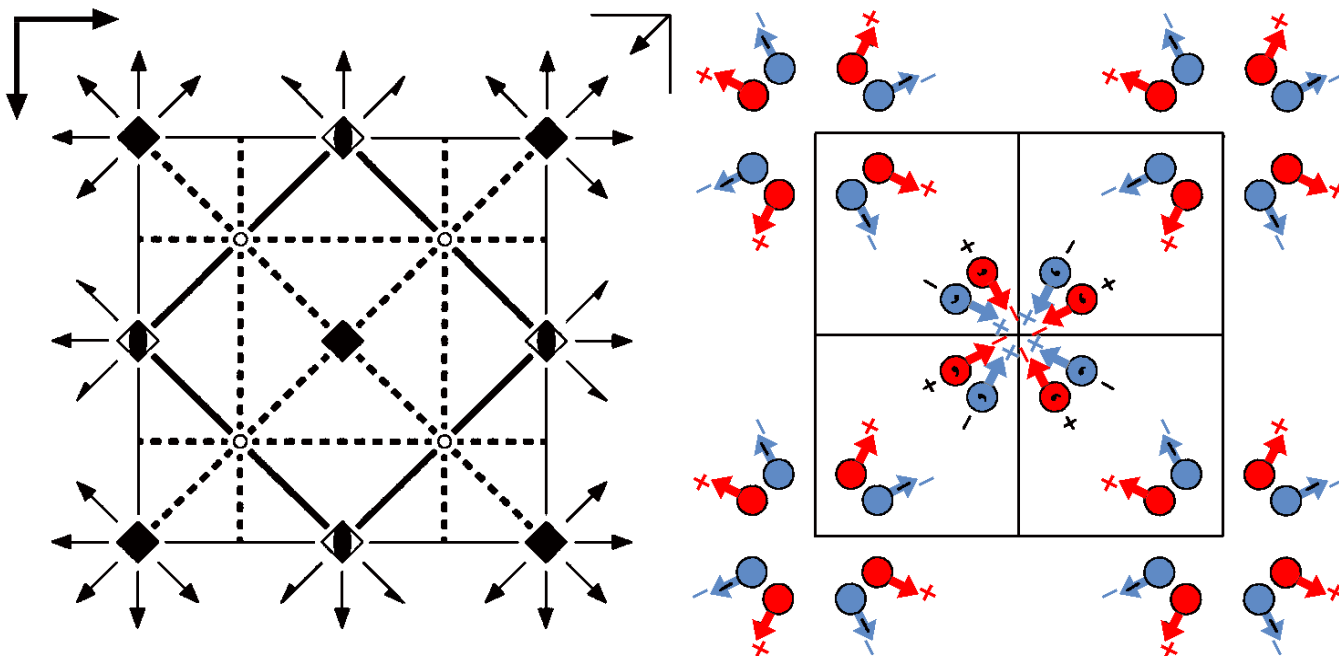
p4/nbm

4/mmm

Tetragonal/Square

No. 62.1.435

p4/n2/b2/m



Origin at 422 at 4/n22/g at $-1/4, -1/4, 0$ from center (2/m)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|---|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z ⁺ 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x, \bar{x} ,0
(2 _{\bar{xy}} 0,0,0) |
| (9) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (10) n(1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (11) $\bar{4}^+$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^+$ 1/2,1/2,0) | (12) $\bar{4}^-$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^-$ 1/2,1/2,0) |
| (13) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (14) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (15) m x+1/2, \bar{x} ,z
(m _{xy} 1/2,1/2,0) | (16) g(1/2,1/2,0) x,x,z
(m _{\bar{xy}} 1/2,1/2,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
16 i 1	(1) x, y, z $[u, v, w]$	(2) \bar{x}, \bar{y}, z $[\bar{u}, \bar{v}, w]$		
	(3) \bar{y}, x, z $[\bar{v}, u, w]$	(4) y, \bar{x}, z $[v, \bar{u}, w]$		
	(5) \bar{x}, y, \bar{z} $[\bar{u}, v, \bar{w}]$	(6) x, \bar{y}, \bar{z} $[u, \bar{v}, \bar{w}]$		
	(7) y, x, \bar{z} $[v, u, \bar{w}]$	(8) $\bar{y}, \bar{x}, \bar{z}$ $[\bar{v}, \bar{u}, \bar{w}]$		
	(9) $\bar{x} + 1/2, \bar{y} + 1/2, \bar{z}$ $[u, v, w]$	(10) $x + 1/2, y + 1/2, \bar{z}$ $[\bar{u}, \bar{v}, w]$		
	(11) $y + 1/2, \bar{x} + 1/2, \bar{z}$ $[\bar{v}, u, w]$	(12) $\bar{y} + 1/2, x + 1/2, \bar{z}$ $[v, \bar{u}, w]$		
	(13) $x + 1/2, \bar{y} + 1/2, z$ $[\bar{u}, v, \bar{w}]$	(14) $\bar{x} + 1/2, y + 1/2, z$ $[u, \bar{v}, \bar{w}]$		
	(15) $\bar{y} + 1/2, \bar{x} + 1/2, z$ $[v, u, \bar{w}]$	(16) $y + 1/2, x + 1/2, z$ $[\bar{v}, \bar{u}, \bar{w}]$		
8 h ..m	$x, x + 1/2, z$ $[\bar{u}, u, 0]$	$\bar{x}, \bar{x} + 1/2, z$ $[u, \bar{u}, 0]$	$\bar{x} + 1/2, x, z$ $[\bar{u}, \bar{u}, 0]$	$x + 1/2, \bar{x}, z$ $[u, u, 0]$
	$\bar{x}, x + 1/2, \bar{z}$ $[u, u, 0]$	$x, \bar{x} + 1/2, \bar{z}$ $[\bar{u}, \bar{u}, 0]$	$x + 1/2, x, \bar{z}$ $[u, \bar{u}, 0]$	$\bar{x} + 1/2, \bar{x}, \bar{z}$ $[\bar{u}, \bar{u}, 0]$
8 g .2.	$x, 0, 0$ $[u, 0, 0]$	$\bar{x}, 0, 0$ $[\bar{u}, 0, 0]$	$0, x, 0$ $[0, u, 0]$	$0, \bar{x}, 0$ $[0, \bar{u}, 0]$
	$\bar{x} + 1/2, 1/2, 0$ $[u, 0, 0]$	$x + 1/2, 1/2, 0$ $[\bar{u}, 0, 0]$	$1/2, \bar{x} + 1/2, 0$ $[0, u, 0]$	$1/2, x + 1/2, 0$ $[0, \bar{u}, 0]$
8 f ..2	$x, x, 0$ $[u, u, 0]$	$\bar{x}, \bar{x}, 0$ $[\bar{u}, \bar{u}, 0]$	$\bar{x}, x, 0$ $[\bar{u}, u, 0]$	$x, \bar{x}, 0$ $[u, \bar{u}, 0]$
	$\bar{x} + 1/2, \bar{x} + 1/2, 0$ $[u, u, 0]$	$x + 1/2, x + 1/2, 0$ $[\bar{u}, \bar{u}, 0]$	$x + 1/2, \bar{x} + 1/2, 0$ $[\bar{u}, u, 0]$	$\bar{x} + 1/2, x + 1/2, 0$ $[u, \bar{u}, 0]$
4 e 2.mm	$0, 1/2, z$ $[0, 0, 0]$	$1/2, 0, z$ $[0, 0, 0]$	$0, 1/2, \bar{z}$ $[0, 0, 0]$	$1/2, 0, \bar{z}$ $[0, 0, 0]$
4 d 4..	$0, 0, z$ $[0, 0, w]$	$0, 0, \bar{z}$ $[0, 0, \bar{w}]$	$1/2, 1/2, \bar{z}$ $[0, 0, w]$	$1/2, 1/2, z$ $[0, 0, \bar{w}]$
4 c ..2/m	$1/4, 1/4, 0$ $[u, u, 0]$	$3/4, 3/4, 0$ $[\bar{u}, \bar{u}, 0]$	$3/4, 1/4, 0$ $[\bar{u}, u, 0]$	$1/4, 3/4, 0$ $[u, \bar{u}, 0]$

2 b $\bar{4}2m$ $0,1/2,0$ [0,0,0] $1/2,0,0$ [0,0,0]

2 a 422 $0,0,0$ [0,0,0] $1/2,1/2,0$ [0,0,0]

Symmetry of special projections

Along [001] p_4 mm
 $a^* = (a-b)/2$ $b^* = (a+b)/2$
 Origin at 0,0,z

Along [100] $p_{2a^*}2m'm'$ Along [110] $p2mm1'$
 $a^* = b/2$ $a^* = (-a+b)/2$
 Origin at x,0,0 Origin at x,x,0

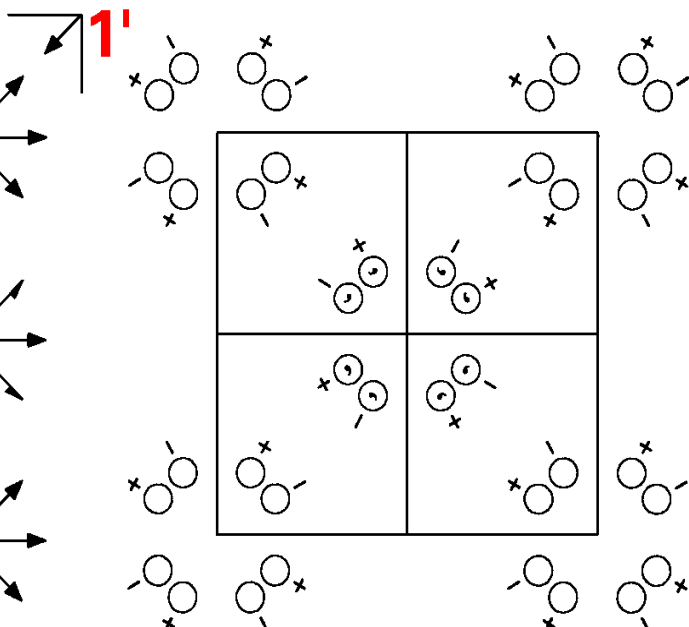
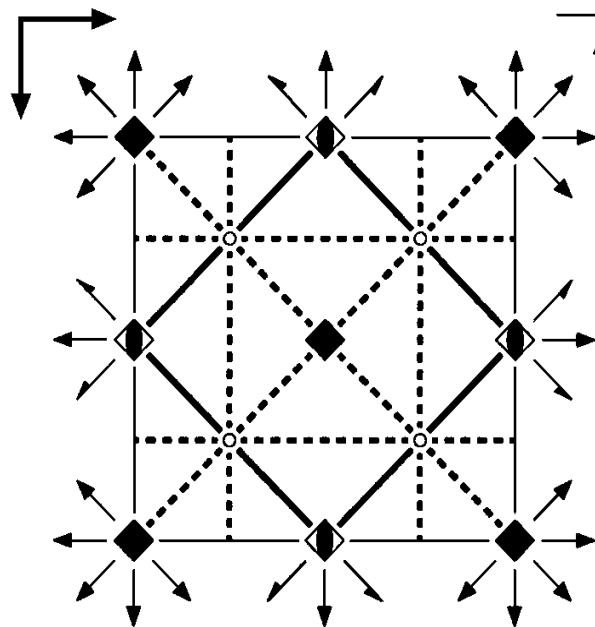
p4/nbm1'

4/mmm1'

Tetragonal/Square

No. 62.2.436

p4/n2/b2/m1'



Origin at 4221' at 4/n22/g1' at $-1/4, -1/4, 0$ from center (2/m1')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|---|---|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x,x̄,0
(2 _{x̄y} 0,0,0) |
| (9) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (10) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (11) $\bar{4}^+$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^+$ 1/2,1/2,0) | (12) $\bar{4}^-$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^-$ 1/2,1/2,0) |
| (13) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (14) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (15) m x+1/2,x̄,z
(m _{xy} 1/2,1/2,0) | (16) g (1/2,1/2,0) x,x,z
(m _{x̄y} 1/2,1/2,0) |

For 1' + set

- | | | | |
|--|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 4 ⁺ ' 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ ' 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x,x̄,0
(2 _{x̄y} 0,0,0)' |

- (9) $\bar{1}$ ' $1/4, 1/4, 0$ (10) n' $(1/2, 1/2, 0)$ $x, y, 0$ (11) $\bar{4}^+$ ' $1/2, 0, z$; $1/2, 0, 0$ (12) $\bar{4}^-$ ' $1/2, 0, z$; $1/2, 0, 0$
 $(\bar{1}|1/2, 1/2, 0)'$ $(m_z|1/2, 1/2, 0)'$ $(\bar{4}_z|1/2, 1/2, 0)'$ $(\bar{4}_z^{-1}|1/2, 1/2, 0)'$
- (13) a' $(1/2, 0, 0)$ $x, 1/4, z$ (14) b' $(0, 1/2, 0)$ $1/4, y, z$ (15) m' $x + 1/2, \bar{x}, z$ (16) g' $(1/2, 1/2, 0)$ x, x, z
 $(m_y|1/2, 1/2, 0)'$ $(m_x|1/2, 1/2, 0)'$ $(m_{xy}|1/2, 1/2, 0)'$ $(m_{\bar{xy}}|1/2, 1/2, 0)'$

Generators selected (1); $t(1, 0, 0)$; $t(0, 1, 0)$; (2); (3); (5); (9); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	1+	1'		
16 i 11'	(1) x, y, z [0,0,0]	(2) \bar{x}, \bar{y}, z [0,0,0]		
	(3) \bar{y}, x, z [0,0,0]	(4) y, \bar{x}, z [0,0,0]		
	(5) \bar{x}, y, \bar{z} [0,0,0]	(6) x, \bar{y}, \bar{z} [0,0,0]		
	(7) y, x, \bar{z} [0,0,0]	(8) $\bar{y}, \bar{x}, \bar{z}$ [0,0,0]		
	(9) $\bar{x} + 1/2, \bar{y} + 1/2, \bar{z}$ [0,0,0]	(10) $x + 1/2, y + 1/2, \bar{z}$ [0,0,0]		
	(11) $y + 1/2, \bar{x} + 1/2, \bar{z}$ [0,0,0]	(12) $\bar{y} + 1/2, x + 1/2, \bar{z}$ [0,0,0]		
	(13) $x + 1/2, \bar{y} + 1/2, z$ [0,0,0]	(14) $\bar{x} + 1/2, y + 1/2, z$ [0,0,0]		
	(15) $\bar{y} + 1/2, \bar{x} + 1/2, z$ [0,0,0]	(16) $y + 1/2, x + 1/2, z$ [0,0,0]		
8 h ..m1'	$x, x + 1/2, z$ [0,0,0]	$\bar{x}, \bar{x} + 1/2, z$ [0,0,0]	$\bar{x} + 1/2, x, z$ [0,0,0]	$x + 1/2, \bar{x}, z$ [0,0,0]
	$\bar{x}, x + 1/2, \bar{z}$ [0,0,0]	$x, \bar{x} + 1/2, \bar{z}$ [0,0,0]	$x + 1/2, x, \bar{z}$ [0,0,0]	$\bar{x} + 1/2, \bar{x}, \bar{z}$ [0,0,0]
8 g .2.1'	$x, 0, 0$ [0,0,0]	$\bar{x}, 0, 0$ [0,0,0]	$0, x, 0$ [0,0,0]	$0, \bar{x}, 0$ [0,0,0]
	$\bar{x} + 1/2, 1/2, 0$ [0,0,0]	$x + 1/2, 1/2, 0$ [0,0,0]	$1/2, \bar{x} + 1/2, 0$ [0,0,0]	$1/2, x + 1/2, 0$ [0,0,0]
8 f ..21'	$x, x, 0$ [0,0,0]	$\bar{x}, \bar{x}, 0$ [0,0,0]	$\bar{x}, x, 0$ [0,0,0]	$x, \bar{x}, 0$ [0,0,0]
	$\bar{x} + 1/2, \bar{x} + 1/2, 0$ [0,0,0]	$x + 1/2, x + 1/2, 0$ [0,0,0]	$x + 1/2, \bar{x} + 1/2, 0$ [0,0,0]	$\bar{x} + 1/2, x + 1/2, 0$ [0,0,0]
4 e 2.mm1'	$0, 1/2, z$ [0,0,0]	$1/2, 0, z$ [0,0,0]	$0, 1/2, \bar{z}$ [0,0,0]	$1/2, 0, \bar{z}$ [0,0,0]

Continued

No. 62.2.436

$p4/nbm1'$

4	d	$4..1'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$	$1/2,1/2,z [0,0,0]$
4	c	$..2/m1'$	$1/4,1/4,0 [0,0,0]$	$3/4,3/4,0 [0,0,0]$	$3/4,1/4,0 [0,0,0]$	$1/4,3/4,0 [0,0,0]$
2	b	$\bar{4}2m1'$	$0,1/2,0 [0,0,0]$	$1/2,0,0 [0,0,0]$		
2	a	$4221'$	$0,0,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$		

Symmetry of special projections

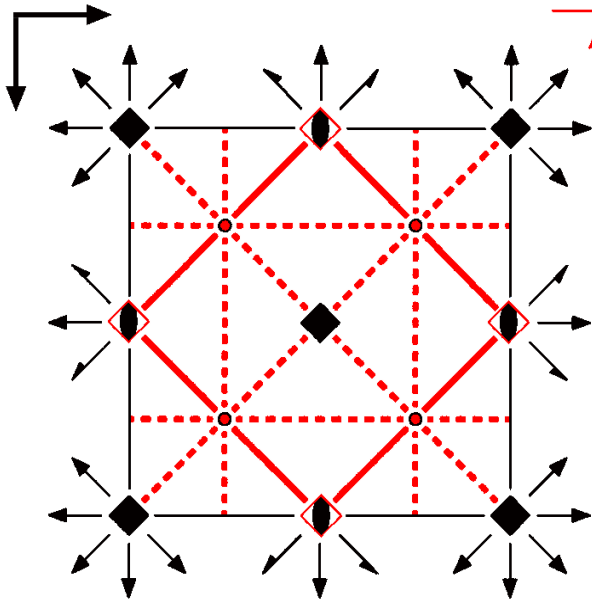
Along $[001]$ $p4mm1'$
 $a^* = (a-b)/2$ $b^* = (a+b)/2$
Origin at $0,0,z$

Along $[100]$ $p2mm1'$
 $a^* = b/2$
Origin at $x,0,0$

Along $[110]$ $p2mm1'$
 $a^* = (-a+b)/2$
Origin at $x,x,0$

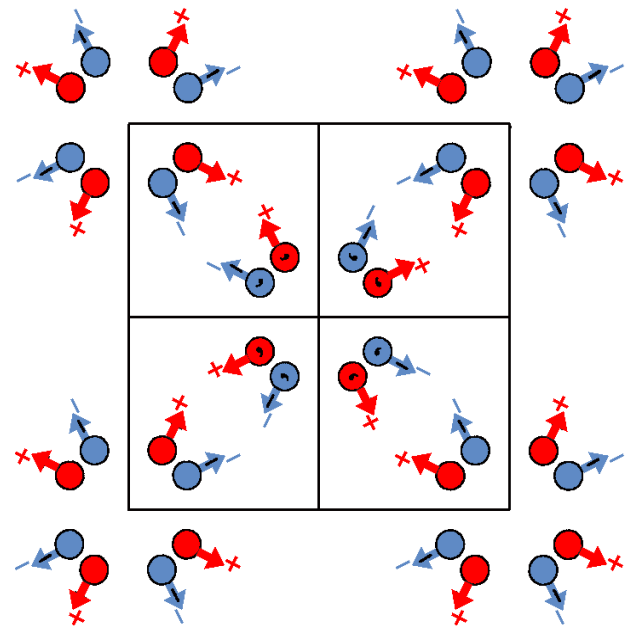
p4/n'b'm'

No. 62.3.437



4/m'm'm'

p4/n'2/b'2/m'



Tetragonal/Square

Origin at 422 at 4/n'22/g' at $-1/4, -1/4, 0$ from center ($2/m'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z ⁺ 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻ 0,0,0) |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x,x̄,0
(2 _{x̄y} 0,0,0) |
| (9) $\bar{1}$ ' 1/4,1/4,0
($\bar{1}$ ' 1/2,1/2,0)' | (10) n' (1/2,1/2,0) x,y,0
(m _z ' 1/2,1/2,0)' | (11) $\bar{4}^{+}$ ' 1/2,0,z; 1/2,0,0
($\bar{4}_z^{+}$ ' 1/2,1/2,0)' | (12) $\bar{4}^{-}$ ' 1/2,0,z; 1/2,0,0
($\bar{4}_z^{-}$ ' 1/2,1/2,0)' |
| (13) a' (1/2,0,0) x,1/4,z
(m _y ' 1/2,1/2,0)' | (14) b' (0,1/2,0) 1/4,y,z
(m _x ' 1/2,1/2,0)' | (15) m' x+1/2,x̄,z
(m _{xy} ' 1/2,1/2,0)' | (16) g' (1/2,1/2,0) x,x,z
(m _{x̄y} ' 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 i 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]		
	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]		
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x, \bar{y},\bar{z} [u, \bar{v},\bar{w}]		
	(7) y,x, \bar{z} [v,u, \bar{w}]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]		
	(9) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},\bar{v},\bar{w}]	(10) x+1/2,y+1/2, \bar{z} [u,v, \bar{w}]		
	(11) y+1/2, $\bar{x}+1/2,\bar{z}$ [v, \bar{u},\bar{w}]	(12) $\bar{y}+1/2,x+1/2,\bar{z}$ [\bar{v},u,\bar{w}]		
	(13) x+1/2, $\bar{y}+1/2,z$ [u, \bar{v},w]	(14) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]		
	(15) $\bar{y}+1/2,\bar{x}+1/2,z$ [\bar{v},\bar{u},w]	(16) y+1/2,x+1/2,z [v,u,w]		
8 h ..m'	x,x+1/2,z [u,u,w]	$\bar{x},\bar{x}+1/2,z$ [\bar{u},\bar{u},w]	$\bar{x}+1/2,x,z$ [\bar{u},u,w]	x+1/2, \bar{x},z [u, \bar{u},w]
	$\bar{x},x+1/2,\bar{z}$ [\bar{u},u,\bar{w}]	x, $\bar{x}+1/2,\bar{z}$ [u, \bar{u},\bar{w}]	x+1/2,x, \bar{z} [u,u, \bar{w}]	$\bar{x}+1/2,\bar{x},\bar{z}$ [\bar{u},\bar{u},\bar{w}]
8 g .2.	x,0,0 [u,0,0]	$\bar{x},0,0$ [$\bar{u},0,0$]	0,x,0 [0,u,0]	0, $\bar{x},0$ [0, $\bar{u},0$]
	$\bar{x}+1/2,1/2,0$ [$\bar{u},0,0$]	x+1/2,1/2,0 [u,0,0]	1/2, $\bar{x}+1/2,0$ [0, $\bar{u},0$]	1/2,x+1/2,0 [0,u,0]
8 f ..2	x,x,0 [u,u,0]	$\bar{x},\bar{x},0$ [$\bar{u},\bar{u},0$]	$\bar{x},x,0$ [$\bar{u},u,0$]	x, $\bar{x},0$ [u, $\bar{u},0$]
	$\bar{x}+1/2,\bar{x}+1/2,0$ [$\bar{u},\bar{u},0$]	x+1/2,x+1/2,0 [u,u,0]	x+1/2, $\bar{x}+1/2,0$ [u, $\bar{u},0$]	$\bar{x}+1/2,x+1/2,0$ [$\bar{u},u,0$]
4 e ..m'm'	0,1/2,z [0,0,w]	1/2,0,z [0,0,w]	0,1/2, \bar{z} [0,0, \bar{w}]	1/2,0, \bar{z} [0,0, \bar{w}]
4 d 4..	0,0,z [0,0,w]	0,0, \bar{z} [0,0, \bar{w}]	1/2,1/2, \bar{z} [0,0, \bar{w}]	1/2,1/2,z [0,0,w]
4 c ..2/m'	1/4,1/4,0 [0,0,0]	3/4,3/4,0 [0,0,0]	3/4,1/4,0 [0,0,0]	1/4,3/4,0 [0,0,0]

2 b $\bar{4}2m'$ 0,1/2,0 [0,0,0] 1/2,0,0 [0,0,0]

2 a 422 0,0,0 [0,0,0] 1/2,1/2,0 [0,0,0]

Symmetry of special projections

Along [001] $p4m'm'$
 $a^* = (a-b)/2$ $b^* = (a+b)/2$
 Origin at 0,0,z

Along [100] $p2m'm'$
 $a^* = b/2$
 Origin at x,0,0

Along [110] $p2m'm'$
 $a^* = (-a+b)/2$
 Origin at x,x,0

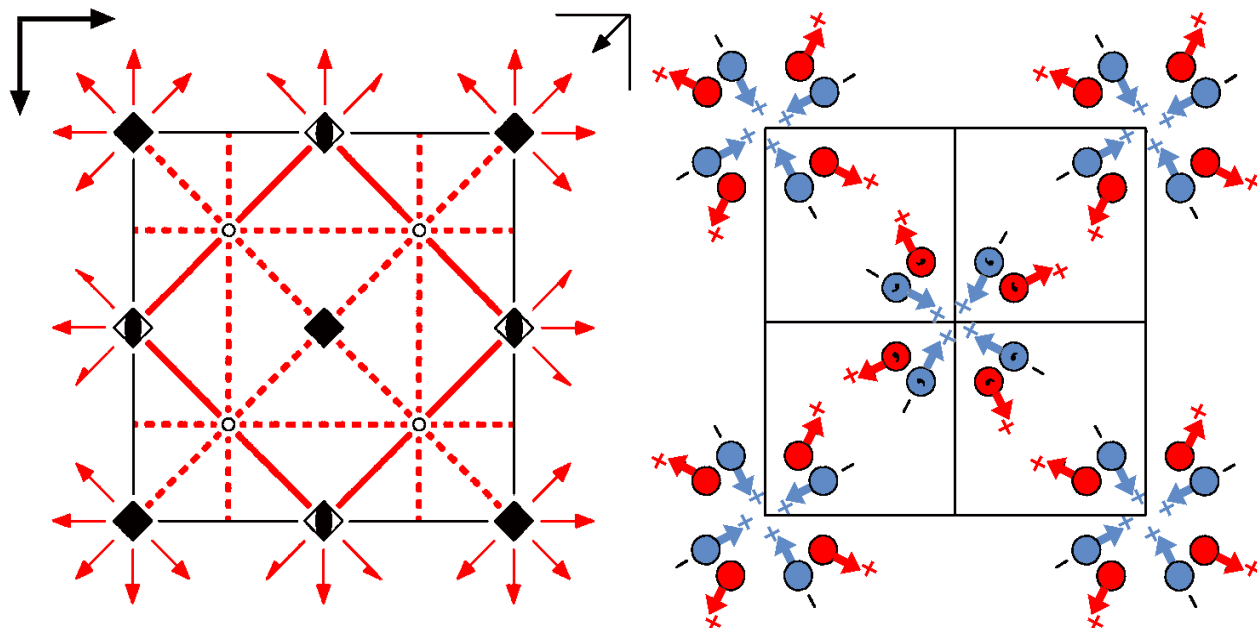
p4/nb'm'

4/mm'm'

Tetragonal/Square

No. 62.4.438

p4/n2'/b'2'/m'



Origin at 42'2' at 4/n2'2'/g' at -1/4,-1/4,0 from center (2'/m')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|---|---|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x,̄x,0
(2 _{̄xy} 0,0,0)' |
| (9) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (10) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (11) $\bar{4}^+$ 1/2,0,z; 1/2,0,0
($\bar{4}_z$ 1/2,1/2,0) | (12) $\bar{4}^-$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^{-1}$ 1/2,1/2,0) |
| (13) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (14) b' (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0)' | (15) m' x+1/2,̄x,z
(m _{xy} 1/2,1/2,0)' | (16) g' (1/2,1/2,0) x,x,z
(m _{̄xy} 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 i 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]		
	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]		
	(5) \bar{x},y,\bar{z} [\bar{u},\bar{v},w]	(6) x, \bar{y},\bar{z} [\bar{u},v,w]		
	(7) y,x, \bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]		
	(9) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [u,v,w]	(10) x+1/2,y+1/2, \bar{z} [\bar{u},\bar{v},w]		
	(11) y+1/2, $\bar{x}+1/2,\bar{z}$ [\bar{v},u,w]	(12) $\bar{y}+1/2,x+1/2,\bar{z}$ [v, \bar{u},w]		
	(13) x+1/2, $\bar{y}+1/2,z$ [u, \bar{v},w]	(14) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]		
	(15) $\bar{y}+1/2,\bar{x}+1/2,z$ [\bar{v},\bar{u},w]	(16) y+1/2,x+1/2,z [v,u,w]		
8 h ..m'	x,x+1/2,z [u,u,w]	$\bar{x},\bar{x}+1/2,z$ [\bar{u},\bar{u},w]	$\bar{x}+1/2,x,z$ [\bar{u},u,w]	x+1/2, \bar{x},z [u, \bar{u},w]
	$\bar{x},x+1/2,\bar{z}$ [u, \bar{u},w]	x, $\bar{x}+1/2,\bar{z}$ [\bar{u},u,w]	x+1/2,x, \bar{z} [\bar{u},\bar{u},w]	$\bar{x}+1/2,\bar{x},\bar{z}$ [u,u,w]
8 g .2'	x,0,0 [0,v,w]	$\bar{x},0,0$ [0, \bar{v},w]	0,x,0 [$\bar{v},0,w$]	0, $\bar{x},0$ [v,0,w]
	$\bar{x}+1/2,1/2,0$ [0,v,w]	x+1/2,1/2,0 [0, \bar{v},w]	1/2, $\bar{x}+1/2,0$ [$\bar{v},0,w$]	1/2,x+1/2,0 [v,0,w]
8 f ..2'	x,x,0 [\bar{u},u,w]	$\bar{x},\bar{x},0$ [u, \bar{u},w]	$\bar{x},x,0$ [\bar{u},\bar{u},w]	x, $\bar{x},0$ [u,u,w]
	$\bar{x}+1/2,\bar{x}+1/2,0$ [\bar{u},u,w]	x+1/2,x+1/2,0 [u, \bar{u},w]	x+1/2, $\bar{x}+1/2,0$ [\bar{u},\bar{u},w]	$\bar{x}+1/2,x+1/2,0$ [u,u,w]
4 e ..m'm'	0,1/2,z [0,0,w]	1/2,0,z [0,0,w]	0,1/2, \bar{z} [0,0,w]	1/2,0, \bar{z} [0,0,w]
4 d 4..	0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]	1/2,1/2, \bar{z} [0,0,w]	1/2,1/2,z [0,0,w]
4 c ..2'/m'	1/4,1/4,0 [0,0,0]	3/4,3/4,0 [0,0,0]	3/4,1/4,0 [0,0,0]	1/4,3/4,0 [0,0,0]

2 b $\bar{4}2'm'$ 0,1/2,0 [0,0,w] 1/2,0,0 [0,0,w]

2 a $42'2'$ 0,0,0 [0,0,w] 1/2,1/2,0 [0,0,w]

Symmetry of special projections

Along [001] p_p4mm
 $a^* = (a-b)/2$ $b^* = (a+b)/2$
 Origin at 0,0,z

Along [100] $p2'm'm$
 $a^* = b/2$
 Origin at x,0,0

Along [110] $p2'm'm$
 $a^* = (-a+b)/2$
 Origin at x,x,0

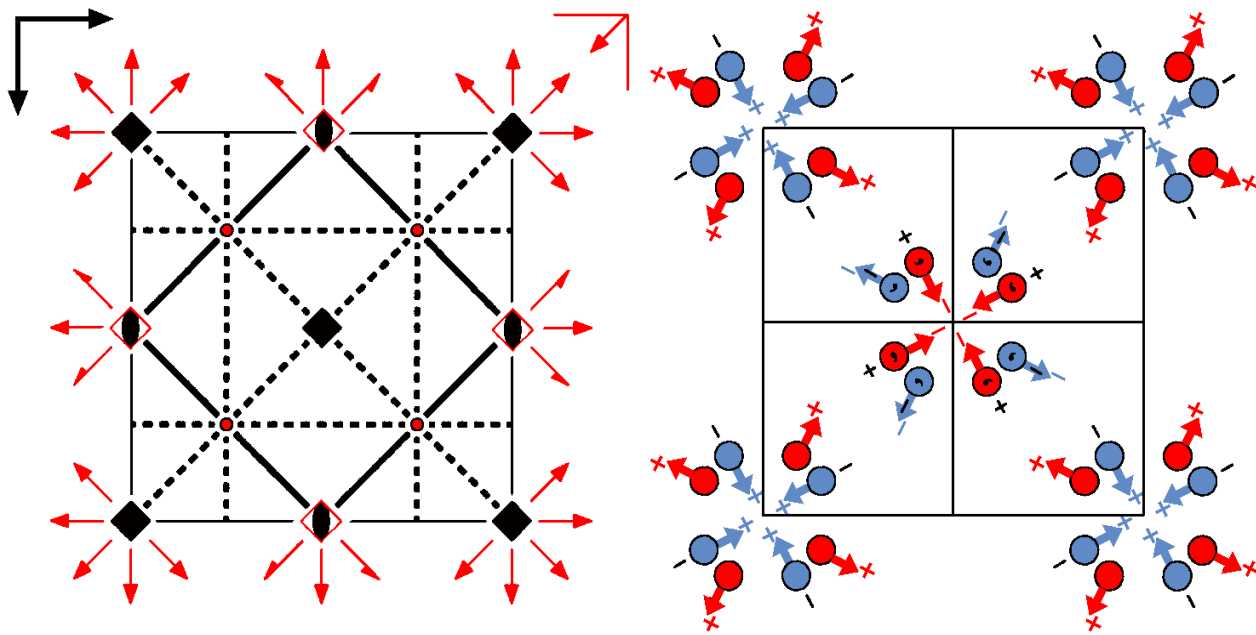
p4/n'bm

4/m'mm

Tetragonal/Square

No. 62.5.439

p4/n'2'/b2'/m



Origin at 42'2' at 4/n'2'2'/g at -1/4,-1/4,0 from center (2'/m)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|---|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2' 0,y,0
(2 _y 0,0,0)' | (6) 2' x,0,0
(2 _x 0,0,0)' | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x,x̄,0
(2 _{x̄y} 0,0,0)' |
| (9) 1̄' 1/4,1/4,0
(1̄ 1/2,1/2,0)' | (10) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' | (11) 4̄ ⁺ 1/2,0,z; 1/2,0,0
(4̄ _z 1/2,1/2,0)' | (12) 4̄ ⁻ 1/2,0,z; 1/2,0,0
(4̄ _z ⁻¹ 1/2,1/2,0)' |
| (13) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (14) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (15) m x+1/2,x̄,z
(m _{xy} 1/2,1/2,0) | (16) g (1/2,1/2,0) x,x,z
(m _{x̄y} 1/2,1/2,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
16 i 1	(1) x, y, z [u,v,w]	(2) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]		
	(3) \bar{y}, x, z [\bar{v}, u, w]	(4) y, \bar{x}, z [v, \bar{u} ,w]		
	(5) \bar{x}, y, \bar{z} [u, \bar{v}, w]	(6) x, \bar{y}, \bar{z} [\bar{u}, v, w]		
	(7) y, x, \bar{z} [\bar{v}, \bar{u}, w]	(8) $\bar{y}, \bar{x}, \bar{z}$ [v,u,w]		
	(9) $\bar{x} + 1/2, \bar{y} + 1/2, \bar{z}$ [$\bar{u}, \bar{v}, \bar{w}$]	(10) $x + 1/2, y + 1/2, \bar{z}$ [u,v, \bar{w}]		
	(11) $y + 1/2, \bar{x} + 1/2, \bar{z}$ [v, \bar{u}, \bar{w}]	(12) $\bar{y} + 1/2, x + 1/2, \bar{z}$ [\bar{v}, u, \bar{w}]		
	(13) $x + 1/2, \bar{y} + 1/2, z$ [\bar{u}, v, \bar{w}]	(14) $\bar{x} + 1/2, y + 1/2, z$ [u, \bar{v}, \bar{w}]		
	(15) $\bar{y} + 1/2, \bar{x} + 1/2, z$ [v,u, \bar{w}]	(16) $y + 1/2, x + 1/2, z$ [$\bar{v}, \bar{u}, \bar{w}$]		
8 h ..m	$x, x + 1/2, z$ [$\bar{u}, u, 0$]	$\bar{x}, \bar{x} + 1/2, z$ [u, $\bar{u}, 0$]	$\bar{x} + 1/2, x, z$ [$\bar{u}, \bar{u}, 0$]	$x + 1/2, \bar{x}, z$ [u,u,0]
	$\bar{x}, x + 1/2, \bar{z}$ [$\bar{u}, \bar{u}, 0$]	$x, \bar{x} + 1/2, \bar{z}$ [u,u,0]	$x + 1/2, x, \bar{z}$ [$\bar{u}, u, 0$]	$\bar{x} + 1/2, \bar{x}, \bar{z}$ [u, $\bar{u}, 0$]
8 g .2'	$x, 0, 0$ [0,v,w]	$\bar{x}, 0, 0$ [0, \bar{v}, w]	$0, x, 0$ [$\bar{v}, 0, w$]	$0, \bar{x}, 0$ [v,0,w]
	$\bar{x} + 1/2, 1/2, 0$ [0, \bar{v}, \bar{w}]	$x + 1/2, 1/2, 0$ [0,v, \bar{w}]	$1/2, \bar{x} + 1/2, 0$ [v,0, \bar{w}]	$1/2, x + 1/2, 0$ [$\bar{v}, 0, \bar{w}$]
8 f ..2'	$x, x, 0$ [\bar{u}, u, w]	$\bar{x}, \bar{x}, 0$ [u, \bar{u}, w]	$\bar{x}, x, 0$ [\bar{u}, \bar{u}, w]	$x, \bar{x}, 0$ [u,u,w]
	$\bar{x} + 1/2, \bar{x} + 1/2, 0$ [u, \bar{u}, \bar{w}]	$x + 1/2, x + 1/2, 0$ [\bar{u}, u, \bar{w}]	$x + 1/2, \bar{x} + 1/2, 0$ [u,u, \bar{w}]	$\bar{x} + 1/2, x + 1/2, 0$ [$\bar{u}, \bar{u}, \bar{w}$]
4 e 2.mm	$0, 1/2, z$ [0,0,0]	$1/2, 0, z$ [0,0,0]	$0, 1/2, \bar{z}$ [0,0,0]	$1/2, 0, \bar{z}$ [0,0,0]
4 d 4..	$0, 0, z$ [0,0,w]	$0, 0, \bar{z}$ [0,0,w]	$1/2, 1/2, \bar{z}$ [0,0, \bar{w}]	$1/2, 1/2, z$ [0,0, \bar{w}]
4 c ..2'/m	$1/4, 1/4, 0$ [0,0,0]	$3/4, 3/4, 0$ [0,0,0]	$3/4, 1/4, 0$ [0,0,0]	$1/4, 3/4, 0$ [0,0,0]

2 b $\bar{4}2'm$ 0,1/2,0 [0,0,0] 1/2,0,0 [0,0,0]

2 a $42'2'$ 0,0,0 [0,0,w] 1/2,1/2,0 [0,0, \bar{w}]

Symmetry of special projections

Along [001] $p4mm$
 $a^* = (a-b)/2$ $b^* = (a+b)/2$
 Origin at 0,0,z

Along [100] $p_{2a^*}2mm$ $a^* = b/2$
 Origin at x,1/4,0

Along [110] $p2mm1'$
 $a^* = (-a+b)/2$
 Origin at x,x,0

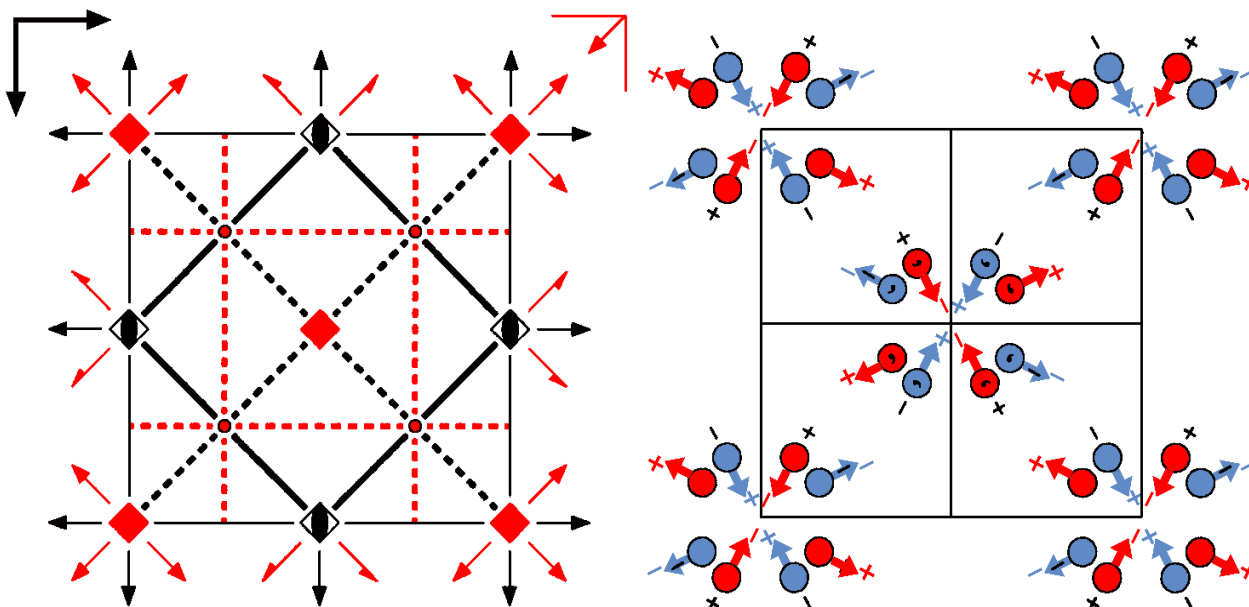
p4'/n'b'm

4'/m'm'm

Tetragonal/Square

No. 62.6.440

p4'/n'2'/b'2'/m



Origin at 4'22' at 4'/n'22'/g at $-1/4, -1/4, 0$ from center ($2'/m$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|---|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x,x̄,0
(2 _{xy} ̄ 0,0,0)' |
| (9) 1̄ 1/4,1/4,0
(1̄ 1/2,1/2,0)' | (10) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' | (11) 4̄ ⁺ 1/2,0,z; 1/2,0,0
(4̄ _z 1/2,1/2,0) | (12) 4̄ ⁻ 1/2,0,z; 1/2,0,0
(4̄ _z ⁻¹ 1/2,1/2,0) |
| (13) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (14) b' (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0)' | (15) m x+1/2,x̄,z
(m _{xy} 1/2,1/2,0) | (16) g (1/2,1/2,0) x,x,z
(m _{xy} ̄ 1/2,1/2,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 i 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]		
	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]		
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]		
	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]		
	(9) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},\bar{v},\bar{w}]	(10) $x+1/2,y+1/2,\bar{z}$ [u,v,\bar{w}]		
	(11) $y+1/2,\bar{x}+1/2,\bar{z}$ [\bar{v},u,w]	(12) $\bar{y}+1/2,x+1/2,\bar{z}$ [v,\bar{u},w]		
	(13) $x+1/2,\bar{y}+1/2,z$ [u,\bar{v},w]	(14) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]		
	(15) $\bar{y}+1/2,\bar{x}+1/2,z$ [v,u,\bar{w}]	(16) $y+1/2,x+1/2,z$ [\bar{v},\bar{u},\bar{w}]		
8 h ..m	$x,x+1/2,z$ [$\bar{u},u,0$]	$\bar{x},\bar{x}+1/2,z$ [$u,\bar{u},0$]	$\bar{x}+1/2,x,z$ [$u,u,0$]	$x+1/2,\bar{x},z$ [$\bar{u},\bar{u},0$]
	$\bar{x},x+1/2,\bar{z}$ [$u,u,0$]	$x,\bar{x}+1/2,\bar{z}$ [$\bar{u},\bar{u},0$]	$x+1/2,x,\bar{z}$ [$\bar{u},u,0$]	$\bar{x}+1/2,\bar{x},\bar{z}$ [$u,\bar{u},0$]
8 g .2.	$x,0,0$ [$u,0,0$]	$\bar{x},0,0$ [$\bar{u},0,0$]	$0,x,0$ [$0,\bar{u},0$]	$0,\bar{x},0$ [$0,u,0$]
	$\bar{x}+1/2,1/2,0$ [$\bar{u},0,0$]	$x+1/2,1/2,0$ [$u,0,0$]	$1/2,\bar{x}+1/2,0$ [$0,u,0$]	$1/2,x+1/2,0$ [$0,\bar{u},0$]
8 f ..2'	$x,x,0$ [\bar{u},u,w]	$\bar{x},\bar{x},0$ [u,\bar{u},w]	$\bar{x},x,0$ [u,u,\bar{w}]	$x,\bar{x},0$ [\bar{u},\bar{u},\bar{w}]
	$\bar{x}+1/2,\bar{x}+1/2,0$ [u,\bar{u},\bar{w}]	$x+1/2,x+1/2,0$ [\bar{u},u,\bar{w}]	$x+1/2,\bar{x}+1/2,0$ [\bar{u},\bar{u},w]	$\bar{x}+1/2,x+1/2,0$ [u,u,w]
4 e 2.mm	$0,1/2,z$ [$0,0,0$]	$1/2,0,z$ [$0,0,0$]	$0,1/2,\bar{z}$ [$0,0,0$]	$1/2,0,\bar{z}$ [$0,0,0$]
4 d 4'..	$0,0,z$ [$0,0,0$]	$0,0,\bar{z}$ [$0,0,0$]	$1/2,1/2,\bar{z}$ [$0,0,0$]	$1/2,1/2,z$ [$0,0,0$]
4 c ..2'/m	$1/4,1/4,0$ [$0,0,0$]	$3/4,3/4,0$ [$0,0,0$]	$3/4,1/4,0$ [$0,0,0$]	$1/4,3/4,0$ [$0,0,0$]

Continued

No. 62.6.440

$p4'/n'b'm$

2 b $\bar{4}2m$ 0,1/2,0 [0,0,0] 1/2,0,0 [0,0,0]

2 a $4'22'$ 0,0,0 [0,0,0] 1/2,1/2,0 [0,0,0]

Symmetry of special projections

Along [001] $p4'mm'$
 $a^* = (a-b)/2$ $b^* = (a+b)/2$
Origin at 0,0,z

Along [100] $p2'mm'$
 $a^* = b/2$
Origin at x,0,0

Along [110] $p2mm1'$
 $a^* = (-a+b)/2$
Origin at x,x,0

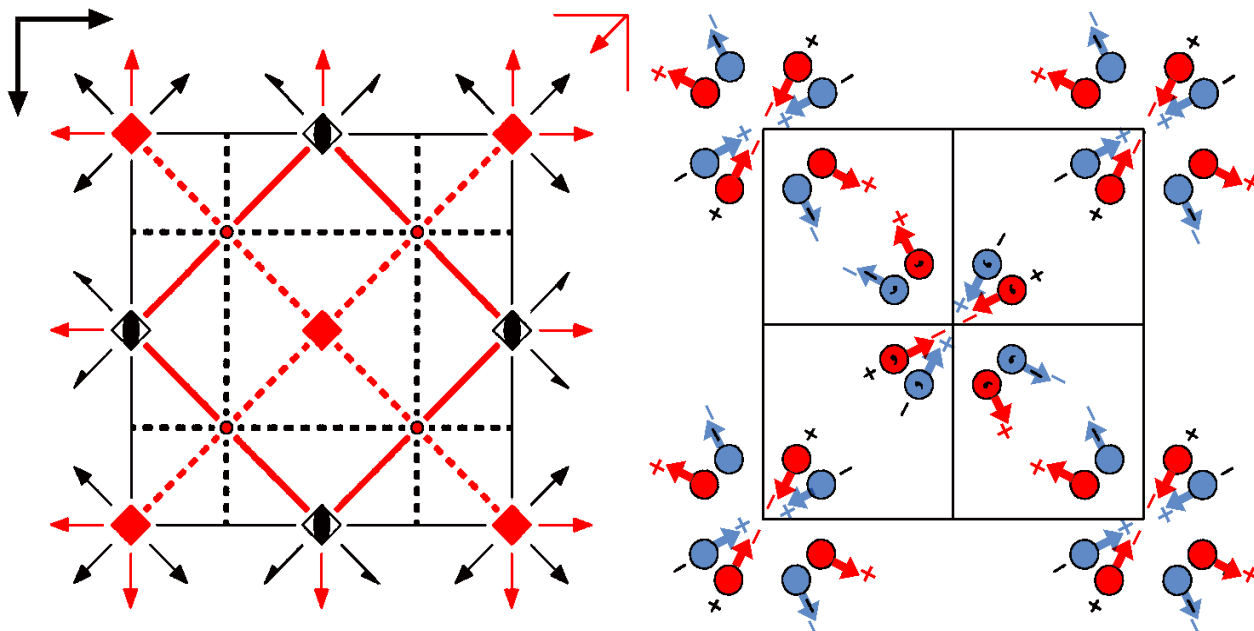
p4'/n'bm'

4'/m'mm'

Tetragonal/Square

No. 62.7.441

p4'/n'2'/b2/m'



Origin at 4'2'2 at 4'/n'2'2/g' at -1/4,-1/4,0 from center (2/m')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|---|---|---|--|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2' _y 0,y,0
(2 _y 0,0,0)' | (6) 2' _x x,0,0
(2 _x 0,0,0)' | (7) 2 _{xy} x,x,0
(2 _{xy} 0,0,0) | (8) 2 _{x̄y} x,x̄,0
(2 _{x̄y} 0,0,0) |
| (9) $\bar{1}$ ' 1/4,1/4,0
($\bar{1}$ ' 1/2,1/2,0)' | (10) n' _z (1/2,1/2,0) x,y,0
(n' _z 1/2,1/2,0)' | (11) $\bar{4}$ ⁺ 1/2,0,z; 1/2,0,0
($\bar{4}$ _z ⁺ 1/2,1/2,0) | (12) $\bar{4}$ ⁻ 1/2,0,z; 1/2,0,0
($\bar{4}$ _z ⁻¹ 1/2,1/2,0) |
| (13) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (14) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (15) m' _{xy} x+1/2,x̄,z
(m _{xy} 1/2,1/2,0)' | (16) g' (1/2,1/2,0) x,x,z
(m _{x̄y} 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 i 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]		
	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]		
	(5) \bar{x},y,\bar{z} [u,\bar{v},w]	(6) x, \bar{y},\bar{z} [\bar{u},v,w]		
	(7) y,x, \bar{z} [v,u,\bar{w}]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]		
	(9) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},\bar{v},\bar{w}]	(10) x+1/2,y+1/2, \bar{z} [v,u,\bar{w}]		
	(11) y+1/2, $\bar{x}+1/2,\bar{z}$ [\bar{v},u,w]	(12) $\bar{y}+1/2,x+1/2,\bar{z}$ [v,\bar{u},w]		
	(13) x+1/2, $\bar{y}+1/2,z$ [\bar{u},v,\bar{w}]	(14) $\bar{x}+1/2,y+1/2,z$ [u,\bar{v},\bar{w}]		
	(15) $\bar{y}+1/2,\bar{x}+1/2,z$ [\bar{v},\bar{u},w]	(16) y+1/2,x+1/2,z [v,u,w]		
8 h ..m'	x,x+1/2,z [u,u,w]	$\bar{x},\bar{x}+1/2,z$ [\bar{u},\bar{u},w]	$\bar{x}+1/2,x,z$ [u,\bar{u},\bar{w}]	x+1/2, \bar{x},z [\bar{u},u,\bar{w}]
	$\bar{x},x+1/2,\bar{z}$ [u,\bar{u},w]	x, $\bar{x}+1/2,\bar{z}$ [\bar{u},u,w]	x+1/2,x, \bar{z} [u,u,\bar{w}]	$\bar{x}+1/2,\bar{x},\bar{z}$ [\bar{u},\bar{u},\bar{w}]
8 g .2'	x,0,0 [0,v,w]	$\bar{x},0,0$ [0, \bar{v},w]	0,x,0 [v,0, \bar{w}]	0, $\bar{x},0$ [$\bar{v},0,\bar{w}$]
	$\bar{x}+1/2,1/2,0$ [0, \bar{v},\bar{w}]	x+1/2,1/2,0 [0,v, \bar{w}]	1/2, $\bar{x}+1/2,0$ [$\bar{v},0,w$]	1/2,x+1/2,0 [v,0,w]
8 f ..2	x,x,0 [u,u,0]	$\bar{x},\bar{x},0$ [$\bar{u},\bar{u},0$]	$\bar{x},x,0$ [$u,\bar{u},0$]	x, $\bar{x},0$ [$\bar{u},u,0$]
	$\bar{x}+1/2,\bar{x}+1/2,0$ [$\bar{u},\bar{u},0$]	x+1/2,x+1/2,0 [u,u,0]	x+1/2, $\bar{x}+1/2,0$ [$\bar{u},u,0$]	$\bar{x}+1/2,x+1/2,0$ [u, $\bar{u},0$]
4 e 2.m'm'	0,1/2,z [0,0,w]	1/2,0,z [0,0, \bar{w}]	0,1/2, \bar{z} [0,0,w]	1/2,0, \bar{z} [0,0, \bar{w}]
4 d 4'..	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]	1/2,1/2, \bar{z} [0,0,0]	1/2,1/2,z [0,0,0]
4 c ..2/m'	1/4,1/4,0 [0,0,0]	3/4,3/4,0 [0,0,0]	3/4,1/4,0 [0,0,0]	1/4,3/4,0 [0,0,0]

Continued

No. 62.7.441

$p4'/n'bm'$

2 b $\bar{4}2'm'$ 0,1/2,0 [0,0,w] 1/2,0,0 [0,0, \bar{w}]

2 a $4'2'2$ 0,0,0 [0,0,0] 1/2,1/2,0 [0,0,0]

Symmetry of special projections

Along [001] $p4'm'm$
 $a^* = (a-b)/2$ $b^* = (a+b)/2$
Origin at 0,0,z

Along [100] $p_{2a^*}2mm$
 $a^* = b/2$
Origin at x,0,0

Along [110] $p2'mm'$
 $a^* = (-a+b)/2$
Origin at x,x,0

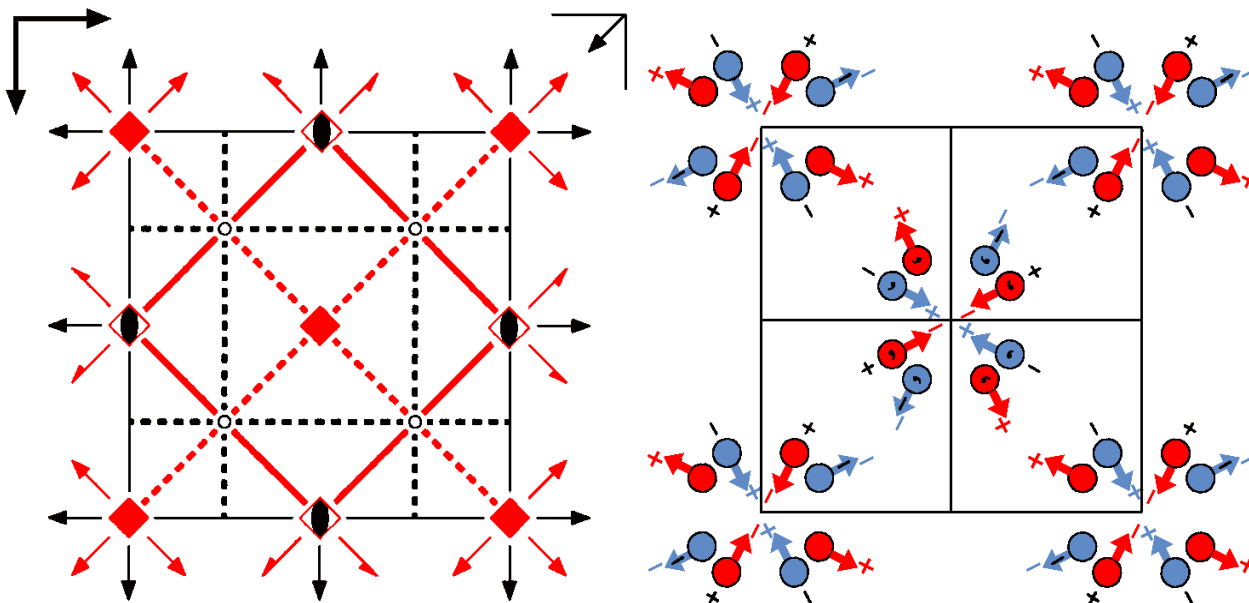
p4'/nbm'

4'/mmm'

Tetragonal/Square

No. 62.8.442

p4'/n2/b2'/m'



Origin at 4'22' at 4'/n22'/g' at $-1/4, -1/4, 0$ from center ($2'/m'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|---|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2 0,y,0
(2 _y 0,0,0) | (6) 2 x,0,0
(2 _x 0,0,0) | (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x, \bar{x} ,0
(2 _{\bar{xy}} 0,0,0)' |
| (9) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (10) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (11) $\bar{4}^+$ 1/2,0,z; 1/2,0,0
($\bar{4}_z$ 1/2,1/2,0)' | (12) $\bar{4}^-$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^{-1}$ 1/2,1/2,0)' |
| (13) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (14) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (15) m' x+1/2, \bar{x} ,z
(m _{xy} 1/2,1/2,0)' | (16) g' (1/2,1/2,0) x,x,z
(m _{\bar{xy}} 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 i 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]		
	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]		
	(5) \bar{x},y,\bar{z} [\bar{u},v,\bar{w}]	(6) x,\bar{y},\bar{z} [u,\bar{v},\bar{w}]		
	(7) y,x,\bar{z} [\bar{v},\bar{u},w]	(8) \bar{y},\bar{x},\bar{z} [v,u,w]		
	(9) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [u,v,w]	(10) $x+1/2,y+1/2,\bar{z}$ [\bar{u},\bar{v},w]		
	(11) $y+1/2,\bar{x}+1/2,\bar{z}$ [v,\bar{u},\bar{w}]	(12) $\bar{y}+1/2,x+1/2,\bar{z}$ [\bar{v},u,\bar{w}]		
	(13) $x+1/2,\bar{y}+1/2,z$ [\bar{u},v,\bar{w}]	(14) $\bar{x}+1/2,y+1/2,z$ [u,\bar{v},\bar{w}]		
	(15) $\bar{y}+1/2,\bar{x}+1/2,z$ [\bar{v},\bar{u},w]	(16) $y+1/2,x+1/2,z$ [v,u,w]		
8 h ..m'	$x,x+1/2,z$ [u,u,w]	$\bar{x},\bar{x}+1/2,z$ [\bar{u},\bar{u},w]	$\bar{x}+1/2,x,z$ [u,\bar{u},\bar{w}]	$x+1/2,\bar{x},z$ [\bar{u},u,\bar{w}]
	$\bar{x},x+1/2,\bar{z}$ [\bar{u},u,\bar{w}]	$x,\bar{x}+1/2,\bar{z}$ [u,\bar{u},\bar{w}]	$x+1/2,x,\bar{z}$ [\bar{u},\bar{u},w]	$\bar{x}+1/2,\bar{x},\bar{z}$ [u,u,w]
8 g .2.	$x,0,0$ [$u,0,0$]	$\bar{x},0,0$ [$\bar{u},0,0$]	$0,x,0$ [$0,\bar{u},0$]	$0,\bar{x},0$ [$0,u,0$]
	$\bar{x}+1/2,1/2,0$ [$u,0,0$]	$x+1/2,1/2,0$ [$\bar{u},0,0$]	$1/2,\bar{x}+1/2,0$ [$0,\bar{u},0$]	$1/2,x+1/2,0$ [$0,u,0$]
8 f ..2'	$x,x,0$ [\bar{u},u,w]	$\bar{x},\bar{x},0$ [u,\bar{u},w]	$\bar{x},x,0$ [u,u,\bar{w}]	$x,\bar{x},0$ [\bar{u},\bar{u},\bar{w}]
	$\bar{x}+1/2,\bar{x}+1/2,0$ [\bar{u},u,w]	$x+1/2,x+1/2,0$ [u,\bar{u},w]	$x+1/2,\bar{x}+1/2,0$ [u,u,\bar{w}]	$\bar{x}+1/2,x+1/2,0$ [\bar{u},\bar{u},\bar{w}]
4 e ..m'm'	$0,1/2,z$ [$0,0,w$]	$1/2,0,z$ [$0,0,\bar{w}$]	$0,1/2,\bar{z}$ [$0,0,\bar{w}$]	$1/2,0,\bar{z}$ [$0,0,w$]
4 d 4'..	$0,0,z$ [$0,0,0$]	$0,0,\bar{z}$ [$0,0,0$]	$1/2,1/2,\bar{z}$ [$0,0,0$]	$1/2,1/2,z$ [$0,0,0$]
4 c ..2'/m'	$1/4,1/4,0$ [\bar{u},u,w]	$3/4,3/4,0$ [u,\bar{u},w]	$3/4,1/4,0$ [u,u,\bar{w}]	$1/4,3/4,0$ [\bar{u},\bar{u},\bar{w}]

2 b $\bar{4}2m'$ 0,1/2,0 [0,0,0] 1/2,0,0 [0,0,0]

2 a $4'22'$ 0,0,0 [0,0,0] 1/2,1/2,0 [0,0,0]

Symmetry of special projections

Along [001] $p_{p^*}4m'm'$
 $a^* = (a-b)/2$ $b^* = (a+b)/2$
 Origin at 0,1/2,z

Along [100] $p_{2a^*}2m'm'$ $a^* = b/2$
 Origin at x,1/4,0

Along [110] $p2mm$
 $a^* = (-a+b)/2$
 Origin at x,x,0

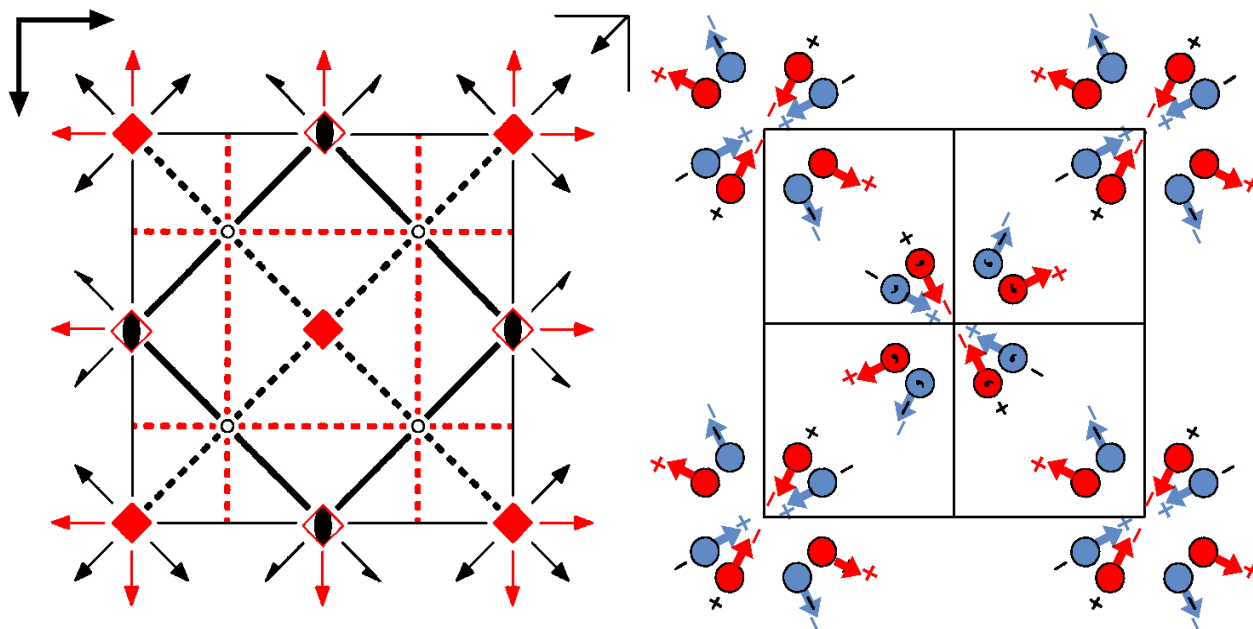
p4'/nb'm

4'/mm'm

Tetragonal/Square

No. 62.9.443

p4'/n2'/b'2/m



Origin at 4'2'2 at 4'/n2'2/g at $-1/4, -1/4, 0$ from center (2/m)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|---|---|---|--|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2' _y 0,y,0
(2 _y 0,0,0)' | (6) 2' _x x,0,0
(2 _x 0,0,0)' | (7) 2 _{xy} x,x,0
(2 _{xy} 0,0,0) | (8) 2 _{x̄y} x,x̄,0
(2 _{x̄y} 0,0,0) |
| (9) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (10) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (11) $\bar{4}^+$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^+$ 1/2,1/2,0)' | (12) $\bar{4}^-$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^-$ 1/2,1/2,0)' |
| (13) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (14) b' (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0)' | (15) m x+1/2,x̄,z
(m _{xy} 1/2,1/2,0) | (16) g (1/2,1/2,0) x,x,z
(m _{x̄y} 1/2,1/2,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 i 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]		
	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]		
	(5) \bar{x},y,\bar{z} [u,\bar{v},w]	(6) x, \bar{y},\bar{z} [\bar{u},v,w]		
	(7) y,x, \bar{z} [v,u,\bar{w}]	(8) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]		
	(9) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [u,v,w]	(10) x+1/2,y+1/2, \bar{z} [\bar{u},\bar{v},w]		
	(11) y+1/2, $\bar{x}+1/2,\bar{z}$ [v,\bar{u},\bar{w}]	(12) $\bar{y}+1/2,x+1/2,\bar{z}$ [\bar{v},u,\bar{w}]		
	(13) x+1/2, $\bar{y}+1/2,z$ [u,\bar{v},w]	(14) $\bar{x}+1/2,y+1/2,z$ [\bar{u},v,w]		
	(15) $\bar{y}+1/2,\bar{x}+1/2,z$ [v,u,\bar{w}]	(16) y+1/2,x+1/2,z [\bar{v},\bar{u},\bar{w}]		
8 h ..m	x,x+1/2,z [$\bar{u},u,0$]	$\bar{x},\bar{x}+1/2,z$ [$u,\bar{u},0$]	$\bar{x}+1/2,x,z$ [$u,u,0$]	x+1/2, \bar{x},z [$\bar{u},\bar{u},0$]
	$\bar{x},x+1/2,\bar{z}$ [$\bar{u},\bar{u},0$]	x, $\bar{x}+1/2,\bar{z}$ [$u,u,0$]	x+1/2,x, \bar{z} [$u,\bar{u},0$]	$\bar{x}+1/2,\bar{x},\bar{z}$ [$\bar{u},u,0$]
8 g .2'	x,0,0 [0,v,w]	$\bar{x},0,0$ [0, \bar{v},w]	0,x,0 [v,0, \bar{w}]	0, $\bar{x},0$ [$\bar{v},0,\bar{w}$]
	$\bar{x}+1/2,1/2,0$ [0,v,w]	x+1/2,1/2,0 [0, \bar{v},w]	1/2, $\bar{x}+1/2,0$ [v,0, \bar{w}]	1/2,x+1/2,0 [$\bar{v},0,\bar{w}$]
8 f ..2	x,x,0 [u,u,0]	$\bar{x},\bar{x},0$ [$\bar{u},\bar{u},0$]	$\bar{x},x,0$ [u, $\bar{u},0$]	x, $\bar{x},0$ [$\bar{u},u,0$]
	$\bar{x}+1/2,\bar{x}+1/2,0$ [u,u,0]	x+1/2,x+1/2,0 [$\bar{u},\bar{u},0$]	x+1/2, $\bar{x}+1/2,0$ [u, $\bar{u},0$]	$\bar{x}+1/2,x+1/2,0$ [$\bar{u},u,0$]
4 e 2.mm	0,1/2,z [0,0,0]	1/2,0,z [0,0,0]	0,1/2, \bar{z} [0,0,0]	1/2,0, \bar{z} [0,0,0]
4 d 4'..	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]	1/2,1/2, \bar{z} [0,0,0]	1/2,1/2,z [0,0,0]
4 c ..2/m	1/4,1/4,0 [u,u,0]	3/4,3/4,0 [$\bar{u},\bar{u},0$]	3/4,1/4,0 [u, $\bar{u},0$]	1/4,3/4,0 [$\bar{u},u,0$]

Continued

No. 62.9.443

$p4'/nb'm$

2 b $\bar{4}'2'm$ 0,1/2,0 [0,0,0] 1/2,0,0 [0,0,0]

2 a $4'2'2$ 0,0,0 [0,0,0] 1/2,1/2,0 [0,0,0]

Symmetry of special projections

Along [001] p_p4mm
 $a^* = (a-b)/2$ $b^* = (a+b)/2$
Origin at 0,1/2,z

Along [100] $p2mm$
 $a^* = b/2$
Origin at x,0,0

Along [110] $p2mm1'$
 $a^* = (-a+b)/2$
Origin at x,x,0

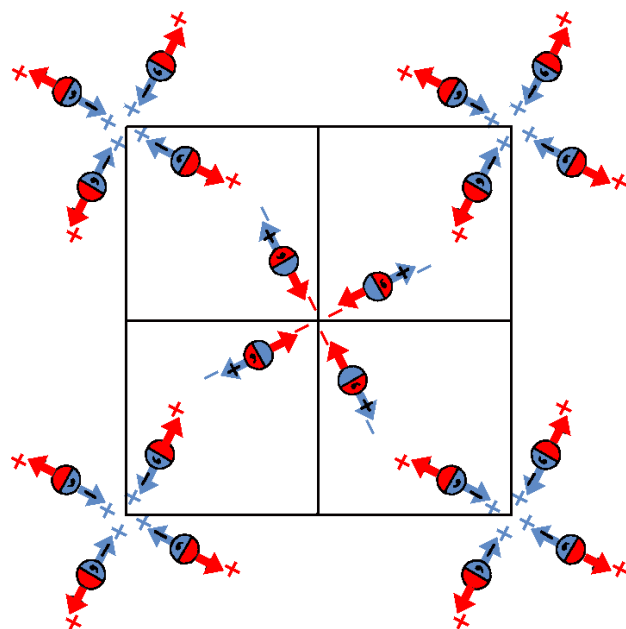
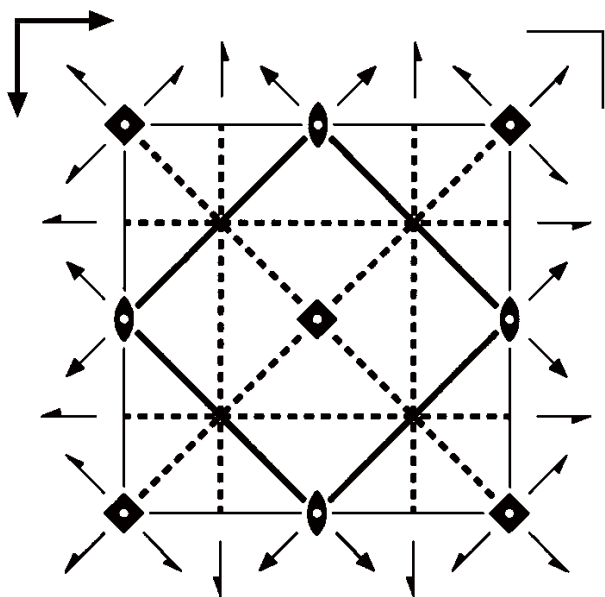
p4/mbm

4/mmm

Tetragonal/Square

No. 63.1.444

p4/m2₁/b2/m



Origin at center (4/m) at 4/m12₁/g

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1/2$; $y \leq 1/2 - x$; $0 \leq z$

Symmetry operations

- | | | | |
|---|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (6) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) | (7) 2 (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0) | (8) 2 x, \bar{x} +1/2,0
(2 _{\bar{xy}} 1/2,1/2,0) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z^+$ 0,0,0) | (12) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^-$ 0,0,0) |
| (13) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (14) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (15) m x+1/2, \bar{x} ,z
(m _{xy} 1/2,1/2,0) | (16) g (1/2,1/2,0) x,x,z
(m _{\bar{xy}} 1/2,1/2,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$		
	(3) $\bar{y},x,z [\bar{v},u,w]$	(4) $y,\bar{x},z [v,\bar{u},w]$		
	(5) $\bar{x}+1/2,y+1/2,\bar{z} [\bar{u},v,\bar{w}]$	(6) $x+1/2,\bar{y}+1/2,\bar{z} [u,\bar{v},\bar{w}]$		
	(7) $y+1/2,x+1/2,\bar{z} [v,u,\bar{w}]$	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z} [\bar{v},\bar{u},\bar{w}]$		
	(9) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},w]$	(10) $x,y,\bar{z} [u,\bar{v},w]$		
	(11) $y,\bar{x},\bar{z} [\bar{v},u,w]$	(12) $\bar{y},x,\bar{z} [v,\bar{u},w]$		
	(13) $x+1/2,\bar{y}+1/2,z [\bar{u},v,\bar{w}]$	(14) $\bar{x}+1/2,y+1/2,z [u,\bar{v},\bar{w}]$		
	(15) $\bar{y}+1/2,\bar{x}+1/2,z [v,u,\bar{w}]$	(16) $y+1/2,x+1/2,z [\bar{v},\bar{u},\bar{w}]$		
8 g ..m	$x,x+1/2,z [\bar{u},u,0]$	$\bar{x},\bar{x}+1/2,z [u,\bar{u},0]$	$\bar{x}+1/2,x,z [\bar{u},\bar{u},0]$	$x+1/2,\bar{x},z [u,u,0]$
	$\bar{x}+1/2,x,\bar{z} [u,u,0]$	$x+1/2,\bar{x},\bar{z} [\bar{u},\bar{u},0]$	$x,x+1/2,\bar{z} [u,\bar{u},0]$	$\bar{x},\bar{x}+1/2,\bar{z} [\bar{u},u,0]$
8 f m..	$x,y,0 [0,0,w]$	$\bar{x},\bar{y},0 [0,0,w]$	$\bar{y},x,0 [0,0,w]$	$y,\bar{x},0 [0,0,w]$
	$\bar{x}+1/2,y+1/2,0 [0,0,\bar{w}]$	$x+1/2,\bar{y}+1/2,0 [0,0,\bar{w}]$	$y+1/2,x+1/2,0 [0,0,\bar{w}]$	$\bar{y}+1/2,\bar{x}+1/2,0 [0,0,\bar{w}]$
4 e m.2m	$x,x+1/2,0 [0,0,0]$	$\bar{x},\bar{x}+1/2,0 [0,0,0]$	$\bar{x}+1/2,x,0 [0,0,0]$	$x+1/2,\bar{x},0 [0,0,0]$
4 d 2.mm	$0,1/2,z [0,0,0]$	$1/2,0,z [0,0,0]$	$1/2,0,\bar{z} [0,0,0]$	$0,1/2,\bar{z} [0,0,0]$
4 c 4..	$0,0,z [0,0,w]$	$1/2,1/2,\bar{z} [0,0,\bar{w}]$	$0,0,\bar{z} [0,0,\bar{w}]$	$1/2,1/2,z [0,0,w]$
2 b m.mm	$0,1/2,0 [0,0,0]$	$1/2,0,0 [0,0,0]$		
2 a 4/m..	$0,0,0 [0,0,w]$	$1/2,1/2,0 [0,0,\bar{w}]$		

Symmetry of special projections

Along [001] $p4gm1'$ $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] $p_{2a^*}2m'm'$ $a^* = b/2$

Origin at x,1/4,0

Along [110] $p2mm1'$ $a^* = (-a+b)/2$

Origin at x,x,0

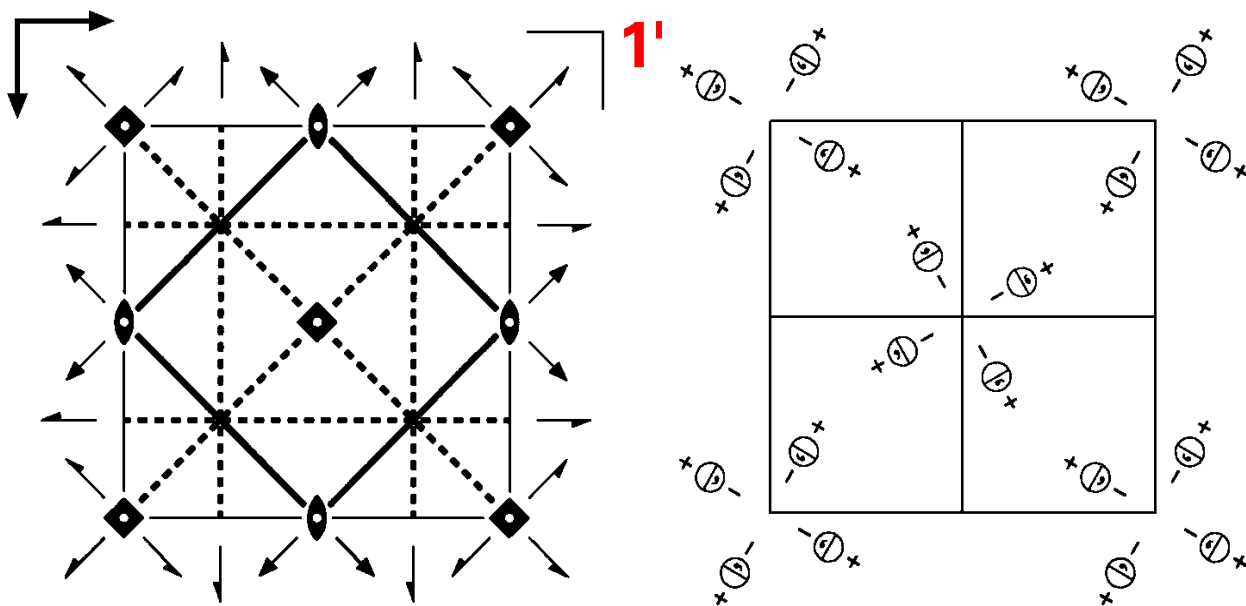
p4/mbm1'

4/mmm1'

Tetragonal/Square

No. 63.2.445

p4/m2₁/b2/m1'



Origin at center (4/m1') at 4/m12₁/g1'

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1/2$; $y \leq 1/2 - x$; $0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|---|---|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (6) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) | (7) 2 (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0) | (8) 2 x,x̄+1/2,0
(2 _{x̄y} 1/2,1/2,0) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z^+$ 0,0,0) | (12) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^-$ 0,0,0) |
| (13) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (14) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (15) m x+1/2,x̄,z
(m _{xy} 1/2,1/2,0) | (16) g (1/2,1/2,0) x,x,z
(m _{x̄y} 1/2,1/2,0) |

For 1' + set

- | | | | |
|--|--|---|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 4 ⁺ ' 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ ' 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (6) 2' (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0)' | (7) 2' (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0)' | (8) 2' x,x̄+1/2,0
(2 _{x̄y} 1/2,1/2,0)' |

(9) $\bar{1}$ ' 0,0,0 ($\bar{1}$ 0,0,0)'	(10) m' x,y,0 (m_z 0,0,0)'	(11) $\bar{4}^+$ ' 0,0,z; 0,0,0 ($\bar{4}_z$ 0,0,0)'	(12) $\bar{4}^-$ ' 0,0,z; 0,0,0 ($\bar{4}_z^{-1}$ 0,0,0)'
(13) a' (1/2,0,0) x,1/4,z (m_y 1/2,1/2,0)'	(14) b' (0,1/2,0) 1/4,y,z (m_x 1/2,1/2,0)'	(15) m' x+1/2, \bar{x} ,z (m_{xy} 1/2,1/2,0)'	(16) g' (1/2,1/2,0) x,x,z ($m_{\bar{xy}}$ 1/2,1/2,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	1+	1'		
16 h 11'	(1) x,y,z [0,0,0]	(2) \bar{x},\bar{y},z [0,0,0]		
	(3) \bar{y},x,z [0,0,0]	(4) y, \bar{x},z [0,0,0]		
	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [0,0,0]	(6) x+1/2, $\bar{y}+1/2,\bar{z}$ [0,0,0]		
	(7) y+1/2,x+1/2, \bar{z} [0,0,0]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [0,0,0]		
	(9) \bar{x},\bar{y},\bar{z} [0,0,0]	(10) x,y, \bar{z} [0,0,0]		
	(11) y, \bar{x},\bar{z} [0,0,0]	(12) \bar{y},x,\bar{z} [0,0,0]		
	(13) x+1/2, $\bar{y}+1/2,z$ [0,0,0]	(14) $\bar{x}+1/2,y+1/2,z$ [0,0,0]		
	(15) $\bar{y}+1/2,\bar{x}+1/2,z$ [0,0,0]	(16) y+1/2,x+1/2,z [0,0,0]		
8 g ..m1'	x,x+1/2,z [0,0,0]	$\bar{x},\bar{x}+1/2,z$ [0,0,0]	$\bar{x}+1/2,x,z$ [0,0,0]	x+1/2, \bar{x},z [0,0,0]
	$\bar{x}+1/2,x,\bar{z}$ [0,0,0]	x+1/2, \bar{x},\bar{z} [0,0,0]	x,x+1/2, \bar{z} [0,0,0]	$\bar{x},\bar{x}+1/2,\bar{z}$ [0,0,0]
8 f m..1'	x,y,0 [0,0,0]	$\bar{x},\bar{y},0$ [0,0,0]	$\bar{y},x,0$ [0,0,0]	y, $\bar{x},0$ [0,0,0]
	$\bar{x}+1/2,y+1/2,0$ [0,0,0]	x+1/2, $\bar{y}+1/2,0$ [0,0,0]	y+1/2,x+1/2,0 [0,0,0]	$\bar{y}+1/2,\bar{x}+1/2,0$ [0,0,0]
4 e m.2m1'	x,x+1/2,0 [0,0,0]	$\bar{x},\bar{x}+1/2,0$ [0,0,0]	$\bar{x}+1/2,x,0$ [0,0,0]	x+1/2, $\bar{x},0$ [0,0,0]
4 d 2.mm1'	0,1/2,z [0,0,0]	1/2,0,z [0,0,0]	1/2,0, \bar{z} [0,0,0]	0,1/2, \bar{z} [0,0,0]

Continued

No. 63.2.445

$p4/mbm1'$

4 c $4..1'$ $0,0,z [0,0,0]$ $1/2,1/2,\bar{z} [0,0,0]$ $0,0,\bar{z} [0,0,0]$ $1/2,1/2,z [0,0,0]$

2 b $m.mm1'$ $0,1/2,0 [0,0,0]$ $1/2,0,0 [0,0,0]$

2 a $4/m..1'$ $0,0,0 [0,0,0]$ $1/2,1/2,0 [0,0,0]$

Symmetry of special projections

Along $[001]$ $p4gm1'$

$a^* = a$ $b^* = b$

Origin at $0,0,z$

Along $[100]$ $p2mm1'$

$a^* = b/2$

Origin at $x,0,0$

Along $[110]$ $p2mm1'$

$a^* = (-a+b)/2$

Origin at $x,x,0$

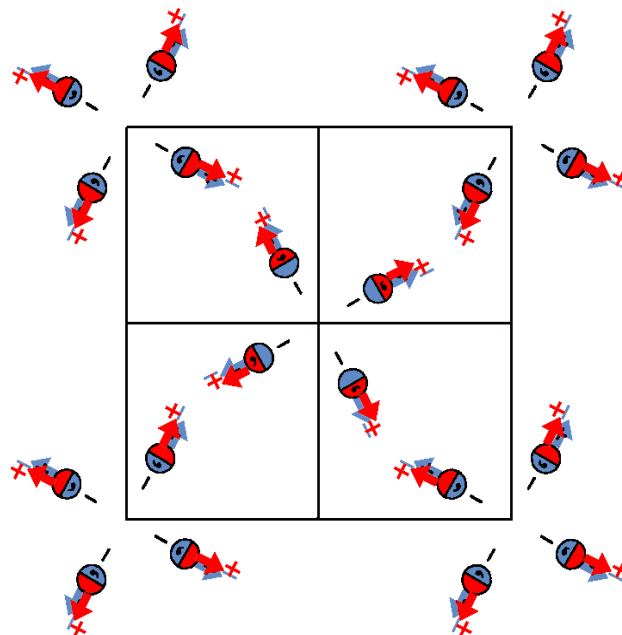
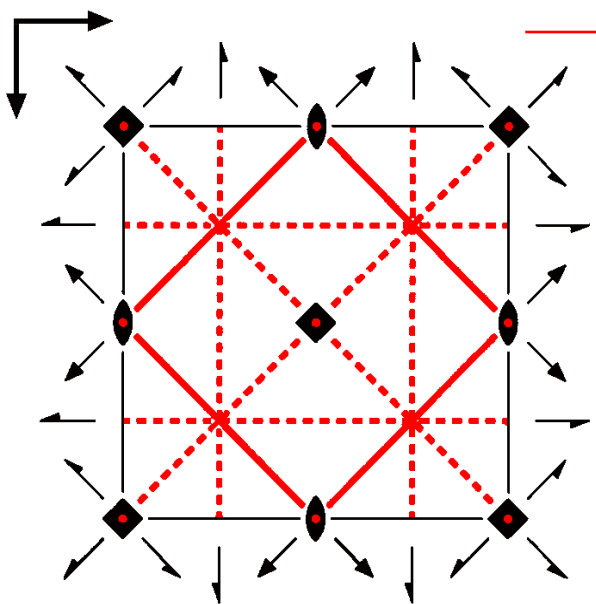
p4/m'b'm'

4/m'm'm'

Tetragonal/Square

No. 63.3.446

p4/m'2₁/b'2/m'



Origin at center (4/m') at 4/m'12₁/g'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (6) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) | (7) 2 (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0) | (8) 2 x,x̄+1/2,0
(2 _{x̄y} 1/2,1/2,0) |
| (9) $\bar{1}$ ' 0,0,0
($\bar{1}$ ' 0,0,0)' | (10) m' x,y,0
(m _z ' 0,0,0)' | (11) $\bar{4}^+$ ' 0,0,z; 0,0,0
($\bar{4}_z^+$ ' 0,0,0)' | (12) $\bar{4}^-$ ' 0,0,z; 0,0,0
($\bar{4}_z^-$ ' 0,0,0)' |
| (13) a' (1/2,0,0) x,1/4,z
(m _y ' 1/2,1/2,0)' | (14) b' (0,1/2,0) 1/4,y,z
(m _x ' 1/2,1/2,0)' | (15) m' x+1/2,x̄,z
(m _{xy} ' 1/2,1/2,0)' | (16) g' (1/2,1/2,0) x,x,z
(m _{x̄y} ' 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates				
Multiplicity, Wyckoff letter, Site symmetry					
16 h 1	(1) x, y, z [u,v,w]	(2) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]			
	(3) \bar{y}, x, z [\bar{v}, u, w]	(4) y, \bar{x}, z [v, \bar{u} ,w]			
	(5) $\bar{x}+1/2, y+1/2, \bar{z}$ [\bar{u}, v, \bar{w}]	(6) $x+1/2, \bar{y}+1/2, \bar{z}$ [u, \bar{v}, \bar{w}]			
	(7) $y+1/2, x+1/2, \bar{z}$ [v,u, \bar{w}]	(8) $\bar{y}+1/2, \bar{x}+1/2, \bar{z}$ [$\bar{v}, \bar{u}, \bar{w}$]			
	(9) $\bar{x}, \bar{y}, \bar{z}$ [$\bar{u}, \bar{v}, \bar{w}$]	(10) x, y, \bar{z} [u,v, \bar{w}]			
	(11) y, \bar{x}, \bar{z} [v, \bar{u}, \bar{w}]	(12) \bar{y}, x, \bar{z} [\bar{v}, u, \bar{w}]			
	(13) $x+1/2, \bar{y}+1/2, z$ [u, \bar{v}, w]	(14) $\bar{x}+1/2, y+1/2, z$ [\bar{u}, v, w]			
	(15) $\bar{y}+1/2, \bar{x}+1/2, z$ [\bar{v}, \bar{u}, w]	(16) $y+1/2, x+1/2, z$ [v,u,w]			
	8 g ..m'	$x, x+1/2, z$ [u,u,w]	$\bar{x}, \bar{x}+1/2, z$ [\bar{u}, \bar{u}, w]	$\bar{x}+1/2, x, z$ [\bar{u}, u, w]	$x+1/2, \bar{x}, z$ [u, \bar{u}, w]
		$\bar{x}+1/2, x, \bar{z}$ [\bar{u}, u, \bar{w}]	$x+1/2, \bar{x}, \bar{z}$ [u, \bar{u}, \bar{w}]	$x, x+1/2, \bar{z}$ [u,u, \bar{w}]	$\bar{x}, \bar{x}+1/2, \bar{z}$ [$\bar{u}, \bar{u}, \bar{w}$]
	8 f m'..	$x, y, 0$ [u,v,0]	$\bar{x}, \bar{y}, 0$ [$\bar{u}, \bar{v}, 0$]	$\bar{y}, x, 0$ [$\bar{v}, u, 0$]	$y, \bar{x}, 0$ [v, $\bar{u}, 0$]
		$\bar{x}+1/2, y+1/2, 0$ [$\bar{u}, v, 0$]	$x+1/2, \bar{y}+1/2, 0$ [u, $\bar{v}, 0$]	$y+1/2, x+1/2, 0$ [v,u,0]	$\bar{y}+1/2, \bar{x}+1/2, 0$ [$\bar{v}, \bar{u}, 0$]
	4 e m'.2m'	$x, x+1/2, 0$ [u,u,0]	$\bar{x}, \bar{x}+1/2, 0$ [$\bar{u}, \bar{u}, 0$]	$\bar{x}+1/2, x, 0$ [$\bar{u}, u, 0$]	$x+1/2, \bar{x}, 0$ [u, $\bar{u}, 0$]
	4 d 2.m'm'	$0, 1/2, z$ [0,0,w]	$1/2, 0, z$ [0,0,w]	$1/2, 0, \bar{z}$ [0,0, \bar{w}]	$0, 1/2, \bar{z}$ [0,0, \bar{w}]
	4 c 4..	$0, 0, z$ [0,0,w]	$1/2, 1/2, \bar{z}$ [0,0, \bar{w}]	$0, 0, \bar{z}$ [0,0, \bar{w}]	$1/2, 1/2, z$ [0,0,w]
	2 b m'.m'm'	$0, 1/2, 0$ [0,0,0]	$1/2, 0, 0$ [0,0,0]		
2 a 4/m'..	$0, 0, 0$ [0,0,0]	$1/2, 1/2, 0$ [0,0,0]			

Symmetry of special projections

Along [001] p4g'm'

 $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] p2m'm'

 $a^* = b/2$

Origin at x,0,0

Along [110] p2m'm'

 $a^* = (-a+b)/2$

Origin at x,x,0

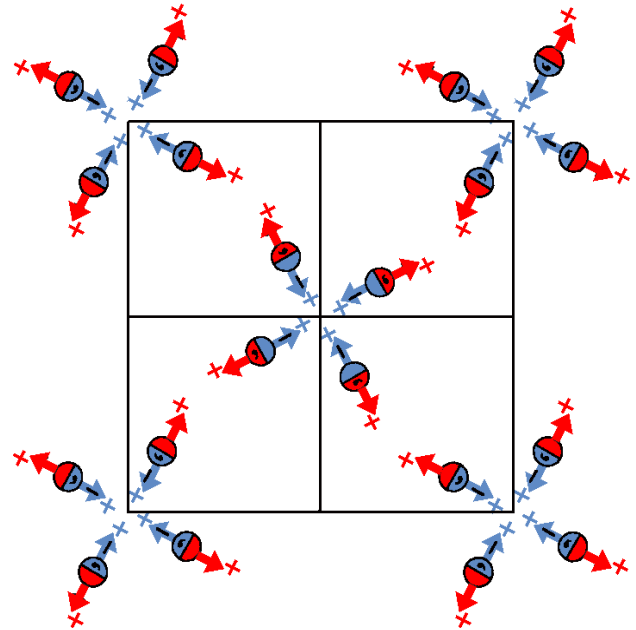
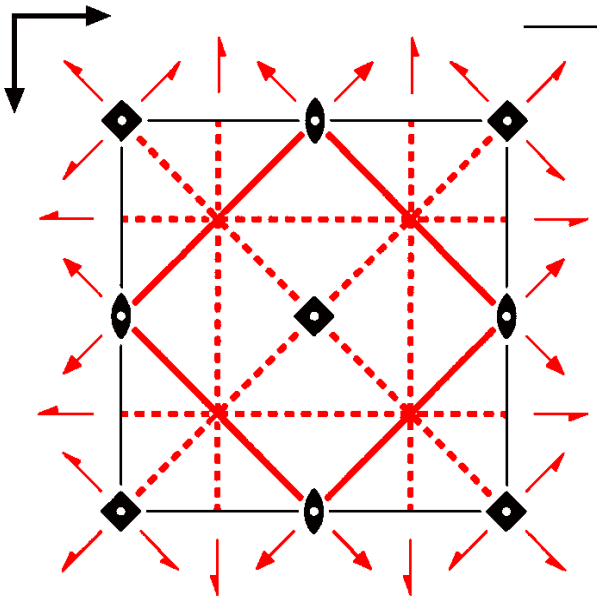
p4/mb'm'

4/mm'm'

Tetragonal/Square

No. 63.4.447

p4/m2₁'/b'2'/m'



Origin at center (4/m) at 4/m12₁'/g

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1/2$; $y \leq 1/2 - x$; $0 \leq z$

Symmetry operations

- | | | | |
|---|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2' _y (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (6) 2' _x (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0)' | (7) 2' _{xy} (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0)' | (8) 2' _{xy} (x,1/2,0) x,1/2,0
(2 _{xy} 1/2,1/2,0)' |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m _z x,y,0
(m _z 0,0,0) | (11) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z^+$ 0,0,0) | (12) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^-$ 0,0,0) |
| (13) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (14) b' (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0)' | (15) m' _{xy} x+1/2,x,z
(m _{xy} 1/2,1/2,0)' | (16) g' (1/2,1/2,0) x,x,z
(m _{xy} 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 h 1	(1) x, y, z [u,v,w]	(2) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]		
	(3) \bar{y}, x, z [\bar{v}, u, w]	(4) y, \bar{x}, z [v, \bar{u} ,w]		
	(5) $\bar{x}+1/2, y+1/2, \bar{z}$ [u, \bar{v}, w]	(6) $x+1/2, \bar{y}+1/2, \bar{z}$ [\bar{u}, v, w]		
	(7) $y+1/2, x+1/2, \bar{z}$ [\bar{v}, \bar{u}, w]	(8) $\bar{y}+1/2, \bar{x}+1/2, \bar{z}$ [v,u,w]		
	(9) $\bar{x}, \bar{y}, \bar{z}$ [u,v,w]	(10) x, y, \bar{z} [\bar{u}, \bar{v}, w]		
	(11) y, \bar{x}, \bar{z} [\bar{v}, u, w]	(12) \bar{y}, x, \bar{z} [v, \bar{u} ,w]		
	(13) $x+1/2, \bar{y}+1/2, z$ [u, \bar{v}, w]	(14) $\bar{x}+1/2, y+1/2, z$ [\bar{u}, v, w]		
	(15) $\bar{y}+1/2, \bar{x}+1/2, z$ [\bar{v}, \bar{u}, w]	(16) $y+1/2, x+1/2, z$ [v,u,w]		
8 g ..m'	$x, x+1/2, z$ [u,u,w]	$\bar{x}, \bar{x}+1/2, z$ [\bar{u}, \bar{u}, w]	$\bar{x}+1/2, x, z$ [\bar{u}, u, w]	$x+1/2, \bar{x}, z$ [u, \bar{u}, w]
	$\bar{x}+1/2, x, \bar{z}$ [u, \bar{u}, w]	$x+1/2, \bar{x}, \bar{z}$ [\bar{u}, u, w]	$x, x+1/2, \bar{z}$ [\bar{u}, \bar{u}, w]	$\bar{x}, \bar{x}+1/2, \bar{z}$ [u,u,w]
8 f m..	$x, y, 0$ [0,0,w]	$\bar{x}, \bar{y}, 0$ [0,0,w]	$\bar{y}, x, 0$ [0,0,w]	$y, \bar{x}, 0$ [0,0,w]
	$\bar{x}+1/2, y+1/2, 0$ [0,0,w]	$x+1/2, \bar{y}+1/2, 0$ [0,0,w]	$y+1/2, x+1/2, 0$ [0,0,w]	$\bar{y}+1/2, \bar{x}+1/2, 0$ [0,0,w]
4 e m.2'm'	$x, x+1/2, 0$ [0,0,w]	$\bar{x}, \bar{x}+1/2, 0$ [0,0,w]	$\bar{x}+1/2, x, 0$ [0,0,w]	$x+1/2, \bar{x}, 0$ [0,0,w]
4 d 2.m'm'	$0, 1/2, z$ [0,0,w]	$1/2, 0, z$ [0,0,w]	$1/2, 0, \bar{z}$ [0,0,w]	$0, 1/2, \bar{z}$ [0,0,w]
4 c 4..	$0, 0, z$ [0,0,w]	$1/2, 1/2, \bar{z}$ [0,0,w]	$0, 0, \bar{z}$ [0,0,w]	$1/2, 1/2, z$ [0,0,w]
2 b m.m'm'	$0, 1/2, 0$ [0,0,w]	$1/2, 0, 0$ [0,0,w]		
2 a 4/m..	$0, 0, 0$ [0,0,w]	$1/2, 1/2, 0$ [0,0,w]		

Symmetry of special projections

Along [001] p4gm1'

 $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] p2'm'm

 $a^* = b/2$

Origin at x,0,0

Along [110] p2'm'm

 $a^* = (-a+b)/2$

Origin at x,x,0

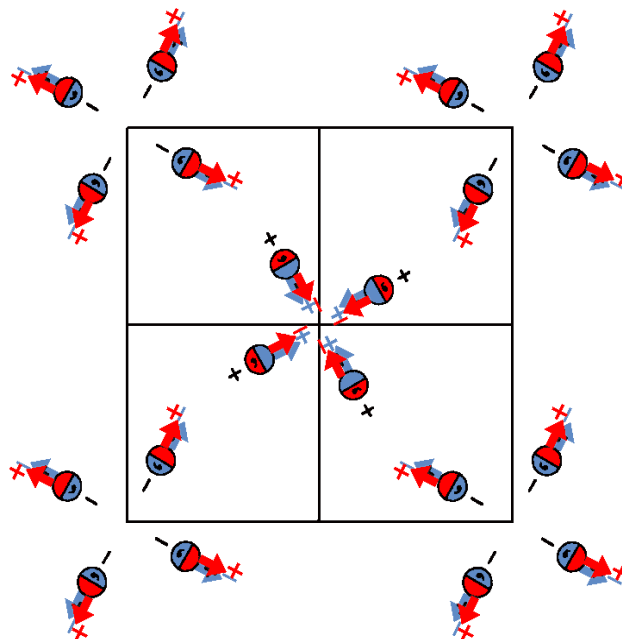
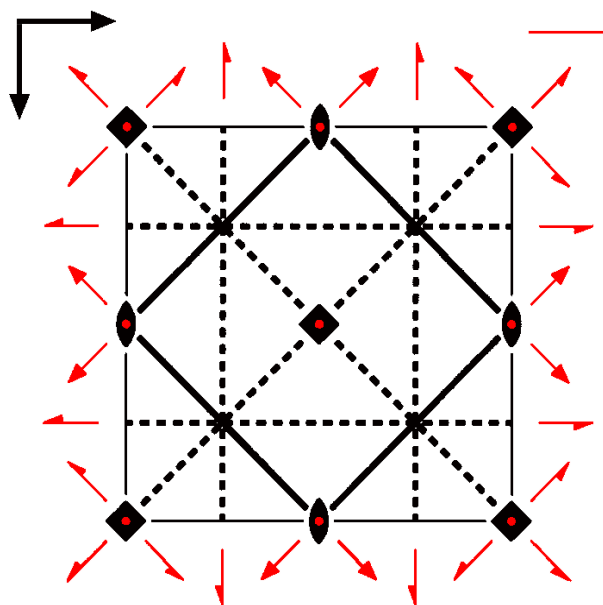
p4/m'bm

4/m'mm

Tetragonal/Square

No. 63.5.448

p4/m'2₁'/b2'/m



Origin at center (4/m') at 4/m'12₁'/g

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0)' | (6) 2' (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0)' | (7) 2' (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0)' | (8) 2' x, $\bar{x}+1/2,0$
(2 _{\bar{xy}} 1/2,1/2,0)' |
| (9) $\bar{1}$ ' 0,0,0
($\bar{1}$ ' 0,0,0)' | (10) m' x,y,0
(m _z ' 0,0,0)' | (11) $\bar{4}^+$ ' 0,0,z; 0,0,0
($\bar{4}_z^+$ ' 0,0,0)' | (12) $\bar{4}^-$ ' 0,0,z; 0,0,0
($\bar{4}_z^-$ ' 0,0,0)' |
| (13) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (14) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (15) m x+1/2, \bar{x},z
(m _{xy} 1/2,1/2,0) | (16) g (1/2,1/2,0) x,x,z
(m _{\bar{xy}} 1/2,1/2,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 h 1	(1) x, y, z [u,v,w]	(2) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]		
	(3) \bar{y}, x, z [\bar{v}, u, w]	(4) y, \bar{x}, z [v, \bar{u} ,w]		
	(5) $\bar{x}+1/2, y+1/2, \bar{z}$ [u, \bar{v}, w]	(6) $x+1/2, \bar{y}+1/2, \bar{z}$ [\bar{u}, v, w]		
	(7) $y+1/2, x+1/2, \bar{z}$ [\bar{v}, \bar{u}, w]	(8) $\bar{y}+1/2, \bar{x}+1/2, \bar{z}$ [v,u,w]		
	(9) $\bar{x}, \bar{y}, \bar{z}$ [$\bar{u}, \bar{v}, \bar{w}$]	(10) x, y, \bar{z} [u,v, \bar{w}]		
	(11) y, \bar{x}, \bar{z} [v, \bar{u}, \bar{w}]	(12) \bar{y}, x, \bar{z} [\bar{v}, u, \bar{w}]		
	(13) $x+1/2, \bar{y}+1/2, z$ [\bar{u}, v, \bar{w}]	(14) $\bar{x}+1/2, y+1/2, z$ [u, \bar{v}, \bar{w}]		
	(15) $\bar{y}+1/2, \bar{x}+1/2, z$ [v,u, \bar{w}]	(16) $y+1/2, x+1/2, z$ [$\bar{v}, \bar{u}, \bar{w}$]		
8 g ..m	$x, x+1/2, z$ [$\bar{u}, u, 0$]	$\bar{x}, \bar{x}+1/2, z$ [u, $\bar{u}, 0$]	$\bar{x}+1/2, x, z$ [$\bar{u}, \bar{u}, 0$]	$x+1/2, \bar{x}, z$ [u,u,0]
	$\bar{x}+1/2, x, \bar{z}$ [$\bar{u}, \bar{u}, 0$]	$x+1/2, \bar{x}, \bar{z}$ [u,u,0]	$x, x+1/2, \bar{z}$ [$\bar{u}, u, 0$]	$\bar{x}, \bar{x}+1/2, \bar{z}$ [u, $\bar{u}, 0$]
8 f m'..	$x, y, 0$ [u,v,0]	$\bar{x}, \bar{y}, 0$ [$\bar{u}, \bar{v}, 0$]	$\bar{y}, x, 0$ [$\bar{v}, u, 0$]	$y, \bar{x}, 0$ [v, $\bar{u}, 0$]
	$\bar{x}+1/2, y+1/2, 0$ [u, $\bar{v}, 0$]	$x+1/2, \bar{y}+1/2, 0$ [$\bar{u}, v, 0$]	$y+1/2, x+1/2, 0$ [$\bar{v}, \bar{u}, 0$]	$\bar{y}+1/2, \bar{x}+1/2, 0$ [v,u,0]
4 e m'.2'm	$x, x+1/2, 0$ [$\bar{u}, u, 0$]	$\bar{x}, \bar{x}+1/2, 0$ [u, $\bar{u}, 0$]	$\bar{x}+1/2, x, 0$ [$\bar{u}, \bar{u}, 0$]	$x+1/2, \bar{x}, 0$ [u,u,0]
4 d 2.mm	$0, 1/2, z$ [0,0,0]	$1/2, 0, z$ [0,0,0]	$1/2, 0, \bar{z}$ [0,0,0]	$0, 1/2, \bar{z}$ [0,0,0]
4 c 4..	$0, 0, z$ [0,0,w]	$1/2, 1/2, \bar{z}$ [0,0,w]	$0, 0, \bar{z}$ [0,0, \bar{w}]	$1/2, 1/2, z$ [0,0, \bar{w}]
2 b m'.mm	$0, 1/2, 0$ [0,0,0]	$1/2, 0, 0$ [0,0,0]		
2 a 4/m'..	$0, 0, 0$ [0,0,0]	$1/2, 1/2, 0$ [0,0,0]		

Symmetry of special projections

Along [001] p4gm

 $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] $p_{2a^*}2m'm'$ $a^* = b/2$

Origin at x,0,0

Along [110] $p2mm1'$ $a^* = (-a+b)/2$

Origin at x,x,0

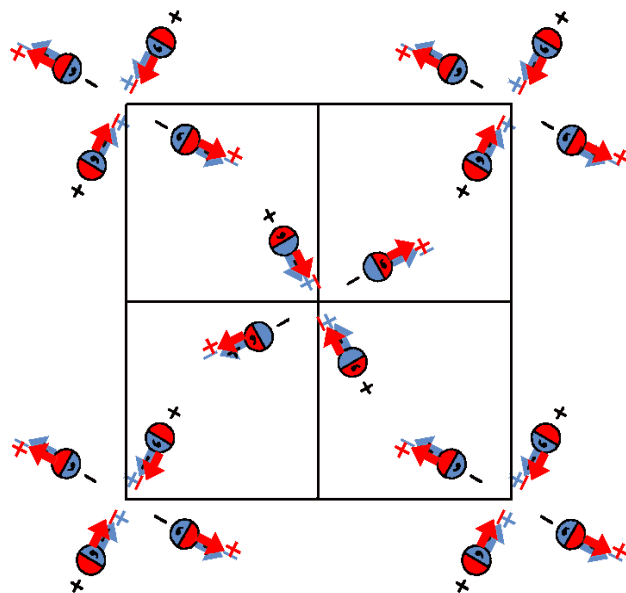
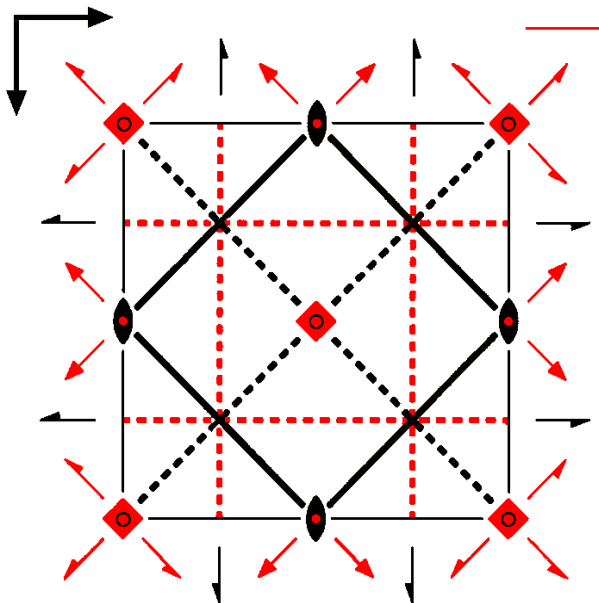
p4'/m'b'm

4'/m'm'm

Tetragonal/Square

No. 63.6.449

p4'/m'2₁/b'2'/m



Origin at center (4'/m') at 4'/m'12₁'/g

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|---|---|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (6) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) | (7) 2' (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0)' | (8) 2' x,x̄+1/2,0
(2 _{x̄y} 1/2,1/2,0)' |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (10) m' x,y,0
(m _z 0,0,0)' | (11) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z$ 0,0,0) | (12) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^{-1}$ 0,0,0) |
| (13) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0)' | (14) b' (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0)' | (15) m x+1/2,x̄,z
(m _{xy} 1/2,1/2,0) | (16) g (1/2,1/2,0) x,x,z
(m _{x̄y} 1/2,1/2,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 h 1	(1) $x, y, z [u, v, w]$	(2) $\bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]$		
	(3) $\bar{y}, x, z [v, \bar{u}, \bar{w}]$	(4) $y, \bar{x}, z [\bar{v}, u, \bar{w}]$		
	(5) $\bar{x} + 1/2, y + 1/2, \bar{z} [\bar{u}, v, \bar{w}]$	(6) $x + 1/2, \bar{y} + 1/2, \bar{z} [u, \bar{v}, \bar{w}]$		
	(7) $y + 1/2, x + 1/2, \bar{z} [\bar{v}, \bar{u}, w]$	(8) $\bar{y} + 1/2, \bar{x} + 1/2, \bar{z} [v, u, w]$		
	(9) $\bar{x}, \bar{y}, \bar{z} [\bar{u}, \bar{v}, \bar{w}]$	(10) $x, y, \bar{z} [u, v, \bar{w}]$		
	(11) $y, \bar{x}, \bar{z} [\bar{v}, u, w]$	(12) $\bar{y}, x, \bar{z} [v, \bar{u}, w]$		
	(13) $x + 1/2, \bar{y} + 1/2, z [u, \bar{v}, w]$	(14) $\bar{x} + 1/2, y + 1/2, z [\bar{u}, v, w]$		
	(15) $\bar{y} + 1/2, \bar{x} + 1/2, z [v, u, \bar{w}]$	(16) $y + 1/2, x + 1/2, z [\bar{v}, \bar{u}, \bar{w}]$		
8 g ..m	$x, x + 1/2, z [\bar{u}, u, 0]$	$\bar{x}, \bar{x} + 1/2, z [u, \bar{u}, 0]$	$\bar{x} + 1/2, x, z [u, u, 0]$	$x + 1/2, \bar{x}, z [\bar{u}, \bar{u}, 0]$
	$\bar{x} + 1/2, x, \bar{z} [u, u, 0]$	$x + 1/2, \bar{x}, \bar{z} [\bar{u}, \bar{u}, 0]$	$x, x + 1/2, \bar{z} [\bar{u}, u, 0]$	$\bar{x}, \bar{x} + 1/2, \bar{z} [u, \bar{u}, 0]$
8 f m'..	$x, y, 0 [u, v, 0]$	$\bar{x}, \bar{y}, 0 [\bar{u}, \bar{v}, 0]$	$\bar{y}, x, 0 [v, \bar{u}, 0]$	$y, \bar{x}, 0 [\bar{v}, u, 0]$
	$\bar{x} + 1/2, y + 1/2, 0 [\bar{u}, v, 0]$	$x + 1/2, \bar{y} + 1/2, 0 [u, \bar{v}, 0]$	$y + 1/2, x + 1/2, 0 [\bar{v}, \bar{u}, 0]$	$\bar{y} + 1/2, \bar{x} + 1/2, 0 [v, u, 0]$
4 e m'.2'm	$x, x + 1/2, 0 [\bar{u}, u, 0]$	$\bar{x}, \bar{x} + 1/2, 0 [u, \bar{u}, 0]$	$\bar{x} + 1/2, x, 0 [u, u, 0]$	$x + 1/2, \bar{x}, 0 [\bar{u}, \bar{u}, 0]$
4 d 2.mm	$0, 1/2, z [0, 0, 0]$	$1/2, 0, z [0, 0, 0]$	$1/2, 0, \bar{z} [0, 0, 0]$	$0, 1/2, \bar{z} [0, 0, 0]$
4 c 4'..	$0, 0, z [0, 0, 0]$	$1/2, 1/2, \bar{z} [0, 0, 0]$	$0, 0, \bar{z} [0, 0, 0]$	$1/2, 1/2, z [0, 0, 0]$
2 b m'.mm	$0, 1/2, 0 [0, 0, 0]$	$1/2, 0, 0 [0, 0, 0]$		
2 a 4'/m'..	$0, 0, 0 [0, 0, 0]$	$1/2, 1/2, 0 [0, 0, 0]$		

Symmetry of special projections

Along [001] p4'g'm

 $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] p2'mm'

 $a^* = b/2$

Origin at x,0,0

Along [110] p2mm1'

 $a^* = (-a+b)/2$

Origin at x,x,0

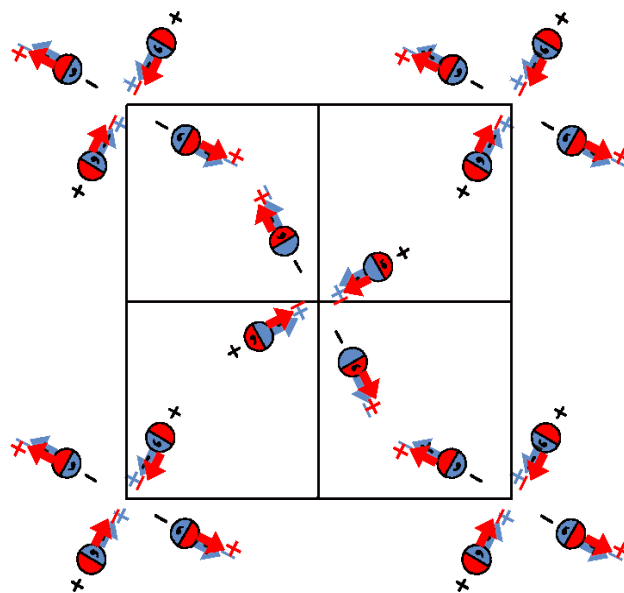
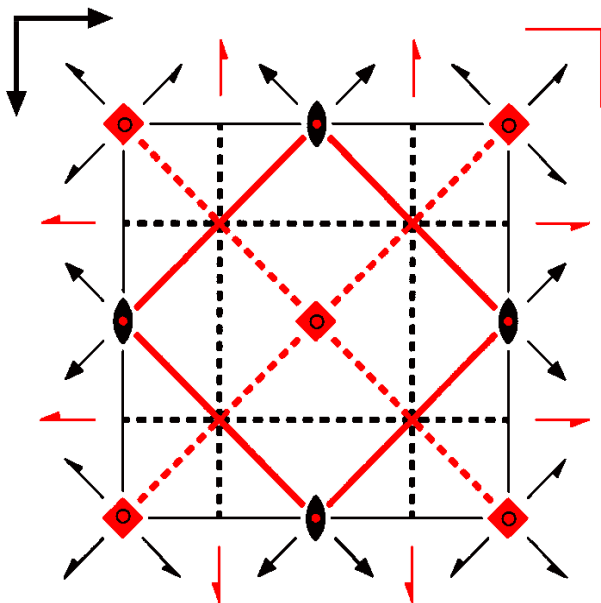
p4'/m'bm'

4'/m'mm'

Tetragonal/Square

No. 63.7.450

p4'/m'2₁'/b2/m'



Origin at center (4'/m') at 4'/m'12₁/g'

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|---|---|---|---|
| (1) 1
(1 0,0,0) | (2) 2 _z 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ _z 0,0,z
(4 _z 0,0,0) ⁺ | (4) 4 ⁻ _z 0,0,z
(4 _z ⁻¹ 0,0,0) ⁻ |
| (5) 2' _y (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) ['] | (6) 2' _x (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) ['] | (7) 2 (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0) | (8) 2 (x, x̄+1/2,0) (2 _{xȳ} 1/2,1/2,0) |
| (9) 1̄ (0,0,0)
(1̄ 0,0,0) ['] | (10) m' _z x,y,0
(m _z 0,0,0) ['] | (11) 4 ⁺ _z 0,0,z; 0,0,0
(4 _z ⁺ 0,0,0) | (12) 4 ⁻ _z 0,0,z; 0,0,0
(4 _z ⁻¹ 0,0,0) |
| (13) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (14) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (15) m' _{xy} x+1/2,x̄,z
(m _{xy} 1/2,1/2,0) ['] | (16) g' (1/2,1/2,0) x,x,z
(m _{xȳ} 1/2,1/2,0) ['] |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates				
Multiplicity, Wyckoff letter, Site symmetry					
16 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]			
	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]			
	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [u,\bar{v},w]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]			
	(7) $y+1/2,x+1/2,\bar{z}$ [v,u,\bar{w}]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [\bar{v},\bar{u},\bar{w}]			
	(9) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(10) x,y, \bar{z} [u,v, \bar{w}]			
	(11) y,\bar{x},\bar{z} [\bar{v},u,w]	(12) \bar{y},x,\bar{z} [v,\bar{u},w]			
	(13) $x+1/2,\bar{y}+1/2,z$ [\bar{u},v,\bar{w}]	(14) $\bar{x}+1/2,y+1/2,z$ [u,\bar{v},\bar{w}]			
	(15) $\bar{y}+1/2,\bar{x}+1/2,z$ [\bar{v},\bar{u},w]	(16) $y+1/2,x+1/2,z$ [v,u,w]			
	8 g ..m'	x,x+1/2,z [u,u,w]	$\bar{x},\bar{x}+1/2,z$ [\bar{u},\bar{u},w]	$\bar{x}+1/2,x,z$ [u, \bar{u},\bar{w}]	$x+1/2,\bar{x},z$ [\bar{u},u,\bar{w}]
		$\bar{x}+1/2,x,\bar{z}$ [u, \bar{u},w]	$x+1/2,\bar{x},\bar{z}$ [\bar{u},u,w]	$x,x+1/2,\bar{z}$ [u,u, \bar{w}]	$\bar{x},\bar{x}+1/2,\bar{z}$ [\bar{u},\bar{u},\bar{w}]
	8 f m'..	x,y,0 [u,v,0]	$\bar{x},\bar{y},0$ [$\bar{u},\bar{v},0$]	$\bar{y},x,0$ [v, $\bar{u},0$]	y, $\bar{x},0$ [$\bar{v},u,0$]
		$\bar{x}+1/2,y+1/2,0$ [u, $\bar{v},0$]	$x+1/2,\bar{y}+1/2,0$ [$\bar{u},v,0$]	$y+1/2,x+1/2,0$ [v,u,0]	$\bar{y}+1/2,\bar{x}+1/2,0$ [$\bar{v},\bar{u},0$]
	4 e m'.2m'	x,x+1/2,0 [u,u,0]	$\bar{x},\bar{x}+1/2,0$ [$\bar{u},\bar{u},0$]	$\bar{x}+1/2,x,0$ [u, $\bar{u},0$]	$x+1/2,\bar{x},0$ [$\bar{u},u,0$]
	4 d 2.m'm'	0,1/2,z [0,0,w]	1/2,0,z [0,0, \bar{w}]	1/2,0, \bar{z} [0,0,w]	0,1/2, \bar{z} [0,0, \bar{w}]
	4 c 4'..	0,0,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]	0,0, \bar{z} [0,0,0]	1/2,1/2,z [0,0,0]
2 b m'.m'm'	0,1/2,0 [0,0,0]	1/2,0,0 [0,0,0]			
2 a 4'/m'..	0,0,0 [0,0,0]	1/2,1/2,0 [0,0,0]			

Symmetry of special projections

Along [001] p4'gm'

 $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] p_{2a*}2mm $a^* = b/2$

Origin at x,1/4,0

Along [110] p2'mm'

 $a^* = (-a+b)/2$

Origin at x,x,0

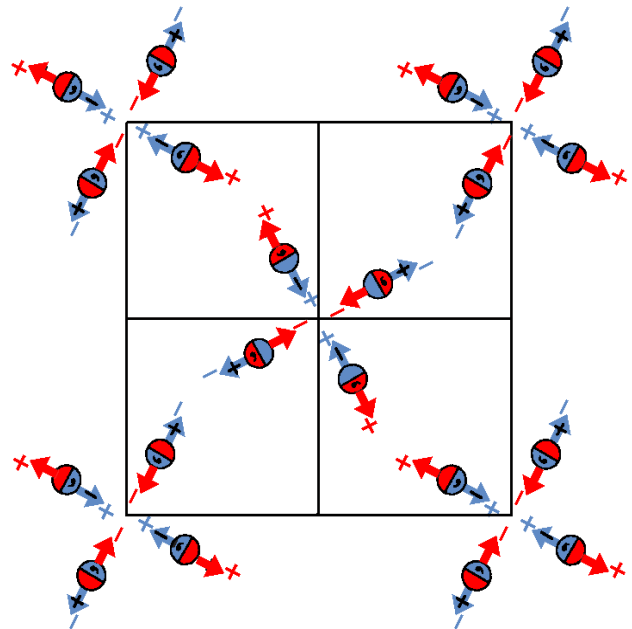
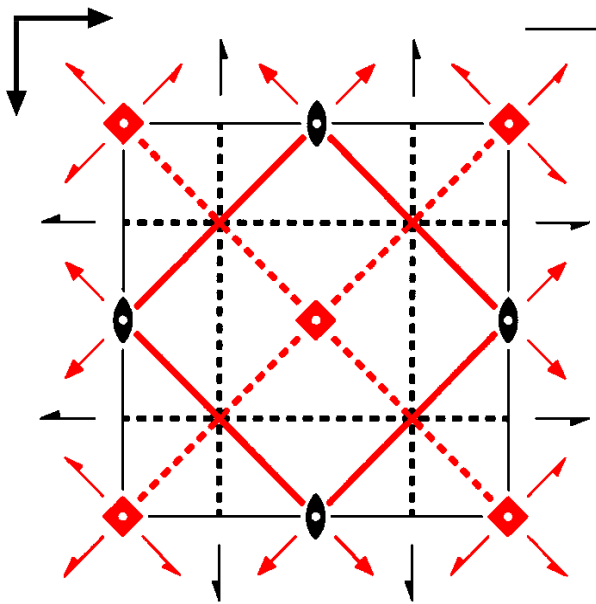
p4'/mbm'

4'/mmm'

Tetragonal/Square

No. 63.8.451

p4'/m2₁/b2'/m'



Origin at center (4'/m) at 4'/m12₁'/g'

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1/2$; $y \leq 1/2 - x$; $0 \leq z$

Symmetry operations

- | | | | |
|---|---|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2 (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) | (6) 2 (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) | (7) 2' (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0)' | (8) 2' x,x̄+1/2,0
(2 _{x̄y} 1/2,1/2,0)' |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z^+$ 0,0,0)' | (12) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^-$ 0,0,0)' |
| (13) a (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) | (14) b (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) | (15) m' x+1/2,x̄,z
(m _{xy} 1/2,1/2,0)' | (16) g' (1/2,1/2,0) x,x,z
(m _{x̄y} 1/2,1/2,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]		
	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y,\bar{x},z [\bar{v},u,\bar{w}]		
	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [u,\bar{v},\bar{w}]		
	(7) $y+1/2,x+1/2,\bar{z}$ [\bar{v},\bar{u},w]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [v,u,w]		
	(9) \bar{x},\bar{y},\bar{z} [u,v,w]	(10) x,y,\bar{z} [\bar{u},\bar{v},w]		
	(11) y,\bar{x},\bar{z} [v,\bar{u},\bar{w}]	(12) \bar{y},x,\bar{z} [\bar{v},u,\bar{w}]		
	(13) $x+1/2,\bar{y}+1/2,z$ [\bar{u},v,\bar{w}]	(14) $\bar{x}+1/2,y+1/2,z$ [u,\bar{v},\bar{w}]		
	(15) $\bar{y}+1/2,\bar{x}+1/2,z$ [\bar{v},\bar{u},w]	(16) $y+1/2,x+1/2,z$ [v,u,w]		
8 g ..m'	$x,x+1/2,z$ [u,u,w]	$\bar{x},\bar{x}+1/2,z$ [\bar{u},\bar{u},w]	$\bar{x}+1/2,x,z$ [u,\bar{u},\bar{w}]	$x+1/2,\bar{x},z$ [\bar{u},u,\bar{w}]
	$\bar{x}+1/2,x,\bar{z}$ [\bar{u},u,\bar{w}]	$x+1/2,\bar{x},\bar{z}$ [u,\bar{u},\bar{w}]	$x,x+1/2,\bar{z}$ [\bar{u},\bar{u},w]	$\bar{x},\bar{x}+1/2,\bar{z}$ [u,u,w]
8 f m..	$x,y,0$ [$0,0,w$]	$\bar{x},\bar{y},0$ [$0,0,w$]	$\bar{y},x,0$ [$0,0,\bar{w}$]	$y,\bar{x},0$ [$0,0,\bar{w}$]
	$\bar{x}+1/2,y+1/2,0$ [$0,0,\bar{w}$]	$x+1/2,\bar{y}+1/2,0$ [$0,0,\bar{w}$]	$y+1/2,x+1/2,0$ [$0,0,w$]	$\bar{y}+1/2,\bar{x}+1/2,0$ [$0,0,w$]
4 e m.2'm'	$x,x+1/2,0$ [$0,0,w$]	$\bar{x},\bar{x}+1/2,0$ [$0,0,w$]	$\bar{x}+1/2,x,0$ [$0,0,\bar{w}$]	$x+1/2,\bar{x},0$ [$0,0,\bar{w}$]
4 d 2.m'm'	$0,1/2,z$ [$0,0,w$]	$1/2,0,z$ [$0,0,\bar{w}$]	$1/2,0,\bar{z}$ [$0,0,\bar{w}$]	$0,1/2,\bar{z}$ [$0,0,w$]
4 c 4'..	$0,0,z$ [$0,0,0$]	$1/2,1/2,\bar{z}$ [$0,0,0$]	$0,0,\bar{z}$ [$0,0,0$]	$1/2,1/2,z$ [$0,0,0$]
2 b m.m'm'	$0,1/2,0$ [$0,0,w$]	$1/2,0,0$ [$0,0,\bar{w}$]		
2 a 4'/m..	$0,0,0$ [$0,0,0$]	$1/2,1/2,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] p4gm1'

 $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] p_{2a*}2mm $a^* = b/2$

Origin at x,0,0

Along [110] p2mm

 $a^* = (-a+b)/2$

Origin at x,x,0

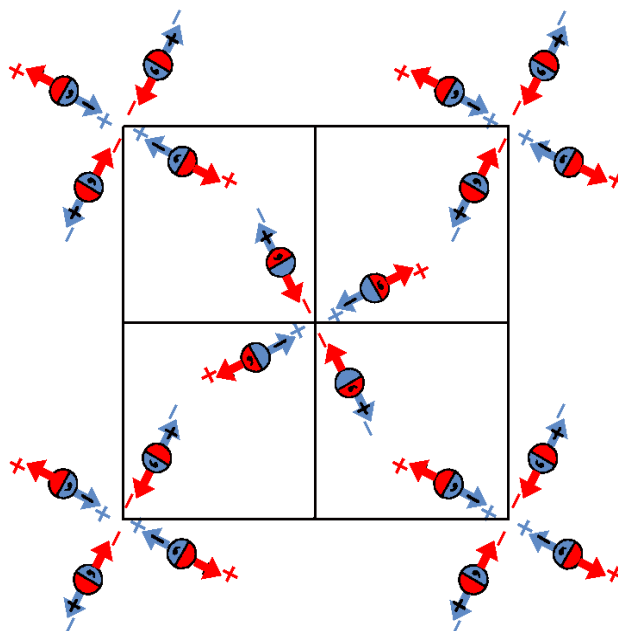
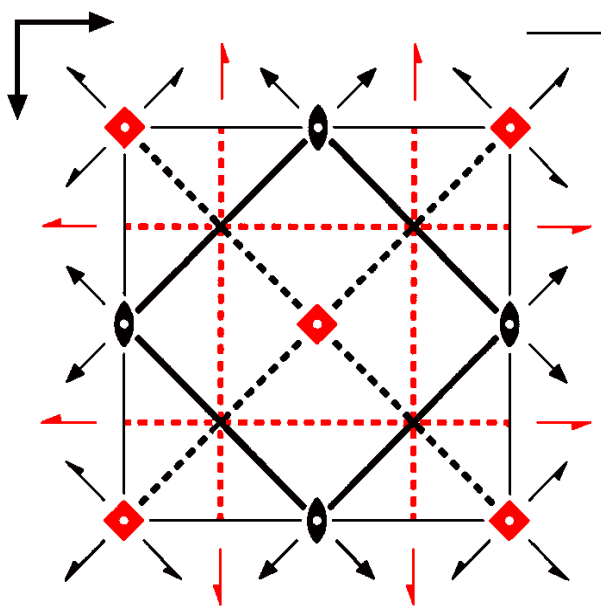
p4'/mb'm

4'/mm'm

Tetragonal/Square

No. 63.9.452

p4'/m2₁'/b'2/m



Origin at center (4'/m) at 4'/m12₁/g

Asymmetric unit $0 \leq x \leq 1/2$; $0 \leq y \leq 1/2$; $y \leq 1/2 - x$; $0 \leq z$

Symmetry operations

- | | | | |
|---|---|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) ⁺ | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) ⁻ |
| (5) 2' (0,1/2,0) 1/4,y,0
(2 _y 1/2,1/2,0) ['] | (6) 2' (1/2,0,0) x,1/4,0
(2 _x 1/2,1/2,0) ['] | (7) 2 (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0) | (8) 2 x,x̄+1/2,0
(2 _{xy} ⁻¹ 1/2,1/2,0) |
| (9) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{4}^+$ 0,0,z; 0,0,0
($\bar{4}_z^+$ 0,0,0) ⁺ | (12) $\bar{4}^-$ 0,0,z; 0,0,0
($\bar{4}_z^-$ 0,0,0) ⁻ |
| (13) a' (1/2,0,0) x,1/4,z
(m _y 1/2,1/2,0) ['] | (14) b' (0,1/2,0) 1/4,y,z
(m _x 1/2,1/2,0) ['] | (15) m x+1/2,x̄,z
(m _{xy} 1/2,1/2,0) | (16) g (1/2,1/2,0) x,x,z
(m _{xy} ⁻¹ 1/2,1/2,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 h 1	(1) x, y, z [u,v,w]	(2) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]		
	(3) \bar{y}, x, z [v, \bar{u} , \bar{w}]	(4) y, \bar{x}, z [\bar{v}, u, \bar{w}]		
	(5) $\bar{x} + 1/2, y + 1/2, \bar{z}$ [u, \bar{v}, w]	(6) $x + 1/2, \bar{y} + 1/2, \bar{z}$ [\bar{u}, v, w]		
	(7) $y + 1/2, x + 1/2, \bar{z}$ [v,u, \bar{w}]	(8) $\bar{y} + 1/2, \bar{x} + 1/2, \bar{z}$ [$\bar{v}, \bar{u}, \bar{w}$]		
	(9) $\bar{x}, \bar{y}, \bar{z}$ [u,v,w]	(10) x, y, \bar{z} [\bar{u}, \bar{v}, w]		
	(11) y, \bar{x}, \bar{z} [v, \bar{u}, \bar{w}]	(12) \bar{y}, x, \bar{z} [\bar{v}, u, \bar{w}]		
	(13) $x + 1/2, \bar{y} + 1/2, z$ [u, \bar{v}, w]	(14) $\bar{x} + 1/2, y + 1/2, z$ [\bar{u}, v, w]		
	(15) $\bar{y} + 1/2, \bar{x} + 1/2, z$ [v,u, \bar{w}]	(16) $y + 1/2, x + 1/2, z$ [$\bar{v}, \bar{u}, \bar{w}$]		
8 g ..m	$x, x + 1/2, z$ [$\bar{u}, u, 0$]	$\bar{x}, \bar{x} + 1/2, z$ [u, $\bar{u}, 0$]	$\bar{x} + 1/2, x, z$ [u,u,0]	$x + 1/2, \bar{x}, z$ [$\bar{u}, \bar{u}, 0$]
	$\bar{x} + 1/2, x, \bar{z}$ [$\bar{u}, \bar{u}, 0$]	$x + 1/2, \bar{x}, \bar{z}$ [u,u,0]	$x, x + 1/2, \bar{z}$ [u, $\bar{u}, 0$]	$\bar{x}, \bar{x} + 1/2, \bar{z}$ [$\bar{u}, u, 0$]
8 f m..	$x, y, 0$ [0,0,w]	$\bar{x}, \bar{y}, 0$ [0,0,w]	$\bar{y}, x, 0$ [0,0, \bar{w}]	$y, \bar{x}, 0$ [0,0, \bar{w}]
	$\bar{x} + 1/2, y + 1/2, 0$ [0,0,w]	$x + 1/2, \bar{y} + 1/2, 0$ [0,0,w]	$y + 1/2, x + 1/2, 0$ [0,0, \bar{w}]	$\bar{y} + 1/2, \bar{x} + 1/2, 0$ [0,0, \bar{w}]
4 e m.2m	$x, x + 1/2, 0$ [0,0,0]	$\bar{x}, \bar{x} + 1/2, 0$ [0,0,0]	$\bar{x} + 1/2, x, 0$ [0,0,0]	$x + 1/2, \bar{x}, 0$ [0,0,0]
4 d 2.mm	$0, 1/2, z$ [0,0,0]	$1/2, 0, z$ [0,0,0]	$1/2, 0, \bar{z}$ [0,0,0]	$0, 1/2, \bar{z}$ [0,0,0]
4 c 4'..	$0, 0, z$ [0,0,0]	$1/2, 1/2, \bar{z}$ [0,0,0]	$0, 0, \bar{z}$ [0,0,0]	$1/2, 1/2, z$ [0,0,0]
2 b m.mm	$0, 1/2, 0$ [0,0,0]	$1/2, 0, 0$ [0,0,0]		
2 a 4'/m..	$0, 0, 0$ [0,0,0]	$1/2, 1/2, 0$ [0,0,0]		

Symmetry of special projections

Along [001] p4gm1'

 $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] p2mm

 $a^* = b/2$

Origin at x,0,0

Along [110] p2mm1'

 $a^* = (-a+b)/2$

Origin at x,x,0

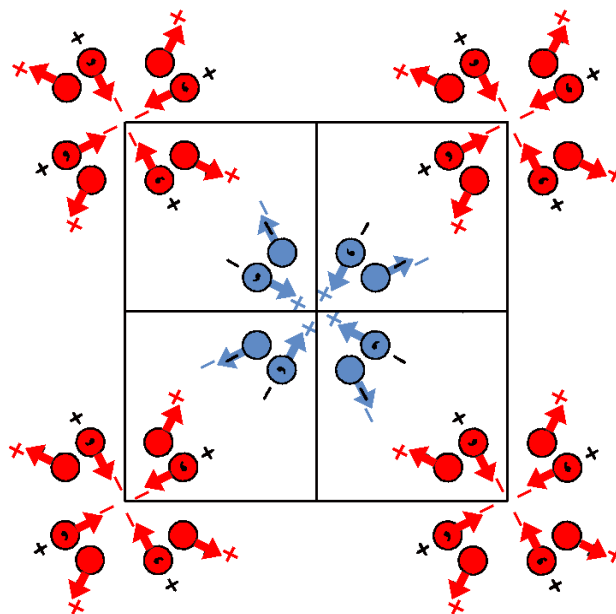
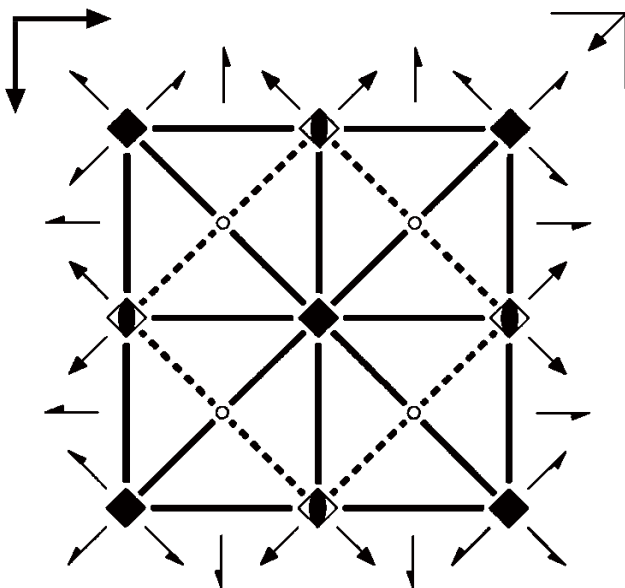
p4/nmm

4/mmm

Tetragonal/Square

No. 64.1.453

p4/n2₁/m2/m



Origin on 4mm at $-1/4, -1/4, 0$ from center (2/m)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|--|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 (1/2,1/2,0) 0,y,0
(2 _y 1/2,1/2,0) | (6) 2 (1/2,1/2,0) x,0,0
(2 _x 1/2,1/2,0) | (7) 2 (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0) | (8) 2 (1/2,1/2,0) x, \bar{x} ,0
(2 _{\bar{xy}} 1/2,1/2,0) |
| (9) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (10) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (11) $\bar{4}^+$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^+$ 1/2,1/2,0) | (12) $\bar{4}^-$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^-$ 1/2,1/2,0) |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) m x, \bar{x} ,z
(m _{xy} 0,0,0) | (16) m x,x,z
(m _{\bar{xy}} 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]		
	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]		
	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [u, \bar{v},\bar{w}]		
	(7) $y+1/2,x+1/2,\bar{z}$ [v,u, \bar{w}]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [\bar{v},\bar{u},\bar{w}]		
	(9) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [u,v,w]	(10) $x+1/2,y+1/2,\bar{z}$ [\bar{u},\bar{v},w]		
	(11) $y+1/2,\bar{x}+1/2,\bar{z}$ [\bar{v},u,w]	(12) $\bar{y}+1/2,x+1/2,\bar{z}$ [v, \bar{u},w]		
	(13) x, \bar{y},z [\bar{u},v,\bar{w}]	(14) \bar{x},y,z [u, \bar{v},\bar{w}]		
	(15) \bar{y},\bar{x},z [v,u, \bar{w}]	(16) y,x,z [\bar{v},\bar{u},\bar{w}]		
8 g ..m	x,x,z [$\bar{u},u,0$]	\bar{x},\bar{x},z [u, $\bar{u},0$]	\bar{x},x,z [$\bar{u},\bar{u},0$]	x, \bar{x},z [u,u,0]
	$\bar{x}+1/2,x+1/2,\bar{z}$ [u,u,0]	$x+1/2,\bar{x}+1/2,\bar{z}$ [$\bar{u},\bar{u},0$]	$x+1/2,x+1/2,\bar{z}$ [u, $\bar{u},0$]	$\bar{x}+1/2,\bar{x}+1/2,\bar{z}$ [$\bar{u},u,0$]
8 f .m.	0,y,z [u,0,0]	0, \bar{y},z [$\bar{u},0,0$]	$\bar{y},0,z$ [0,u,0]	y,0,z [0, $\bar{u},0$]
	1/2,y+1/2, \bar{z} [$\bar{u},0,0$]	1/2, $\bar{y}+1/2,\bar{z}$ [u,0,0]	y+1/2,1/2, \bar{z} [0,u,0]	$\bar{y}+1/2,1/2,\bar{z}$ [0, $\bar{u},0$]
8 e ..2	x,x+1/2,0 [u,u,0]	$\bar{x},\bar{x}+1/2,0$ [$\bar{u},\bar{u},0$]	$\bar{x}+1/2,x,0$ [$\bar{u},u,0$]	x+1/2, $\bar{x},0$ [u, $\bar{u},0$]
	$\bar{x}+1/2,\bar{x},0$ [u,u,0]	$x+1/2,x,0$ [$\bar{u},\bar{u},0$]	x, $\bar{x}+1/2,0$ [$\bar{u},u,0$]	$\bar{x},x+1/2,0$ [u, $\bar{u},0$]
4 d 2mm.	1/2,0,z [0,0,0]	0,1/2,z [0,0,0]	0,1/2, \bar{z} [0,0,0]	1/2,0, \bar{z} [0,0,0]
4 c ..2/m	1/4,1/4,0 [$\bar{u},u,0$]	3/4,3/4,0 [u, $\bar{u},0$]	3/4,1/4,0 [$\bar{u},\bar{u},0$]	1/4,3/4,0 [u,u,0]
2 b 4mm	0,0,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]		

Continued

No. 64.1.453

p4/nmm

2 a $\bar{4}m2$ 1/2,0,0 [0,0,0] 0,1/2,0 [0,0,0]

Symmetry of special projections

Along [001] p_4 4mm
 $a^* = (a-b)/2$ $b^* = (a+b)/2$
Origin at 0,0,z

Along [100] $p2mg$ 1'
 $a^* = b$
Origin at x,1/4,0

Along [110] $p2mm$ 1'
 $a^* = (-a+b)/2$
Origin at x,x,0

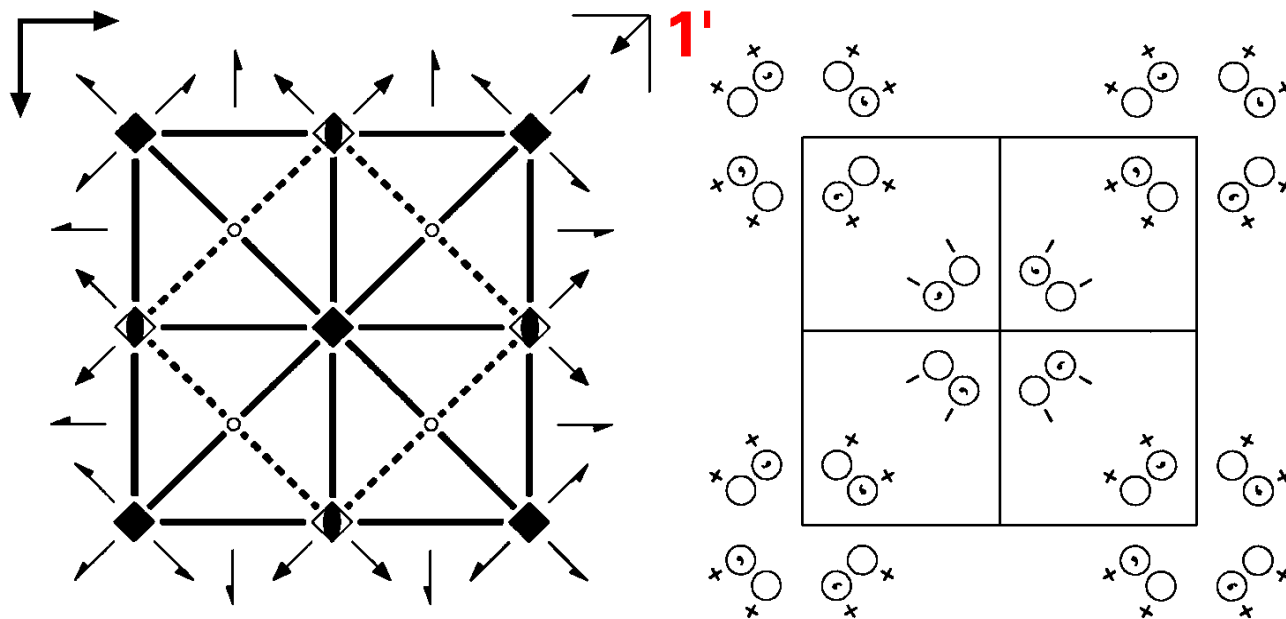
p4/nmm1'

4/mmm1'

Tetragonal/Square

No. 64.2.454

p4/n2₁/m2/m1'



Origin on 4mm1' at -1/4,-1/4,0 from center (2/m1')

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

For 1 + set

- | | | | |
|--|---|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 (1/2,1/2,0) 0,y,0
(2 _y 1/2,1/2,0) | (6) 2 (1/2,1/2,0) x,0,0
(2 _x 1/2,1/2,0) | (7) 2 (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0) | (8) 2 (1/2,1/2,0) x,x̄,0
(2 _{x̄y} 1/2,1/2,0) |
| (9) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (10) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (11) $\bar{4}^+$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^+$ 1/2,1/2,0) | (12) $\bar{4}^-$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^-$ 1/2,1/2,0) |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) m x,x̄,z
(m _{xy} 0,0,0) | (16) m x,x,z
(m _{x̄y} 0,0,0) |

For 1' + set

- | | | | |
|--|--|---|--|
| (1) 1'
(1 0,0,0)' | (2) 2' 0,0,z
(2 _z 0,0,0)' | (3) 4 ⁺ ' 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ ' 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2' (1/2,1/2,0) 0,y,0
(2 _y 1/2,1/2,0)' | (6) 2' (1/2,1/2,0) x,0,0
(2 _x 1/2,1/2,0)' | (7) 2' (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0)' | (8) 2' (1/2,1/2,0) x,x̄,0
(2 _{x̄y} 1/2,1/2,0)' |

(9) $\bar{1}$ ' $1/4, 1/4, 0$ ($\bar{1}$ $1/2, 1/2, 0$)'	(10) n' $(1/2, 1/2, 0)$ $x, y, 0$ (m_z $1/2, 1/2, 0$)'	(11) $\bar{4}^+$ ' $1/2, 0, z; 1/2, 0, 0$ ($\bar{4}_z$ $1/2, 1/2, 0$)'	(12) $\bar{4}^-$ ' $1/2, 0, z; 1/2, 0, 0$ ($\bar{4}_z^{-1}$ $1/2, 1/2, 0$)'
(13) m' $x, 0, z$ (m_y $0, 0, 0$)'	(14) m' $0, y, z$ (m_x $0, 0, 0$)'	(15) m' x, \bar{x}, z (m_{xy} $0, 0, 0$)'	(16) m' x, x, z ($m_{\bar{xy}}$ $0, 0, 0$)'

Generators selected (1); $t(1, 0, 0)$; $t(0, 1, 0)$; (2); (3); (5); (9); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	1+	1'		
16 h 11'	(1) x, y, z [0,0,0]	(2) \bar{x}, \bar{y}, z [0,0,0]		
	(3) \bar{y}, x, z [0,0,0]	(4) y, \bar{x}, z [0,0,0]		
	(5) $\bar{x} + 1/2, y + 1/2, \bar{z}$ [0,0,0]	(6) $x + 1/2, \bar{y} + 1/2, \bar{z}$ [0,0,0]		
	(7) $y + 1/2, x + 1/2, \bar{z}$ [0,0,0]	(8) $\bar{y} + 1/2, \bar{x} + 1/2, \bar{z}$ [0,0,0]		
	(9) $\bar{x} + 1/2, \bar{y} + 1/2, \bar{z}$ [0,0,0]	(10) $x + 1/2, y + 1/2, \bar{z}$ [0,0,0]		
	(11) $y + 1/2, \bar{x} + 1/2, \bar{z}$ [0,0,0]	(12) $\bar{y} + 1/2, x + 1/2, \bar{z}$ [0,0,0]		
	(13) x, \bar{y}, z [0,0,0]	(14) \bar{x}, y, z [0,0,0]		
	(15) \bar{y}, \bar{x}, z [0,0,0]	(16) y, x, z [0,0,0]		
8 g ..m1'	x, x, z [0,0,0]	\bar{x}, \bar{x}, z [0,0,0]	\bar{x}, x, z [0,0,0]	x, \bar{x}, z [0,0,0]
	$\bar{x} + 1/2, x + 1/2, \bar{z}$ [0,0,0]	$x + 1/2, \bar{x} + 1/2, \bar{z}$ [0,0,0]	$x + 1/2, x + 1/2, \bar{z}$ [0,0,0]	$\bar{x} + 1/2, \bar{x} + 1/2, \bar{z}$ [0,0,0]
8 f ..m.1'	$0, y, z$ [0,0,0]	$0, \bar{y}, z$ [0,0,0]	$\bar{y}, 0, z$ [0,0,0]	$y, 0, z$ [0,0,0]
	$1/2, y + 1/2, \bar{z}$ [0,0,0]	$1/2, \bar{y} + 1/2, \bar{z}$ [0,0,0]	$y + 1/2, 1/2, \bar{z}$ [0,0,0]	$\bar{y} + 1/2, 1/2, \bar{z}$ [0,0,0]
8 e ..21'	$x, x + 1/2, 0$ [0,0,0]	$\bar{x}, \bar{x} + 1/2, 0$ [0,0,0]	$\bar{x} + 1/2, x, 0$ [0,0,0]	$x + 1/2, \bar{x}, 0$ [0,0,0]
	$\bar{x} + 1/2, \bar{x}, 0$ [0,0,0]	$x + 1/2, x, 0$ [0,0,0]	$x, \bar{x} + 1/2, 0$ [0,0,0]	$\bar{x}, x + 1/2, 0$ [0,0,0]
4 d 2mm.1'	$1/2, 0, z$ [0,0,0]	$0, 1/2, z$ [0,0,0]	$0, 1/2, \bar{z}$ [0,0,0]	$1/2, 0, \bar{z}$ [0,0,0]

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No. 64.2.454

$p4/nmm1'$

4	c	$..2/m1'$	$1/4, 1/4, 0 [0,0,0]$	$3/4, 3/4, 0 [0,0,0]$	$3/4, 1/4, 0 [0,0,0]$	$1/4, 3/4, 0 [0,0,0]$
2	b	$4mm1'$	$0, 0, z [0,0,0]$	$1/2, 1/2, \bar{z} [0,0,0]$		
2	a	$\bar{4}m21'$	$1/2, 0, 0 [0,0,0]$	$0, 1/2, 0 [0,0,0]$		

Symmetry of special projections

Along $[001]$ $p4mm1'$
 $a^* = (a-b)/2$ $b^* = (a+b)/2$
Origin at $0, 0, z$

Along $[100]$ $p2mg1'$
 $a^* = b$
Origin at $x, 1/4, 0$

Along $[110]$ $p2mm1'$
 $a^* = (-a+b)/2$
Origin at $x, x, 0$

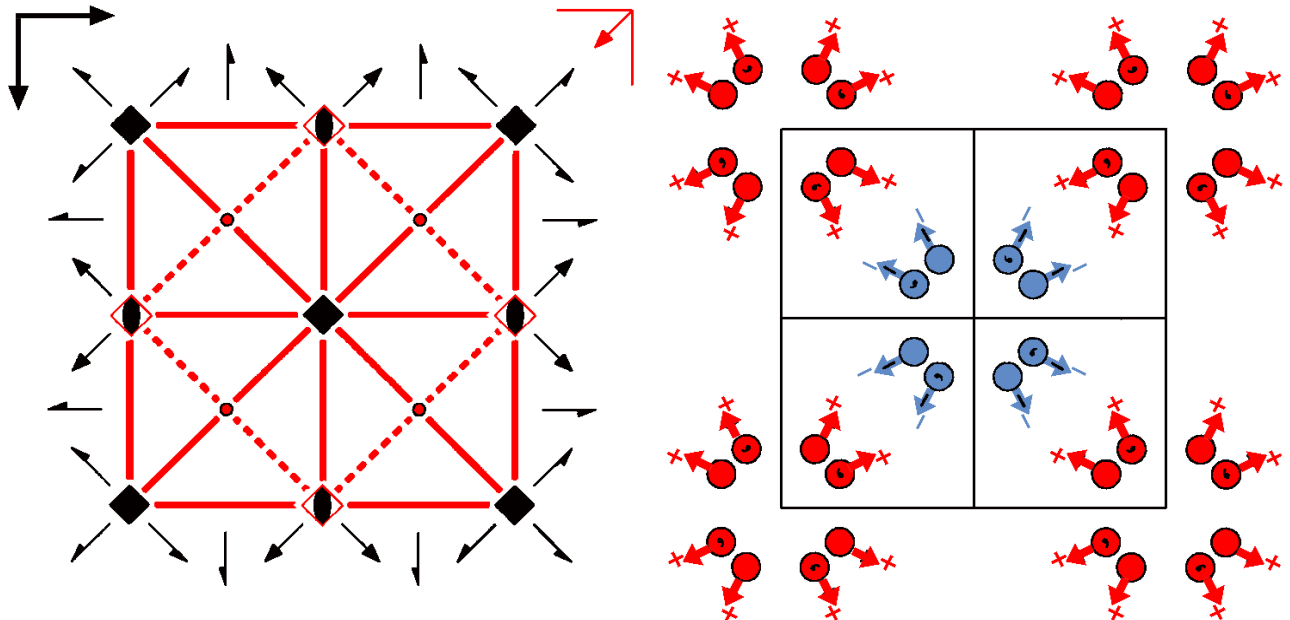
p4/n'm'm'

4/m'm'm'

Tetragonal/Square

No. 64.3.455

p4/n'2₁/m'2/m'



Origin on 4m'm' at $-1/4, -1/4, 0$ from center ($2/m'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2 (1/2,1/2,0) 0,y,0
(2 _y 1/2,1/2,0) | (6) 2 (1/2,1/2,0) x,0,0
(2 _x 1/2,1/2,0) | (7) 2 (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0) | (8) 2 (1/2,1/2,0) x,x̄,0
(2 _{x̄y} 1/2,1/2,0) |
| (9) $\bar{1}$ ' 1/4,1/4,0
($\bar{1}$ ' 1/2,1/2,0)' | (10) n' (1/2,1/2,0) x,y,0
(m _z ' 1/2,1/2,0)' | (11) $\bar{4}$ ⁺ ' 1/2,0,z; 1/2,0,0
($\bar{4}$ _z ' 1/2,1/2,0)' | (12) $\bar{4}$ ⁻ ' 1/2,0,z; 1/2,0,0
($\bar{4}$ _z ⁻¹ ' 0,0,0)' |
| (13) m' x,0,z
(m _y ' 0,0,0)' | (14) m' 0,y,z
(m _x ' 0,0,0)' | (15) m' x,x̄,z
(m _{xy} ' 0,0,0)' | (16) m' x,x,z
(m _{x̄y} ' 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates				
Multiplicity, Wyckoff letter, Site symmetry					
16 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]			
	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]			
	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [u, \bar{v},\bar{w}]			
	(7) $y+1/2,x+1/2,\bar{z}$ [v,u, \bar{w}]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [\bar{v},\bar{u},\bar{w}]			
	(9) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},\bar{v},\bar{w}]	(10) $x+1/2,y+1/2,\bar{z}$ [u,v, \bar{w}]			
	(11) $y+1/2,\bar{x}+1/2,\bar{z}$ [v, \bar{u},\bar{w}]	(12) $\bar{y}+1/2,x+1/2,\bar{z}$ [\bar{v},u,\bar{w}]			
	(13) x, \bar{y},z [u, \bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]			
	(15) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(16) y,x,z [v,u,w]			
	8 g ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	\bar{x},x,z [\bar{u},u,w]	x, \bar{x},z [u, \bar{u},w]
		$\bar{x}+1/2,x+1/2,\bar{z}$ [\bar{u},u,\bar{w}]	$x+1/2,\bar{x}+1/2,\bar{z}$ [u, \bar{u},\bar{w}]	$x+1/2,x+1/2,\bar{z}$ [u,u, \bar{w}]	$\bar{x}+1/2,\bar{x}+1/2,\bar{z}$ [\bar{u},\bar{u},\bar{w}]
	8 f .m.'	0,y,z [0,v,w]	0, \bar{y},z [0, \bar{v},w]	$\bar{y},0,z$ [$\bar{v},0,w$]	y,0,z [v,0,w]
		1/2,y+1/2, \bar{z} [0,v, \bar{w}]	1/2, $\bar{y}+1/2,\bar{z}$ [0, \bar{v},\bar{w}]	y+1/2,1/2, \bar{z} [v,0, \bar{w}]	$\bar{y}+1/2,1/2,\bar{z}$ [$\bar{v},0,\bar{w}$]
	8 e ..2	x,x+1/2,0 [u,u,0]	$\bar{x},\bar{x}+1/2,0$ [$\bar{u},\bar{u},0$]	$\bar{x}+1/2,x,0$ [$\bar{u},u,0$]	x+1/2, $\bar{x},0$ [u, $\bar{u},0$]
		$\bar{x}+1/2,\bar{x},0$ [$\bar{u},\bar{u},0$]	x+1/2,x,0 [u,u,0]	x, $\bar{x}+1/2,0$ [u, $\bar{u},0$]	$\bar{x},x+1/2,0$ [$\bar{u},u,0$]
	4 d 2m'm'	1/2,0,z [0,0,w]	0,1/2,z [0,0,w]	0,1/2, \bar{z} [0,0, \bar{w}]	1/2,0, \bar{z} [0,0, \bar{w}]
	4 c ..2/m'	1/4,1/4,0 [0,0,0]	3/4,3/4,0 [0,0,0]	3/4,1/4,0 [0,0,0]	1/4,3/4,0 [0,0,0]
2 b 4m'm'	0,0,z [0,0,w]	1/2,1/2, \bar{z} [0,0, \bar{w}]			

Continued

No. 64.3.455

$p4/n'm'm'$

2 a $\bar{4}'m'2$ $1/2,0,0 [0,0,0]$ $0,1/2,0 [0,0,0]$

Symmetry of special projections

Along $[001]$ $p4m'm'$
 $a^*=(a-b)/2$ $b^*=(a+b)/2$
Origin at $0,0,z$

Along $[100]$ $p2'm'g$
 $a^* = b$
Origin at $x,1/4,0$

Along $[110]$ $p2'm'm$
 $a^* =(-a+b)/2$
Origin at $x,x,0$

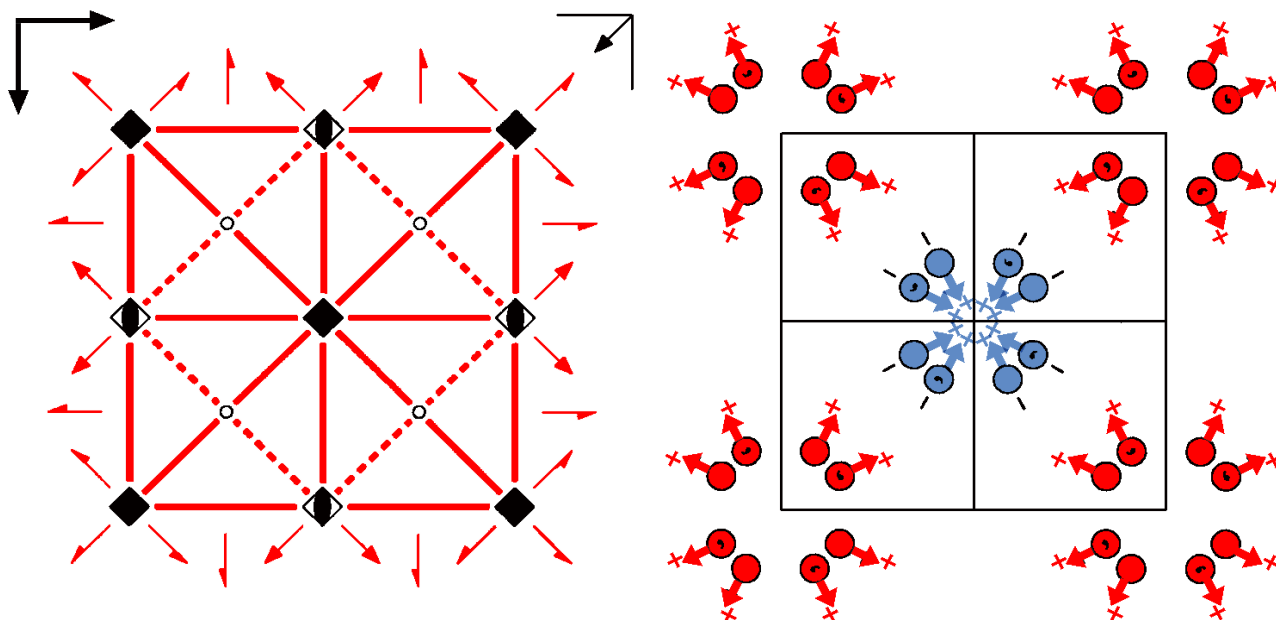
p4/nm'm'

4/mm'm'

Tetragonal/Square

No. 64.4.456

p4/n2₁'/m₂'/m'



Origin on 4m'm' at $-1/4, -1/4, 0$ from center ($2'/m'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2' (1/2,1/2,0) 0,y,0
(2 _y 1/2,1/2,0)' | (6) 2' (1/2,1/2,0) x,0,0
(2 _x 1/2,1/2,0)' | (7) 2' (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0)' | (8) 2' (1/2,1/2,0) x,x̄,0
(2 _{x̄y} 1/2,1/2,0)' |
| (9) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (10) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (11) $\bar{4}^+$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^+$ 1/2,1/2,0) | (12) $\bar{4}^-$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^-$ 1/2,1/2,0) |
| (13) m' x,0,z
(m _y)' | (14) m' 0,y,z
(m _x 0,0,0)' | (15) m' x,x̄,z
(m _{xy} 0,0,0)' | (16) m' x,x,z
(m _{x̄y} 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]		
	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]		
	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},\bar{v},w]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]		
	(7) $y+1/2,x+1/2,\bar{z}$ [\bar{v},\bar{u},w]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [v,u,w]		
	(9) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [u,v,w]	(10) $x+1/2,y+1/2,\bar{z}$ [\bar{u},\bar{v},w]		
	(11) $y+1/2,\bar{x}+1/2,\bar{z}$ [\bar{v},u,w]	(12) $\bar{y}+1/2,x+1/2,\bar{z}$ [v, \bar{u},w]		
	(13) x, \bar{y},z [\bar{u},\bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]		
	(15) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(16) y,x,z [v,u,w]		
8 g ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	\bar{x},x,z [\bar{u},u,w]	x, \bar{x},z [u, \bar{u},w]
	$\bar{x}+1/2,x+1/2,\bar{z}$ [u, \bar{u},w]	$x+1/2,\bar{x}+1/2,\bar{z}$ [\bar{u},u,w]	$x+1/2,x+1/2,\bar{z}$ [\bar{u},\bar{u},w]	$\bar{x}+1/2,\bar{x}+1/2,\bar{z}$ [u,u,w]
8 f .m'	0,y,z [0,v,w]	0, \bar{y},z [0, \bar{v},w]	$\bar{y},0,z$ [$\bar{v},0,w$]	y,0,z [v,0,w]
	1/2,y+1/2, \bar{z} [0, \bar{v},w]	1/2, $\bar{y}+1/2,\bar{z}$ [0,v,w]	y+1/2,1/2, \bar{z} [$\bar{v},0,w$]	$\bar{y}+1/2,1/2,\bar{z}$ [v,0,w]
8 e ..2'	x,x+1/2,0 [\bar{u},u,w]	$\bar{x},\bar{x}+1/2,0$ [u, \bar{u},w]	$\bar{x}+1/2,x,0$ [\bar{u},\bar{u},w]	x+1/2, $\bar{x},0$ [u,u,w]
	$\bar{x}+1/2,\bar{x},0$ [\bar{u},u,w]	x+1/2,x,0 [u, \bar{u},w]	x, $\bar{x}+1/2,0$ [\bar{u},\bar{u},w]	$\bar{x},x+1/2,0$ [u,u,w]
4 d 2m'm'	1/2,0,z [0,0,w]	0,1/2,z [0,0,w]	0,1/2, \bar{z} [0,0,w]	1/2,0, \bar{z} [0,0,w]
4 c ..2'/m'	1/4,1/4,0 [u,u,w]	3/4,3/4,0 [\bar{u},\bar{u},w]	3/4,1/4,0 [\bar{u},u,w]	1/4,3/4,0 [u, \bar{u},w]
2 b 4m'm'	0,0,z [0,0,w]	1/2,1/2, \bar{z} [0,0,w]		

Continued

No. 64.4.456

$p4/nm'm'$

2 a $\bar{4}m'2'$ $1/2,0,0 [0,0,w]$ $0,1/2,0 [0,0,w]$

Symmetry of special projections

Along [001] $p_4m'm'$
 $a^*=(a-b)/2$ $b^*=(a+b)/2$
Origin at $0,0,z$

Along [100] $p2'm'g$
 $a^* = b$
Origin at $x,1/4,0$

Along [110] $p2'm'm$
 $a^* =(-a+b)/2$
Origin at $x,x,0$

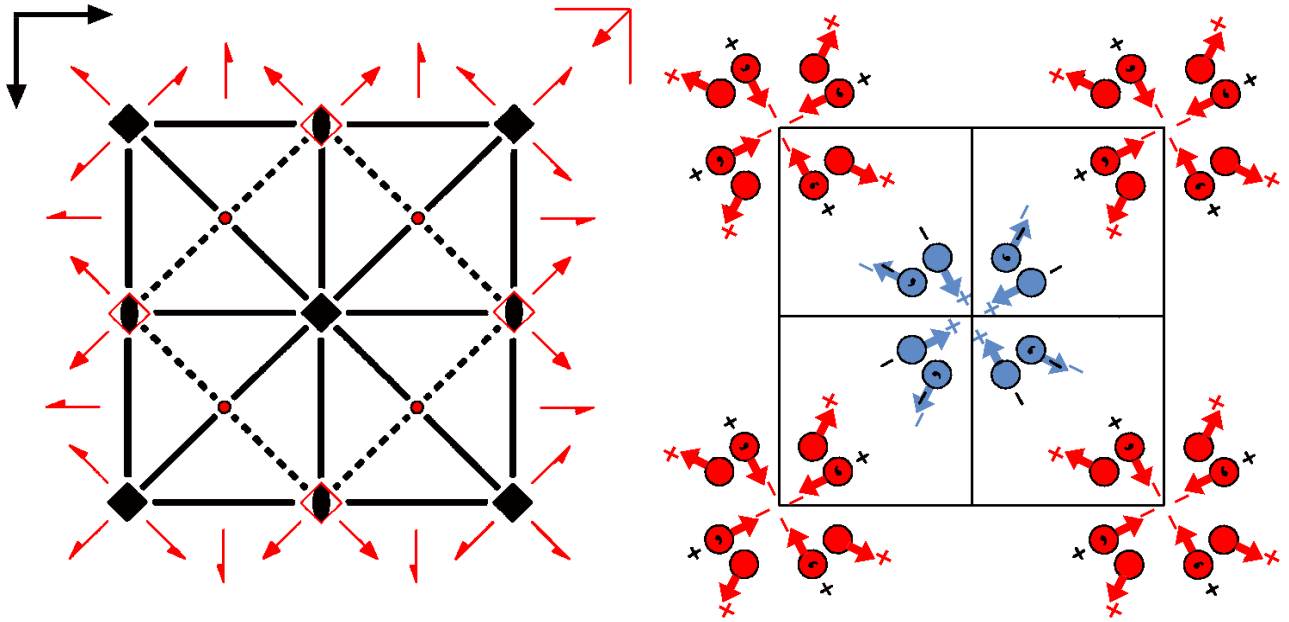
p4/n'mm

4/m'mm

Tetragonal/Square

No. 64.5.457

p4/n'2₁'/m2'/m



Origin on 4mm at $-1/4, -1/4, 0$ from center ($2'/m$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|--|---|--|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) |
| (5) 2' (1/2,1/2,0) 0,y,0
(2 _y 1/2,1/2,0)' | (6) 2' (1/2,1/2,0) x,0,0
(2 _x 1/2,1/2,0)' | (7) 2' (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0)' | (8) 2' (1/2,1/2,0) x,x̄,0
(2 _{x̄y} 1/2,1/2,0)' |
| (9) 1̄' 1/4,1/4,0
(1̄ 1/2,1/2,0)' | (10) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' | (11) 4̄ ⁺ 1/2,0,z; 1/2,0,0
(4̄ _z 1/2,1/2,0)' | (12) 4̄ ⁻ 1/2,0,z; 1/2,0,0
(4̄ _z ⁻¹ 1/2,1/2,0)' |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) m x,x̄,z
(m _{xy} 0,0,0) | (16) m x,x,z
(m _{x̄y} 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]		
	(3) \bar{y},x,z [\bar{v},u,w]	(4) y, \bar{x},z [v, \bar{u},w]		
	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},\bar{v},w]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]		
	(7) $y+1/2,x+1/2,\bar{z}$ [\bar{v},\bar{u},w]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [v,u,w]		
	(9) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},\bar{v},\bar{w}]	(10) $x+1/2,y+1/2,\bar{z}$ [u,v, \bar{w}]		
	(11) $y+1/2,\bar{x}+1/2,\bar{z}$ [v, \bar{u},\bar{w}]	(12) $\bar{y}+1/2,x+1/2,\bar{z}$ [\bar{v},u,\bar{w}]		
	(13) x, \bar{y},z [\bar{u},v,\bar{w}]	(14) \bar{x},y,z [u, \bar{v},\bar{w}]		
	(15) \bar{y},\bar{x},z [v,u, \bar{w}]	(16) y,x,z [\bar{v},\bar{u},\bar{w}]		
8 g ..m	x,x,z [$\bar{u},u,0$]	\bar{x},\bar{x},z [u, $\bar{u},0$]	\bar{x},x,z [$\bar{u},\bar{u},0$]	x, \bar{x},z [u,u,0]
	$\bar{x}+1/2,x+1/2,\bar{z}$ [$\bar{u},\bar{u},0$]	$x+1/2,\bar{x}+1/2,\bar{z}$ [u,u,0]	$x+1/2,x+1/2,\bar{z}$ [$\bar{u},u,0$]	$\bar{x}+1/2,\bar{x}+1/2,\bar{z}$ [u, $\bar{u},0$]
8 f .m.	0,y,z [u,0,0]	0, \bar{y},z [$\bar{u},0,0$]	$\bar{y},0,z$ [0,u,0]	y,0, z [0, $\bar{u},0$]
	1/2,y+1/2, \bar{z} [u,0,0]	1/2, $\bar{y}+1/2,\bar{z}$ [$\bar{u},0,0$]	$y+1/2,1/2,\bar{z}$ [0, $\bar{u},0$]	$\bar{y}+1/2,1/2,\bar{z}$ [0,u,0]
8 e ..2'	x,x+1/2,0 [\bar{u},u,w]	$\bar{x},\bar{x}+1/2,0$ [u, \bar{u},w]	$\bar{x}+1/2,x,0$ [\bar{u},\bar{u},w]	x+1/2, $\bar{x},0$ [u,u,w]
	$\bar{x}+1/2,\bar{x},0$ [u, \bar{u},\bar{w}]	$x+1/2,x,0$ [\bar{u},u,\bar{w}]	x, $\bar{x}+1/2,0$ [u,u, \bar{w}]	$\bar{x},x+1/2,0$ [\bar{u},\bar{u},\bar{w}]
4 d 2mm.	1/2,0,z [0,0,0]	0,1/2,z [0,0,0]	0,1/2, \bar{z} [0,0,0]	1/2,0, \bar{z} [0,0,0]
4 c ..2'/m	1/4,1/4,0 [0,0,0]	3/4,3/4,0 [0,0,0]	3/4,1/4,0 [0,0,0]	1/4,3/4,0 [0,0,0]
2 b 4mm	0,0,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]		

Continued

No. 64.5.457

$p4/n'mm$

2 a $\bar{4}'m2'$ $1/2,0,0 [0,0,0]$ $0,1/2,0 [0,0,0]$

Symmetry of special projections

Along [001] p_4 $4mm$
 $a^* = (a-b)/2$ $b^* = (a+b)/2$
Origin at $0,0,z$

Along [100] $p2mg1'$
 $a^* = b$
Origin at $x,1/4,0$

Along [110] $p2mm1'$
 $a^* = (-a+b)/2$
Origin at $x,x,0$

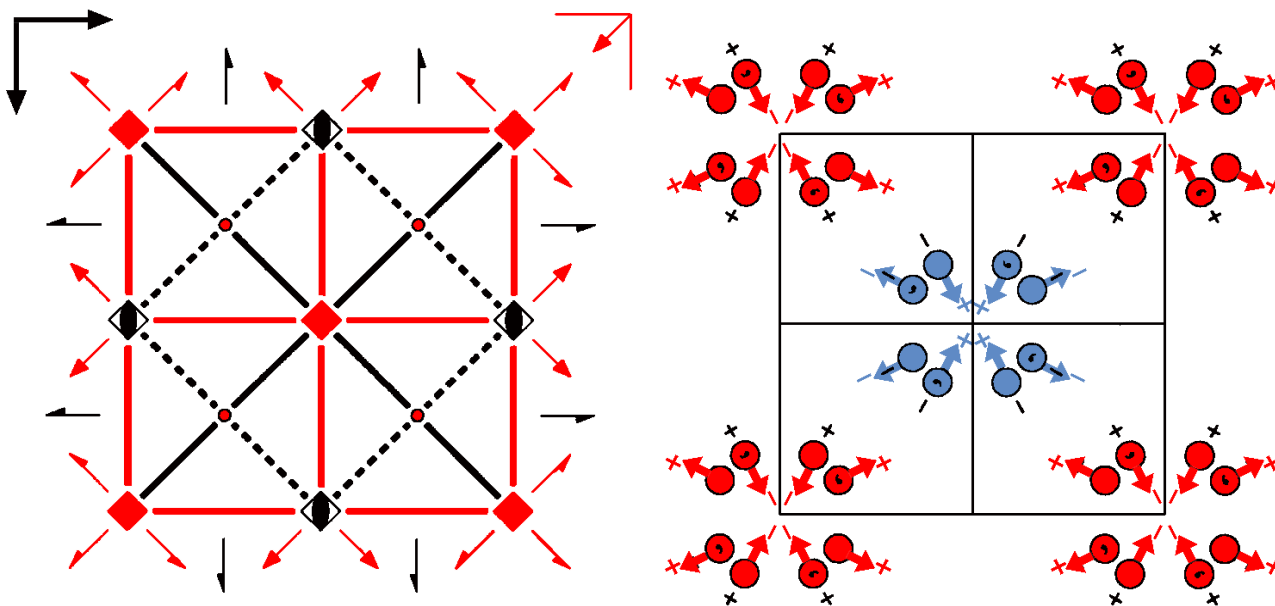
p4'/n'm'm

4'/m'm'm

Tetragonal/Square

No. 64.6.458

p4'/n'2₁/m'2'/m



Origin on 4m'm at $-1/4, -1/4, 0$ from center ($2'/m$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|--|---|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2 (1/2,1/2,0) 0,y,0
(2 _y 1/2,1/2,0) | (6) 2 (1/2,1/2,0) x,0,0
(2 _x 1/2,1/2,0) | (7) 2' (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0)' | (8) 2' (1/2,1/2,0) x,x̄,0
(2 _{xy} ⁻¹ 1/2,1/2,0)' |
| (9) 1̄ 1/4,1/4,0
(1̄ 1/2,1/2,0)' | (10) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' | (11) 4 ⁺ 1/2,0,z; 1/2,0,0
(4 _z ⁺ 1/2,1/2,0) | (12) 4 ⁻ 1/2,0,z; 1/2,0,0
(4 _z ⁻¹ 1/2,1/2,0) |
| (13) m' x,0,z
(m _y 0,0,0)' | (14) m' 0,y,z
(m _x 0,0,0)' | (15) m x,x̄,z
(m _{xy} 0,0,0) | (16) m x,x,z
(m _{xy} ⁻¹ 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]		
	(3) \bar{y},x,z [v, \bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]		
	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [u, \bar{v},\bar{w}]		
	(7) $y+1/2,x+1/2,\bar{z}$ [\bar{v},\bar{u},w]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [v,u,w]		
	(9) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},\bar{v},\bar{w}]	(10) $x+1/2,y+1/2,\bar{z}$ [u,v, \bar{w}]		
	(11) $y+1/2,\bar{x}+1/2,\bar{z}$ [\bar{v},u,w]	(12) $\bar{y}+1/2,x+1/2,\bar{z}$ [v, \bar{u},w]		
	(13) x, \bar{y},z [u, \bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]		
	(15) \bar{y},\bar{x},z [v,u, \bar{w}]	(16) y,x,z [\bar{v},\bar{u},\bar{w}]		
8 g ..m	x,x,z [$\bar{u},u,0$]	\bar{x},\bar{x},z [u, $\bar{u},0$]	\bar{x},x,z [u,u,0]	x, \bar{x},z [$\bar{u},\bar{u},0$]
	$\bar{x}+1/2,x+1/2,\bar{z}$ [u,u,0]	$x+1/2,\bar{x}+1/2,\bar{z}$ [$\bar{u},\bar{u},0$]	$x+1/2,x+1/2,\bar{z}$ [$\bar{u},u,0$]	$\bar{x}+1/2,\bar{x}+1/2,\bar{z}$ [u, $\bar{u},0$]
8 f .m'	0,y,z [0,v,w]	0, \bar{y},z [0, \bar{v},w]	$\bar{y},0,z$ [v,0, \bar{w}]	y,0,z [$\bar{v},0,\bar{w}$]
	1/2,y+1/2, \bar{z} [0,v, \bar{w}]	1/2, $\bar{y}+1/2,\bar{z}$ [0, \bar{v},\bar{w}]	$y+1/2,1/2,\bar{z}$ [$\bar{v},0,w$]	$\bar{y}+1/2,1/2,\bar{z}$ [v,0,w]
8 e ..2'	x,x+1/2,0 [\bar{u},u,w]	$\bar{x},\bar{x}+1/2,0$ [u, \bar{u},w]	$\bar{x}+1/2,x,0$ [u,u, \bar{w}]	$x+1/2,\bar{x},0$ [\bar{u},\bar{u},\bar{w}]
	$\bar{x}+1/2,\bar{x},0$ [u, \bar{u},\bar{w}]	$x+1/2,x,0$ [\bar{u},u,\bar{w}]	x, $\bar{x}+1/2,0$ [\bar{u},\bar{u},w]	$\bar{x},x+1/2,0$ [u,u,w]
4 d 2m'm'	1/2,0,z [0,0,w]	0,1/2,z [0,0, \bar{w}]	0,1/2, \bar{z} [0,0, \bar{w}]	1/2,0, \bar{z} [0,0,w]
4 c ..2'/m	1/4,1/4,0 [0,0,0]	3/4,3/4,0 [0,0,0]	3/4,1/4,0 [0,0,0]	1/4,3/4,0 [0,0,0]
2 b 4'm'm	0,0,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]		

Continued

No. 64.6.458

$p4/n'm'm$

2 a $\bar{4}m'2'$ $1/2,0,0$ $[0,0,w]$ $0,1/2,0$ $[0,0,\bar{w}]$

Symmetry of special projections

Along $[001]$ $p4'mm'$
 $a^*=(a-b)/2$ $b^*=(a+b)/2$
Origin at $0,0,z$

Along $[100]$ $p2'mg'$
 $a^* = b$
Origin at $x,1/4,0$

Along $[110]$ $p2mm1'$
 $a^* =(-a+b)/2$
Origin at $x,x,0$

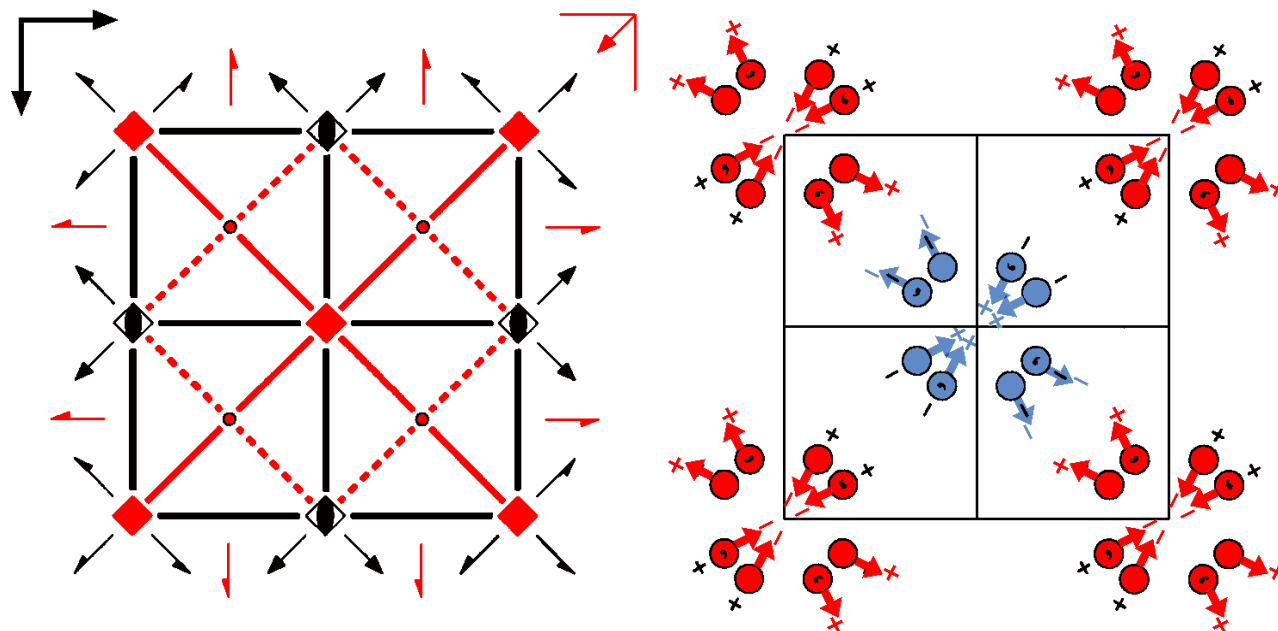
p4'/n'mm'

4'/m'mm'

Tetragonal/Square

No. 64.7.459

p4'/n'2₁'/m2/m'



Origin on 4'mm' at $-1/4, -1/4, 0$ from center ($2/m'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|--|---|--|---|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2' (1/2,1/2,0) 0,y,0
(2 _y 1/2,1/2,0)' | (6) 2' (1/2,1/2,0) x,0,0
(2 _x 1/2,1/2,0)' | (7) 2 (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0) | (8) 2 (1/2,1/2,0) x,x̄,0
(2 _{x̄y} 1/2,1/2,0) |
| (9) 1̄ 1/4,1/4,0
(1̄ 1/2,1/2,0)' | (10) n' (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0)' | (11) 4 ⁺ 1/2,0,z; 1/2,0,0
(4 _z ⁺ 1/2,1/2,0) | (12) 4 ⁻ 1/2,0,z; 1/2,0,0
(4 _z ⁻¹ 1/2,1/2,0) |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) m' x,x̄,z
(m _{xy} 0,0,0)' | (16) m' x,x,z
(m _{x̄y} 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 h 1	(1) x, y, z [u,v,w]	(2) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]		
	(3) \bar{y}, x, z [v, \bar{u} , \bar{w}]	(4) y, \bar{x}, z [\bar{v}, u, \bar{w}]		
	(5) $\bar{x} + 1/2, y + 1/2, \bar{z}$ [u, \bar{v}, w]	(6) $x + 1/2, \bar{y} + 1/2, \bar{z}$ [\bar{u}, v, w]		
	(7) $y + 1/2, x + 1/2, \bar{z}$ [v,u, \bar{w}]	(8) $\bar{y} + 1/2, \bar{x} + 1/2, \bar{z}$ [$\bar{v}, \bar{u}, \bar{w}$]		
	(9) $\bar{x} + 1/2, \bar{y} + 1/2, \bar{z}$ [$\bar{u}, \bar{v}, \bar{w}$]	(10) $x + 1/2, y + 1/2, \bar{z}$ [u,v, \bar{w}]		
	(11) $y + 1/2, \bar{x} + 1/2, \bar{z}$ [\bar{v}, u, w]	(12) $\bar{y} + 1/2, x + 1/2, \bar{z}$ [v, \bar{u}, w]		
	(13) x, \bar{y}, z [\bar{u}, v, \bar{w}]	(14) \bar{x}, y, z [u, \bar{v}, \bar{w}]		
	(15) \bar{y}, \bar{x}, z [\bar{v}, \bar{u}, w]	(16) y, x, z [v,u,w]		
8 g ..m'	x, x, z [u,u,w]	\bar{x}, \bar{x}, z [\bar{u}, \bar{u}, w]	\bar{x}, x, z [u, \bar{u}, \bar{w}]	x, \bar{x}, z [\bar{u}, u, \bar{w}]
	$\bar{x} + 1/2, x + 1/2, \bar{z}$ [u, \bar{u}, w]	$x + 1/2, \bar{x} + 1/2, \bar{z}$ [\bar{u}, u, w]	$x + 1/2, x + 1/2, \bar{z}$ [u,u, \bar{w}]	$\bar{x} + 1/2, \bar{x} + 1/2, \bar{z}$ [$\bar{u}, \bar{u}, \bar{w}$]
8 f .m.	$0, y, z$ [u,0,0]	$0, \bar{y}, z$ [$\bar{u}, 0, 0$]	$\bar{y}, 0, z$ [0, $\bar{u}, 0$]	$y, 0, z$ [0,u,0]
	$1/2, y + 1/2, \bar{z}$ [u,0,0]	$1/2, \bar{y} + 1/2, \bar{z}$ [$\bar{u}, 0, 0$]	$y + 1/2, 1/2, \bar{z}$ [0,u,0]	$\bar{y} + 1/2, 1/2, \bar{z}$ [0, $\bar{u}, 0$]
8 e ..2	$x, x + 1/2, 0$ [u,u,0]	$\bar{x}, \bar{x} + 1/2, 0$ [$\bar{u}, \bar{u}, 0$]	$\bar{x} + 1/2, x, 0$ [u, $\bar{u}, 0$]	$x + 1/2, \bar{x}, 0$ [$\bar{u}, u, 0$]
	$\bar{x} + 1/2, \bar{x}, 0$ [$\bar{u}, \bar{u}, 0$]	$x + 1/2, x, 0$ [u,u,0]	$x, \bar{x} + 1/2, 0$ [$\bar{u}, u, 0$]	$\bar{x}, x + 1/2, 0$ [u, $\bar{u}, 0$]
4 d 2mm.	$1/2, 0, z$ [0,0,0]	$0, 1/2, z$ [0,0,0]	$0, 1/2, \bar{z}$ [0,0,0]	$1/2, 0, \bar{z}$ [0,0,0]
4 c ..2/m'	$1/4, 1/4, 0$ [0,0,0]	$3/4, 3/4, 0$ [0,0,0]	$3/4, 1/4, 0$ [0,0,0]	$1/4, 3/4, 0$ [0,0,0]
2 b 4'mm	$0, 0, z$ [0,0,0]	$1/2, 1/2, \bar{z}$ [0,0,0]		

Continued

No. 64.7.459

$p4'/n'mm'$

2 a $\bar{4}m2$ $1/2,0,0 [0,0,0]$ $0,1/2,0 [0,0,0]$

Symmetry of special projections

Along [001] $p4'm'm$
 $a^*=(a-b)/2$ $b^*=(a+b)/2$
Origin at $0,0,z$

Along [100] $p2mg1'$
 $a^* = b$
Origin at $x,1/4,0$

Along [110] $p2'mm'$
 $a^* =(-a+b)/2$
Origin at $x,x,0$

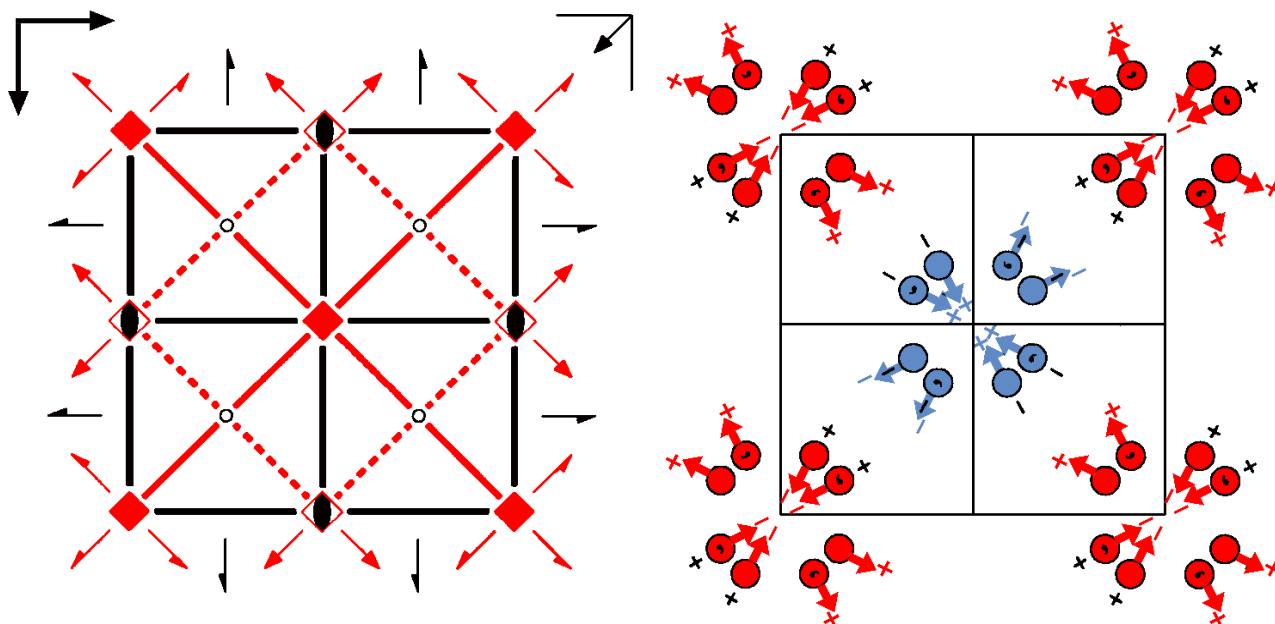
p4'/hmm'

4'/mmm'

Tetragonal/Square

No. 64.8.460

p4'/n2₁/m2'/m'



Origin on 4'mm' at $-1/4, -1/4, 0$ from center ($2'/m'$)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|--|---|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0)' | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0)' |
| (5) 2 (1/2,1/2,0) 0,y,0
(2 _y 1/2,1/2,0) | (6) 2 (1/2,1/2,0) x,0,0
(2 _x 1/2,1/2,0) | (7) 2' (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0)' | (8) 2' (1/2,1/2,0) x,̄x,0
(2 _{̄xy} 1/2,1/2,0)' |
| (9) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (10) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (11) $\bar{4}^+$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^+$ 1/2,1/2,0)' | (12) $\bar{4}^-$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^-$ 1/2,1/2,0)' |
| (13) m x,0,z
(m _y 0,0,0) | (14) m 0,y,z
(m _x 0,0,0) | (15) m' x,̄x,z
(m _{xy} 0,0,0)' | (16) m' x,x,z
(m _{̄xy} 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]		
	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]		
	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [\bar{u},v,\bar{w}]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [u,\bar{v},\bar{w}]		
	(7) $y+1/2,x+1/2,\bar{z}$ [\bar{v},\bar{u},w]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [v,u,w]		
	(9) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [u,v,w]	(10) $x+1/2,y+1/2,\bar{z}$ [\bar{u},\bar{v},w]		
	(11) $y+1/2,\bar{x}+1/2,\bar{z}$ [v,\bar{u},\bar{w}]	(12) $\bar{y}+1/2,x+1/2,\bar{z}$ [\bar{v},u,\bar{w}]		
	(13) x, \bar{y},z [\bar{u},v,\bar{w}]	(14) \bar{x},y,z [u,\bar{v},\bar{w}]		
	(15) \bar{y},\bar{x},z [\bar{v},\bar{u},w]	(16) y,x,z [v,u,w]		
8 g ..m'	x,x,z [u,u,w]	\bar{x},\bar{x},z [\bar{u},\bar{u},w]	\bar{x},x,z [u,\bar{u},\bar{w}]	x, \bar{x},z [\bar{u},u,\bar{w}]
	$\bar{x}+1/2,x+1/2,\bar{z}$ [\bar{u},u,\bar{w}]	$x+1/2,\bar{x}+1/2,\bar{z}$ [u,\bar{u},\bar{w}]	$x+1/2,x+1/2,\bar{z}$ [\bar{u},\bar{u},w]	$\bar{x}+1/2,\bar{x}+1/2,\bar{z}$ [u,u,w]
8 f .m.	0,y,z [u,0,0]	0, \bar{y},z [$\bar{u},0,0$]	$\bar{y},0,z$ [0, $\bar{u},0$]	y,0,z [0,u,0]
	1/2,y+1/2, \bar{z} [$\bar{u},0,0$]	1/2, $\bar{y}+1/2,\bar{z}$ [u,0,0]	y+1/2,1/2, \bar{z} [0, $\bar{u},0$]	$\bar{y}+1/2,1/2,\bar{z}$ [0,u,0]
8 e ..2'	x,x+1/2,0 [\bar{u},u,w]	$\bar{x},\bar{x}+1/2,0$ [u,\bar{u},w]	$\bar{x}+1/2,x,0$ [u,u,\bar{w}]	x+1/2, $\bar{x},0$ [\bar{u},\bar{u},\bar{w}]
	$\bar{x}+1/2,\bar{x},0$ [\bar{u},u,w]	x+1/2,x,0 [u,\bar{u},w]	x, $\bar{x}+1/2,0$ [u,u,\bar{w}]	$\bar{x},x+1/2,0$ [\bar{u},\bar{u},\bar{w}]
4 d 2mm.	1/2,0,z [0,0,0]	0,1/2,z [0,0,0]	0,1/2, \bar{z} [0,0,0]	1/2,0, \bar{z} [0,0,0]
4 c ..2'/m'	1/4,1/4,0 [u,u,w]	3/4,3/4,0 [\bar{u},\bar{u},w]	3/4,1/4,0 [u, \bar{u},\bar{w}]	1/4,3/4,0 [\bar{u},u,\bar{w}]
2 b 4'mm	0,0,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]		

Continued

No. 64.8.460

$p4'/nmm'$

2 a $\bar{4}'m2'$ $1/2,0,0 [0,0,0]$ $0,1/2,0 [0,0,0]$

Symmetry of special projections

Along [001] p_4' $4mm$
 $a^* = (a-b)/2$ $b^* = (a+b)/2$
Origin at $1/2,0,z$

Along [100] $p2mg1'$
 $a^* = b$
Origin at $x,1/4,0$

Along [110] $p2mm$
 $a^* = (-a+b)/2$
Origin at $x,x,0$

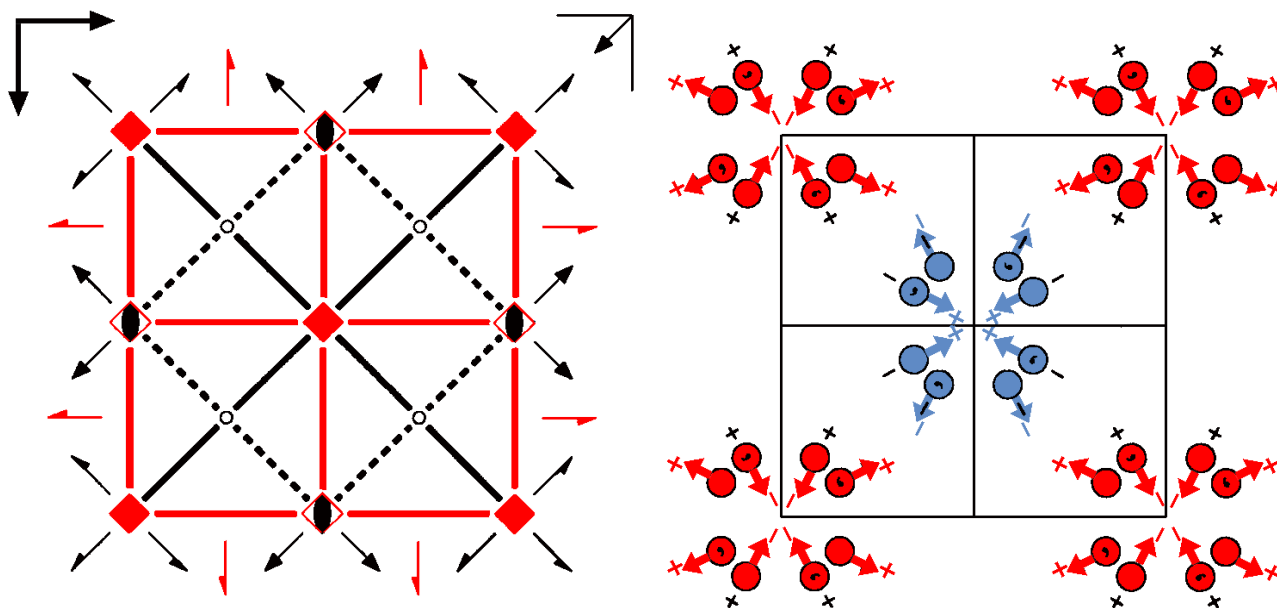
p4'/nm'm

4'/mm'm

Tetragonal/Square

No. 64.9.461

p4'/n2₁'/m'2/m



Origin on 4'm'm at $-1/4, -1/4, 0$ from center (2/m)

Asymmetric unit $0 \leq x \leq 1/2; 0 \leq y \leq 1/2; y \leq 1/2 - x; 0 \leq z$

Symmetry operations

- | | | | |
|--|--|---|--|
| (1) 1
(1 0,0,0) | (2) 2 0,0,z
(2 _z 0,0,0) | (3) 4 ⁺ 0,0,z
(4 _z 0,0,0) ⁺ | (4) 4 ⁻ 0,0,z
(4 _z ⁻¹ 0,0,0) ⁻ |
| (5) 2' (1/2,1/2,0) 0,y,0
(2 _y 1/2,1/2,0) ['] | (6) 2' (1/2,1/2,0) x,0,0
(2 _x 1/2,1/2,0) ['] | (7) 2 (1/2,1/2,0) x,x,0
(2 _{xy} 1/2,1/2,0) | (8) 2 (1/2,1/2,0) x,x̄,0
(2 _{xȳ} 1/2,1/2,0) |
| (9) $\bar{1}$ 1/4,1/4,0
($\bar{1}$ 1/2,1/2,0) | (10) n (1/2,1/2,0) x,y,0
(m _z 1/2,1/2,0) | (11) $\bar{4}^+$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^+$ 1/2,1/2,0) ⁺ | (12) $\bar{4}^-$ 1/2,0,z; 1/2,0,0
($\bar{4}_z^-$ 1/2,1/2,0) ⁻ |
| (13) m' x,0,z
(m _y 0,0,0) ['] | (14) m' 0,y,z
(m _x 0,0,0) ['] | (15) m x,x̄,z
(m _{xy} 0,0,0) | (16) m x,x,z
(m _{xȳ} 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (3); (5); (9)

Positions

	Coordinates			
Multiplicity, Wyckoff letter, Site symmetry				
16 h 1	(1) x,y,z [u,v,w]	(2) \bar{x},\bar{y},z [\bar{u},\bar{v},w]		
	(3) \bar{y},x,z [v,\bar{u},\bar{w}]	(4) y, \bar{x},z [\bar{v},u,\bar{w}]		
	(5) $\bar{x}+1/2,y+1/2,\bar{z}$ [u,\bar{v},w]	(6) $x+1/2,\bar{y}+1/2,\bar{z}$ [\bar{u},v,w]		
	(7) $y+1/2,x+1/2,\bar{z}$ [v,u,\bar{w}]	(8) $\bar{y}+1/2,\bar{x}+1/2,\bar{z}$ [\bar{v},\bar{u},\bar{w}]		
	(9) $\bar{x}+1/2,\bar{y}+1/2,\bar{z}$ [u,v,w]	(10) $x+1/2,y+1/2,\bar{z}$ [\bar{u},\bar{v},w]		
	(11) $y+1/2,\bar{x}+1/2,\bar{z}$ [v,\bar{u},\bar{w}]	(12) $\bar{y}+1/2,x+1/2,\bar{z}$ [\bar{v},u,\bar{w}]		
	(13) x, \bar{y},z [u,\bar{v},w]	(14) \bar{x},y,z [\bar{u},v,w]		
	(15) \bar{y},\bar{x},z [v,u,\bar{w}]	(16) y,x,z [\bar{v},\bar{u},\bar{w}]		
8 g ..m	x,x,z [$\bar{u},u,0$]	\bar{x},\bar{x},z [$u,\bar{u},0$]	\bar{x},x,z [$u,u,0$]	x, \bar{x},z [$\bar{u},\bar{u},0$]
	$\bar{x}+1/2,x+1/2,\bar{z}$ [$\bar{u},\bar{u},0$]	$x+1/2,\bar{x}+1/2,\bar{z}$ [$u,u,0$]	$x+1/2,x+1/2,\bar{z}$ [$u,\bar{u},0$]	$\bar{x}+1/2,\bar{x}+1/2,\bar{z}$ [$\bar{u},u,0$]
8 f .m'	0,y,z [0,v,w]	0, \bar{y},z [0, \bar{v},w]	$\bar{y},0,z$ [v,0, \bar{w}]	y,0,z [$\bar{v},0,\bar{w}$]
	1/2,y+1/2, \bar{z} [0, \bar{v},w]	1/2, $\bar{y}+1/2,\bar{z}$ [0,v,w]	y+1/2,1/2, \bar{z} [v,0, \bar{w}]	$\bar{y}+1/2,1/2,\bar{z}$ [$\bar{v},0,\bar{w}$]
8 e ..2	x,x+1/2,0 [u,u,0]	$\bar{x},\bar{x}+1/2,0$ [$\bar{u},\bar{u},0$]	$\bar{x}+1/2,x,0$ [u, $\bar{u},0$]	x+1/2, $\bar{x},0$ [$\bar{u},u,0$]
	$\bar{x}+1/2,\bar{x},0$ [u,u,0]	$x+1/2,x,0$ [$\bar{u},\bar{u},0$]	x, $\bar{x}+1/2,0$ [u, $\bar{u},0$]	$\bar{x},x+1/2,0$ [$\bar{u},u,0$]
4 d 2m'm'	1/2,0,z [0,0,w]	0,1/2,z [0,0, \bar{w}]	0,1/2, \bar{z} [0,0,w]	1/2,0, \bar{z} [0,0, \bar{w}]
4 c ..2/m	1/4,1/4,0 [$\bar{u},u,0$]	3/4,3/4,0 [u, $\bar{u},0$]	3/4,1/4,0 [u,u,0]	1/4,3/4,0 [$\bar{u},\bar{u},0$]
2 b 4'm'm	0,0,z [0,0,0]	1/2,1/2, \bar{z} [0,0,0]		

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No. 64.9.461

$p4/nm'm$

2 a $\bar{4}m'2$ $1/2,0,0 [0,0,0]$ $0,1/2,0 [0,0,0]$

Symmetry of special projections

Along $[001]$ p_4m'
 $a^*=(a-b)/2$ $b^*=(a+b)/2$
Origin at $1/2,0,z$

Along $[100]$ $p2mg$
 $a^* = b$
Origin at $x,1/4,0$

Along $[110]$ $p2mm1'$
 $a^* =(-a+b)/2$
Origin at $x,x,0$

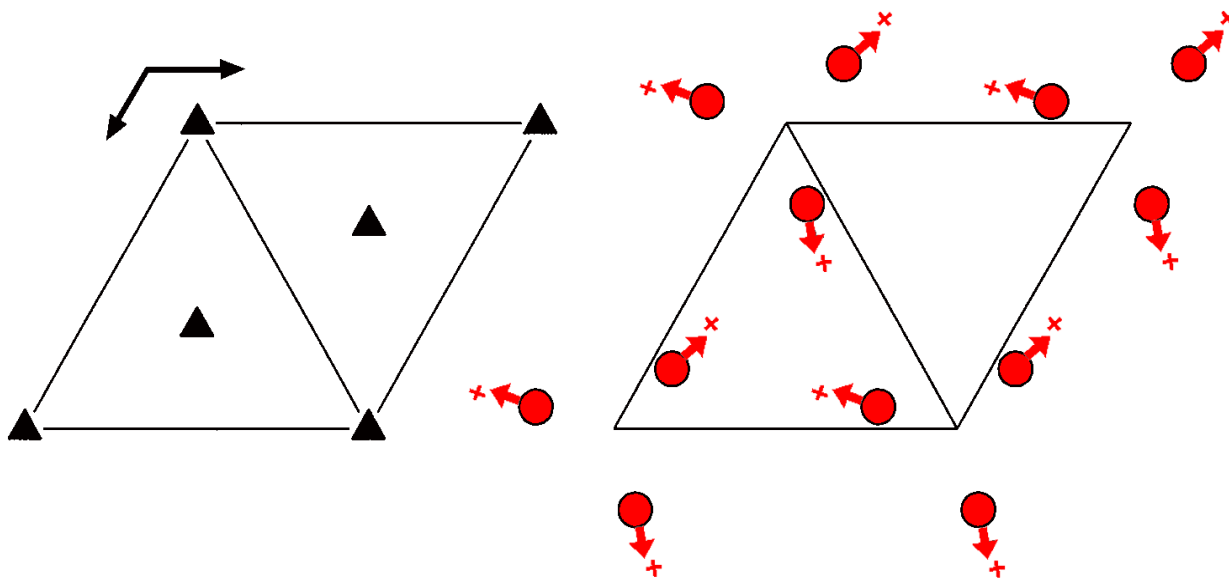
p3

3

Trigonal/Hexagonal

No. 65.1.462

p3



Origin on 3

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq (1 + y)/2;$

$$y \leq \min(1 - x, (1 + x)/2)$$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/3,2/3; 0,1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $3^+ 0,0,z$
(3_z |0,0,0)

(3) $3^- 0,0,z$
(3_z^{-1} |0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2)

Positions

	Coordinates		
Wyckoff letter, Site symmetry			
3 d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
1 c 3..	$2/3,1/3,z [0,0,w]$		
1 b 3..	$1/3,2/3,z [0,0,w]$		
1 a 3..	$0,0,z [0,0,w]$		

Symmetry of special projections

Along [001] $p3$
 $a^* = a \quad b^* = b$
 Origin at $0,0,z$

Along [100] $p111$
 $a^* = (a+2b)/2$
 Origin at $x,0,0$

Along [210] $p111$
 $a^* = b/2$
 Origin at $x,x/2,0$

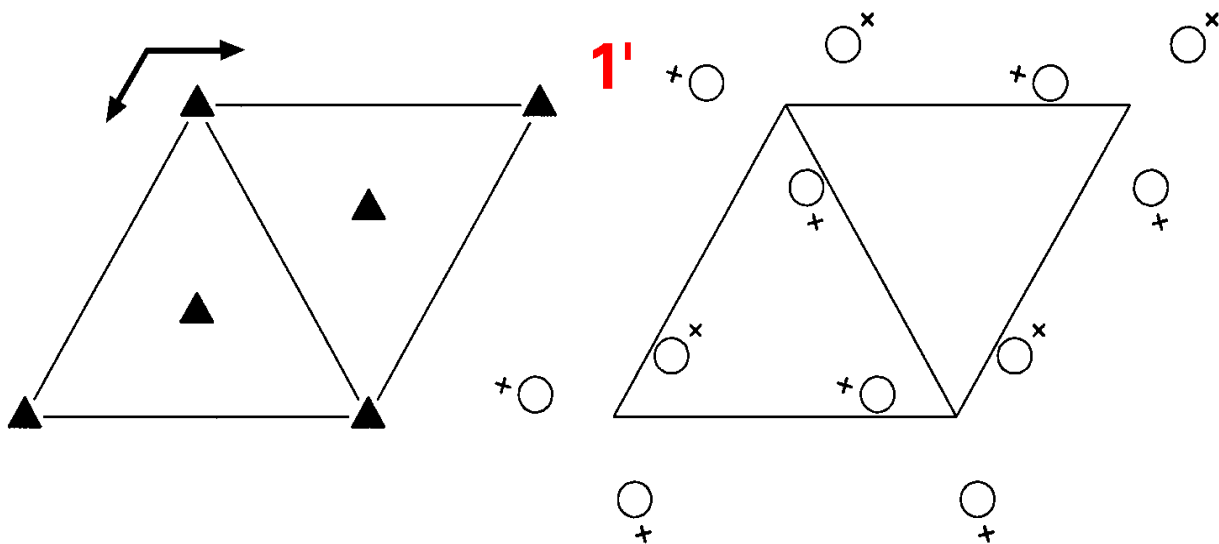
p31'

31'

Trigonal/Hexagonal

No. 65.2.463

p31'



Origin on 31'

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq (1 + y)/2;$

$$y \leq \min(1 - x, (1 + x)/2)$$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/3,2/3; 0,1/2$

Symmetry operations

For 1 + set

(1) 1

$(1|0,0,0)$

(2) 3^+ $0,0,z$

$(3_z|0,0,0)$

(3) 3^- $0,0,z$

$(3_z^{-1}|0,0,0)$

For 1' + set

(1) 1'

$(1|0,0,0)'$

(2) $3^{+ '}$ $0,0,z$

$(3_z|0,0,0)'$

(3) $3^{- '}$ $0,0,z$

$(3_z^{-1}|0,0,0)'$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); $1'$

Positions

Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1'+$	
3 d $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{y},x-y,z [0,0,0]$	(3) $\bar{x}+y,\bar{x},z [0,0,0]$
1 c $3..1$	$2/3,1/3,z [0,0,0]$		
1 b $3..1'$	$1/3,2/3,z [0,0,0]$		
1 a $3..1'$	$0,0,z [0,0,0]$		

Symmetry of special projections

Along $[001]$ $p31'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along $[100]$ $p1111'$ $a^* = (a+2b)/2$ Origin at $x,0,0$	Along $[210]$ $p1111'$ $a^* = b/2$ Origin at $x,x/2,0$
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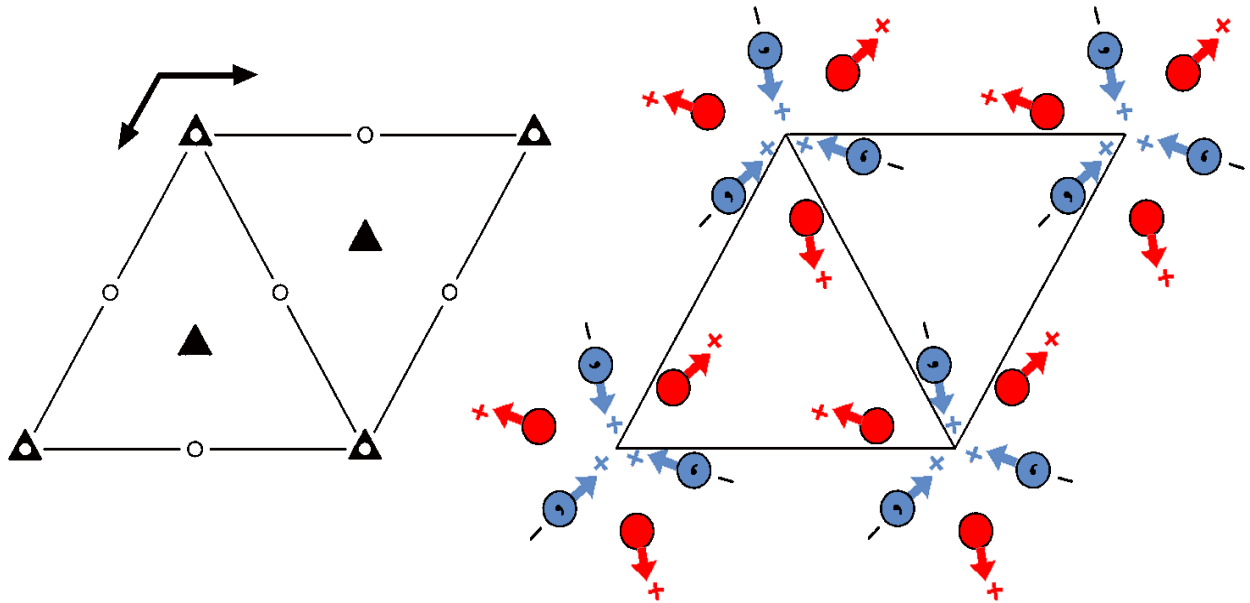
$p\bar{3}$

No. 66.1.464

$\bar{3}$

$p\bar{3}$

Trigonal/Hexagonal



Origin at center ($\bar{3}$)

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq (1 + y)/2;$

$y \leq \min(1 - x, (1 + x)/2); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/3,2/3; 0,1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)

(5) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ |0,0,0)

(6) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ |0,0,0)

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) \bar{y} ,x-y,z [\bar{v} ,u-v,w]	(3) $\bar{x}+y,\bar{x}$,z [$\bar{u}+v,\bar{u}$,w]
6 e 1	(4) \bar{x},\bar{y},\bar{z} [u,v,w]	(5) y, $\bar{x}+y,\bar{z}$ [\bar{v} ,u-v,w]	(6) x-y,x, \bar{z} [$\bar{u}+v,\bar{u}$,w]
3 d $\bar{1}$	1/2,0,0 [u,v,w]	0,1/2,0 [\bar{v} ,u-v,w]	1/2,1/2,0 [$\bar{u}+v,\bar{u}$,w]
2 c 3..	1/3,2/3,z [0,0,w]	2/3,1/3, \bar{z} [0,0,w]	
2 b 3..	0,0,z [0,0,w]	0,0, \bar{z} [0,0,w]	
1 a $\bar{3}$..	0,0,0 [0,0,w]		

Symmetry of special projections

Along [001] p6'
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] p2'11
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] p2'11
 $a^* = b/2$
 Origin at x,x/2,0

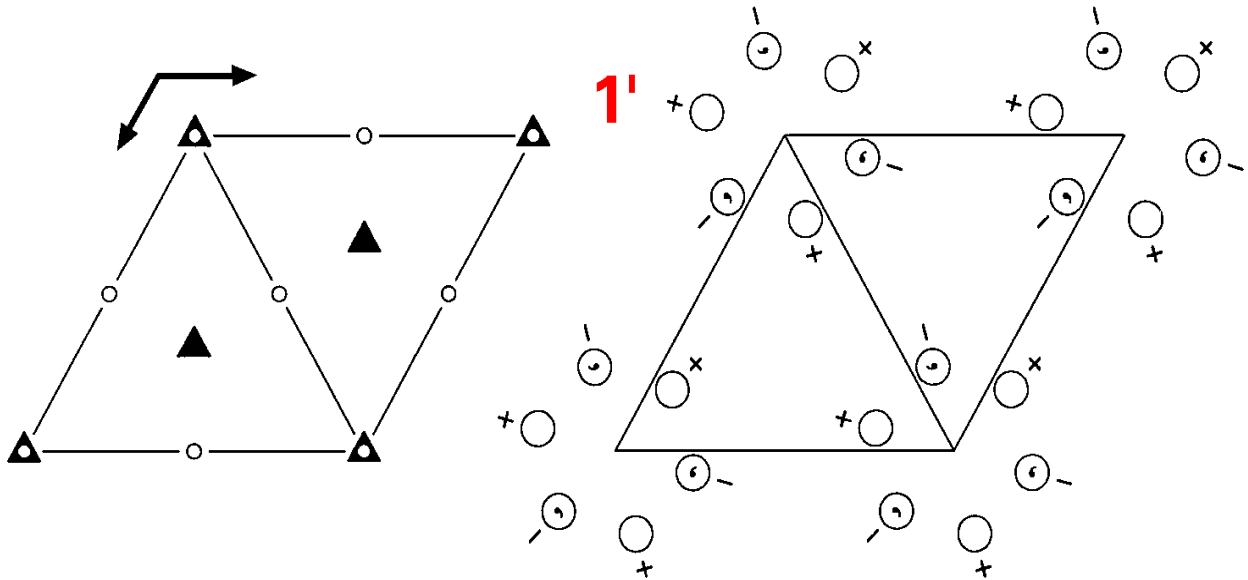
$p\bar{3}1'$

$\bar{3}1'$

Trigonal/Hexagonal

No. 66.2.465

$p\bar{3}1'$



Origin at center ($\bar{3}1'$)

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq (1 + y)/2;$

$y \leq \min(1 - x, (1 + x)/2); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/3,2/3; 0,1/2$

Symmetry operations

For $1 +$ set

- | | | |
|--|---|--|
| (1) 1
($1 0,0,0$) | (2) 3^+ $0,0,z$
($3_z 0,0,0$) | (3) 3^- $0,0,z$
($3_z^{-1} 0,0,0$) |
| (4) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$) | (5) $\bar{3}^+$ $0,0,z; 0,0,0$
($\bar{3}_z 0,0,0$) | (6) $\bar{3}^-$ $0,0,z; 0,0,0$
($\bar{3}_z^{-1} 0,0,0$) |

For $1' +$ set

- | | | |
|--|---|--|
| (1) $1'$
($1 0,0,0$)' | (2) $3^{+'}$ $0,0,z$
($3_z 0,0,0$)' | (3) $3^{-'}$ $0,0,z$
($3_z^{-1} 0,0,0$)' |
| (4) $\bar{1}'$ $0,0,0$
($\bar{1} 0,0,0$)' | (5) $\bar{3}^{+'}$ $0,0,z; 0,0,0$
($\bar{3}_z 0,0,0$)' | (6) $\bar{3}^{-'}$ $0,0,z; 0,0,0$
($\bar{3}_z^{-1} 0,0,0$)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1' +$	
6 e $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{y},x-y,z [0,0,0]$	(3) $\bar{x}+y,\bar{x},z [0,0,0]$
	(4) $\bar{x},\bar{y},\bar{z} [0,0,0]$	(5) $y,\bar{x}+y,\bar{z} [0,0,0]$	(6) $x-y,x,\bar{z} [0,0,0]$
3 d $\bar{1}1'$	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$
2 c $3..1'$	$1/3,2/3,z [0,0,0]$	$2/3,1/3,\bar{z} [0,0,0]$	
2 b $3..1'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
1 a $\bar{3}..1'$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along $[001]$ $p61'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along $[100]$ $p2111'$ $a^* = (a+2b)/2$ Origin at $x,0,0$	Along $[210]$ $p2111'$ $a^* = b/2$ Origin at $x,x/2,0$
--	---	--

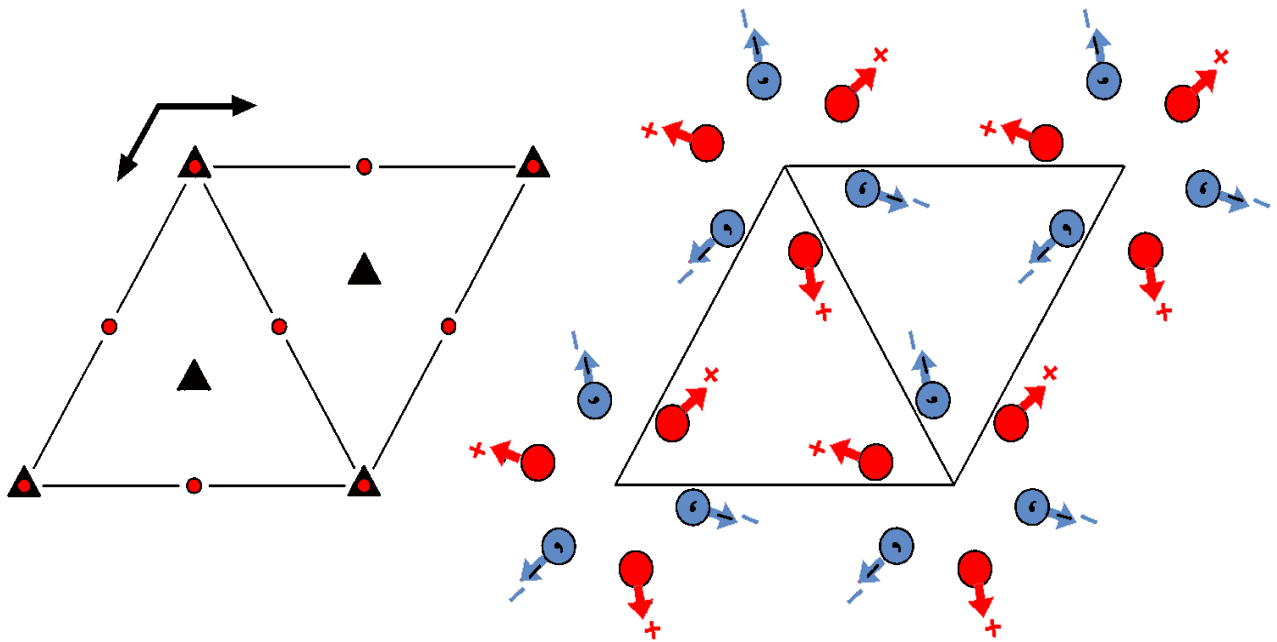
$p\bar{3}'$

$\bar{3}'$

Trigonal/Hexagonal

No. 66.3.466

$p\bar{3}'$



Origin at center ($\bar{3}'$)

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq (1 + y)/2;$

$y \leq \min(1 - x, (1 + x)/2); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/3,2/3; 0,1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $3^+ 0,0,z$
($3_z|0,0,0$)

(3) $3^- 0,0,z$
($3_z^{-1}|0,0,0$)

(4) $\bar{1}' 0,0,0$
($\bar{1}'|0,0,0$)

(5) $\bar{3}^+ ' 0,0,z; 0,0,0$
($\bar{3}_z^+ |0,0,0$)

(6) $\bar{3}^- ' 0,0,z; 0,0,0$
($\bar{3}_z^- |0,0,0$)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4)

Positions

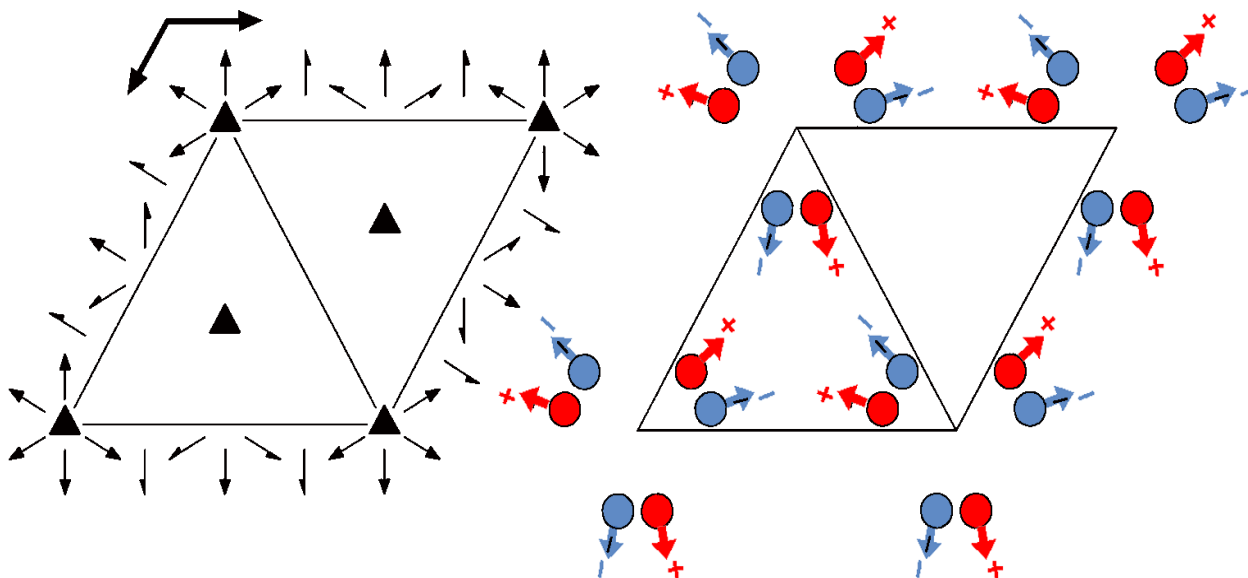
Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
6 e 1	(4) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(5) $y,\bar{x}+y,\bar{z}$ [$v,\bar{u}+v,\bar{w}$]	(6) $x-y,x,\bar{z}$ [$u-v,u,\bar{w}$]
3 d $\bar{1}'$	$1/2,0,0$ [$0,0,0$]	$0,1/2,0$ [$0,0,0$]	$1/2,1/2,0$ [$0,0,0$]
2 c 3..	$1/3,2/3,z$ [$0,0,w$]	$2/3,1/3,\bar{z}$ [$0,0,\bar{w}$]	
2 b 3..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]	
1 a $\bar{3}'..$	$0,0,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $p6$
 $a^* = a$ $b^* = b$
 Origin at $0,0,z$

Along [100] $p211$
 $a^* = (a+2b)/2$
 Origin at $x,0,0$

Along [210] $p211$
 $a^* = b/2$
 Origin at $x,x/2,0$



Origin at 312

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 2/3$; $x \leq (1 + y)/2$;

$y \leq \min(1 - x, (1 + x)/2)$; $0 \leq z$

Vertices $0,0$; $1/2,0$; $2/3,1/3$; $1/3,2/3$; $0,1/2$

Symmetry operations

- | | | |
|--|------------------------------------|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 $x,\bar{x},0$
(2_3 0,0,0) | (5) 2 $x,2x,0$
(2_2 0,0,0) | (6) 2 $2x,x,0$
(2_1 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
6 h 1	(4) \bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]	(5) $\bar{x}+y,y,\bar{z}$ [$\bar{u}+v,v,\bar{w}$]	(6) $x,x-y,\bar{z}$ [$u,u-v,\bar{w}$]
3 g ..2	$x,\bar{x},0$ [$u,\bar{u},0$]	$x,2x,0$ [$u,2u,0$]	$2\bar{x},\bar{x},0$ [$2\bar{u},\bar{u},0$]
2 f 3..	$2/3,1/3,z$ [$0,0,w$]	$2/3,1/3,\bar{z}$ [$0,0,\bar{w}$]	
2 e 3..	$1/3,2/3,z$ [$0,0,w$]	$1/3,2/3,\bar{z}$ [$0,0,\bar{w}$]	
2 d 3..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]	
1 c 3.2	$2/3,1/3,0$ [$0,0,0$]		
1 b 3.2	$1/3,2/3,0$ [$0,0,0$]		
1 a 3.2	$0,0,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $p3m'1$
 $a^* = a$ $b^* = b$
 Origin at $0,0,z$

Along [100] $p11m'$
 $a^* = (a+2b)/2$
 Origin at $x,0,0$

Along [210] $p211$
 $a^* = b/2$
 Origin at $x,x/2,0$

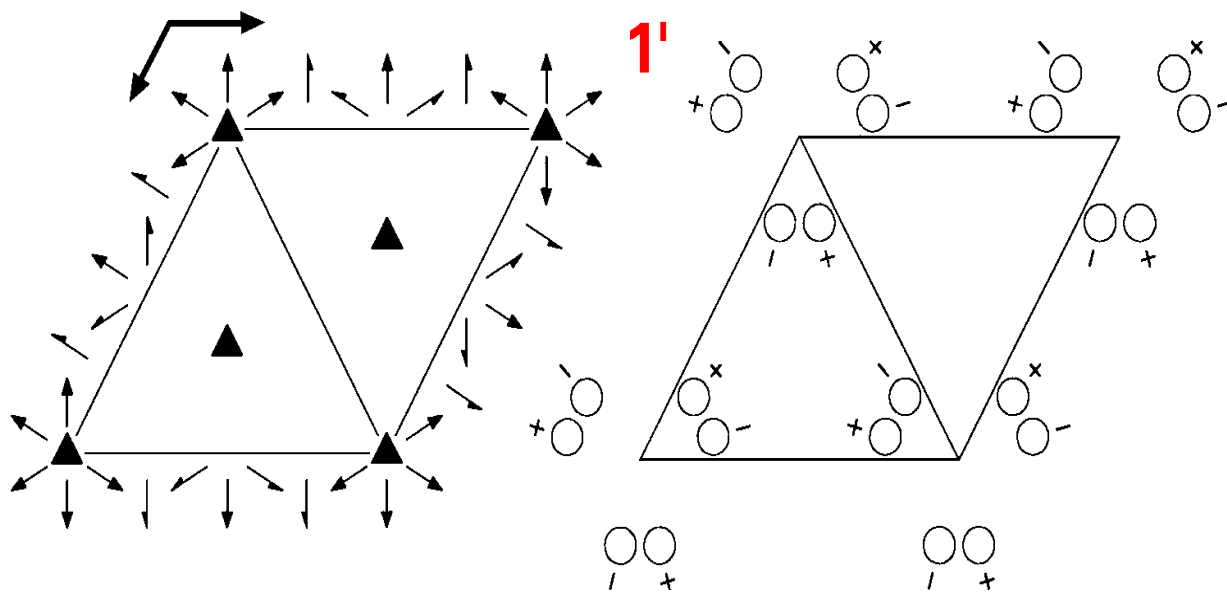
p3121'

3121'

Trigonal/Hexagonal

No. 67.2.468

p3121'



Origin at 3121'

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq (1 + y)/2;$

$y \leq \min(1 - x, (1 + x)/2); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/3,2/3; 0,1/2$

Symmetry operations

For 1 + set

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3 ⁺ 0,0,z
(3 _z 0,0,0) | (3) 3 ⁻ 0,0,z
(3 _z ⁻¹ 0,0,0) |
| (4) 2 x, \bar{x} ,0
(2 ₃ 0,0,0) | (5) 2 x,2x,0
(2 ₂ 0,0,0) | (6) 2 2x,x,0
(2 ₁ 0,0,0) |

For 1' + set

- | | | |
|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 3 ⁺ ' 0,0,z
(3 _z 0,0,0)' | (3) 3 ⁻ ' 0,0,z
(3 _z ⁻¹ 0,0,0)' |
| (4) 2' x, \bar{x} ,0
(2 ₃ 0,0,0)' | (5) 2' x,2x,0
(2 ₂ 0,0,0)' | (6) 2' 2x,x,0
(2 ₁ 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1' +$	
6 h $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{y},x-y,z [0,0,0]$	(3) $\bar{x}+y,\bar{x},z [0,0,0]$
	(4) $\bar{y},\bar{x},\bar{z} [0,0,0]$	(5) $\bar{x}+y,y,\bar{z} [0,0,0]$	(6) $x,x-y,\bar{z} [0,0,0]$
3 g $..21'$	$x,\bar{x},0 [0,0,0]$	$x,2x,0 [0,0,0]$	$2\bar{x},\bar{x},0 [0,0,0]$
2 f $3..1'$	$2/3,1/3,z [0,0,0]$	$2/3,1/3,\bar{z} [0,0,0]$	
2 e $3..1'$	$1/3,2/3,z [0,0,0]$	$1/3,2/3,\bar{z} [0,0,0]$	
2 d $3..1'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
1 c $3.21'$	$2/3,1/3,0 [0,0,0]$		
1 b $3.21'$	$1/3,2/3,0 [0,0,0]$		
1 a $3.21'$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along $[001]$ $p3m11'$
 $a^* = a$ $b^* = b$
 Origin at $0,0,z$

Along $[100]$ $p11m1'$
 $a^* = (a+2b)/2$
 Origin at $x,0,0$

Along $[210]$ $p2111'$
 $a^* = b/2$
 Origin at $x,x/2,0$

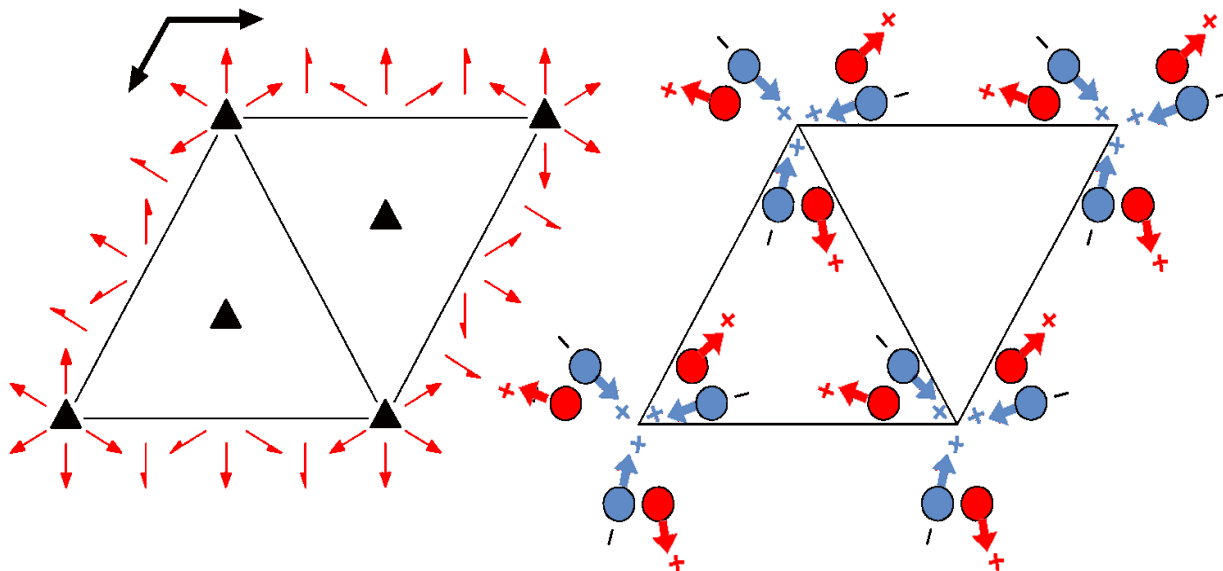
p312'

312'

Trigonal/Hexagonal

No. 67.3.469

p312'



Origin at 312'

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq (1 + y)/2;$

$y \leq \min(1 - x, (1 + x)/2); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/3,2/3; 0,1/2$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3 ⁺ 0,0,z
(3 _z 0,0,0) | (3) 3 ⁻ 0,0,z
(3 _z ⁻¹ 0,0,0) |
| (4) 2' x,x̄,0
(2 ₃ 0,0,0)' | (5) 2' x,2x,0
(2 ₂ 0,0,0)' | (6) 2' 2x,x,0
(2 ₁ 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4)

Positions

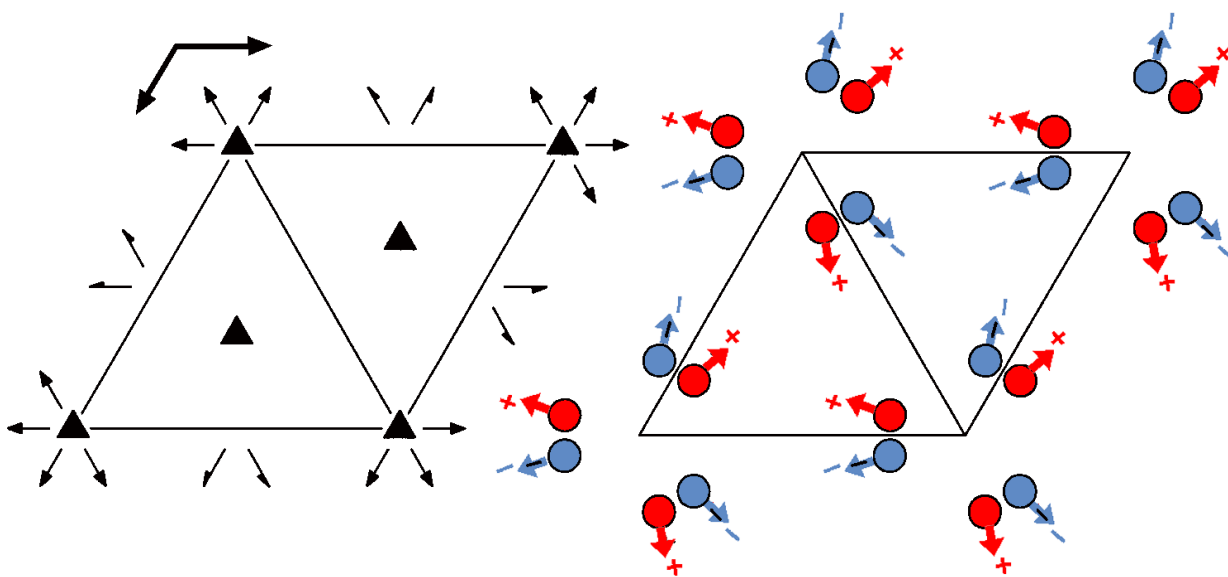
Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
6 h 1	(4) \bar{y},\bar{x},\bar{z} [v,u,w]	(5) $\bar{x}+y,y,\bar{z}$ [u-v, \bar{v},w]	(6) $x,x-y,\bar{z}$ [$\bar{u},\bar{u}+v,w$]
3 g ..2'	$x,\bar{x},0$ [u,u,w]	$x,2x,0$ [$\bar{u},0,w$]	$2\bar{x},\bar{x},0$ [0, \bar{u},w]
2 f 3..	$2/3,1/3,z$ [0,0,w]	$2/3,1/3,\bar{z}$ [0,0,w]	
2 e 3..	$1/3,2/3,z$ [0,0,w]	$1/3,2/3,\bar{z}$ [0,0,w]	
2 d 3..	$0,0,z$ [0,0,w]	$0,0,\bar{z}$ [0,0,w]	
1 c 3.2'	$2/3,1/3,0$ [0,0,w]		
1 b 3.2'	$1/3,2/3,0$ [0,0,w]		
1 a 3.2'	$0,0,0$ [0,0,w]		

Symmetry of special projections

Along [001] $p3m'1$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p11m'$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $p211$
 $a^* = b/2$
 Origin at x,x/2,0



Origin at 321

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 2/3$; $x \leq (1 + y)/2$;

$y \leq \min(1 - x, (1 + x)/2)$; $0 \leq z$

Vertices $0,0$; $1/2,0$; $2/3,1/3$; $1/3,2/3$; $0,1/2$

Symmetry operations

- | | | |
|-----------------------------------|------------------------------------|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 x,x,0
(2_{xy} 0,0,0) | (5) 2 x,0,0
(2_x 0,0,0) | (6) 2 0,y,0
(2_y 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
6 e 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $y,x,\bar{z} [v,u,\bar{w}]$	(5) $x-y,\bar{y},\bar{z} [u-v,\bar{v},\bar{w}]$	(6) $\bar{x},\bar{x}+y,\bar{z} [\bar{u},\bar{u}+v,\bar{w}]$
3 d .2.	$x,0,0 [u,0,0]$	$0,x,0 [0,u,0]$	$\bar{x},\bar{x},0 [\bar{u},\bar{u},0]$
2 c 3..	$1/3,2/3,z [0,0,w]$	$2/3,1/3,\bar{z} [0,0,\bar{w}]$	
2 b 3..	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,\bar{w}]$	
1 a 32.	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p31m'$
 $a^* = a \quad b^* = b$
 Origin at $0,0,z$

Along [100] $p211$
 $a^* = (a+2b)/2$
 Origin at $x,0,0$

Along [210] $p11m'$
 $a^* = b/2$
 Origin at $x,x/2,0$

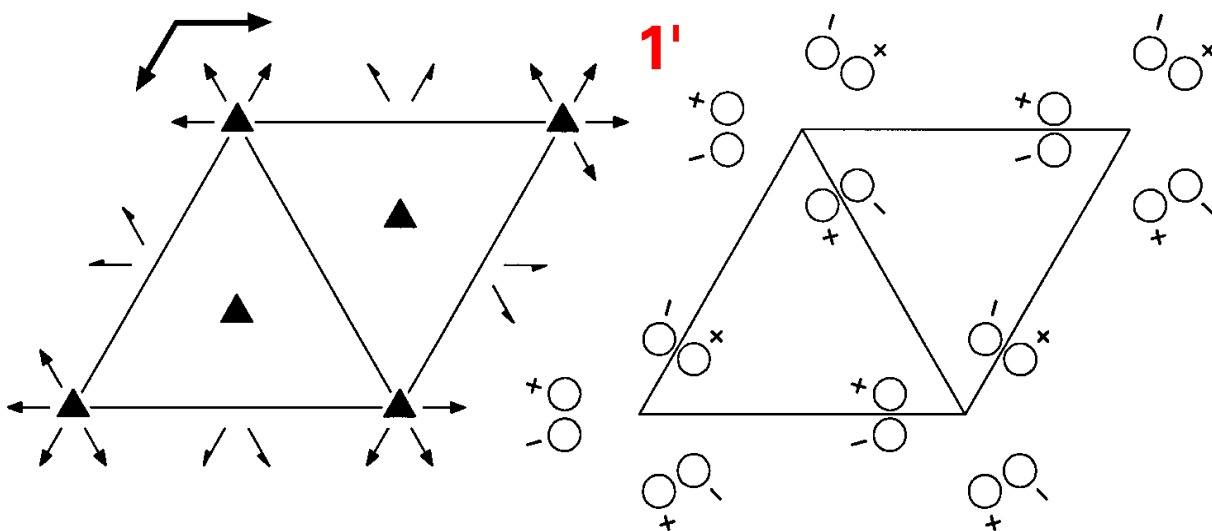
p3211'

3211'

Trigonal/Hexagonal

No. 68.2.471

p3211'



Origin at 3211'

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq (1 + y)/2;$

$y \leq \min(1 - x, (1 + x)/2); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/3,2/3; 0,1/2$

Symmetry operations

For 1 + set

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3 ⁺ 0,0,z
(3 _z 0,0,0) | (3) 3 ⁻ 0,0,z
(3 _z ⁻¹ 0,0,0) |
| (4) 2 _x x,x,0
(2 _{xy} 0,0,0) | (5) 2 _x x,0,0
(2 _x 0,0,0) | (6) 2 _y 0,y,0
(2 _y 0,0,0) |

For 1' + set

- | | | |
|--|---|--|
| (1) 1'
(1 0,0,0)' | (2) 3 ⁺ 0,0,z
(3 _z 0,0,0)' | (3) 3 ⁻ 0,0,z
(3 _z ⁻¹ 0,0,0)' |
| (4) 2' _x x,x,0
(2 _{xy} 0,0,0)' | (5) 2' _x x,0,0
(2 _x 0,0,0)' | (6) 2' _y 0,y,0
(2 _y 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1'$	$+$
6 e $11'$	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0]
	(4) y,x,\bar{z} [0,0,0]	(5) $x-y,\bar{y},\bar{z}$ [0,0,0]	(6) $\bar{x},\bar{x}+y,\bar{z}$ [0,0,0]
3 d $.2.1'$	$x,0,0$ [0,0,0]	$0,x,0$ [0,0,0]	$\bar{x},\bar{x},0$ [0,0,0]
2 c $3..1'$	$1/3,2/3,z$ [0,0,0]	$2/3,1/3,\bar{z}$ [0,0,0]	
2 b $3..1'$	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]	
1 a $32.1'$	$0,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] $p31m1'$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2111'$ $a^* = (a+2b)/2$ Origin at $x,0,0$	Along [210] $p11m1'$ $a^* = b/2$ Origin at $x,x/2,0$
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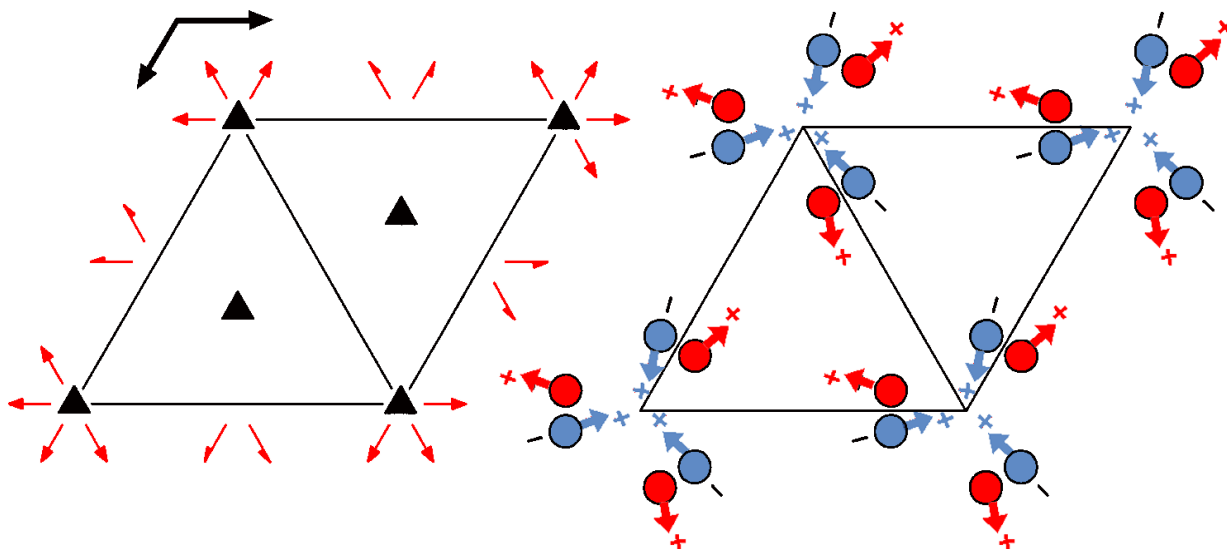
p32'1

32'1

Trigonal/Hexagonal

No. 68.3.472

p32'1



Origin at 32'1

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq (1 + y)/2;$

$y \leq \min(1 - x, (1 + x)/2); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/3,2/3; 0,1/2$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3 ⁺ 0,0,z
(3 _z 0,0,0) | (3) 3 ⁻ 0,0,z
(3 _z ⁻¹ 0,0,0) |
| (4) 2' x,x,0
(2 _{xy} 0,0,0)' | (5) 2' x,0,0
(2 _x 0,0,0)' | (6) 2' 0,y,0
(2 _y 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
6 e 1	(4) y,x,\bar{z} [\bar{v},\bar{u},w]	(5) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(6) $\bar{x},\bar{x}+y,\bar{z}$ [$u,u-v,w$]
3 d .2'	$x,0,0$ [$u,2u,w$]	$0,x,0$ [$2\bar{u},\bar{u},w$]	$\bar{x},\bar{x},0$ [u,\bar{u},w]
2 c 3..	$1/3,2/3,z$ [$0,0,w$]	$2/3,1/3,\bar{z}$ [$0,0,w$]	
2 b 3..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,w$]	
1 a 32'	$0,0,0$ [$0,0,w$]		

Symmetry of special projections

Along [001] $p31m$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p2'11$ $a^* = (a+2b)/2$ Origin at $x,0,0$	Along [210] $p11m$ $a^* = b/2$ Origin at $x,x/2,0$
--	--	--

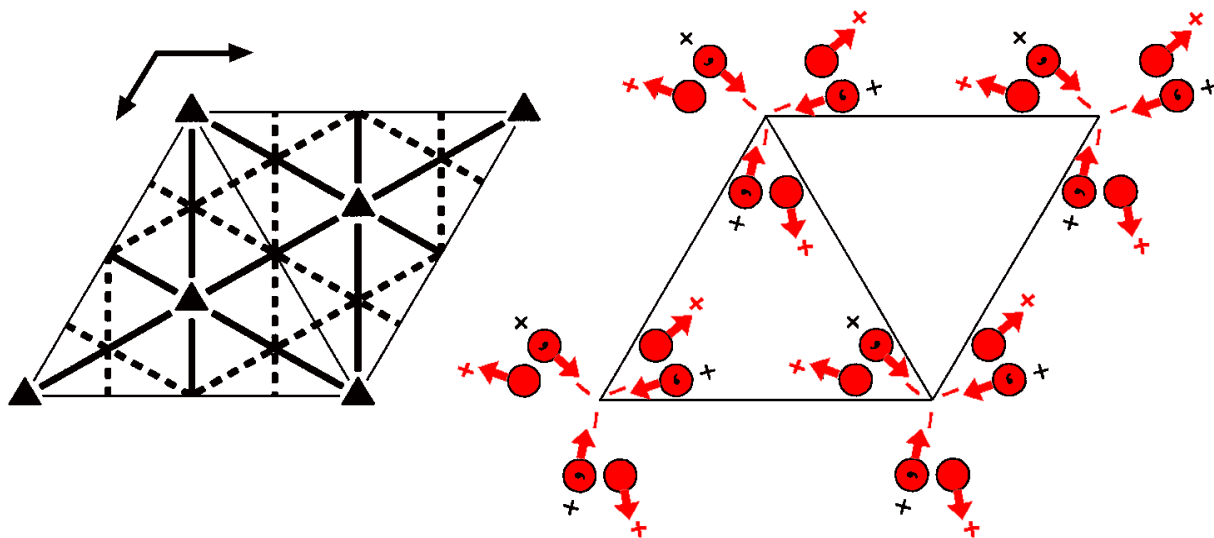
p3m1

3m1

Trigonal/Hexagonal

No. 69.1.473

p3m1



Origin on 3m1

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq 2y;$

$$y \leq \min(1 - x, 2x)$$

Vertices $0,0; 2/3,1/3; 1/3,2/3$

Symmetry operations

(1) 1
(1|0,0,0)

(2) $3^+ 0,0,z$
(3_z |0,0,0)

(3) $3^- 0,0,z$
(3_z^{-1} |0,0,0)

(4) m x,\bar{x},z
(m_{xy} |0,0,0)

(5) m $x,2x,z$
(m_x |0,0,0)

(6) m $2x,x,z$
(m_y |0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
6 e 1	(1) x,y,z $[u,v,w]$	(2) $\bar{y},x-y,z$ $[\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z$ $[\bar{u}+v,\bar{u},w]$
	(4) \bar{y},\bar{x},z $[v,u,\bar{w}]$	(5) $\bar{x}+y,y,z$ $[u-v,\bar{v},\bar{w}]$	(6) $x,x-y,z$ $[\bar{u},\bar{u}+v,\bar{w}]$
3 d .m.	x,\bar{x},z $[u,u,0]$	$x,2x,z$ $[\bar{u},0,0]$	$2\bar{x},\bar{x}, [0,\bar{u},0]$
1 c 3m.	$2/3,1/3,z$ $[0,0,0]$		
1 b 3m.	$1/3,2/3,z$ $[0,0,0]$		
1 a 3m.	$0,0,z$ $[0,0,0]$		

Symmetry of special projections

Along $[001]$ p3m1 $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along $[100]$ $p1111'$ $a^* = (a+2b)/2$ Origin at $x,0,0$	Along $[210]$ $p1m1$ $a^* = b/2$ Origin at $x,x/2,0$
--	---	--

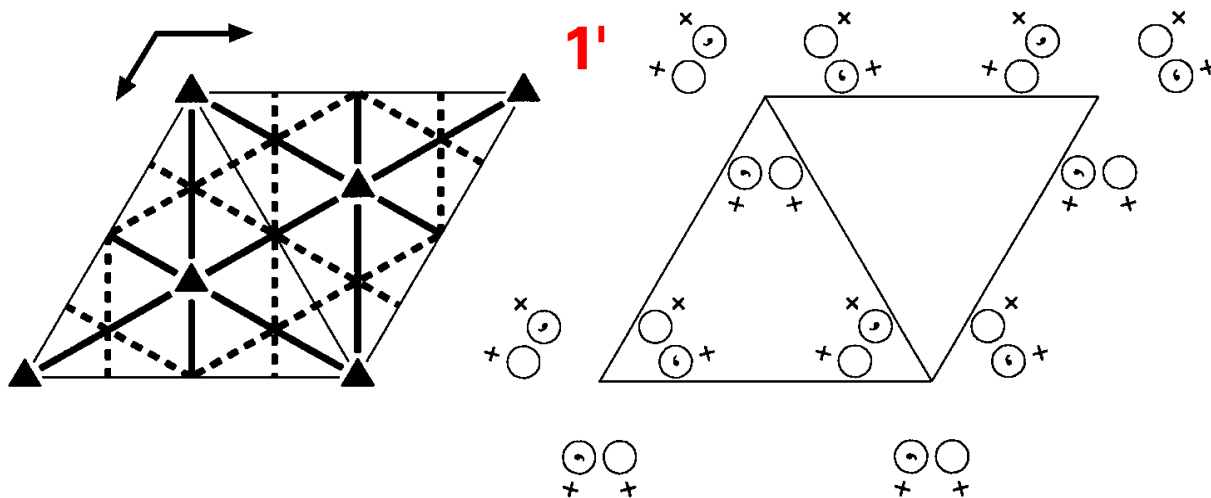
p3m11'

3m11'

Trigonal/Hexagonal

No. 69.2.474

p3m11'



Origin on 3m11'

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq 2y;$

$$y \leq \min(1 - x, 2x)$$

Vertices $0,0; 2/3,1/3; 1/3,2/3$

Symmetry operations

For 1 + set

- | | | |
|---|------------------------------------|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m x,\bar{x},z
(m_{xy} 0,0,0) | (5) m $x,2x,z$
(m_x 0,0,0) | (6) m $2x,x,z$
(m_y 0,0,0) |

For 1' + set

- | | | |
|---|---|--|
| (1) 1'
(1 0,0,0)' | (2) $3^{+ '}$ 0,0,z
(3_z 0,0,0)' | (3) $3^{- '}$ 0,0,z
(3_z^{-1} 0,0,0)' |
| (4) m' x,\bar{x},z
(m_{xy} 0,0,0)' | (5) m' $x,2x,z$
(m_x 0,0,0)' | (6) m' $2x,x,z$
(m_y 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	1+	1' +	
6 e 11'	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0]
	(4) \bar{y},\bar{x},z [0,0,0]	(5) $\bar{x}+y,y,z$ [0,0,0]	(6) x,x-y,z [0,0,0]
3 d .m.1'	x, \bar{x},z [0,0,0]	x,2x,z [0,0,0]	2 \bar{x},\bar{x},z [0,0,0]
1 c 3m.1'	2/3,1/3,z [0,0,0]		
1 b 3m.1'	1/3,2/3,z [0,0,0]		
1 a 3m.1'	0,0,z [0,0,0]		

Symmetry of special projections

Along [001] p3m11'	Along [100] p1111'	Along [210] p1m11'
$a^* = a \quad b^* = b$	$a^* = (a+2b)/2$	$a^* = b/2$
Origin at 0,0,z	Origin at x,0,0	Origin at x,x/2,0

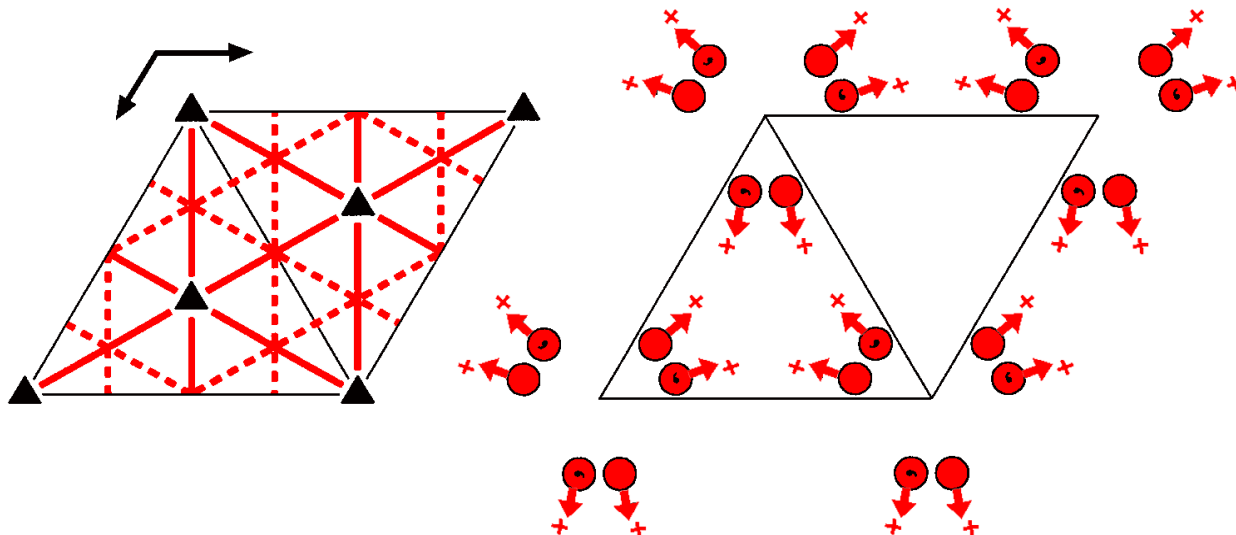
p3m'1

3m'1

Trigonal/Hexagonal

No. 69.3.475

p3m'1



Origin on 3m'1

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq 2y;$

$$y \leq \min(1 - x, 2x)$$

Vertices $0,0; 2/3,1/3; 1/3,2/3$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) m' x, \bar{x} ,z
(m_{xy} |0,0,0)'

(5) m' x,2x,z
(m_x |0,0,0)'

(6) m' 2x,x,z
(m_y |0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z$ [$\bar{u}+v, \bar{u}, w$]
6 e 1	(4) \bar{y}, \bar{x}, z [\bar{v}, \bar{u}, w]	(5) $\bar{x}+y, y, z$ [$\bar{u}+v, v, w$]	(6) $x, x-y, z$ [u,u-v,w]
3 d .m'	x, \bar{x}, z [u, \bar{u} ,w]	$x, 2x, z$ [u,2u,w]	$2\bar{x}, \bar{x}, z$ [2 \bar{u} , \bar{u} ,w]
1 c 3m'	$2/3, 1/3, z$ [0,0,w]		
1 b 3m'	$1/3, 2/3, z$ [0,0,w]		
1 a 3m'	$0, 0, z$ [0,0,w]		

Symmetry of special projections

Along [001] p3m'1
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] p111
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] p1m'1
 $a^* = b/2$
 Origin at x,x/2,0

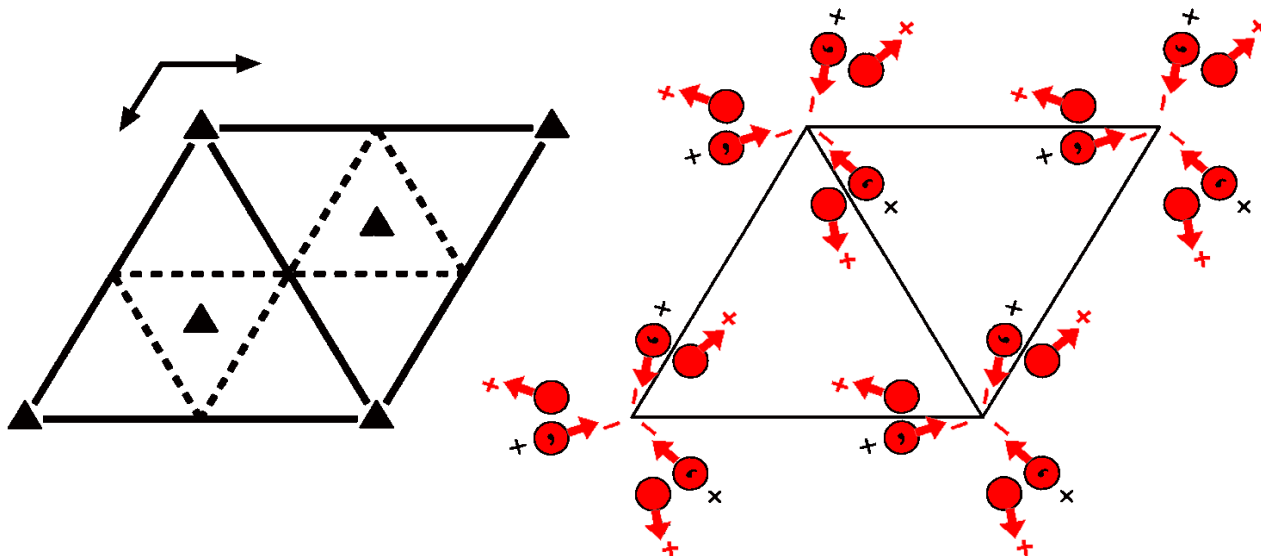
p31m

31m

Trigonal/Hexagonal

No. 70.1.476

p31m



Origin on 31m

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/2$; $x \leq (y + 1)/2$;

$$y \leq \min(1 - x, x)$$

Vertices $0,0$; $1/2,0$; $2/3,1/3$; $1/2,1/2$

Symmetry operations

(1) 1

$(1|0,0,0)$

(2) 3^+ $0,0,z$

$(3_z|0,0,0)$

(3) 3^- $0,0,z$

$(3_z^{-1}|0,0,0)$

(4) m x,x,z

$(m_3|0,0,0)$

(5) m $x,0,z$

$(m_2|0,0,0)$

(6) m $0,y,z$

$(m_1|0,0,0)$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
6 d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $y,x,z [\bar{v},\bar{u},\bar{w}]$	(5) $x-y,\bar{y},z [\bar{u}+v,v,\bar{w}]$	(6) $\bar{x},\bar{x}+y,z [u,u-v,\bar{w}]$
3 c ..m	$x,0,z [u,2u,0]$	$0,x,z [2\bar{u},\bar{u},0]$	$\bar{x},\bar{x},z [u,\bar{u},0]$
2 b 3..	$1/3,2/3,z [0,0,w]$	$2/3,1/3,z [0,0,\bar{w}]$	
1 a 3.m	$0,0,z [0,0,0]$		

Symmetry of special projections

Along [001] p31m $a^* = a \quad b^* = b$ Origin at 0,0,z	Along [100] p1m1 $a^* = (a+2b)/2$ Origin at x,0,0	Along [210] p1111' $a^* = b/2$ Origin at x,x/2,0
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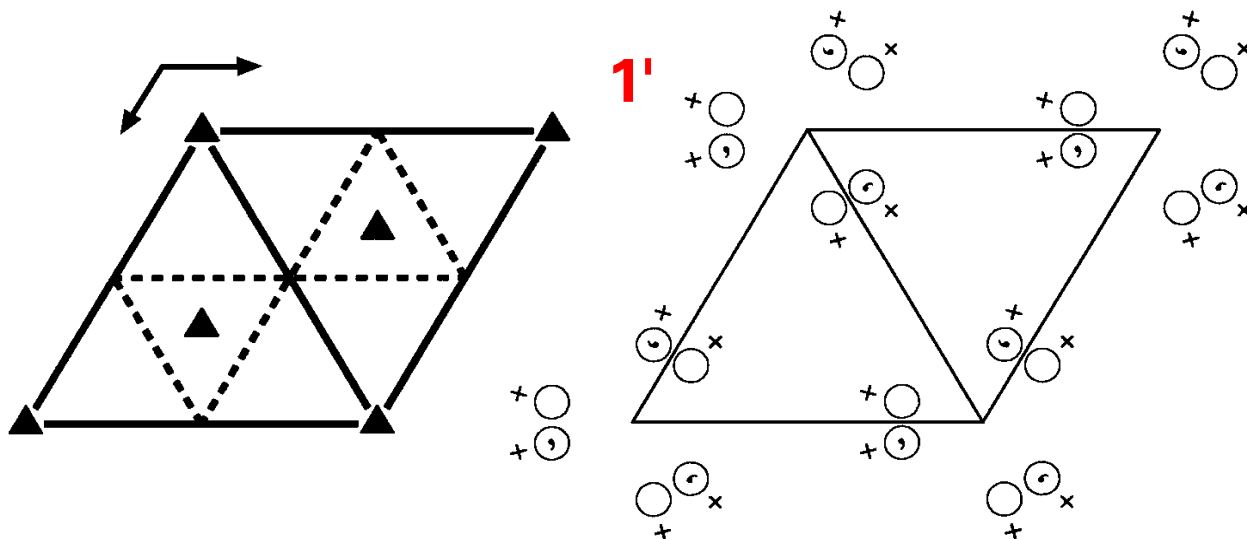
p31m1'

31m1'

Trigonal/Hexagonal

No. 70.2.477

p31m1'



Origin on 31m1'

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (y + 1)/2;$

$$y \leq \min(1 - x, x)$$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

For 1 + set

- | | | |
|--------------------------------|------------------------------------|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m x,x,z
(m_3 0,0,0) | (5) m x,0,z
(m_2 0,0,0) | (6) m 0,y,z
(m_1 0,0,0) |

For 1' + set

- | | | |
|----------------------------------|--|---|
| (1) 1'
(1 0,0,0)' | (2) $3^{+'}$ 0,0,z
(3_z 0,0,0)' | (3) $3^{-'}$ 0,0,z
(3_z^{-1} 0,0,0)' |
| (4) m' x,x,z
(m_3 0,0,0)' | (5) m' x,0,z
(m_2 0,0,0)' | (6) m' 0,y,z
(m_1 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	1+	1' +	
6 d 11'	(1) $x,y,z [0,0,0]$	(2) $\bar{y},x-y,z [0,0,0]$	(3) $\bar{x}+y,\bar{x},z [0,0,0]$
	(4) $y,x,z [0,0,0]$	(5) $x-y,\bar{y},z [0,0,0]$	(6) $\bar{x},\bar{x}+y,z [0,0,0]$
3 c ..m1'	$x,0,z [0,0,0]$	$0,x,z [0,0,0]$	$\bar{x},\bar{x},z [0,0,0]$
2 b 3..1'	$1/3,2/3,z [0,0,0]$	$2/3,1/3,z [0,0,0]$	
1 a 3.m1'	$0,0,z [0,0,0]$		

Symmetry of special projections

Along [001] p31m1' $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] p1m11' $a^* = (a+2b)/2$ Origin at x,0,0	Along [210] p1111' $a^* = b/2$ Origin at x,x/2,0
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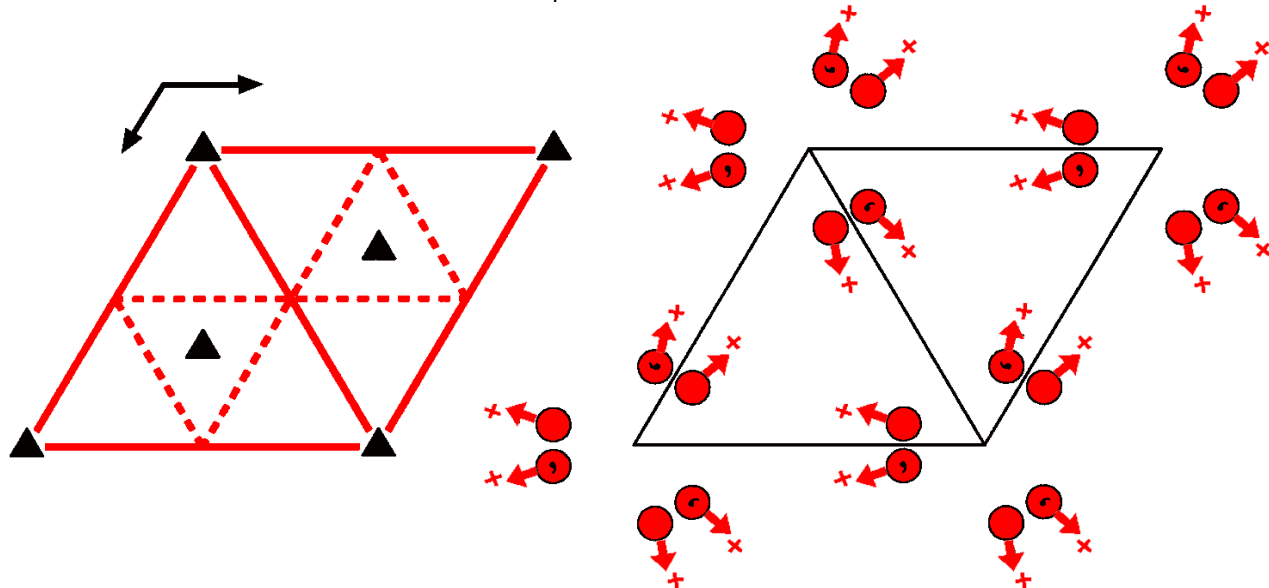
p31m'

No. 70.3.478

31m'

p31m'

Trigonal/Hexagonal



Origin on 31m'

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/2$; $x \leq (y + 1)/2$;

$$y \leq \min(1 - x, x)$$

Vertices $0,0$; $1/2,0$; $2/3,1/3$; $1/2,1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_2 |0,0,0)

(3) 3^- 0,0,z
(3_2^{-1} |0,0,0)

(4) m' x,x,z
(m_3 |0,0,0)'

(5) m' x,0,z
(m_2 |0,0,0)'

(6) m' 0,y,z
(m_1 |0,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
6 d 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $y,x,z [v,u,w]$	(5) $x-y,\bar{y},z [u-v,\bar{v},w]$	(6) $\bar{x},\bar{x}+y,z [\bar{u},\bar{u}+v,w]$
3 c ..m'	$x,0,z [u,0,w]$	$0,x,z [0,u,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$
2 b 3..	$1/3,2/3,z [0,0,w]$	$2/3,1/3,z [0,0,w]$	
1 a 3.m'	$0,0,z [0,0,w]$		

Symmetry of special projections

Along [001] p31m' $a^* = a \quad b^* = b$ Origin at 0,0,z	Along [100] p1m'1 $a^* = (a+2b)/2$ Origin at x,0,0	Along [210] p111 $a^* = b/2$ Origin at x,x/2,0
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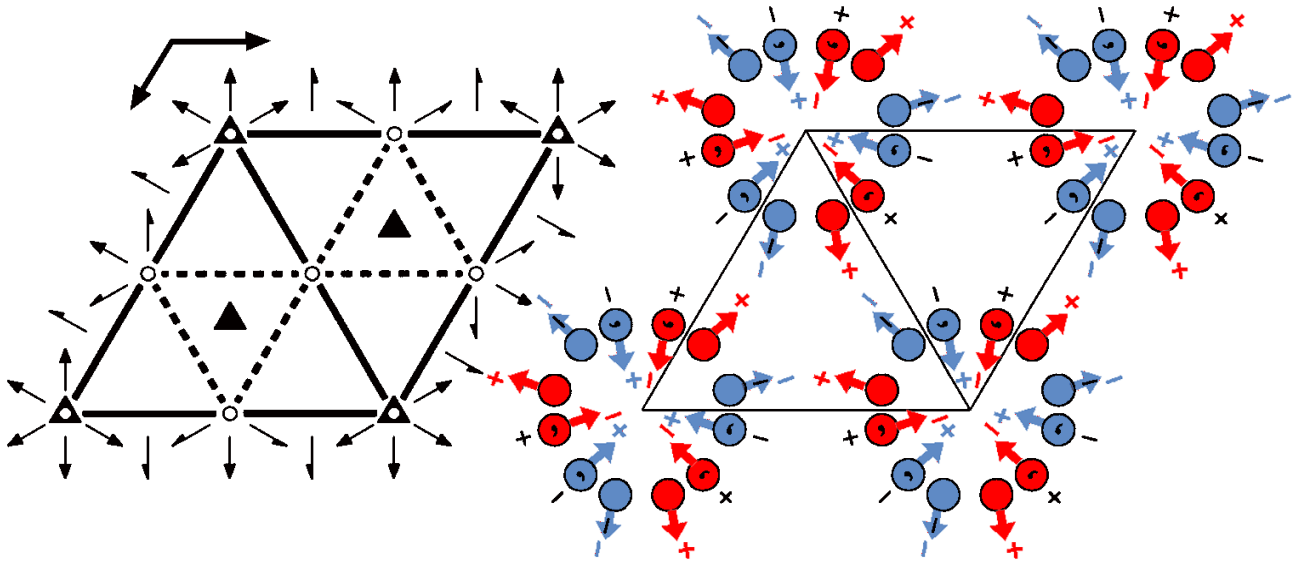
$p\bar{3}1m$

$\bar{3}1m$

Trigonal/Hexagonal

No. 71.1.479

$p\bar{3}12/m$



Origin at center ($\bar{3}1m$)

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/2$; $x \leq (1 + y)/2$;

$y \leq \min(1 - x, x)$; $0 \leq z$

Vertices $0,0$; $1/2,0$; $2/3,1/3$; $1/2,1/2$

Symmetry operations

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 $x,\bar{x},0$
(2_3 0,0,0) | (5) 2 $x,2x,0$
(2_2 0,0,0) | (6) 2 $2x,x,0$
(2_1 0,0,0) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m x,x,z
(m_3 0,0,0) | (11) m $x,0,z$
(m_2 0,0,0) | (12) m $0,y,z$
(m_1 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
12 h 1	(1) x,y,z [u,v,w]	(2) \bar{y} ,x-y,z [\bar{v} ,u-v,w]	(3) $\bar{x}+y$, \bar{x} ,z [$\bar{u}+v$, \bar{u} ,w]	
	(4) \bar{y} , \bar{x} , \bar{z} [\bar{v} , \bar{u} , \bar{w}]	(5) $\bar{x}+y$,y, \bar{z} [$\bar{u}+v$,v, \bar{w}]	(6) x,x-y, \bar{z} [u,u-v, \bar{w}]	
	(7) \bar{x} , \bar{y} , \bar{z} [u,v,w]	(8) y, $\bar{x}+y$, \bar{z} [\bar{v} ,u-v,w]	(9) x-y,x, \bar{z} [$\bar{u}+v$, \bar{u} ,w]	
	(10) y,x,z [\bar{v} , \bar{u} , \bar{w}]	(11) x-y, \bar{y} ,z [$\bar{u}+v$,v, \bar{w}]	(12) \bar{x} , $\bar{x}+y$,z [u,u-v, \bar{w}]	
6 g ..m	x,0,z [u,2u,0]	0,x,z [2 \bar{u} , \bar{u} ,0]	\bar{x} , \bar{x} ,z [u, \bar{u} ,0]	
	0, \bar{x} , \bar{z} [u,2u,0]	\bar{x} ,0, \bar{z} [2 \bar{u} , \bar{u} ,0]	x,x, \bar{z} [u, \bar{u} ,0]	
6 f ..2	x, \bar{x} ,0 [u, \bar{u} ,0]	x,2x,0 [u,2u,0]	2 \bar{x} , \bar{x} ,0 [2 \bar{u} , \bar{u} ,0]	
	\bar{x} ,x,0 [u, \bar{u} ,0]	\bar{x} ,2 \bar{x} ,0 [u,2u,0]	2x,x,0 [2 \bar{u} , \bar{u} ,0]	
4 e 3..	1/3,2/3,z [0,0,w]	1/3,2/3, \bar{z} [0,0, \bar{w}]	2/3,1/3, \bar{z} [0,0,w]	2/3,1/3,z [0,0, \bar{w}]
3 d ..2/m	1/2,0,0 [u,2u,0]	0,1/2,0 [2 \bar{u} , \bar{u} ,0]	1/2,1/2,0 [u, \bar{u} ,0]	
2 c 3.m	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]		
2 b 3.2	1/3,2/3,0 [0,0,0]	2/3,1/3,0 [0,0,0]		
1 a $\bar{3}$.m	0,0,0 [0,0,0]			

Symmetry of special projections

Along [001] p $\bar{6}$ 'm'm
a* = a b* = b
Origin at 0,0,z

Along [100] p2'mm'
a* = (a+2b)/2
Origin at x,0,0

Along [210] p2111'
a* = b/2
Origin at x,x/2,0

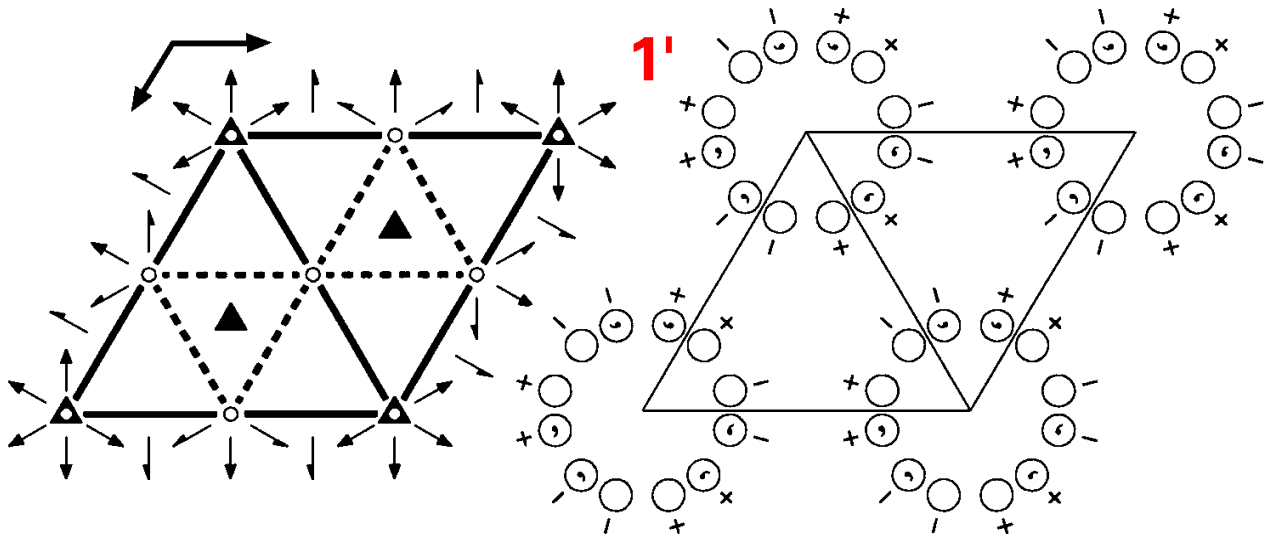
$p\bar{3}1m1'$

$\bar{3}1m1'$

Trigonal/Hexagonal

No. 71.2.480

$p\bar{3}12/m1'$



Origin at center ($\bar{3}1m1'$)

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1+y)/2;$

$y \leq \min(1-x, x); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

For $1 +$ set

- | | | |
|--|---|--|
| (1) 1
($1 0,0,0$) | (2) 3^+ $0,0,z$
($3_z 0,0,0$) | (3) 3^- $0,0,z$
($3_z^{-1} 0,0,0$) |
| (4) 2 $x,\bar{x},0$
($2_3 0,0,0$) | (5) 2 $x,2x,0$
($2_2 0,0,0$) | (6) 2 $2x,x,0$
($2_1 0,0,0$) |
| (7) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$) | (8) $\bar{3}^+$ $0,0,z; 0,0,0$
($\bar{3}_z 0,0,0$) | (9) $\bar{3}^-$ $0,0,z; 0,0,0$
($\bar{3}_z^{-1} 0,0,0$) |
| (10) m x,x,z
($m_3 0,0,0$) | (11) m $x,0,z$
($m_2 0,0,0$) | (12) m $0,y,z$
($m_1 0,0,0$) |

For $1' +$ set

- | | | |
|----------------------------|--|---|
| (1) $1'$
($1 0,0,0$)' | (2) $3^{+'}$ $0,0,z$
($3_z 0,0,0$)' | (3) $3^{-'}$ $0,0,z$
($3_z^{-1} 0,0,0$)' |
|----------------------------|--|---|

(4) $2'$ $x, \bar{x}, 0$ ($2_3 0,0,0$)'	(5) $2'$ $x, 2x, 0$ ($2_2 0,0,0$)'	(6) $2'$ $2x, x, 0$ ($2_1 0,0,0$)'
(7) $\bar{1}'$ $0,0,0$ ($\bar{1} 0,0,0$)'	(8) $\bar{3}^+$ $0,0,z; 0,0,0$ ($\bar{3}_2 0,0,0$)'	(9) $\bar{3}^-$ $0,0,z; 0,0,0$ ($\bar{3}_2^{-1} 0,0,0$)'
(10) m' x,x,z ($m_3 0,0,0$)'	(11) m' $x,0,z$ ($m_2 0,0,0$)'	(12) m' $0,y,z$ ($m_1 0,0,0$)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
	$1+$	$1'$	$+$	$+$
12 h $11'$	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0]	(4) \bar{y},\bar{x},\bar{z} [0,0,0]
	(4) \bar{y},\bar{x},\bar{z} [0,0,0]	(5) $\bar{x}+y,y,\bar{z}$ [0,0,0]	(6) $x,x-y,\bar{z}$ [0,0,0]	(7) \bar{x},\bar{y},\bar{z} [0,0,0]
	(7) \bar{x},\bar{y},\bar{z} [0,0,0]	(8) $y,\bar{x}+y,\bar{z}$ [0,0,0]	(9) $x-y,x,\bar{z}$ [0,0,0]	(10) y,x,z [0,0,0]
	(10) y,x,z [0,0,0]	(11) $x-y,\bar{y},z$ [0,0,0]	(12) $\bar{x},\bar{x}+y,z$ [0,0,0]	
6 g $..m1'$	$x,0,z$ [0,0,0]	$0,x,z$ [0,0,0]	\bar{x},\bar{x},z [0,0,0]	$0,\bar{x},\bar{z}$ [0,0,0]
	$0,\bar{x},\bar{z}$ [0,0,0]	$\bar{x},0,\bar{z}$ [0,0,0]	x,x,\bar{z} [0,0,0]	
6 f $..21'$	$x,\bar{x},0$ [0,0,0]	$x,2x,0$ [0,0,0]	$2\bar{x},\bar{x},0$ [0,0,0]	$\bar{x},x,0$ [0,0,0]
	$\bar{x},x,0$ [0,0,0]	$\bar{x},2\bar{x},0$ [0,0,0]	$2x,x,0$ [0,0,0]	
4 e $3..1'$	$1/3,2/3,z$ [0,0,0]	$1/3,2/3,\bar{z}$ [0,0,0]	$2/3,1/3,\bar{z}$ [0,0,0]	$2/3,1/3,z$ [0,0,0]
3 d $..2/m1'$	$1/2,0,0$ [0,0,0]	$0,1/2,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]	
2 c $3.m1'$	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]		
2 b $3.21'$	$1/3,2/3,0$ [0,0,0]	$2/3,1/3,0$ [0,0,0]		

Continued

No. 71.2.480

$p\bar{3}1m1'$

1 $a \bar{3}.m1'$ 0,0,0 [0,0,0]

Symmetry of special projections

Along [001] $p6mm1'$
 $a^* = a$ $b^* = b$
Origin at 0,0,z

Along [100] $p2mm1'$
 $a^* = (a+2b)/2$
Origin at x,0,0

Along [210] $p2111'$
 $a^* = b/2$
Origin at x,x/2,0

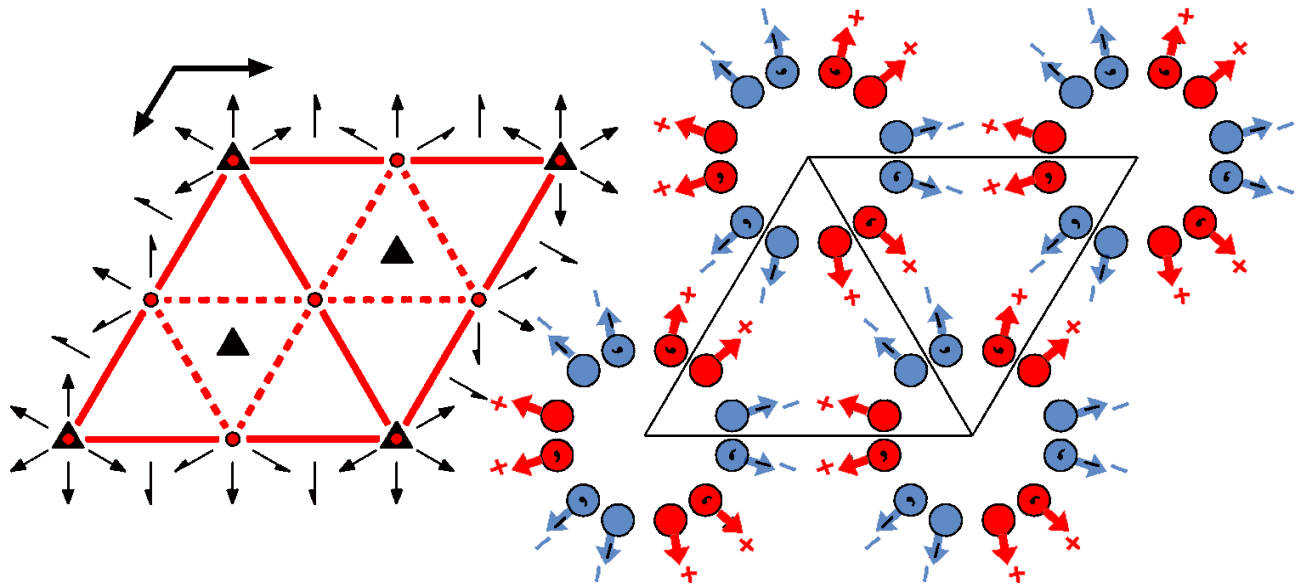
$p\bar{3}1m'$

$\bar{3}1m'$

Trigonal/Hexagonal

No. 71.3.481

$p\bar{3}12/m'$



Origin at center ($\bar{3}1m'$)

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1+y)/2;$

$y \leq \min(1-x, x); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 x, \bar{x} ,0
(2_3 0,0,0) | (5) 2 x,2x,0
(2_2 0,0,0) | (6) 2 2x,x,0
(2_1 0,0,0) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) m' x,x,z
(m_3 0,0,0)' | (11) m' x,0,z
(m_2 0,0,0)' | (12) m' 0,y,z
(m_1 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
12 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$	
	(4) $\bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]$	(5) $\bar{x}+y,y,\bar{z} [\bar{u}+v,v,\bar{w}]$	(6) $x,x-y,\bar{z} [u,u-v,\bar{w}]$	
	(7) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(8) $y,\bar{x}+y,\bar{z} [v,\bar{u}+v,\bar{w}]$	(9) $x-y,x,\bar{z} [u-v,u,\bar{w}]$	
	(10) $y,x,z [v,u,w]$	(11) $x-y,\bar{y},z [u-v,\bar{v},w]$	(12) $\bar{x},\bar{x}+y,z [\bar{u},\bar{u}+v,w]$	
6 g $\bar{3}m'$	$x,0,z [u,0,w]$	$0,x,z [0,u,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$	
	$0,\bar{x},\bar{z} [0,\bar{u},\bar{w}]$	$\bar{x},0,\bar{z} [\bar{u},0,\bar{w}]$	$x,x,\bar{z} [u,u,\bar{w}]$	
6 f $\bar{3}2$	$x,\bar{x},0 [u,\bar{u},0]$	$x,2x,0 [u,2u,0]$	$2\bar{x},\bar{x},0 [2\bar{u},\bar{u},0]$	
	$\bar{x},x,0 [\bar{u},u,0]$	$\bar{x},2\bar{x},0 [\bar{u},2\bar{u},0]$	$2x,x,0 [2u,u,0]$	
4 e $3..$	$1/3,2/3,z [0,0,w]$	$1/3,2/3,\bar{z} [0,0,\bar{w}]$	$2/3,1/3,\bar{z} [0,0,\bar{w}]$	$2/3,1/3,z [0,0,w]$
3 d $\bar{3}2/m'$	$1/2,0,0 [u,2u,0]$	$0,1/2,0 [2\bar{u},\bar{u},0]$	$1/2,1/2,0 [u,\bar{u},0]$	
2 c $3.m'$	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,\bar{w}]$		
2 b 3.2	$1/3,2/3,0 [0,0,0]$	$2/3,1/3,0 [0,0,0]$		
1 a $\bar{3}'1.m'$	$0,0,0 [0,0,0]$			

Symmetry of special projections

Along [001] $p\bar{6}m'm'$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p2m'm'$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $p211$
 $a^* = b/2$
 Origin at x,x/2,0

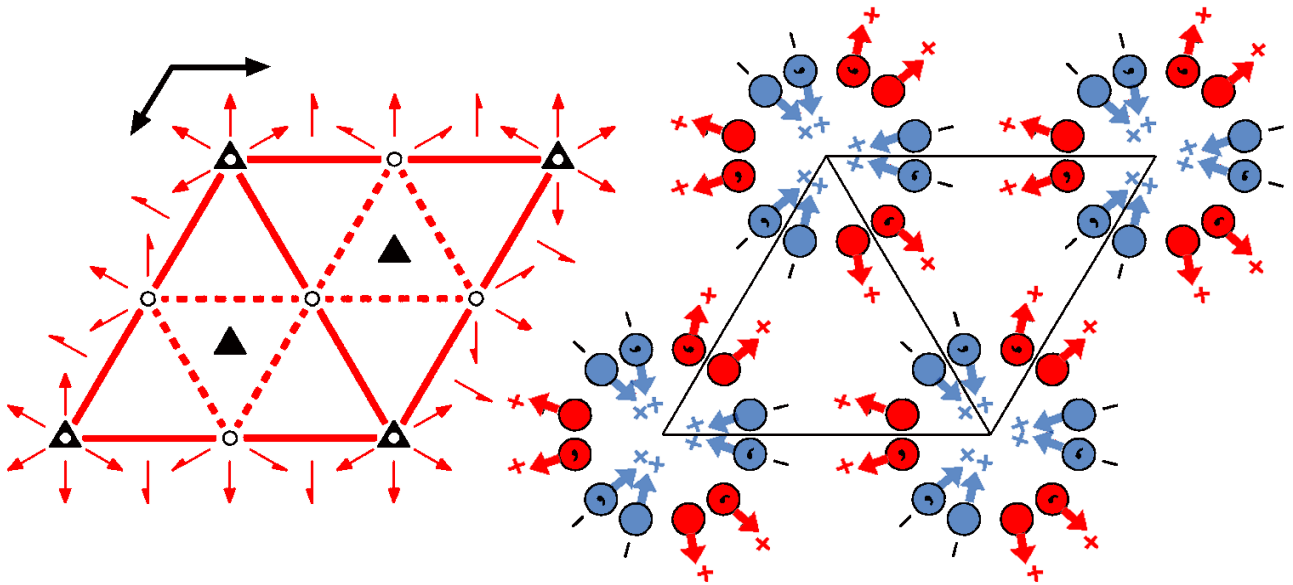
$p\bar{3}1m'$

$\bar{3}1m'$

Trigonal/Hexagonal

No. 71.4.482

$p\bar{3}12'/m'$



Origin at center ($\bar{3}1m'$)

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1+y)/2;$

$y \leq \min(1-x, x); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ x, \bar{x} ,0
(2_3 0,0,0)' | (5) $2'$ x,2x,0
(2_2 0,0,0)' | (6) $2'$ 2x,x,0
(2_1 0,0,0)' |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m' x,x,z
(m_3 0,0,0)' | (11) m' x,0,z
(m_2 0,0,0)' | (12) m' 0,y,z
(m_1 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
12 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$	
	(4) $\bar{y},\bar{x},\bar{z} [v,u,w]$	(5) $\bar{x}+y,y,\bar{z} [u-v,\bar{v},w]$	(6) $x,x-y,\bar{z} [\bar{u},\bar{u}+v,w]$	
	(7) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(8) $y,\bar{x}+y,\bar{z} [\bar{v},u-v,w]$	(9) $x-y,x,\bar{z} [\bar{u}+v,\bar{u},w]$	
	(10) $y,x,z [v,u,w]$	(11) $x-y,\bar{y},z [u-v,\bar{v},w]$	(12) $\bar{x},\bar{x}+y,z [\bar{u},\bar{u}+v,w]$	
6 g $\bar{3}m'$	$x,0,z [u,0,w]$	$0,x,z [0,u,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$	
	$0,\bar{x},\bar{z} [0,u,w]$	$\bar{x},0,\bar{z} [u,0,w]$	$x,x,\bar{z} [\bar{u},\bar{u},w]$	
6 f $\bar{3}2'$	$x,\bar{x},0 [u,u,w]$	$x,2x,0 [\bar{u},0,w]$	$2\bar{x},\bar{x},0 [0,\bar{u},w]$	
	$\bar{x},x,0 [u,u,w]$	$\bar{x},2\bar{x},0 [\bar{u},0,w]$	$2x,x,0 [0,\bar{u},w]$	
4 e $3..$	$1/3,2/3,z [0,0,w]$	$1/3,2/3,\bar{z} [0,0,w]$	$2/3,1/3,\bar{z} [0,0,w]$	$2/3,1/3,z [0,0,w]$
3 d $\bar{3}2'/m'$	$1/2,0,0 [u,0,w]$	$0,1/2,0 [0,u,w]$	$1/2,1/2,0 [\bar{u},\bar{u},w]$	
2 c $3.m'$	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$		
2 b $3.2'$	$1/3,2/3,0 [0,0,w]$	$2/3,1/3,0 [0,0,w]$		
1 a $\bar{3}.m'$	$0,0,0 [0,0,w]$			

Symmetry of special projections

Along [001] $p6'mm'$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p2'm'm$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $p2'11$
 $a^* = b/2$
 Origin at x,x/2,0

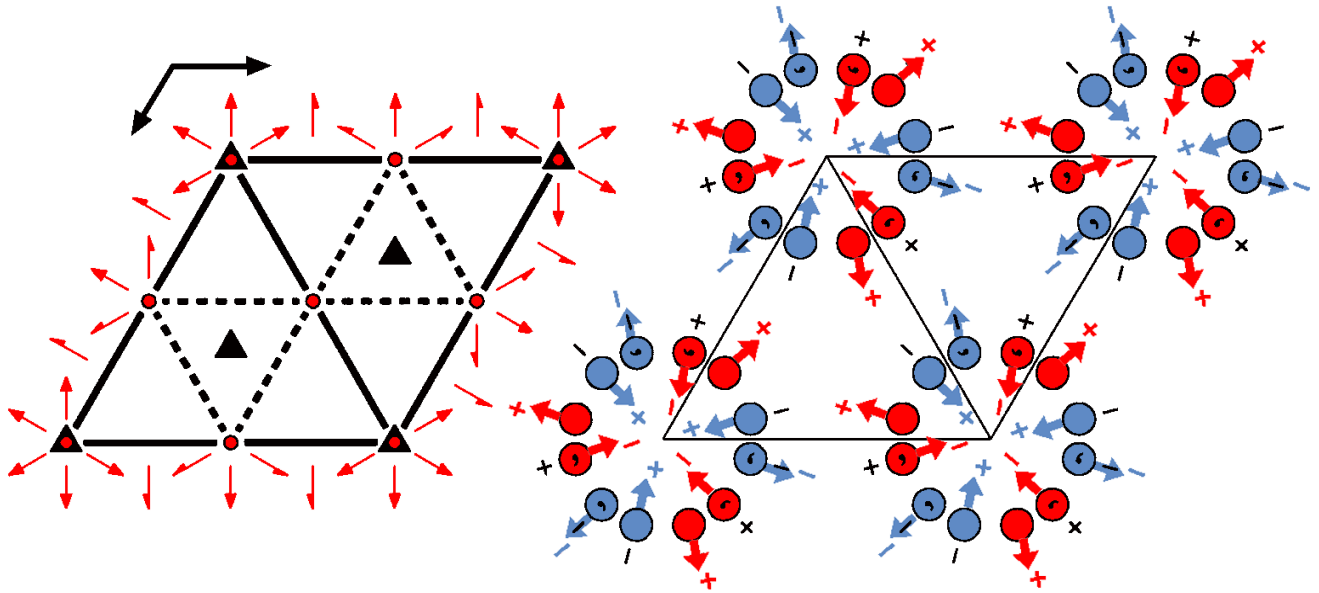
$p\bar{3}1m$

$\bar{3}1m$

Trigonal/Hexagonal

No. 71.5.483

$p\bar{3}12'/m$



Origin at center ($\bar{3}1m$)

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/2$; $x \leq (1+y)/2$;

$y \leq \min(1-x, x)$; $0 \leq z$

Vertices $0,0$; $1/2,0$; $2/3,1/3$; $1/2,1/2$

Symmetry operations

- | | | |
|---|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ $0,0,z$
(3_z 0,0,0) | (3) 3^- $0,0,z$
(3_z^{-1} 0,0,0) |
| (4) $2'$ $x,\bar{x},0$
(2_3 0,0,0)' | (5) $2'$ $x,2x,0$
(2_2 0,0,0)' | (6) $2'$ $2x,x,0$
(2_1 0,0,0)' |
| (7) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^+$ $0,0,z$; $0,0,0$
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^-$ $0,0,z$; $0,0,0$
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) m x,x,z
(m_3 0,0,0) | (11) m $x,0,z$
(m_2 0,0,0) | (12) m $0,y,z$
(m_1 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates			
12 h 1	(1) $x, y, z [u, v, w]$	(2) $\bar{y}, x-y, z [\bar{v}, u-v, w]$	(3) $\bar{x}+y, \bar{x}, z [\bar{u}+v, \bar{u}, w]$	
	(4) $\bar{y}, \bar{x}, \bar{z} [v, u, w]$	(5) $\bar{x}+y, y, \bar{z} [u-v, \bar{v}, w]$	(6) $x, x-y, \bar{z} [\bar{u}, \bar{u}+v, w]$	
	(7) $\bar{x}, \bar{y}, \bar{z} [\bar{u}, \bar{v}, \bar{w}]$	(8) $y, \bar{x}+y, \bar{z} [v, \bar{u}+v, \bar{w}]$	(9) $x-y, x, \bar{z} [u-v, u, \bar{w}]$	
	(10) $y, x, z [\bar{v}, \bar{u}, \bar{w}]$	(11) $x-y, \bar{y}, z [\bar{u}+v, v, \bar{w}]$	(12) $\bar{x}, \bar{x}+y, z [u, u-v, \bar{w}]$	
6 g ..m	$x, 0, z [u, 2u, 0]$	$0, x, z [2\bar{u}, \bar{u}, 0]$	$\bar{x}, \bar{x}, z [u, \bar{u}, 0]$	
	$0, \bar{x}, \bar{z} [2u, u, 0]$	$\bar{x}, 0, \bar{z} [\bar{u}, 2\bar{u}, 0]$	$x, x, \bar{z} [\bar{u}, u, 0]$	
6 f ..2'	$x, \bar{x}, 0 [u, u, w]$	$x, 2x, 0 [\bar{u}, 0, w]$	$2\bar{x}, \bar{x}, 0 [0, \bar{u}, w]$	
	$\bar{x}, x, 0 [\bar{u}, \bar{u}, \bar{w}]$	$\bar{x}, 2\bar{x}, 0 [u, 0, \bar{w}]$	$2x, x, 0 [0, u, \bar{w}]$	
4 e 3..	$1/3, 2/3, z [0, 0, w]$	$1/3, 2/3, \bar{z} [0, 0, w]$	$2/3, 1/3, \bar{z} [0, 0, \bar{w}]$	$2/3, 1/3, z [0, 0, \bar{w}]$
3 d ..2'/m	$1/2, 0, 0 [0, 0, 0]$	$0, 1/2, 0 [0, 0, 0]$	$1/2, 1/2, 0 [0, 0, 0]$	
2 c 3.m	$0, 0, z [0, 0, 0]$	$0, 0, \bar{z} [0, 0, 0]$		
2 b 3.2'	$1/3, 2/3, 0 [0, 0, w]$	$2/3, 1/3, 0 [0, 0, \bar{w}]$		
1 a $\bar{3}'$.m	$0, 0, 0 [0, 0, 0]$			

Symmetry of special projections

Along [001] $p6mm$
 $a^* = a$ $b^* = b$
 Origin at $0, 0, z$

Along [100] $p2mm$
 $a^* = (a+2b)/2$
 Origin at $x, 0, 0$

Along [210] $p2111'$
 $a^* = b/2$
 Origin at $x, x/2, 0$

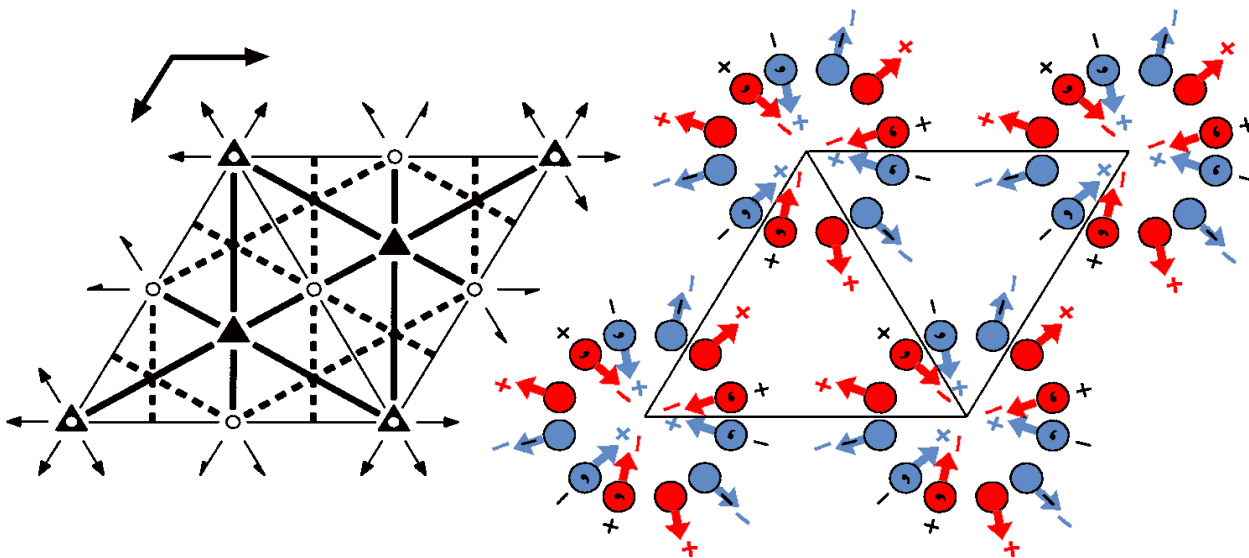
$p\bar{3}m1$

$\bar{3}m1$

Trigonal/Hexagonal

No. 72.1.484

$p\bar{3}2/m1$



Origin at center ($\bar{3}m1$)

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/3$; $x \leq (1 + y)/2$; $y \leq x/2$

Vertices $0,0$; $1/2,0$; $2/3,1/3$

Symmetry operations

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 x,x,0
(2_{xy} 0,0,0) | (5) 2 x,0,0
(2_x 0,0,0) | (6) 2 0,y,0
(2_y 0,0,0) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (11) m x,2x,z
(m_x 0,0,0) | (12) m 2x,x,z
(m_y 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 g 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) y,x, \bar{z} [v,u, \bar{w}]	(5) x-y, \bar{y},\bar{z} [u-v, \bar{v},\bar{w}]	(6) $\bar{x},\bar{x}+y,\bar{z}$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(7) \bar{x},\bar{y},\bar{z} [u,v,w]	(8) y, $\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(9) x-y,x, \bar{z} [$\bar{u}+v,\bar{u},w$]
	(10) \bar{y},\bar{x},z [v,u, \bar{w}]	(11) $\bar{x}+y,y,z$ [u-v, \bar{v},\bar{w}]	(12) x,x-y,z [$\bar{u},\bar{u}+v,\bar{w}$]
6 f .m.	x, \bar{x},z [u,u,0]	x,2x,z [$\bar{u},0,0$]	2 \bar{x},\bar{x},z [0, $\bar{u},0$]
	\bar{x},x,\bar{z} [u,u,0]	2x,x, \bar{z} [0, $\bar{u},0$]	$\bar{x},2\bar{x},\bar{z}$ [$\bar{u},0,0$]
6 e .2.	x,0,0 [u,0,0]	0,x,0 [0,u,0]	$\bar{x},\bar{x},0$ [$\bar{u},\bar{u},0$]
	$\bar{x},0,0$ [u,0,0]	0, $\bar{x},0$ [0,u,0]	x,x,0 [$\bar{u},\bar{u},0$]
3 d .2/m.	1/2,0,0 [u,0,0]	0,1/2,0 [0,u,0]	1/2,1/2,0 [$\bar{u},\bar{u},0$]
2 c 3m.	1/3,2/3,z [0,0,0]	2/3,1/3, \bar{z} [0,0,0]	
2 b 3m.	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]	
1 a $\bar{3}m.$	0,0,0 [0,0,0]		

Symmetry of special projections

Along [001] p6'mm'
a* = a b* = b
Origin at 0,0,z

Along [100] p2111'
a* = (a+2b)/2
Origin at x,0,0

Along [210] p2'mm'
a* = b/2
Origin at x,x/2,0

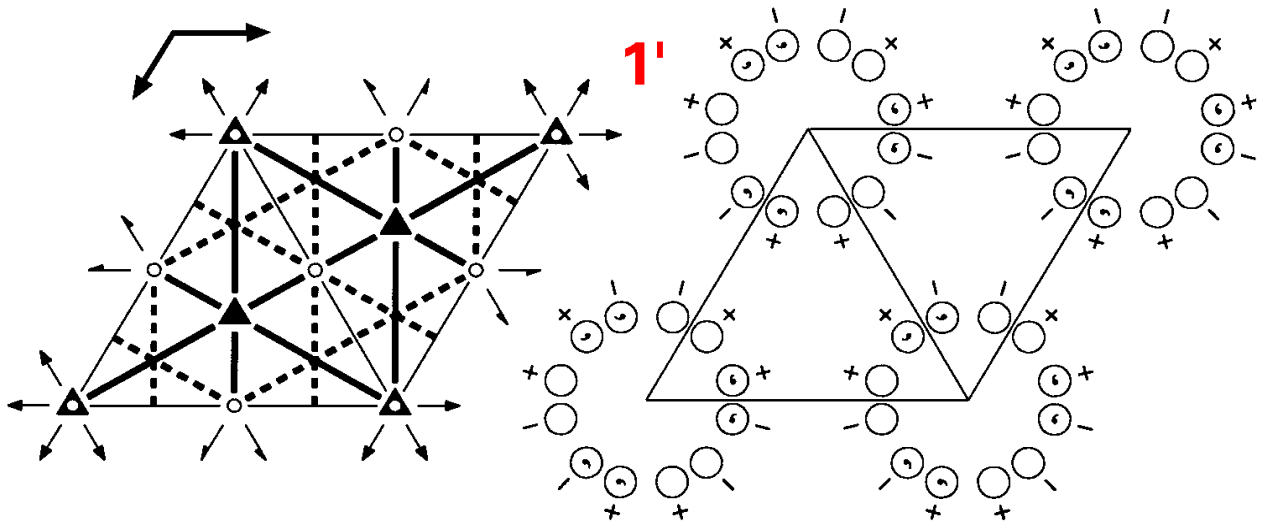
$p\bar{3}m11'$

$\bar{3}m11'$

Trigonal/Hexagonal

No. 72.2.485

$p\bar{3}2/m11'$



Origin at center ($\bar{3}m11'$)

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/3$; $x \leq (1 + y)/2$; $y \leq x/2$

Vertices $0,0$; $1/2,0$; $2/3,1/3$

Symmetry operations

For $1 +$ set

- | | | |
|--|--|---|
| (1) 1
($1 0,0,0$) | (2) 3^+ $0,0,z$
($3_z 0,0,0$) | (3) 3^- $0,0,z$
($3_z^{-1} 0,0,0$) |
| (4) 2 $x,x,0$
($2_{xy} 0,0,0$) | (5) 2 $x,0,0$
($2_x 0,0,0$) | (6) 2 $0,y,0$
($2_y 0,0,0$) |
| (7) $\bar{1}$ $0,0,0$
($\bar{1} 0,0,0$) | (8) $\bar{3}^+$ $0,0,z$; $0,0,0$
($\bar{3}_z 0,0,0$) | (9) $\bar{3}^-$ $0,0,z$; $0,0,0$
($\bar{3}_z^{-1} 0,0,0$) |
| (10) m x,\bar{x},z
($m_{xy} 0,0,0$) | (11) m $x,2x,z$
($m_x 0,0,0$) | (12) m $2x,x,z$
($m_y 0,0,0$) |

For $1' +$ set

- | | | |
|----------------------------|--|---|
| (1) $1'$
($1 0,0,0$)' | (2) $3^{+'}$ $0,0,z$
($3_z 0,0,0$)' | (3) $3^{-'}$ $0,0,z$
($3_z^{-1} 0,0,0$)' |
|----------------------------|--|---|

(4) $2'$ $x,x,0$ ($2_{xy} 0,0,0$)'	(5) $2'$ $x,0,0$ ($2_x 0,0,0$)'	(6) $2'$ $0,y,0$ ($2_y 0,0,0$)'
(7) $\bar{1}$ ' $0,0,0$ ($\bar{1} 0,0,0$)'	(8) $\bar{3}^+$ ' $0,0,z; 0,0,0$ ($\bar{3}_z 0,0,0$)'	(9) $\bar{3}^-$ ' $0,0,z; 0,0,0$ ($\bar{3}_z^{-1} 0,0,0$)'
(10) m' x,\bar{x},z ($m_{xy} 0,0,0$)'	(11) m' $x,2x,z$ ($m_x 0,0,0$)'	(12) m' $2x,x,z$ ($m_y 0,0,0$)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1'$	$+$
12 g $11'$	(1) x,y,z [0,0,0] (4) y,x,\bar{z} [0,0,0] (7) \bar{x},\bar{y},\bar{z} [0,0,0] (10) \bar{y},\bar{x},z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0] (5) $x-y,\bar{y},\bar{z}$ [0,0,0] (8) $y,\bar{x}+y,\bar{z}$ [0,0,0] (11) $\bar{x}+y,y,z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0] (6) $\bar{x},\bar{x}+y,\bar{z}$ [0,0,0] (9) $x-y,x,\bar{z}$ [0,0,0] (12) $x,x-y,z$ [0,0,0]
6 f $.m.1'$	x,\bar{x},z [0,0,0] \bar{x},x,\bar{z} [0,0,0]	$x,2x,z$ [0,0,0] $2x,x,\bar{z}$ [0,0,0]	$2\bar{x},\bar{x},z$ [0,0,0] $\bar{x},2\bar{x},\bar{z}$ [0,0,0]
6 e $.2.1'$	$x,0,0$ [0,0,0] $\bar{x},0,0$ [0,0,0]	$0,x,0$ [0,0,0] $0,\bar{x},0$ [0,0,0]	$\bar{x},\bar{x},0$ [0,0,0] $x,x,0$ [0,0,0]
3 d $.2/m.1'$	$1/2,0,0$ [0,0,0]	$0,1/2,0$ [0,0,0]	$1/2,1/2,0$ [0,0,0]
2 c $3m.1'$	$1/3,2/3,z$ [0,0,0]	$2/3,1/3,\bar{z}$ [0,0,0]	
2 b $3m.1'$	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]	
1 a $\bar{3}m.1'$	$0,0,0$ [0,0,0]		

Symmetry of special projections

Along [001] $p6mm1'$ $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] $p2111'$ $a^* = (a+2b)/2$

Origin at x,0,0

Along [210] $p2mm1'$ $a^* = b/2$

Origin at x,x/2,0

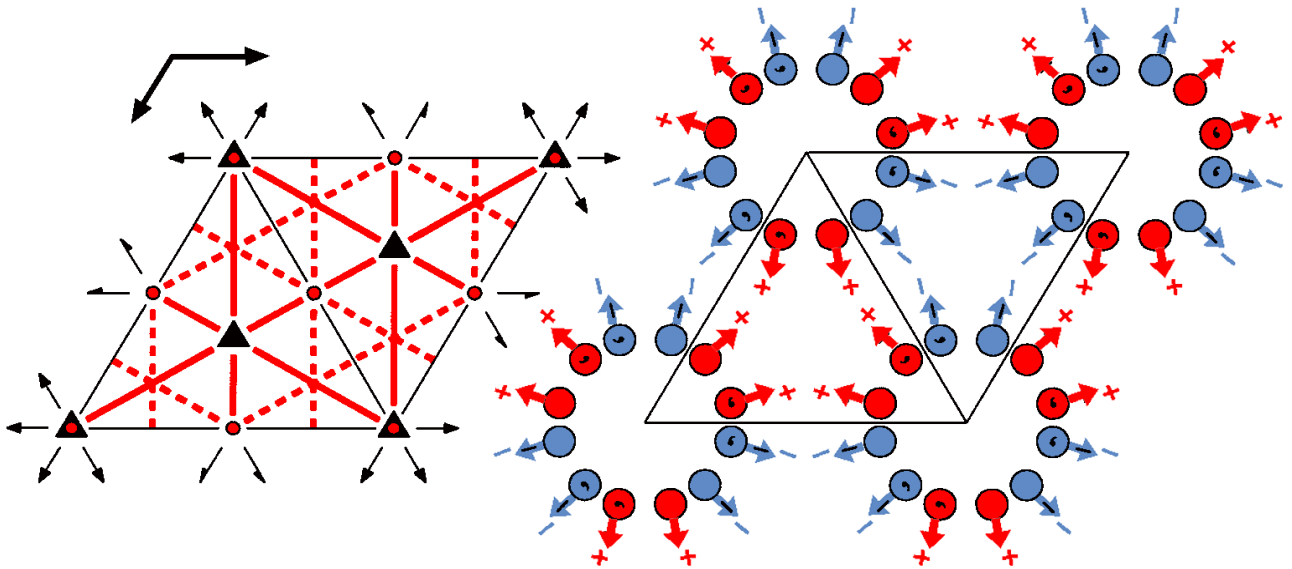
$p\bar{3}m'1$

$\bar{3}m'1$

Trigonal/Hexagonal

No. 72.3.486

$p\bar{3}2/m'1$



Origin at center ($\bar{3}m'1$)

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/3$; $x \leq (1 + y)/2$; $y \leq x/2$

Vertices $0,0$; $1/2,0$; $2/3,1/3$

Symmetry operations

- | | | |
|--|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 x,x,0
(2_{xy} 0,0,0) | (5) 2 x,0,0
(2_x 0,0,0) | (6) 2 0,y,0
(2_y 0,0,0) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (11) m' x,2x,z
(m_x 0,0,0)' | (12) m' 2x,x,z
(m_y 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 g 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $y,x,\bar{z} [v,u,\bar{w}]$	(5) $x-y,\bar{y},\bar{z} [u-v,\bar{v},\bar{w}]$	(6) $\bar{x},\bar{x}+y,\bar{z} [\bar{u},\bar{u}+v,\bar{w}]$
	(7) $\bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]$	(8) $y,\bar{x}+y,\bar{z} [v,\bar{u}+v,\bar{w}]$	(9) $x-y,x,\bar{z} [u-v,u,\bar{w}]$
	(10) $\bar{y},\bar{x},z [\bar{v},\bar{u},w]$	(11) $\bar{x}+y,y,z [\bar{u}+v,v,w]$	(12) $x,x-y,z [u,u-v,w]$
6 f .m'	$x,\bar{x},z [u,\bar{u},w]$	$x,2x,z [u,2u,w]$	$2\bar{x},\bar{x},z [2\bar{u},\bar{u},w]$
	$\bar{x},x,\bar{z} [\bar{u},u,\bar{w}]$	$2x,x,\bar{z} [2u,u,\bar{w}]$	$\bar{x},2\bar{x},\bar{z} [\bar{u},2\bar{u},\bar{w}]$
6 e .2.	$x,0,0 [u,0,0]$	$0,x,0 [0,u,0]$	$\bar{x},\bar{x},0 [\bar{u},\bar{u},0]$
	$\bar{x},0,0 [\bar{u},0,0]$	$0,\bar{x},0 [0,\bar{u},0]$	$x,x,0 [u,u,0]$
3 d .2/m'	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$
2 c 3m'	$1/3,2/3,z [0,0,w]$	$2/3,1/3,\bar{z} [0,0,\bar{w}]$	
2 b 3m'	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,\bar{w}]$	
1 a $\bar{3}'m'$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p\bar{6}m'm'$
 $a^* = a \quad b^* = b$
 Origin at 0,0,z

Along [100] $p211$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $p2m'm'$
 $a^* = b/2$
 Origin at x,x/2,0

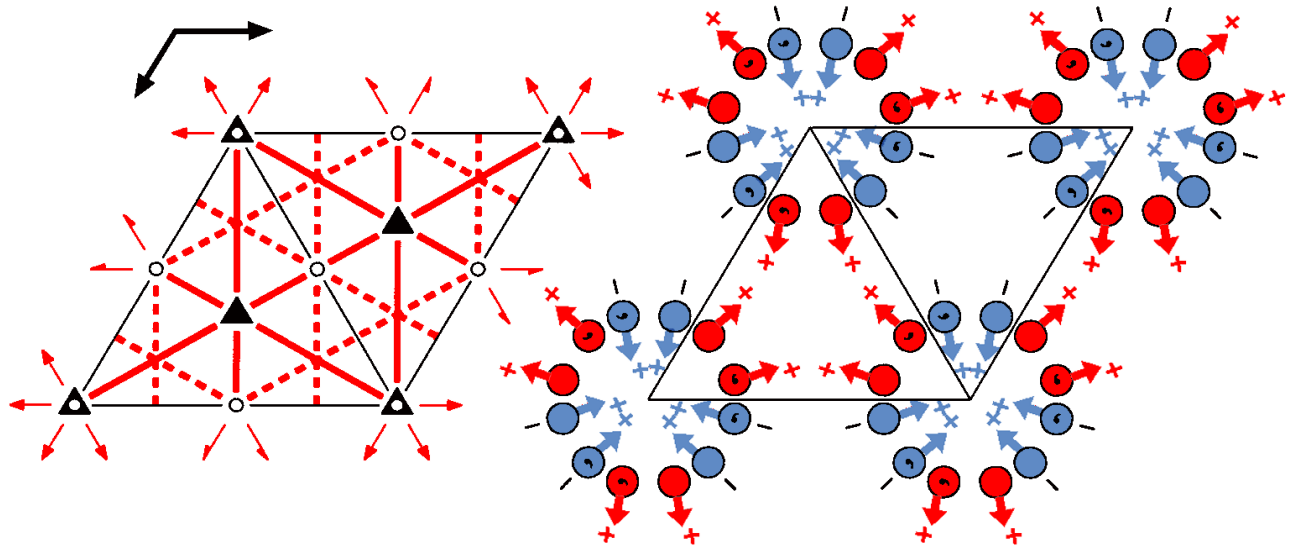
$p\bar{3}m'1$

$\bar{3}m'1$

Trigonal/Hexagonal

No. 72.4.487

$p\bar{3}2'/m'1$



Origin at center ($\bar{3}m'1$)

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/3$; $x \leq (1 + y)/2$; $y \leq x/2$

Vertices $0,0$; $1/2,0$; $2/3,1/3$

Symmetry operations

- | | | |
|--|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ $0,0,z$
(3_z 0,0,0) | (3) 3^- $0,0,z$
(3_z^{-1} 0,0,0) |
| (4) $2'$ $x,x,0$
(2_{xy} 0,0,0)' | (5) $2'$ $x,0,0$
(2_x 0,0,0)' | (6) $2'$ $0,y,0$
(2_y 0,0,0)' |
| (7) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ $0,0,z$; $0,0,0$
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ $0,0,z$; $0,0,0$
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m' x,\bar{x},z
(m_{xy} 0,0,0)' | (11) m' $x,2x,z$
(m_x 0,0,0)' | (12) m' $2x,x,z$
(m_y 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 g 1	(1) x,y,z $[u,v,w]$	(2) $\bar{y},x-y,z$ $[\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z$ $[\bar{u}+v,\bar{u},w]$
	(4) y,x,\bar{z} $[\bar{v},\bar{u},w]$	(5) $x-y,\bar{y},\bar{z}$ $[\bar{u}+v,v,w]$	(6) $\bar{x},\bar{x}+y,\bar{z}$ $[u,u-v,w]$
	(7) \bar{x},\bar{y},\bar{z} $[u,v,w]$	(8) $y,\bar{x}+y,\bar{z}$ $[\bar{v},u-v,w]$	(9) $x-y,x,\bar{z}$ $[\bar{u}+v,\bar{u},w]$
	(10) \bar{y},\bar{x},z $[\bar{v},\bar{u},w]$	(11) $\bar{x}+y,y,z$ $[\bar{u}+v,v,w]$	(12) $x,x-y,z$ $[u,u-v,w]$
6 f $.m'$	x,\bar{x},z $[u,\bar{u},w]$	$x,2x,z$ $[u,2u,w]$	$2\bar{x},\bar{x},z$ $[2\bar{u},\bar{u},w]$
	\bar{x},x,\bar{z} $[u,\bar{u},w]$	$2x,x,\bar{z}$ $[2u,\bar{u},w]$	$\bar{x},2\bar{x},\bar{z}$ $[u,2u,w]$
6 e $.2'$	$x,0,0$ $[u,2u,w]$	$0,x,0$ $[2\bar{u},\bar{u},w]$	$\bar{x},\bar{x},0$ $[u,\bar{u},w]$
	$\bar{x},0,0$ $[u,2u,w]$	$0,\bar{x},0$ $[2\bar{u},\bar{u},w]$	$x,x,0$ $[u,\bar{u},w]$
3 d $.2'/m'$	$1/2,0,0$ $[u,2u,w]$	$0,1/2,0$ $[2\bar{u},\bar{u},w]$	$1/2,1/2,0$ $[u,\bar{u},w]$
2 c $3m'$	$1/3,2/3,z$ $[0,0,w]$	$2/3,1/3,\bar{z}$ $[0,0,w]$	
2 b $3m'$	$0,0,z$ $[0,0,w]$	$0,0,\bar{z}$ $[0,0,w]$	
1 a $\bar{3}m'$	$0,0,0$ $[0,0,w]$		

Symmetry of special projections

Along $[001]$ $p6'mm'$
 $a^* = a$ $b^* = b$
 Origin at $0,0,z$

Along $[100]$ $p2'11$
 $a^* = (a+2b)/2$
 Origin at $x,0,0$

Along $[210]$ $p2'm'm$
 $a^* = b/2$
 Origin at $x,x/2,0$

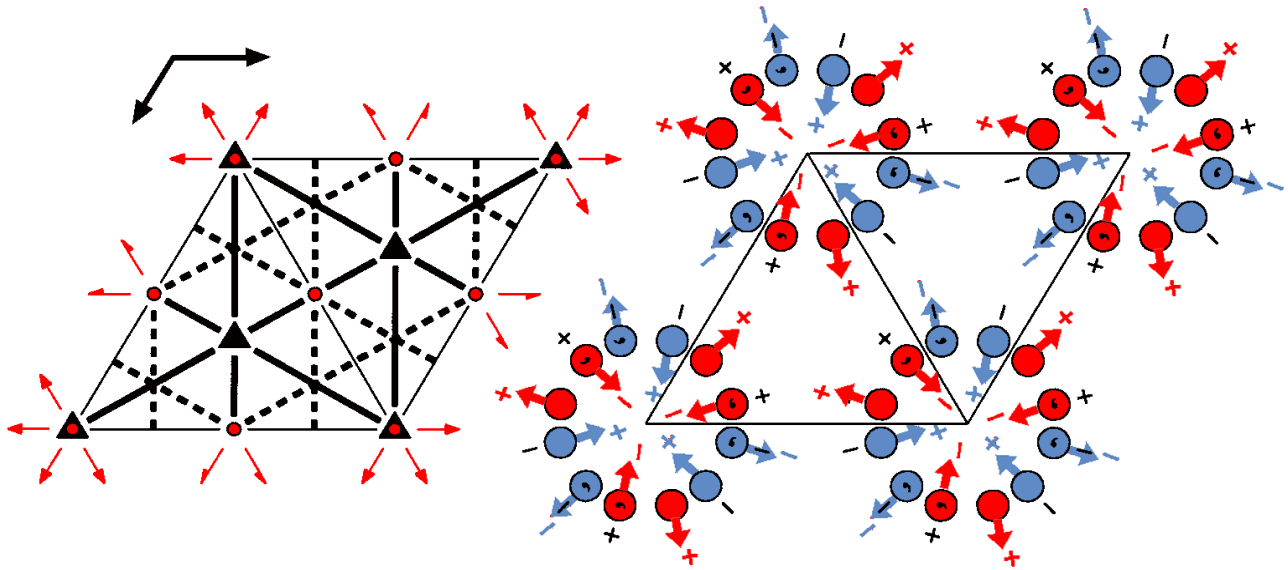
$p\bar{3}m1$

$\bar{3}m1$

Trigonal/Hexagonal

No. 72.5.488

$p\bar{3}2/m1$



Origin at center ($\bar{3}m1$)

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/3$; $x \leq (1 + y)/2$; $y \leq x/2$

Vertices $0,0$; $1/2,0$; $2/3,1/3$

Symmetry operations

- | | | |
|---|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ $0,0,z$
(3_z 0,0,0) | (3) 3^- $0,0,z$
(3_z^{-1} 0,0,0) |
| (4) $2'$ $x,x,0$
(2_{xy} 0,0,0)' | (5) $2'$ $x,0,0$
(2_x 0,0,0)' | (6) $2'$ $0,y,0$
(2_y 0,0,0)' |
| (7) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^+$ $0,0,z$; $0,0,0$
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^-$ $0,0,z$; $0,0,0$
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) m x,\bar{x},z
(m_{xy} 0,0,0) | (11) m $x,2x,z$
(m_x 0,0,0) | (12) m $2x,x,z$
(m_y 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

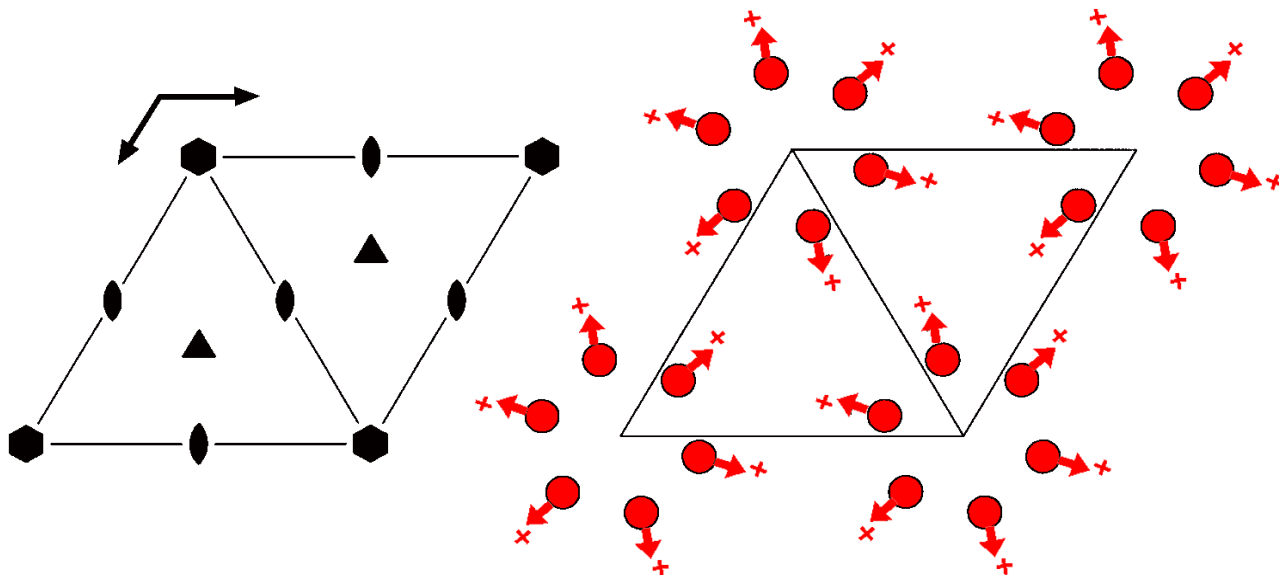
	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 g 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) y,x,\bar{z} [\bar{v},\bar{u},w]	(5) $x-y,\bar{y},\bar{z}$ [$\bar{u}+v,v,w$]	(6) $\bar{x},\bar{x}+y,\bar{z}$ [$u,u-v,w$]
	(7) \bar{x},\bar{y},\bar{z} [\bar{u},\bar{v},\bar{w}]	(8) $y,\bar{x}+y,\bar{z}$ [$v,\bar{u}+v,\bar{w}$]	(9) $x-y,x,\bar{z}$ [$u-v,u,\bar{w}$]
	(10) \bar{y},\bar{x},z [v,u,\bar{w}]	(11) $\bar{x}+y,y,z$ [$u-v,\bar{v},\bar{w}$]	(12) $x,x-y,z$ [$\bar{u},\bar{u}+v,\bar{w}$]
6 f .m.	x,\bar{x},z [$u,u,0$]	$x,2x,z$ [$\bar{u},0,0$]	$2\bar{x},\bar{x},z$ [$0,\bar{u},0$]
	\bar{x},x,\bar{z} [$\bar{u},\bar{u},0$]	$2x,x,\bar{z}$ [$0,u,0$]	$\bar{x},2\bar{x},\bar{z}$ [$u,0,0$]
6 e .2'	$x,0,0$ [$u,2u,w$]	$0,x,0$ [$2\bar{u},\bar{u},w$]	$\bar{x},\bar{x},0$ [u,\bar{u},w]
	$\bar{x},0,0$ [$\bar{u},2\bar{u},\bar{w}$]	$0,\bar{x},0$ [$2u,u,\bar{w}$]	$x,x,0$ [\bar{u},u,\bar{w}]
3 d .2'/m.	$1/2,0,0$ [$0,0,0$]	$0,1/2,0$ [$0,0,0$]	$1/2,1/2,0$ [$0,0,0$]
2 c 3m.	$1/3,2/3,z$ [$0,0,0$]	$2/3,1/3,\bar{z}$ [$0,0,0$]	
2 b 3m.	$0,0,z$ [$0,0,0$]	$0,0,\bar{z}$ [$0,0,0$]	
1 a $\bar{3}'m$.	$0,0,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $p6mm$
 $a^* = a$ $b^* = b$
 Origin at $0,0,z$

Along [100] $p2111'$
 $a^* = (a+2b)/2$
 Origin at $x,0,0$

Along [210] $p2mm$
 $a^* = b/2$
 Origin at $x,x/2,0$



Origin on 6

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/2$; $x \leq (1+y)/2$;

$$y \leq \min(1-x, x)$$

Vertices $0,0$; $1/2,0$; $2/3,1/3$; $1/2,1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) 2 0,0,z
(2_z |0,0,0)

(5) 6^- 0,0,z
(6_z^{-1} |0,0,0)

(6) 6^+ 0,0,z
(6_z |0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
6 d 1	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z$ [$u-v,u,w$]
3 c 2..	$1/2,0,z$ [$0,0,w$]	$0,1/2,z$ [$0,0,w$]	$1/2,1/2,z$ [$0,0,w$]
2 b 3..	$1/3,2/3,z$ [$0,0,w$]	$2/3,1/3,z$ [$0,0,w$]	
1 a 6..	$0,0,z$ [$0,0,w$]		

Symmetry of special projections

Along [001] $p6$ $a^* = a$ $b^* = b$ Origin at $0,0,z$	Along [100] $p1m'1$ $a^* = (a+2b)/2$ Origin at $x,0,0$	Along [210] $p1m'1$ $a^* = b/2$ Origin at $x,x/2,0$
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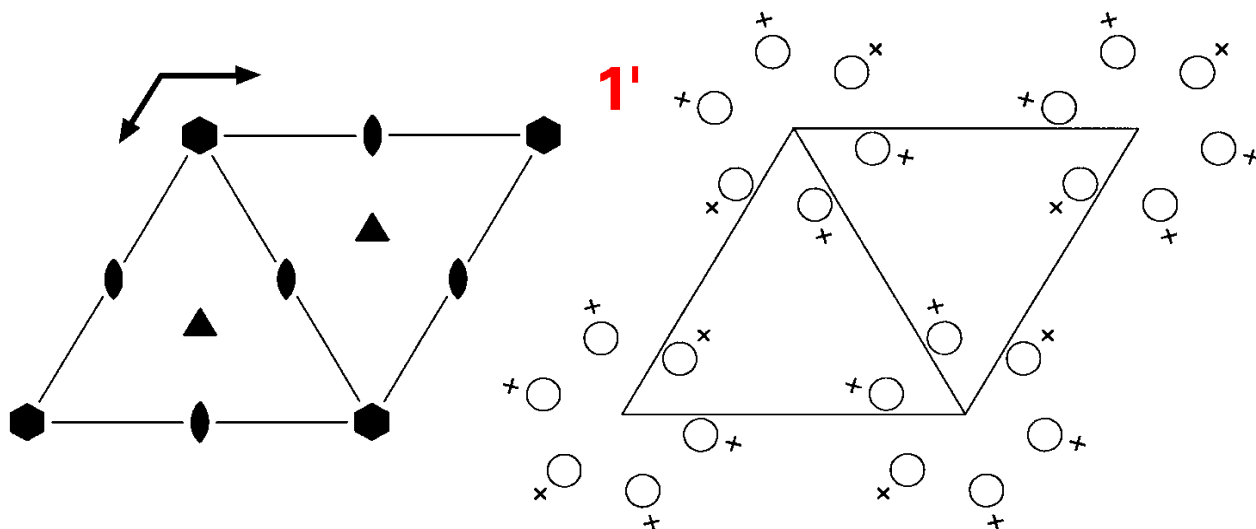
p61'

61'

Hexagonal/Hexagonal

No. 73.2.490

p61'



Origin on 61'

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1 + y)/2;$

$$y \leq \min(1 - x, x)$$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

For 1 + set

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3 ⁺ 0,0,z
(3 _z 0,0,0) | (3) 3 ⁻ 0,0,z
(3 _z ⁻¹ 0,0,0) |
| (4) 2 0,0,z
(2 _z 0,0,0) | (5) 6 ⁻ 0,0,z
(6 _z ⁻¹ 0,0,0) | (6) 6 ⁺ 0,0,z
(6 _z 0,0,0) |

For 1' + set

- | | | |
|--|--|--|
| (1) 1'
(1 0,0,0)' | (2) 3 ⁺ 0,0,z
(3 _z 0,0,0)' | (3) 3 ⁻ 0,0,z
(3 _z ⁻¹ 0,0,0)' |
| (4) 2' 0,0,z
(2 _z 0,0,0)' | (5) 6 ⁻ 0,0,z
(6 _z ⁻¹ 0,0,0)' | (6) 6 ⁺ 0,0,z
(6 _z 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1'$	$+$
6 d $11'$	(1) x,y,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0]
	(4) \bar{x},\bar{y},z [0,0,0]	(5) $y,\bar{x}+y,z$ [0,0,0]	(6) $x-y,x,z$ [0,0,0]
3 c $2..1'$	$1/2,0,z$ [0,0,0]	$0,1/2,z$ [0,0,0]	$1/2,1/2,z$ [0,0,0]
2 b $3..1'$	$1/3,2/3,z$ [0,0,0]	$2/3,1/3,z$ [0,0,0]	
1 a $6..1'$	$0,0,z$ [0,0,0]		

Symmetry of special projections

Along [001] $p61'$ $a^* = a$ $b^* = b$ Origin at 0,0,z	Along [100] $p1m11'$ $a^* = (a+2b)/2$ Origin at $x,0,0$	Along [210] $p1m11'$ $a^* = b/2$ Origin at $x,x/2,0$
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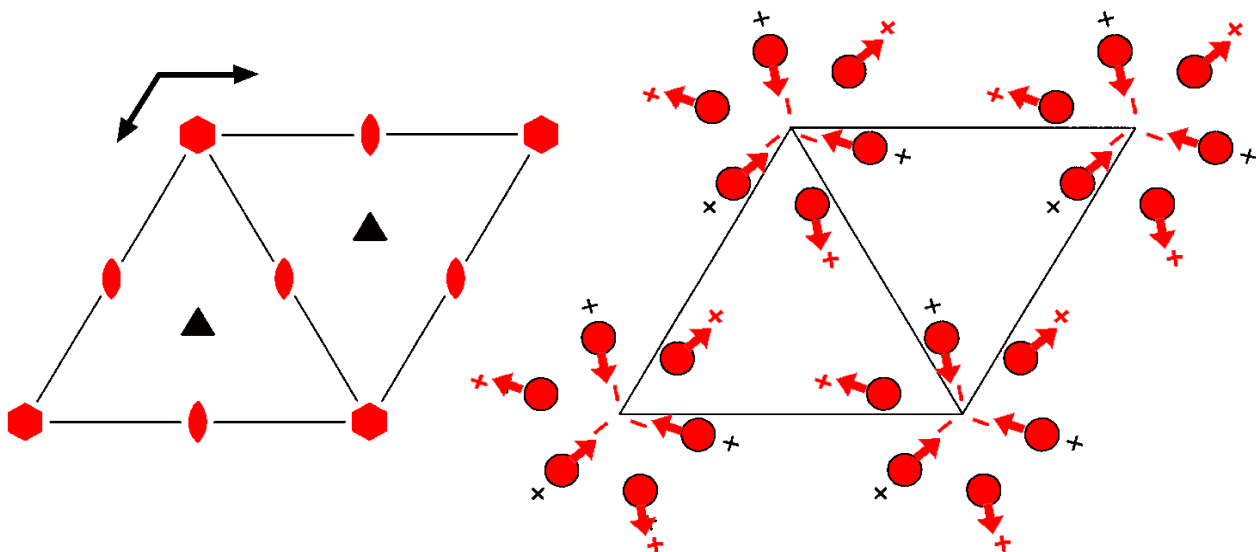
p6'

6'

Hexagonal/Hexagonal

No. 73.3.491

p6'



Origin on 6'

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1 + y)/2;$

$$y \leq \min(1 - x, x)$$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) $2'$ 0,0,z
(2_z |0,0,0)'

(5) 6^- 0,0,z
(6_z^{-1} |0,0,0)'

(6) 6^+ 0,0,z
(6_z |0,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z $[u,v,w]$	(2) $\bar{y},x-y,z$ $[\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z$ $[\bar{u}+v,\bar{u},w]$
6 d 1	(4) \bar{x},\bar{y},z $[u,v,\bar{w}]$	(5) $y,\bar{x}+y,z$ $[\bar{v},u-v,\bar{w}]$	(6) $x-y,x,z$ $[\bar{u}+v,\bar{u},\bar{w}]$
3 c 2'..	$1/2,0,z$ $[u,v,0]$	$0,1/2,z$ $[\bar{v},u-v,0]$	$1/2,1/2,z$ $[\bar{u}+v,\bar{u},0]$
2 b 3'..	$1/3,2/3,z$ $[0,0,w]$	$2/3,1/3,z$ $[0,0,\bar{w}]$	
1 a 6'..	$0,0,z$ $[0,0,0]$		

Symmetry of special projections

Along $[001]$ $p6'$
 $a^* = a$ $b^* = b$
 Origin at $0,0,z$

Along $[100]$ $p1m1$
 $a^* = (a+2b)/2$
 Origin at $x,0,0$

Along $[210]$ $p1m1$
 $a^* = b/2$
 Origin at $x,x/2,0$

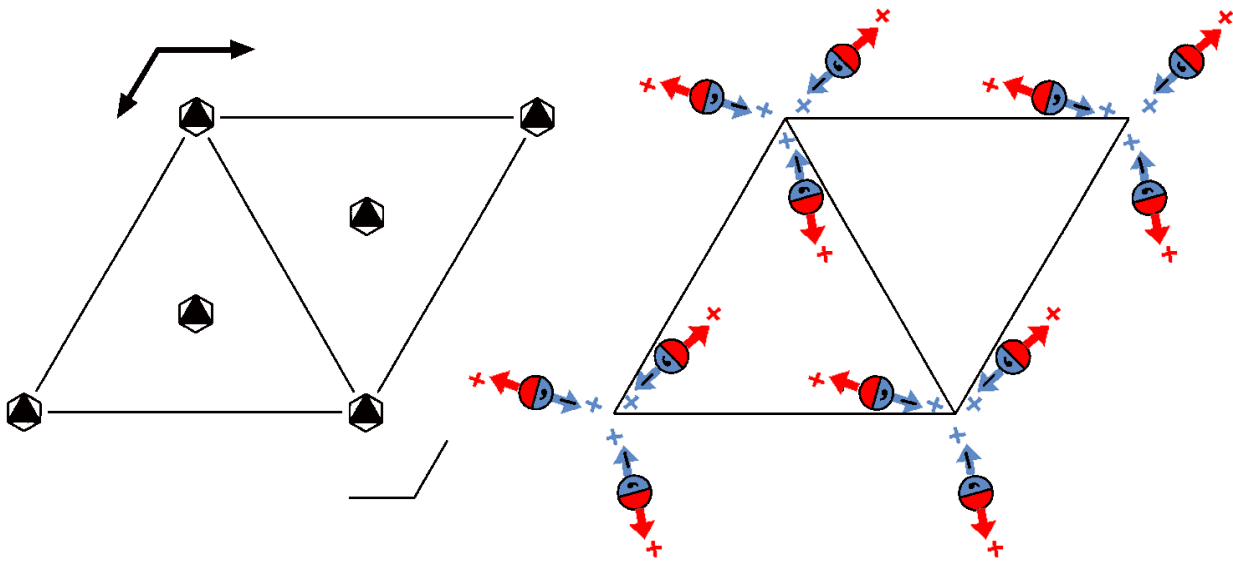
$p\bar{6}$

No. 74.1.492

$\bar{6}$

$p\bar{6}$

Hexagonal/Hexagonal



Origin at $\bar{6}$

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq (1+y)/2;$

$y \leq \min(1-x, (1+x)/2); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/3,2/3; 0,1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) m x,y,0
(m_z |0,0,0)

(5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ |0,0,0)

(6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ |0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
6 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(5) $\bar{y},x-y,\bar{z} [v,\bar{u}+v,w]$	(6) $\bar{x}+y,\bar{x},\bar{z} [u-v,u,w]$
3 g m..	$x,y,0 [0,0,w]$	$\bar{y},x-y,0 [0,0,w]$	$\bar{x}+y,\bar{x},0 [0,0,w]$
2 f 3..	$2/3,1/3,z [0,0,w]$	$2/3,1/3,\bar{z} [0,0,w]$	
2 e 3..	$1/3,2/3,z [0,0,w]$	$1/3,2/3,\bar{z} [0,0,w]$	
2 d 3..	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$	
1 c $\bar{6}$..	$2/3,1/3,0 [0,0,w]$		
1 b $\bar{6}$..	$1/3,2/3,0 [0,0,w]$		
1 a $\bar{6}$..	$0,0,0 [0,0,w]$		

Symmetry of special projections

Along [001] $p3'$
 $a^* = a \quad b^* = b$
 Origin at 0,0,z

Along [100] $p11m$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $p11m$
 $a^* = b/2$
 Origin at x,x/2,0

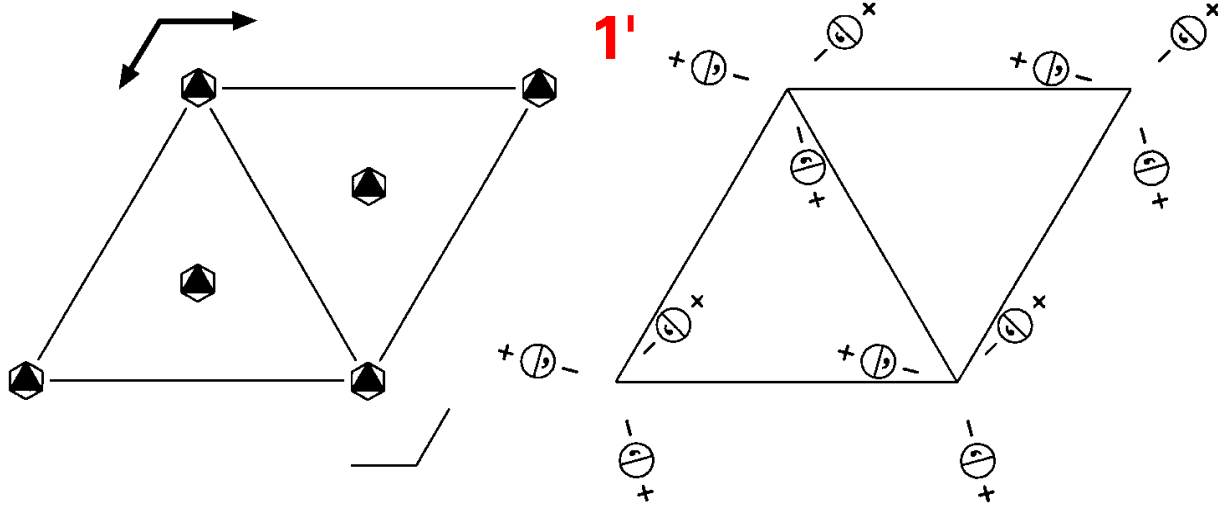
$p\bar{6}1'$

$\bar{6}1'$

Hexagonal/Hexagonal

No. 74.2.493

$p\bar{6}1'$



Origin at $\bar{6}1'$

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq (1+y)/2;$

$y \leq \min(1-x, (1+x)/2); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/3,2/3; 0,1/2$

Symmetry operations

For 1 + set

(1) 1 (1 0,0,0)	(2) 3^+ 0,0,z (3_z 0,0,0)	(3) 3^- 0,0,z (3_z^{-1} 0,0,0)
--------------------	------------------------------------	---

(4) m x,y,0 (m_z 0,0,0)	(5) $\bar{6}^-$ 0,0,z; 0,0,0 ($\bar{6}_z^{-1}$ 0,0,0)	(6) $\bar{6}^+$ 0,0,z; 0,0,0 ($\bar{6}_z$ 0,0,0)
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For 1' + set

(1) 1' (1 0,0,0)'	(2) $3^{+'}$ 0,0,z (3_z 0,0,0)'	(3) $3^{-'}$ 0,0,z (3_z^{-1} 0,0,0)'
----------------------	--	---

(4) m' x,y,0 (m_z 0,0,0)'	(5) $\bar{6}^{-'}$ 0,0,z; 0,0,0 ($\bar{6}_z^{-1}$ 0,0,0)'	(6) $\bar{6}^{+'}$ 0,0,z; 0,0,0 ($\bar{6}_z$ 0,0,0)'
----------------------------------	--	---

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1' +$	
6 h $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{y},x-y,z [0,0,0]$	(3) $\bar{x}+y,\bar{x},z [0,0,0]$
	(4) $x,y,\bar{z} [0,0,0]$	(5) $\bar{y},x-y,\bar{z} [0,0,0]$	(6) $\bar{x}+y,\bar{x},\bar{z} [0,0,0]$
3 g $m..1'$	$x,y,0 [0,0,0]$	$\bar{y},x-y,0 [0,0,0]$	$\bar{x}+y,\bar{x},0 [0,0,0]$
2 f $3..1'$	$2/3,1/3,z [0,0,0]$	$2/3,1/3,\bar{z} [0,0,0]$	
2 e $3..1'$	$1/3,2/3,z [0,0,0]$	$1/3,2/3,\bar{z} [0,0,0]$	
2 d $3..1'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
1 c $\bar{6}..1'$	$2/3,1/3,0 [0,0,0]$		
1 b $\bar{6}..1'$	$1/3,2/3,0 [0,0,0]$		
1 a $\bar{6}..1'$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along $[001]$ $p31'$
 $a^* = a$ $b^* = b$
 Origin at $0,0,z$

Along $[100]$ $p11m1'$
 $a^* = (a+2b)/2$
 Origin at $x,0,0$

Along $[210]$ $p11m1'$
 $a^* = b/2$
 Origin at $x,x/2,0$

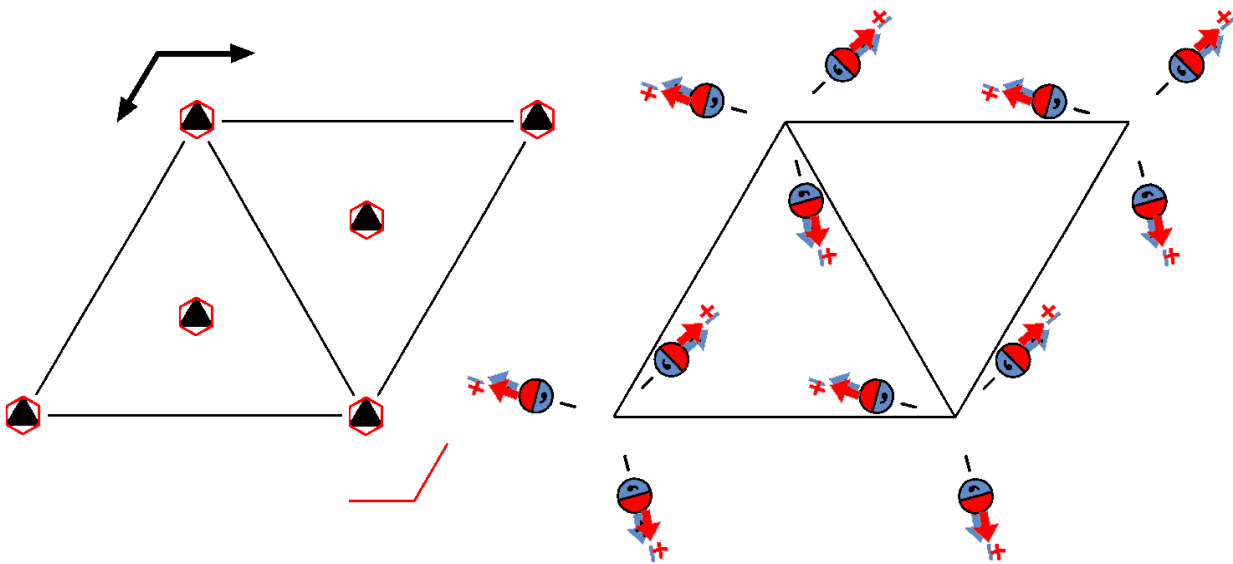
$p\bar{6}'$

$\bar{6}'$

Hexagonal/Hexagonal

No. 74.3.494

$p\bar{6}'$



Origin at $\bar{6}'$

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq (1+y)/2;$

$y \leq \min(1-x, (1+x)/2); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/3,2/3; 0,1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) m' x,y,0
(m_z |0,0,0)'

(5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ |0,0,0)'

(6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ |0,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
6 h 1	(4) x,y,\bar{z} [u,v,\bar{w}]	(5) $\bar{y},x-y,\bar{z}$ [$\bar{v},u-v,\bar{w}$]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [$\bar{u}+v,\bar{u},\bar{w}$]
3 g $m'..$	$x,y,0$ [$u,v,0$]	$\bar{y},x-y,0$ [$\bar{v},u-v,0$]	$\bar{x}+y,\bar{x},0$ [$\bar{u}+v,\bar{u},0$]
2 f $3..$	$2/3,1/3,z$ [$0,0,w$]	$2/3,1/3,\bar{z}$ [$0,0,\bar{w}$]	
2 e $3..$	$1/3,2/3,z$ [$0,0,w$]	$1/3,2/3,\bar{z}$ [$0,0,\bar{w}$]	
2 d $3..$	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,\bar{w}$]	
1 c $\bar{6}'..$	$2/3,1/3,0$ [$0,0,0$]		
1 b $\bar{6}'..$	$1/3,2/3,0$ [$0,0,0$]		
1 a $\bar{6}'..$	$0,0,0$ [$0,0,0$]		

Symmetry of special projections

Along $[001]$ $p3$
 $a^* = a$ $b^* = b$
 Origin at $0,0,z$

Along $[100]$ $p11m'$
 $a^* = (a+2b)/2$
 Origin at $x,0,0$

Along $[210]$ $p11m'$
 $a^* = b/2$
 Origin at $x,x/2,0$

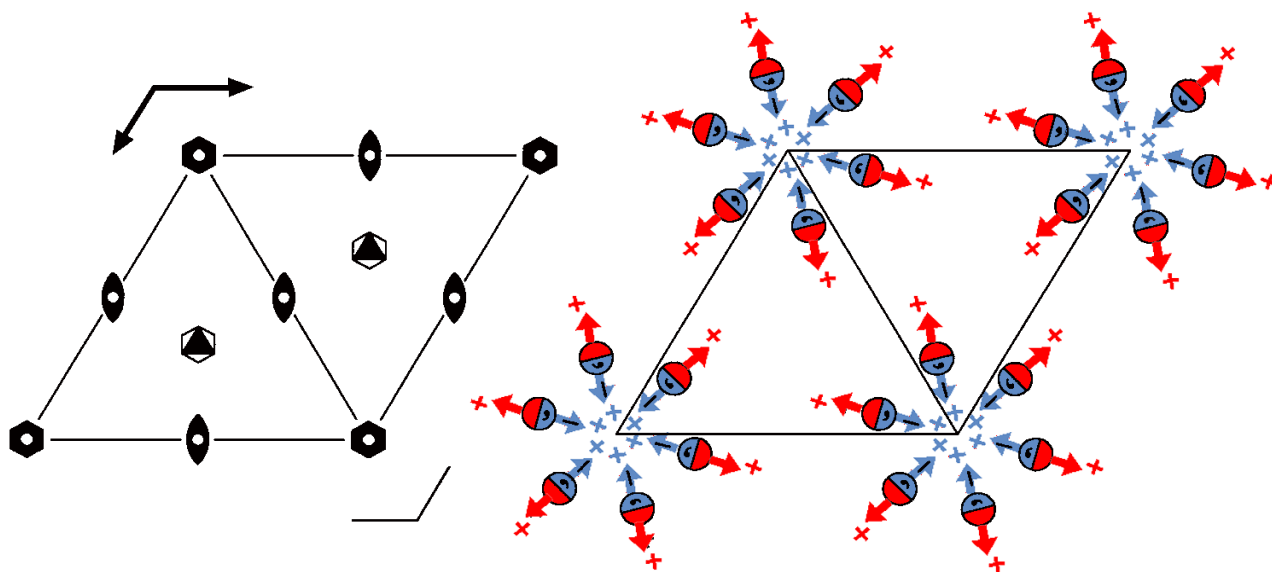
p6/m

6/m

Hexagonal/Hexagonal

No. 75.1.495

p6/m



Origin at center (6/m)

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1 + y)/2;$

$y \leq \min(1 - x, x); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m x,y,0
(m_z 0,0,0) | (11) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (12) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) \bar{x},\bar{y},z [\bar{u},\bar{v},w]	(5) $y,\bar{x}+y,z$ [$v,\bar{u}+v,w$]	(6) $x-y,x,z$ [$u-v,u,w$]
	(7) \bar{x},\bar{y},\bar{z} [u,v,w]	(8) $y,\bar{x}+y,\bar{z}$ [$\bar{v},u-v,w$]	(9) $x-y,x,\bar{z}$ [$\bar{u}+v,\bar{u},w$]
	(10) x,y,\bar{z} [\bar{u},\bar{v},w]	(11) $\bar{y},x-y,\bar{z}$ [$v,\bar{u}+v,w$]	(12) $\bar{x}+y,\bar{x},\bar{z}$ [$u-v,u,w$]
6 g m..	$x,y,0$ [$0,0,w$]	$\bar{y},x-y,0$ [$0,0,w$]	$\bar{x}+y,\bar{x},0$ [$0,0,w$]
	$\bar{x},\bar{y},0$ [$0,0,w$]	$y,\bar{x}+y,0$ [$0,0,w$]	$x-y,x,0$ [$0,0,w$]
6 f 2..	$1/2,0,z$ [$0,0,w$]	$0,1/2,z$ [$0,0,w$]	$1/2,1/2,z$ [$0,0,w$]
	$1/2,0,\bar{z}$ [$0,0,w$]	$0,1/2,\bar{z}$ [$0,0,w$]	$1/2,1/2,\bar{z}$ [$0,0,w$]
4 e 3..	$1/3,2/3,z$ [$0,0,w$]	$2/3,1/3,z$ [$0,0,w$]	
	$1/3,2/3,\bar{z}$ [$0,0,w$]	$2/3,1/3,\bar{z}$ [$0,0,w$]	
3 d $2/m..$	$1/2,0,0$ [$0,0,w$]	$0,1/2,0$ [$0,0,w$]	$1/2,1/2,0$ [$0,0,w$]
2 c 6..	$0,0,z$ [$0,0,w$]	$0,0,\bar{z}$ [$0,0,w$]	
2 b $\bar{6}..$	$1/3,2/3,0$ [$0,0,w$]	$2/3,1/3,0$ [$0,0,w$]	
1 a $6/m..$	$0,0,0$ [$0,0,w$]		

Symmetry of special projections

Along [001] $\rho\bar{6}$
 $a^* = a$ $b^* = b$
 Origin at $0,0,z$

Along [100] $\rho 2'm'm$
 $a^* = (a+2b)/2$
 Origin at $x,0,0$

Along [210] $\rho 2'm'm$
 $a^* = b/2$
 Origin at $x,x/2,0$

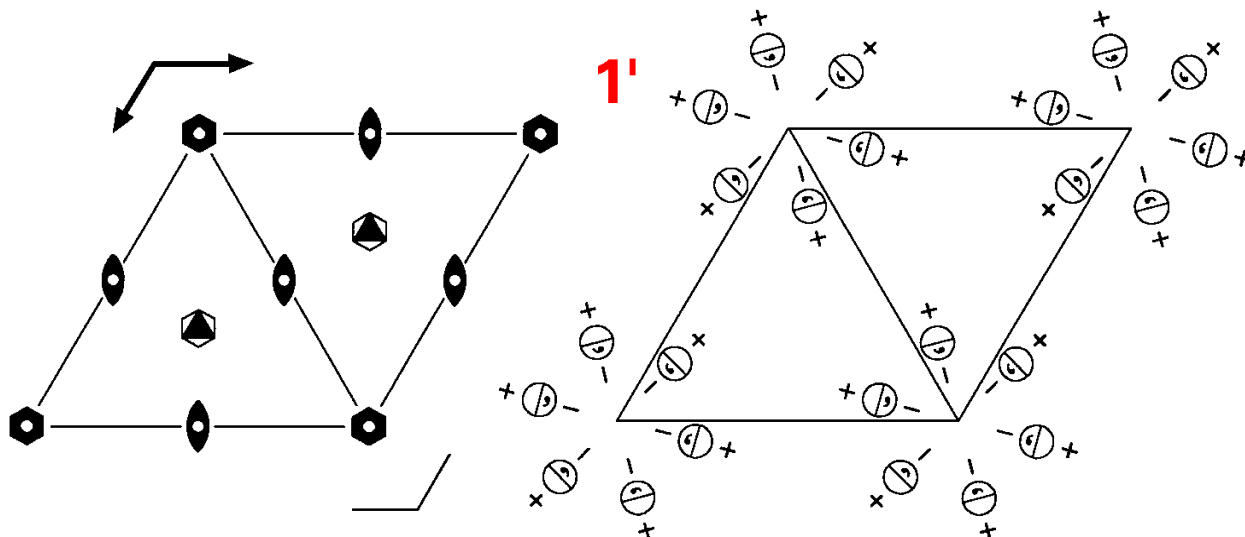
p6/m1'

6/m1'

Hexagonal/Hexagonal

No. 75.2.496

p6/m1'



Origin at center (6/m1')

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1+y)/2;$

$y \leq \min(1-x, x); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

For 1+ set

- | | | |
|--|--|---|
| (1) 1
(1 0,0,0) | (2) 3 ⁺ 0,0,z
(3 _z 0,0,0) | (3) 3 ⁻ 0,0,z
(3 _z ⁻¹ 0,0,0) |
| (4) 2 0,0,z
(2 _z 0,0,0) | (5) 6 ⁺ 0,0,z
(6 _z ⁺ 0,0,0) | (6) 6 ⁻ 0,0,z
(6 _z ⁻ 0,0,0) |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z^+$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^-$ 0,0,0) |
| (10) m x,y,0
(m _z 0,0,0) | (11) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^-$ 0,0,0) | (12) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z^+$ 0,0,0) |

For 1'+ set

- | | | |
|----------------------|--|--|
| (1) 1'
(1 0,0,0)' | (2) 3 ⁺ ' 0,0,z
(3 _z 0,0,0)' | (3) 3 ⁻ ' 0,0,z
(3 _z ⁻¹ 0,0,0)' |
|----------------------|--|--|

(4) $2' \quad 0,0,z$ $(2_z 0,0,0)'$	(5) $6^- \quad 0,0,z$ $(6_z^{-1} 0,0,0)'$	(6) $6^+ \quad 0,0,z$ $(6_z 0,0,0)'$
(7) $\bar{1}' \quad 0,0,0$ $(\bar{1} 0,0,0)'$	(8) $\bar{3}^+ \quad 0,0,z; \quad 0,0,0$ $(\bar{3}_z 0,0,0)'$	(9) $\bar{3}^- \quad 0,0,z; \quad 0,0,0$ $(\bar{3}_z^{-1} 0,0,0)'$
(10) $m' \quad x,y,0$ $(m_z 0,0,0)'$	(11) $\bar{6}^- \quad 0,0,z; \quad 0,0,0$ $(\bar{6}_z^{-1} 0,0,0)'$	(12) $\bar{6}^+ \quad 0,0,z; \quad 0,0,0$ $(\bar{6}_z 0,0,0)'$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1'+$	
12 h $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{y},x-y,z [0,0,0]$	(3) $\bar{x}+y,\bar{x},z [0,0,0]$
	(4) $\bar{x},\bar{y},z [0,0,0]$	(5) $y,\bar{x}+y,z [0,0,0]$	(6) $x-y,x,z [0,0,0]$
	(7) $\bar{x},\bar{y},\bar{z} [0,0,0]$	(8) $y,\bar{x}+y,\bar{z} [0,0,0]$	(9) $x-y,x,\bar{z} [0,0,0]$
	(10) $x,y,\bar{z} [0,0,0]$	(11) $\bar{y},x-y,\bar{z} [0,0,0]$	(12) $\bar{x}+y,\bar{x},\bar{z} [0,0,0]$
6 g $m..1'$	$x,y,0 [0,0,0]$	$\bar{y},x-y,0 [0,0,0]$	$\bar{x}+y,\bar{x},0 [0,0,0]$
	$\bar{x},\bar{y},0 [0,0,0]$	$y,\bar{x}+y,0 [0,0,0]$	$x-y,x,0 [0,0,0]$
6 f $2..1'$	$1/2,0,z [0,0,0]$	$0,1/2,z [0,0,0]$	$1/2,1/2,z [0,0,0]$
	$1/2,0,\bar{z} [0,0,0]$	$0,1/2,\bar{z} [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$
4 e $3..1'$	$1/3,2/3,z [0,0,0]$	$2/3,1/3,z [0,0,0]$	
	$1/3,2/3,\bar{z} [0,0,0]$	$2/3,1/3,\bar{z} [0,0,0]$	
3 d $2/m..1'$	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$
2 c $6..1'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	

Continued

No. 75.2.496

$p\bar{6}/m1'$

2 $b \bar{6}..1'$ $1/3, 2/3, 0 [0,0,0]$

$2/3, 1/3, 0 [0,0,0]$

1 $a \bar{6}/m..1'$ $0,0,0 [0,0,0]$

Symmetry of special projections

Along $[001]$ $p\bar{6}1'$

$a^* = a \quad b^* = b$

Origin at $0,0,z$

Along $[100]$ $p2mm1'$

$a^* = (a+2b)/2$

Origin at $x,0,0$

Along $[210]$ $p2mm1'$

$a^* = b/2$

Origin at $x,x/2,0$

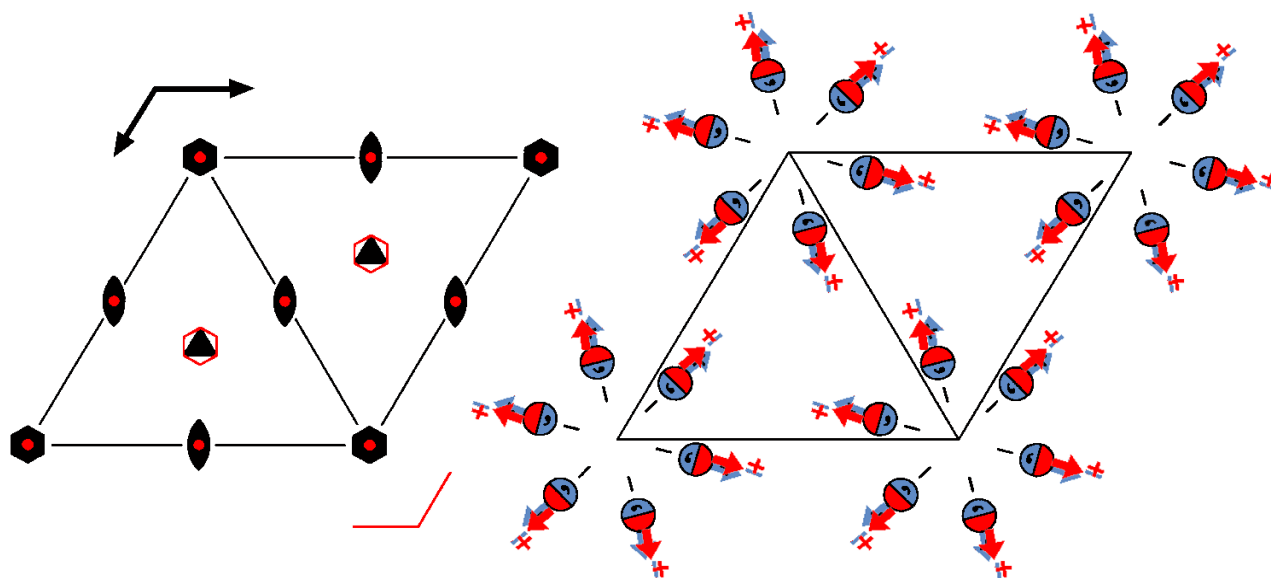
p6/m'

6/m'

Hexagonal/Hexagonal

No. 75.3.497

p6/m'



Origin at center (6/m')

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/2$; $x \leq (1 + y)/2$;

$y \leq \min(1 - x, x)$; $0 \leq z$

Vertices $0,0$; $1/2,0$; $2/3,1/3$; $1/2,1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) 2 0,0,z
(2_z |0,0,0)

(5) 6^- 0,0,z
(6_z^{-1} |0,0,0)

(6) 6^+ 0,0,z
(6_z |0,0,0)

(7) $\bar{1}$ 0,0,0
($\bar{1}$ |0,0,0)'

(8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ |0,0,0)'

(9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ |0,0,0)'

(10) m' x,y,0
(m_z |0,0,0)'

(11) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ |0,0,0)'

(12) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ |0,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 h 1	(1) x, y, z $[u, v, w]$	(2) $\bar{y}, x-y, z$ $[\bar{v}, u-v, w]$	(3) $\bar{x}+y, \bar{x}, z$ $[\bar{u}+v, \bar{u}, w]$ $[\bar{u}, \bar{v}, w]$
	(4) \bar{x}, \bar{y}, z $[\bar{u}, \bar{v}, w]$	(5) $y, \bar{x}+y, z$ $[v, \bar{u}+v, w]$	(6) $x-y, x, z$ $[u-v, u, w]$
	(7) $\bar{x}, \bar{y}, \bar{z}$ $[\bar{u}, \bar{v}, \bar{w}]$	(8) $y, \bar{x}+y, \bar{z}$ $[v, \bar{u}+v, \bar{w}]$	(9) $x-y, x, \bar{z}$ $[u-v, u, \bar{w}]$
	(10) x, y, \bar{z} $[u, v, \bar{w}]$	(11) $\bar{y}, x-y, \bar{z}$ $[\bar{v}, u-v, \bar{w}]$	(12) $\bar{x}+y, \bar{x}, \bar{z}$ $[\bar{u}+v, \bar{u}, \bar{w}]$
6 g $m'..$	$x, y, 0$ $[u, v, 0]$	$\bar{y}, x-y, 0$ $[\bar{v}, u-v, 0]$	$\bar{x}+y, \bar{x}, 0$ $[\bar{u}+v, \bar{u}, 0]$
	$\bar{x}, \bar{y}, 0$ $[\bar{u}, \bar{v}, 0]$	$y, \bar{x}+y, 0$ $[v, \bar{u}+v, 0]$	$x-y, x, 0$ $[u-v, u, 0]$
6 f $2..$	$1/2, 0, z$ $[0, 0, w]$	$0, 1/2, z$ $[0, 0, w]$	$1/2, 1/2, z$ $[0, 0, w]$
	$1/2, 0, \bar{z}$ $[0, 0, \bar{w}]$	$0, 1/2, \bar{z}$ $[0, 0, \bar{w}]$	$1/2, 1/2, \bar{z}$ $[0, 0, \bar{w}]$
4 e $3..$	$1/3, 2/3, z$ $[0, 0, w]$	$2/3, 1/3, z$ $[0, 0, w]$	
	$1/3, 2/3, \bar{z}$ $[0, 0, \bar{w}]$	$2/3, 1/3, \bar{z}$ $[0, 0, \bar{w}]$	
3 d $2/m'..$	$1/2, 0, 0$ $[0, 0, 0]$	$0, 1/2, 0$ $[0, 0, 0]$	$1/2, 1/2, 0$ $[0, 0, 0]$
2 c $6..$	$0, 0, z$ $[0, 0, w]$	$0, 0, \bar{z}$ $[0, 0, \bar{w}]$	
2 b $\bar{6}'..$	$1/3, 2/3, 0$ $[0, 0, 0]$	$2/3, 1/3, 0$ $[0, 0, 0]$	
1 a $6/m'..$	$0, 0, 0$ $[0, 0, 0]$		

Symmetry of special projections

Along $[001]$ $\rho 61'$
 $a^* = a$ $b^* = b$
 Origin at $0, 0, z$

Along $[100]$ $\rho 2m'm'$
 $a^* = (a+2b)/2$
 Origin at $x, 0, 0$

Along $[210]$ $\rho 2m'm'$
 $a^* = b/2$
 Origin at $x, x/2, 0$

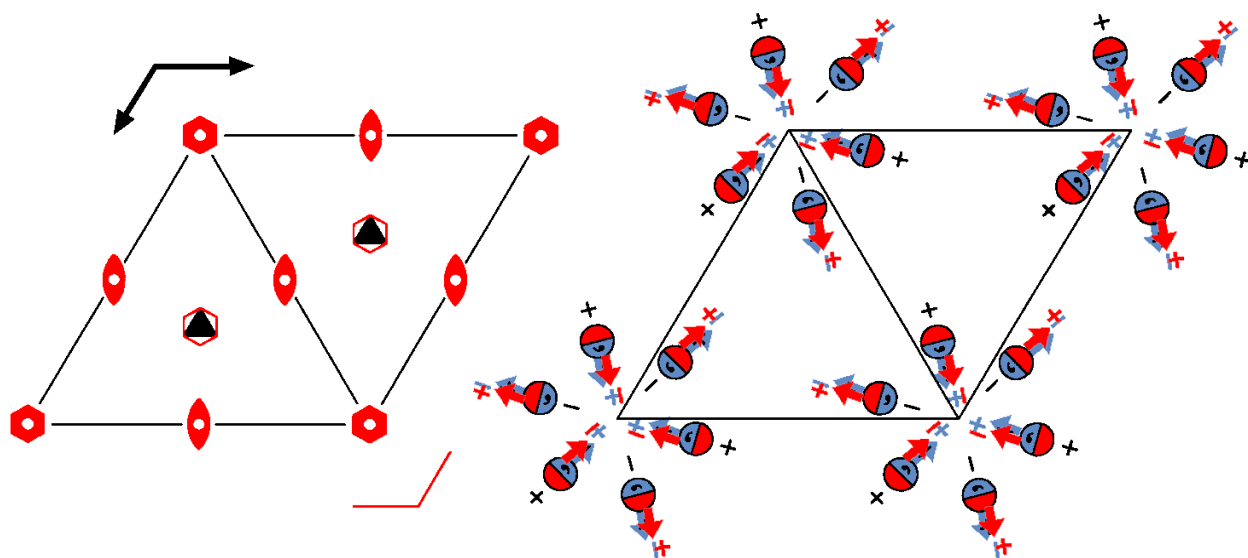
$p6'/m'$

$6'/m'$

Hexagonal/Hexagonal

No. 75.4.498

$p6'/m'$



Origin at center ($6'/m'$)

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1 + y)/2;$

$y \leq \min(1 - x, x); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) $6^-'$ 0,0,z
(6_z^{-1} 0,0,0)' | (6) $6^+'$ 0,0,z
(6_z 0,0,0)' |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (10) m' x,y,0
(m_z 0,0,0)' | (11) $\bar{6}^-'$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (12) $\bar{6}^+'$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(5) $y,\bar{x}+y,z [\bar{v},u-v,\bar{w}]$	(6) $x-y,x,z [\bar{u}+v,\bar{u},\bar{w}]$
	(7) $\bar{x},\bar{y},\bar{z} [u,v,w]$	(8) $y,\bar{x}+y,\bar{z} [\bar{v},u-v,w]$	(9) $x-y,x,\bar{z} [\bar{u}+v,\bar{u},w]$
	(10) $x,y,\bar{z} [u,v,\bar{w}]$	(11) $\bar{y},x-y,\bar{z} [\bar{v},u-v,\bar{w}]$	(12) $\bar{x}+y,\bar{x},\bar{z} [\bar{u}+v,\bar{u},\bar{w}]$
6 g $m'..$	$x,y,0 [u,v,0]$	$\bar{y},x-y,0 [\bar{v},u-v,0]$	$\bar{x}+y,\bar{x},0 [\bar{u}+v,\bar{u},0]$
	$\bar{x},\bar{y},0 [u,v,0]$	$y,\bar{x}+y,0 [\bar{v},u-v,0]$	$x-y,x,0 [\bar{u}+v,\bar{u},0]$
6 f $2'..$	$1/2,0,z [u,v,0]$	$0,1/2,z [\bar{v},u-v,0]$	$1/2,1/2,z [\bar{u}+v,\bar{u},0]$
	$1/2,0,\bar{z} [u,v,0]$	$0,1/2,\bar{z} [\bar{v},u-v,0]$	$1/2,1/2,\bar{z} [\bar{u}+v,\bar{u},0]$
4 e $3..$	$1/3,2/3,z [0,0,w]$	$2/3,1/3,z [0,0,\bar{w}]$	
	$1/3,2/3,\bar{z} [0,0,\bar{w}]$	$2/3,1/3,\bar{z} [0,0,w]$	
3 d $2'/m'..$	$1/2,0,0 [u,v,0]$	$0,1/2,0 [\bar{v},u-v,0]$	$1/2,1/2,0 [\bar{u}+v,\bar{u},0]$
2 c $6'..$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
2 b $\bar{6}'..$	$1/3,2/3,0 [0,0,0]$	$2/3,1/3,0 [0,0,0]$	
1 a $6'/m'..$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $\rho 61'$
 $a^* = a \quad b^* = b$
 Origin at 0,0,z

Along [100] $\rho 2'mm'$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $\rho 2'mm'$
 $a^* = b/2$
 Origin at x,x/2,0

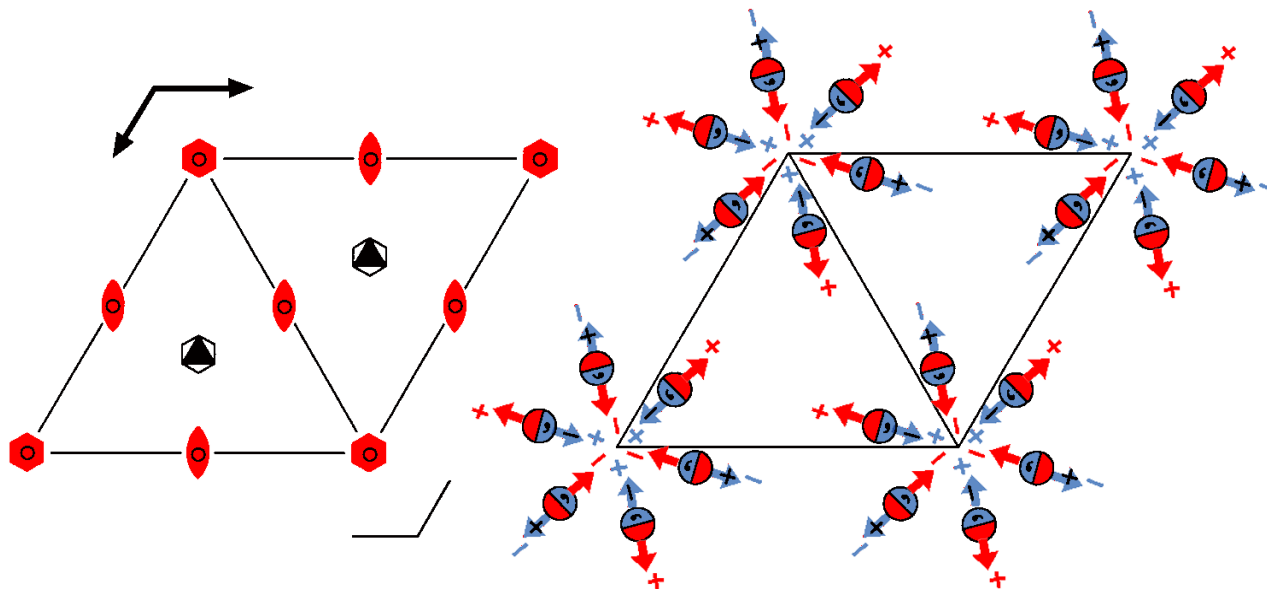
p6'/m

6'/m

Hexagonal/Hexagonal

No. 75.5.499

p6'/m



Origin at center (6'/m)

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1 + y)/2;$

$y \leq \min(1 - x, x); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (8) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (9) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (10) m x,y,0
(m_z 0,0,0) | (11) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (12) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

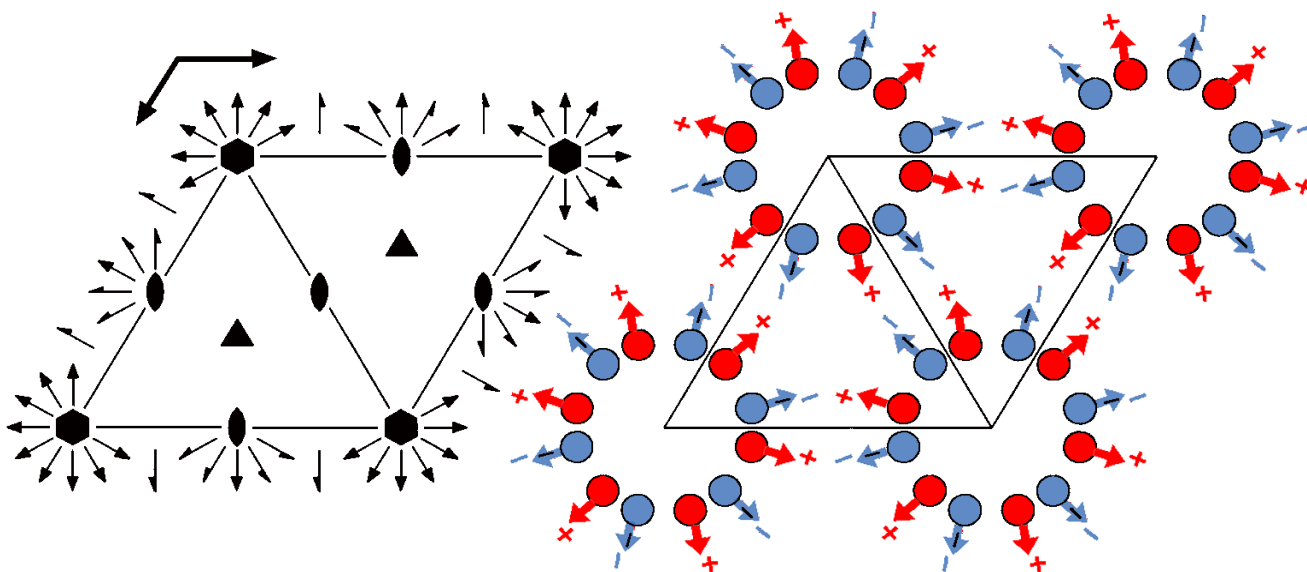
	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 h 1	(1) x, y, z $[u, v, w]$	(2) $\bar{y}, x-y, z$ $[\bar{v}, u-v, w]$	(3) $\bar{x}+y, \bar{x}, z$ $[\bar{u}+v, \bar{u}, w]$
	(4) \bar{x}, \bar{y}, z $[u, v, \bar{w}]$	(5) $y, \bar{x}+y, z$ $[\bar{v}, u-v, \bar{w}]$	(6) $x-y, x, z$ $[\bar{u}+v, \bar{u}, \bar{w}]$
	(7) $\bar{x}, \bar{y}, \bar{z}$ $[\bar{u}, \bar{v}, \bar{w}]$	(8) $y, \bar{x}+y, \bar{z}$ $[v, \bar{u}+v, \bar{w}]$	(9) $x-y, x, \bar{z}$ $[u-v, u, \bar{w}]$
	(10) x, y, \bar{z} $[\bar{u}, \bar{v}, w]$	(11) $\bar{y}, x-y, \bar{z}$ $[v, \bar{u}+v, w]$	(12) $\bar{x}+y, \bar{x}, \bar{z}$ $[u-v, u, w]$
6 g m..	$x, y, 0$ $[0, 0, w]$	$\bar{y}, x-y, 0$ $[0, 0, w]$	$\bar{x}+y, \bar{x}, 0$ $[0, 0, w]$
	$\bar{x}, \bar{y}, 0$ $[0, 0, \bar{w}]$	$y, \bar{x}+y, 0$ $[0, 0, \bar{w}]$	$x-y, x, 0$ $[0, 0, \bar{w}]$
6 f 2'..	$1/2, 0, z$ $[u, v, 0]$	$0, 1/2, z$ $[\bar{v}, u-v, 0]$	$1/2, 1/2, z$ $[\bar{u}+v, \bar{u}, 0]$
	$1/2, 0, \bar{z}$ $[\bar{u}, \bar{v}, 0]$	$0, 1/2, \bar{z}$ $[v, \bar{u}+v, 0]$	$1/2, 1/2, \bar{z}$ $[u-v, u, 0]$
4 e 3..	$1/3, 2/3, z$ $[0, 0, w]$	$2/3, 1/3, z$ $[0, 0, \bar{w}]$	
	$1/3, 2/3, \bar{z}$ $[0, 0, w]$	$2/3, 1/3, \bar{z}$ $[0, 0, \bar{w}]$	
3 d 2'/m..	$1/2, 0, 0$ $[0, 0, 0]$	$0, 1/2, 0$ $[0, 0, 0]$	$1/2, 1/2, 0$ $[0, 0, 0]$
2 c 6'..	$0, 0, z$ $[0, 0, 0]$	$0, 0, \bar{z}$ $[0, 0, 0]$	
2 b $\bar{6}$..	$1/3, 2/3, 0$ $[0, 0, w]$	$2/3, 1/3, 0$ $[0, 0, \bar{w}]$	
1 a 6'/m..	$0, 0, 0$ $[0, 0, 0]$		

Symmetry of special projections

Along $[001]$ $\rho 6'$
 $a^* = a$ $b^* = b$
 Origin at $0, 0, z$

Along $[100]$ $\rho 2mm$
 $a^* = (a+2b)/2$
 Origin at $x, 0, 0$

Along $[210]$ $\rho 2mm$
 $a^* = b/2$
 Origin at $x, x/2, 0$



Origin at 622

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/2$; $x \leq (1 + y)/2$;

$y \leq \min(1 - x, x)$; $0 \leq z$

Vertices $0,0$; $1/2,0$; $2/3,1/3$; $1/2,1/2$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 i 1	(1) x, y, z $[u, v, w]$	(2) $\bar{y}, x-y, z$ $[\bar{v}, u-v, w]$	(3) $\bar{x}+y, \bar{x}, z$ $[\bar{u}+v, \bar{u}, w]$
	(4) \bar{x}, \bar{y}, z $[\bar{u}, \bar{v}, w]$	(5) $y, \bar{x}+y, z$ $[v, \bar{u}+v, w]$	(6) $x-y, x, z$ $[u-v, u, w]$
	(7) y, x, \bar{z} $[v, u, \bar{w}]$	(8) $x-y, \bar{y}, \bar{z}$ $[u-v, \bar{v}, \bar{w}]$	(9) $\bar{x}, \bar{x}+y, \bar{z}$ $[\bar{u}, \bar{u}+v, \bar{w}]$
	(10) $\bar{y}, \bar{x}, \bar{z}$ $[\bar{v}, \bar{u}, \bar{w}]$	(11) $\bar{x}+y, y, \bar{z}$ $[\bar{u}+v, v, \bar{w}]$	(12) $x, x-y, \bar{z}$ $[u, u-v, \bar{w}]$
6 h .2	$x, \bar{x}, 0$ $[u, \bar{u}, 0]$	$x, 2x, 0$ $[u, 2u, 0]$	$2\bar{x}, \bar{x}, 0$ $[2\bar{u}, \bar{u}, 0]$
	$\bar{x}, x, 0$ $[\bar{u}, u, 0]$	$\bar{x}, 2\bar{x}, 0$ $[\bar{u}, 2\bar{u}, 0]$	$2x, x, 0$ $[2u, u, 0]$
6 g .2.	$x, 0, 0$ $[u, 0, 0]$	$0, x, 0$ $[0, u, 0]$	$\bar{x}, \bar{x}, 0$ $[\bar{u}, \bar{u}, 0]$
	$\bar{x}, 0, 0$ $[\bar{u}, 0, 0]$	$0, \bar{x}, 0$ $[0, \bar{u}, 0]$	$x, x, 0$ $[u, u, 0]$
6 f 2..	$1/2, 0, z$ $[0, 0, w]$	$0, 1/2, z$ $[0, 0, w]$	$1/2, 1/2, z$ $[0, 0, w]$
	$0, 1/2, \bar{z}$ $[0, 0, \bar{w}]$	$1/2, 0, \bar{z}$ $[0, 0, \bar{w}]$	$1/2, 1/2, \bar{z}$ $[0, 0, \bar{w}]$
4 e 3..	$1/3, 2/3, z$ $[0, 0, w]$	$2/3, 1/3, z$ $[0, 0, w]$	
	$2/3, 1/3, \bar{z}$ $[0, 0, \bar{w}]$	$1/3, 2/3, \bar{z}$ $[0, 0, \bar{w}]$	
3 d 222	$1/2, 0, 0$ $[0, 0, 0]$	$0, 1/2, 0$ $[0, 0, 0]$	$1/2, 1/2, 0$ $[0, 0, 0]$
2 c 6..	$0, 0, z$ $[0, 0, w]$	$0, 0, \bar{z}$ $[0, 0, \bar{w}]$	
2 b 3.2	$1/3, 2/3, 0$ $[0, 0, 0]$	$2/3, 1/3, 0$ $[0, 0, 0]$	
1 a 622	$0, 0, 0$ $[0, 0, 0]$		

Symmetry of special projections

Along [001] $p6m'm'$ $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] $p2m'm'$ $a^* = (a+2b)/2$

Origin at x,0,0

Along [210] $p2m'm'$ $a^* = b/2$

Origin at x,x/2,0

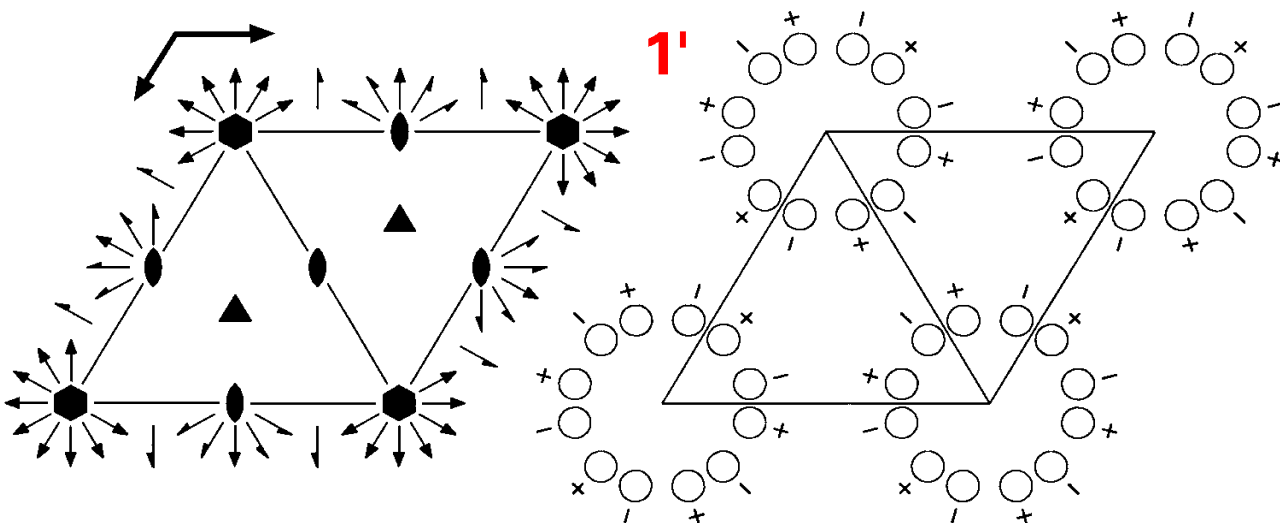
p6221'

6221'

Hexagonal/Hexagonal

No. 76.2.501

p6221'



Origin at 6221'

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1 + y)/2;$

$y \leq \min(1 - x, x); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

For 1 + set

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |

For 1' + set

- | | | |
|----------------------|--|---|
| (1) 1'
(1 0,0,0)' | (2) $3^{+'}$ 0,0,z
(3_z 0,0,0)' | (3) $3^{-'}$ 0,0,z
(3_z^{-1} 0,0,0)' |
|----------------------|--|---|

(4) $2' \quad 0,0,z$ $(2_z 0,0,0)'$	(5) $6^{-1} \quad 0,0,z$ $(6_z^{-1} 0,0,0)'$	(6) $6^+ \quad 0,0,z$ $(6_z 0,0,0)'$
(7) $2' \quad x,x,0$ $(2_{xy} 0,0,0)'$	(8) $2' \quad x,0,0$ $(2_x 0,0,0)'$	(9) $2' \quad 0,y,0$ $(2_y 0,0,0)'$
(10) $2' \quad x,\bar{x},0$ $(2_3 0,0,0)'$	(11) $2' \quad x,2x,0$ $(2_2 0,0,0)'$	(12) $2' \quad 2x,x,0$ $(2_1 0,0,0)'$

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1'+$	
12 i $11'$	(1) $x,y,z [0,0,0]$	(2) $\bar{y},x-y,z [0,0,0]$	(3) $\bar{x}+y,\bar{x},z [0,0,0]$
	(4) $\bar{x},\bar{y},z [0,0,0]$	(5) $y,\bar{x}+y,z [0,0,0]$	(6) $x-y,x,z [0,0,0]$
	(7) $y,x,\bar{z} [0,0,0]$	(8) $x-y,\bar{y},\bar{z} [0,0,0]$	(9) $\bar{x},\bar{x}+y,\bar{z} [0,0,0]$
	(10) $\bar{y},\bar{x},\bar{z} [0,0,0]$	(11) $\bar{x}+y,y,\bar{z} [0,0,0]$	(12) $x,x-y,\bar{z} [0,0,0]$
6 h $..21'$	$x,\bar{x},0 [0,0,0]$	$x,2x,0 [0,0,0]$	$2\bar{x},\bar{x},0 [0,0,0]$
	$\bar{x},x,0 [0,0,0]$	$\bar{x},2\bar{x},0 [0,0,0]$	$2x,x,0 [0,0,0]$
6 g $.2.1'$	$x,0,0 [0,0,0]$	$0,x,0 [0,0,0]$	$\bar{x},\bar{x},0 [0,0,0]$
	$\bar{x},0,0 [0,0,0]$	$0,\bar{x},0 [0,0,0]$	$x,x,0 [0,0,0]$
6 f $2..1'$	$1/2,0,z [0,0,0]$	$0,1/2,z [0,0,0]$	$1/2,1/2,z [0,0,0]$
	$0,1/2,\bar{z} [0,0,0]$	$1/2,0,\bar{z} [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$
4 e $3..1'$	$1/3,2/3,z [0,0,0]$	$2/3,1/3,z [0,0,0]$	
	$2/3,1/3,\bar{z} [0,0,0]$	$1/3,2/3,\bar{z} [0,0,0]$	
3 d $2221'$	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$

Continued

No. 76.2.501

$p6221'$

2 c $6..1'$ $0,0,z$ $[0,0,0]$

$0,0,\bar{z}$ $[0,0,0]$

2 b $3.21'$ $1/3,2/3,0$ $[0,0,0]$

$2/3,1/3,0$ $[0,0,0]$

1 a $6221'$ $0,0,0$ $[0,0,0]$

Symmetry of special projections

Along $[001]$ $p6mm1'$

$a^* = a$ $b^* = b$

Origin at $0,0,z$

Along $[100]$ $p2mm1'$

$a^* = (a+2b)/2$

Origin at $x,0,0$

Along $[210]$ $p2mm1'$

$a^* = b/2$

Origin at $x,x/2,0$

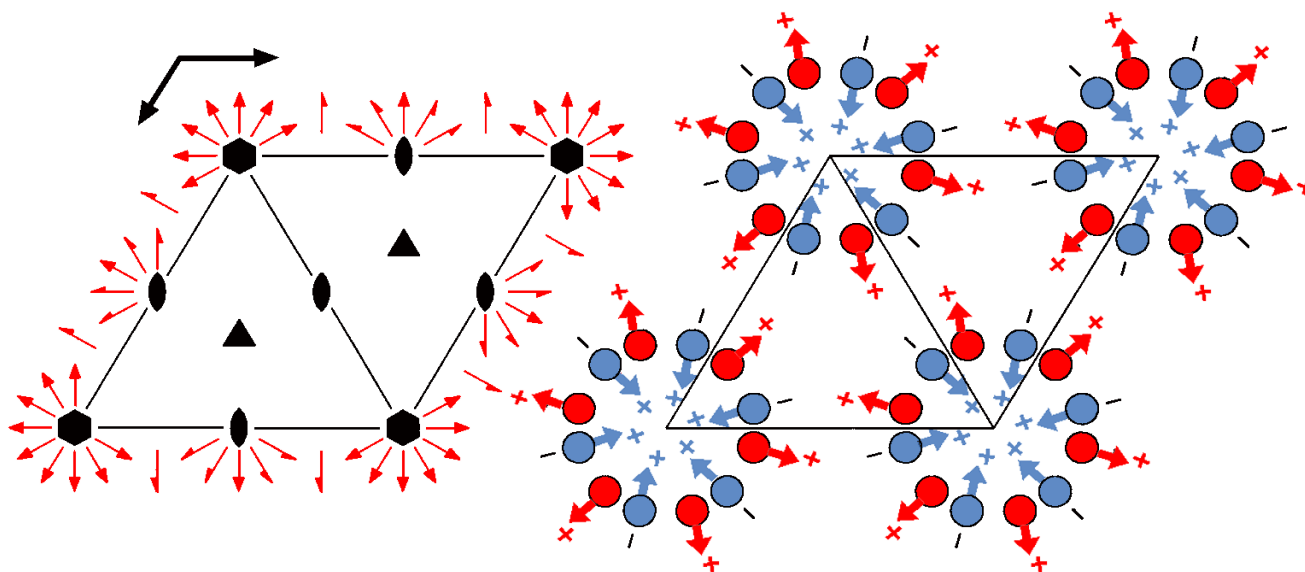
p62'2'

62'2'

Hexagonal/Hexagonal

No. 76.3.502

p62'2'



Origin at 62'2'

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1 + y)/2;$

$y \leq \min(1 - x, x); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3 ⁺ 0,0,z
(3 _z 0,0,0) | (3) 3 ⁻ 0,0,z
(3 _z ⁻¹ 0,0,0) |
| (4) 2 0,0,z
(2 _z 0,0,0) | (5) 6 ⁻ 0,0,z
(6 _z ⁻¹ 0,0,0) | (6) 6 ⁺ 0,0,z
(6 _z 0,0,0) |
| (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x,0,0
(2 _x 0,0,0)' | (9) 2' 0,y,0
(2 _y 0,0,0)' |
| (10) 2' x,x̄,0
(2 ₃ 0,0,0)' | (11) 2' x,2x,0
(2 ₂ 0,0,0)' | (12) 2' 2x,x,0
(2 ₁ 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 i 1	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z$ [$\bar{u}+v, \bar{u}, w$]
	(4) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]	(5) $y, \bar{x}+y, z$ [$v, \bar{u}+v, w$]	(6) $x-y, x, z$ [$u-v, u, w$]
	(7) y, x, \bar{z} [\bar{v}, \bar{u}, w]	(8) $x-y, \bar{y}, \bar{z}$ [$\bar{u}+v, v, w$]	(9) $\bar{x}, \bar{x}+y, \bar{z}$ [$u, u-v, w$]
	(10) $\bar{y}, \bar{x}, \bar{z}$ [v, u, w]	(11) $\bar{x}+y, y, \bar{z}$ [$u-v, \bar{v}, w$]	(12) $x, x-y, \bar{z}$ [$\bar{u}, \bar{u}+v, w$]
6 h ..2'	$x, \bar{x}, 0$ [u,u,w]	$x, 2x, 0$ [$\bar{u}, 0, w$]	$2\bar{x}, \bar{x}, 0$ [0, \bar{u} ,w]
	$\bar{x}, x, 0$ [\bar{u}, \bar{u}, w]	$\bar{x}, 2\bar{x}, 0$ [u,0,w]	$2x, x, 0$ [0,u,w]
6 g .2'	$x, 0, 0$ [u,2u,w]	$0, x, 0$ [2 \bar{u} , \bar{u} ,w]	$\bar{x}, \bar{x}, 0$ [u, \bar{u} ,w]
	$\bar{x}, 0, 0$ [$\bar{u}, 2\bar{u}, w$]	$0, \bar{x}, 0$ [2u,u,w]	$x, x, 0$ [\bar{u}, u, w]
6 f 2'..	$1/2, 0, z$ [0,0,w]	$0, 1/2, z$ [0,0,w]	$1/2, 1/2, z$ [0,0,w]
	$0, 1/2, \bar{z}$ [0,0,w]	$1/2, 0, \bar{z}$ [0,0,w]	$1/2, 1/2, \bar{z}$ [0,0,w]
4 e 3..	$1/3, 2/3, z$ [0,0,w]	$2/3, 1/3, z$ [0,0,w]	
	$2/3, 1/3, \bar{z}$ [0,0,w]	$1/3, 2/3, \bar{z}$ [0,0,w]	
3 d 22'2'	$1/2, 0, 0$ [0,0,w]	$0, 1/2, 0$ [0,0,w]	$1/2, 1/2, 0$ [0,0,w]
2 c 6..	$0, 0, z$ [0,0,w]	$0, 0, \bar{z}$ [0,0,w]	
2 b 3.2'	$1/3, 2/3, 0$ [0,0,w]	$2/3, 1/3, 0$ [0,0,w]	
1 a 62'2'	$0, 0, 0$ [0,0,w]		

Symmetry of special projections

Along [001] p6mm

 $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] p2'm'm

 $a^* = (a+2b)/2$

Origin at x,0,0

Along [210] p2'm'm

 $a^* = b/2$

Origin at x,x/2,0

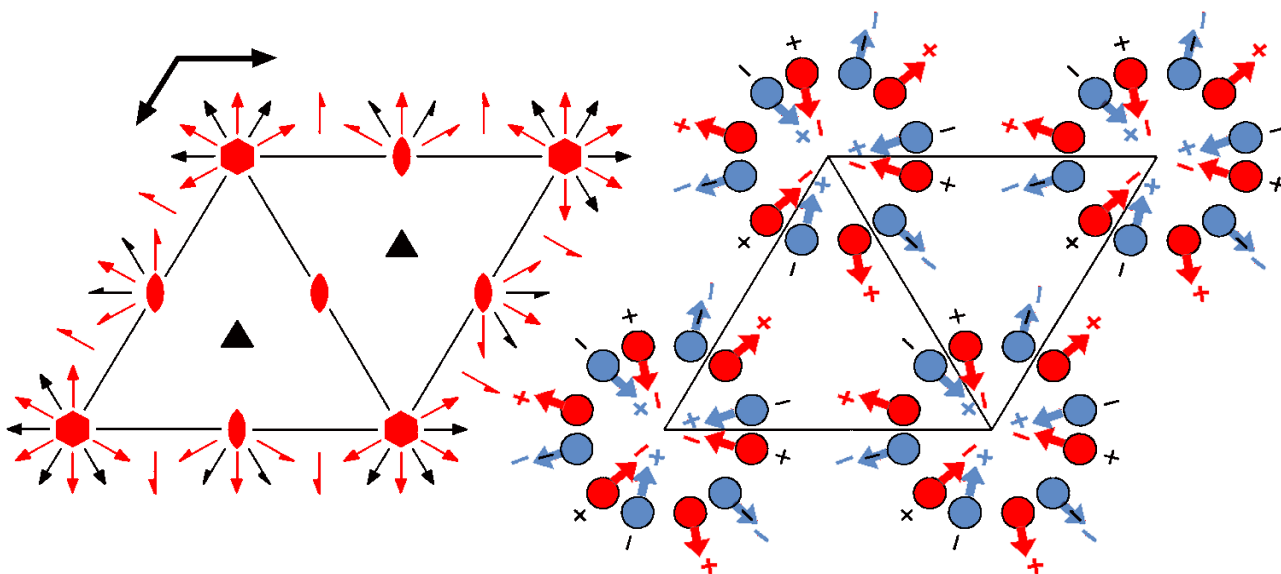
p6'22'

6'22'

Hexagonal/Hexagonal

No. 76.4.503

p6'22'



Origin at 6'22'

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1 + y)/2;$

$y \leq \min(1 - x, x); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

- | | | |
|--|--|---|
| (1) 1
(1 0,0,0) | (2) 3 ⁺ 0,0,z
(3 _z 0,0,0) | (3) 3 ⁻ 0,0,z
(3 _z ⁻¹ 0,0,0) |
| (4) 2' 0,0,z
(2 _z 0,0,0)' | (5) 6 ⁻ 0,0,z
(6 _z ⁻¹ 0,0,0)' | (6) 6 ⁺ 0,0,z
(6 _z 0,0,0)' |
| (7) 2 x,x,0
(2 _{xy} 0,0,0) | (8) 2 x,0,0
(2 _x 0,0,0) | (9) 2 0,y,0
(2 _y 0,0,0) |
| (10) 2' x,x̄,0
(2 ₃ 0,0,0)' | (11) 2' x,2x,0
(2 ₂ 0,0,0)' | (12) 2' 2x,x,0
(2 ₁ 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 i 1	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z$ [$\bar{u}+v, \bar{u}, w$]
	(4) \bar{x}, \bar{y}, z [u,v, \bar{w}]	(5) $y, \bar{x}+y, z$ [$\bar{v}, u-v, \bar{w}$]	(6) $x-y, x, z$ [$\bar{u}+v, \bar{u}, \bar{w}$]
	(7) y, x, \bar{z} [v,u, \bar{w}]	(8) $x-y, \bar{y}, \bar{z}$ [u-v, \bar{v}, \bar{w}]	(9) $\bar{x}, \bar{x}+y, \bar{z}$ [$\bar{u}, \bar{u}+v, \bar{w}$]
	(10) $\bar{y}, \bar{x}, \bar{z}$ [v,u,w]	(11) $\bar{x}+y, y, \bar{z}$ [u-v, \bar{v}, w]	(12) $x, x-y, \bar{z}$ [$\bar{u}, \bar{u}+v, w$]
6 h ..2'	$x, \bar{x}, 0$ [u,u,w]	$x, 2x, 0$ [$\bar{u}, 0, w$]	$2\bar{x}, \bar{x}, 0$ [0, \bar{u}, w]
	$\bar{x}, x, 0$ [u,u, \bar{w}]	$\bar{x}, 2\bar{x}, 0$ [$\bar{u}, 0, \bar{w}$]	$2x, x, 0$ [0, \bar{u}, \bar{w}]
6 g .2.	$x, 0, 0$ [u,0,0]	$0, x, 0$ [0,u,0]	$\bar{x}, \bar{x}, 0$ [$\bar{u}, \bar{u}, 0$]
	$\bar{x}, 0, 0$ [u,0,0]	$0, \bar{x}, 0$ [0,u,0]	$x, x, 0$ [$\bar{u}, \bar{u}, 0$]
6 f 2'..	$1/2, 0, z$ [u,v,0]	$0, 1/2, z$ [$\bar{v}, u-v, 0$]	$1/2, 1/2, z$ [$\bar{u}+v, \bar{u}, 0$]
	$0, 1/2, \bar{z}$ [v,u,0]	$1/2, 0, \bar{z}$ [u-v, $\bar{v}, 0$]	$1/2, 1/2, \bar{z}$ [$\bar{u}, \bar{u}+v, 0$]
4 e 3..	$1/3, 2/3, z$ [0,0,w]	$2/3, 1/3, z$ [0,0, \bar{w}]	
	$2/3, 1/3, \bar{z}$ [0,0, \bar{w}]	$1/3, 2/3, \bar{z}$ [0,0,w]	
3 d 2'22'	$1/2, 0, 0$ [u,0,0]	$0, 1/2, 0$ [0,u,0]	$1/2, 1/2, 0$ [$\bar{u}, \bar{u}, 0$]
2 c 6'..	$0, 0, z$ [0,0,0]	$0, 0, \bar{z}$ [0,0,0]	
2 b 3.2'	$1/3, 2/3, 0$ [0,0,w]	$2/3, 1/3, 0$ [0,0, \bar{w}]	
1 a 6'22'	$0, 0, 0$ [0,0,0]		

Symmetry of special projections

Along [001] $p6'mm'$ $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] $p2mm$ $a^* = (a+2b)/2$

Origin at x,0,0

Along [210] $p2'mm'$ $a^* = b/2$

Origin at x,x/2,0

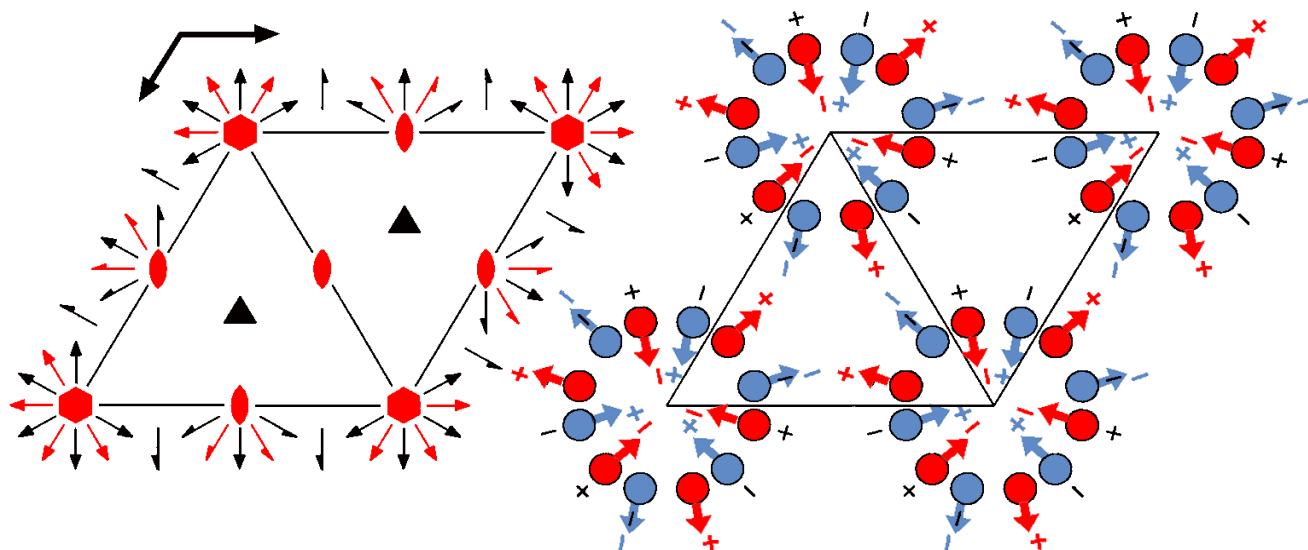
p6'2'2

6'2'2

Hexagonal/Hexagonal

No. 76.5.504

p6'2'2



Origin at 6'2'2

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1 + y)/2;$

$y \leq \min(1 - x, x); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3 ⁺ 0,0,z
(3 _z 0,0,0) | (3) 3 ⁻ 0,0,z
(3 _z ⁻¹ 0,0,0) |
| (4) 2' 0,0,z
(2 _z 0,0,0)' | (5) 6 ⁻ 0,0,z
(6 _z ⁻¹ 0,0,0)' | (6) 6 ⁺ 0,0,z
(6 _z 0,0,0)' |
| (7) 2' x,x,0
(2 _{xy} 0,0,0)' | (8) 2' x,0,0
(2 _x 0,0,0)' | (9) 2' 0,y,0
(2 _y 0,0,0)' |
| (10) 2 x,x̄,0
(2 ₃ 0,0,0) | (11) 2 x,2x,0
(2 ₂ 0,0,0) | (12) 2 2x,x,0
(2 ₁ 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 i 1	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z$ [$\bar{u}+v, \bar{u}, w$]
	(4) \bar{x}, \bar{y}, z [u,v, \bar{w}]	(5) $y, \bar{x}+y, z$ [$\bar{v}, u-v, \bar{w}$]	(6) $x-y, x, z$ [$\bar{u}+v, \bar{u}, \bar{w}$]
	(7) y, x, \bar{z} [\bar{v}, \bar{u}, w]	(8) $x-y, \bar{y}, \bar{z}$ [$\bar{u}+v, v, w$]	(9) $\bar{x}, \bar{x}+y, \bar{z}$ [u,u-v,w]
	(10) $\bar{y}, \bar{x}, \bar{z}$ [$\bar{v}, \bar{u}, \bar{w}$]	(11) $\bar{x}+y, y, \bar{z}$ [$\bar{u}+v, v, \bar{w}$]	(12) $x, x-y, \bar{z}$ [u,u-v, \bar{w}]
6 h ..2	$x, \bar{x}, 0$ [u, $\bar{u}, 0$]	$x, 2x, 0$ [u,2u,0]	$2\bar{x}, \bar{x}, 0$ [2 $\bar{u}, \bar{u}, 0$]
	$\bar{x}, x, 0$ [u, $\bar{u}, 0$]	$\bar{x}, 2\bar{x}, 0$ [u,2u,0]	$2x, x, 0$ [2 $\bar{u}, \bar{u}, 0$]
6 g .2'	$x, 0, 0$ [u,2u,w]	$0, x, 0$ [2 \bar{u}, \bar{u}, w]	$\bar{x}, \bar{x}, 0$ [u, \bar{u}, w]
	$\bar{x}, 0, 0$ [u,2u, \bar{w}]	$0, \bar{x}, 0$ [2 $\bar{u}, \bar{u}, \bar{w}$]	$x, x, 0$ [u, \bar{u}, \bar{w}]
6 f 2'..	$1/2, 0, z$ [u,v,0]	$0, 1/2, z$ [$\bar{v}, u-v, 0$]	$1/2, 1/2, z$ [$\bar{u}+v, \bar{u}, 0$]
	$0, 1/2, \bar{z}$ [$\bar{v}, \bar{u}, 0$]	$1/2, 0, \bar{z}$ [$\bar{u}+v, v, 0$]	$1/2, 1/2, \bar{z}$ [u,u-v,0]
4 e 3..	$1/3, 2/3, z$ [0,0,w]	$2/3, 1/3, z$ [0,0, \bar{w}]	
	$2/3, 1/3, \bar{z}$ [0,0,w]	$1/3, 2/3, \bar{z}$ [0,0, \bar{w}]	
3 d 2'2'2	$1/2, 0, 0$ [u,2u,0]	$0, 1/2, 0$ [2 $\bar{u}, \bar{u}, 0$]	$1/2, 1/2, 0$ [u, $\bar{u}, 0$]
2 c 6'..	$0, 0, z$ [0,0,0]	$0, 0, \bar{z}$ [0,0,0]	
2 b 3.2	$1/3, 2/3, 0$ [0,0,0]	$2/3, 1/3, 0$ [0,0,0]	
1 a 6'2'2	$0, 0, 0$ [0,0,0]		

Symmetry of special projections

Along [001] $p6'm'm$ $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] $p2'mm'$ $a^* = (a+2b)/2$

Origin at x,0,0

Along [210] $p2mm$ $a^* = b/2$

Origin at x,x/2,0

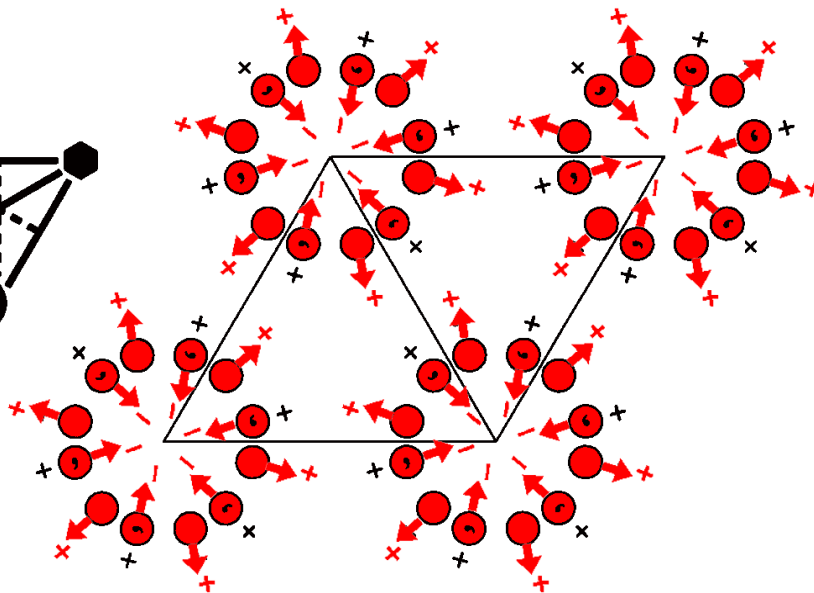
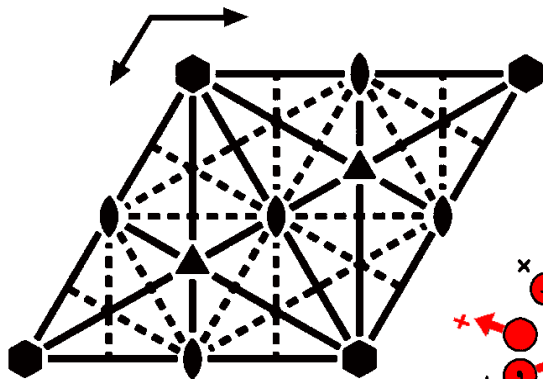
p6mm

6mm

Hexagonal/Hexagonal

No. 77.1.505

p6mm



Origin on 6mm

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/3$; $x \leq (1 + y)/2$; $y \leq x/2$

Vertices $0,0$; $1/2,0$; $2/3,1/3$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) m x,\bar{x},z
(m_{xy} 0,0,0) | (8) m $x,2x,z$
(m_x 0,0,0) | (9) m $2x,x,z$
(m_y 0,0,0) |
| (10) m x,x,z
(m_3 0,0,0) | (11) m $x,0,z$
(m_2 0,0,0) | (12) m $0,y,z$
(m_1 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 f 1	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z$ [$\bar{u}+v, \bar{u}, w$]
	(4) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]	(5) $y, \bar{x}+y, z$ [$v, \bar{u}+v, w$]	(6) $x-y, x, z$ [$u-v, u, w$]
	(7) \bar{y}, \bar{x}, z [v, u, \bar{w}]	(8) $\bar{x}+y, y, z$ [$u-v, \bar{v}, \bar{w}$]	(9) $x, x-y, z$ [$\bar{u}, \bar{u}+v, \bar{w}$]
	(10) y, x, z [$\bar{v}, \bar{u}, \bar{w}$]	(11) $x-y, \bar{y}, z$ [$\bar{u}+v, v, \bar{w}$]	(12) $\bar{x}, \bar{x}+y, z$ [$u, u-v, \bar{w}$]
6 e .m.	x, \bar{x}, z [u,u,0]	$x, 2x, z$ [$\bar{u}, 0, 0$]	$2\bar{x}, \bar{x}, z$ [0, \bar{u} ,0]
	\bar{x}, x, z [$\bar{u}, \bar{u}, 0$]	$\bar{x}, 2\bar{x}, z$ [u,0,0]	$2x, x, z$ [0,u,0]
6 d ..m	$x, 0, z$ [u,2u,0]	$0, x, z$ [2 \bar{u} , \bar{u} ,0]	\bar{x}, \bar{x}, z [u, \bar{u} ,0]
	$\bar{x}, 0, z$ [$\bar{u}, 2\bar{u}, 0$]	$0, \bar{x}, z$ [2u,u,0]	x, x, z [$\bar{u}, u, 0$]
3 c 2mm	$1/2, 0, z$ [0,0,0]	$0, 1/2, z$ [0,0,0]	$1/2, 1/2, z$ [0,0,0]
2 b 3m.	$1/3, 2/3, z$ [0,0,0]	$2/3, 1/3, z$ [0,0,0]	
1 a 6mm	$0, 0, z$ [0,0,0]		

Symmetry of special projections

Along [001] p6mm
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] p1m1'
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] p1m1'
 $a^* = b/2$
 Origin at x,x/2,0

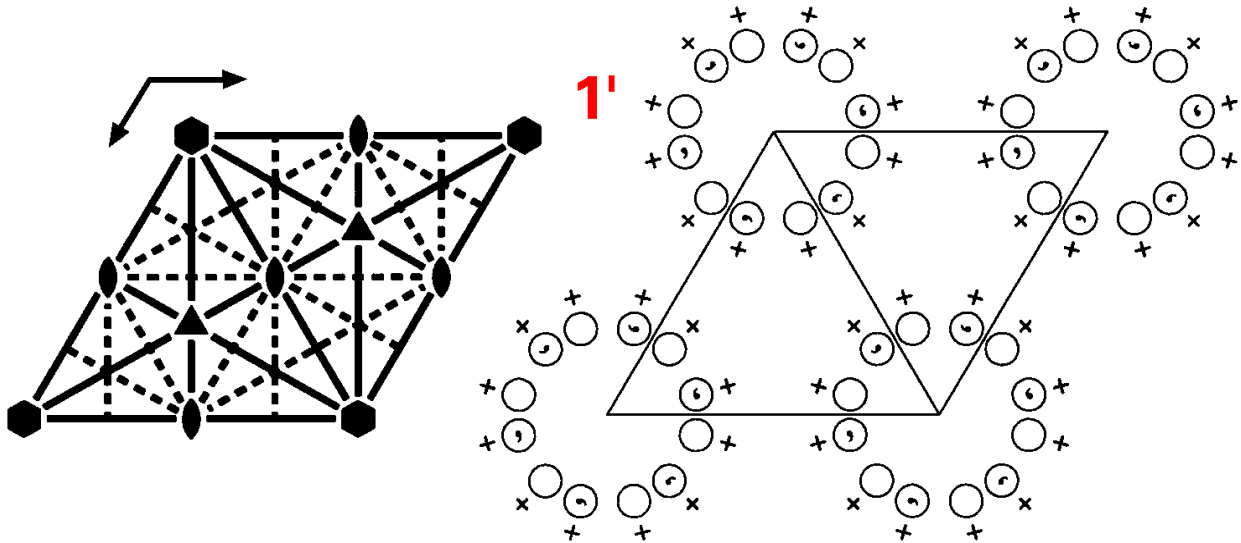
p6mm1'

6mm1'

Hexagonal/Hexagonal

No. 77.2.506

p6mm1'



Origin on 6mm1'

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/3$; $x \leq (1 + y)/2$; $y \leq x/2$

Vertices $0,0$; $1/2,0$; $2/3,1/3$

Symmetry operations

For 1 + set

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3 ⁺ 0,0,z
(3 _z 0,0,0) | (3) 3 ⁻ 0,0,z
(3 _z ⁻¹ 0,0,0) |
| (4) 2 0,0,z
(2 _z 0,0,0) | (5) 6 ⁻ 0,0,z
(6 _z ⁻¹ 0,0,0) | (6) 6 ⁺ 0,0,z
(6 _z 0,0,0) |
| (7) m x,x̄,z
(m _{xy} 0,0,0) | (8) m x,2x,z
(m _x 0,0,0) | (9) m 2x,x,z
(m _y 0,0,0) |
| (10) m x,x,z
(m ₃ 0,0,0) | (11) m x,0,z
(m ₂ 0,0,0) | (12) m 0,y,z
(m ₁ 0,0,0) |

For 1' + set

- | | | |
|----------------------|---|---|
| (1) 1'
(1 0,0,0)' | (2) 3 ^{+'} 0,0,z
(3 _z 0,0,0)' | (3) 3 ^{'-} 0,0,z
(3 _z ⁻¹ 0,0,0)' |
|----------------------|---|---|

(4) $2' \quad 0,0,z$ ($2_z 0,0,0$)'	(5) $6^{-1} \quad 0,0,z$ ($6_z^{-1} 0,0,0$)'	(6) $6^{+1} \quad 0,0,z$ ($6_z 0,0,0$)'
(7) $m' \quad x,\bar{x},z$ ($m_{xy} 0,0,0$)'	(8) $m' \quad x,2x,z$ ($m_x 0,0,0$)'	(9) $m' \quad 2x,x,z$ ($m_y 0,0,0$)'
(10) $m' \quad x,x,z$ ($m_3 0,0,0$)'	(11) $m' \quad x,0,z$ ($m_2 0,0,0$)'	(12) $m' \quad 0,y,z$ ($m_1 0,0,0$)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	1+	1' +	
12 f 11'	(1) $x,y,z [0,0,0]$	(2) $\bar{y},x-y,z [0,0,0]$	(3) $\bar{x}+y,\bar{x},z [0,0,0]$
	(4) $\bar{x},\bar{y},z [0,0,0]$	(5) $y,\bar{x}+y,z [0,0,0]$	(6) $x-y,x,z [0,0,0]$
	(7) $\bar{y},\bar{x},z [0,0,0]$	(8) $\bar{x}+y,y,z [0,0,0]$	(9) $x,x-y,z [0,0,0]$
	(10) $y,x,z [0,0,0]$	(11) $x-y,\bar{y},z [0,0,0]$	(12) $\bar{x},\bar{x}+y,z [0,0,0]$
6 e .m.1'	$x,\bar{x},z [0,0,0]$	$x,2x,z [0,0,0]$	$2\bar{x},\bar{x},z [0,0,0]$
	$\bar{x},x,z [0,0,0]$	$\bar{x},2\bar{x},z [0,0,0]$	$2x,x,z [0,0,0]$
6 d ..m1'	$x,0,z [0,0,0]$	$0,x,z [0,0,0]$	$\bar{x},\bar{x},z [0,0,0]$
	$\bar{x},0,z [0,0,0]$	$0,\bar{x},z [0,0,0]$	$x,x,z [0,0,0]$
3 c 2mm1'	$1/2,0,z [0,0,0]$	$0,1/2,z [0,0,0]$	$1/2,1/2,z [0,0,0]$
2 b 3m.1'	$1/3,2/3,z [0,0,0]$	$2/3,1/3,z [0,0,0]$	
1 a 6mm1'	$0,0,z [0,0,0]$		

Symmetry of special projections

Along [001] $p\bar{6}mm1'$

$$a^* = a \quad b^* = b$$

Origin at 0,0,z

Along [100] $p1m11'$

$$a^* = (a+2b)/2$$

Origin at x,0,0

Along [210] $p1m11'$

$$a^* = b/2$$

Origin at x,x/2,0

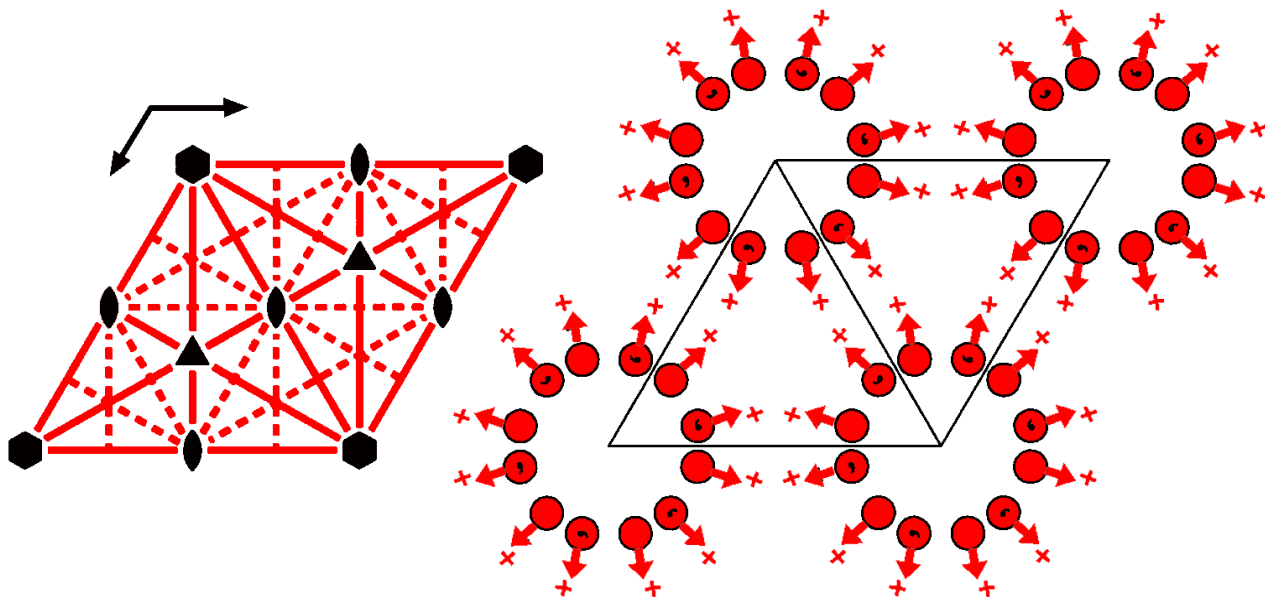
p6m'm'

6m'm'

Hexagonal/Hexagonal

No. 77.3.507

p6m'm'



Origin on 6m'm'

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/3; x \leq (1 + y)/2; y \leq x/2$

Vertices $0,0; 1/2,0; 2/3,1/3$

Symmetry operations

- | | | |
|---|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (8) m' x,2x,z
(m_x 0,0,0)' | (9) m' 2x,x,z
(m_y 0,0,0)' |
| (10) m' x,x,z
(m_3 0,0,0)' | (11) m' x,0,z
(m_2 0,0,0)' | (12) m' 0,y,z
(m_1 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z [\bar{u},\bar{v},w]$	(5) $y,\bar{x}+y,z [v,\bar{u}+v,w]$	(6) $x-y,x,z [u-v,u,w]$
	(7) $\bar{y},\bar{x},z [\bar{v},\bar{u},w]$	(8) $\bar{x}+y,y,z [\bar{u}+v,v,w]$	(9) $x,x-y,z [u,u-v,w]$
	(10) $y,x,z [v,u,w]$	(11) $x-y,\bar{y},z [u-v,\bar{v},w]$	(12) $\bar{x},\bar{x}+y,z [\bar{u},\bar{u}+v,w]$
6 e .m'	$x,\bar{x},z [u,\bar{u},w]$	$x,2x,z [u,2u,w]$	$2\bar{x},\bar{x},z [2\bar{u},\bar{u},w]$
	$\bar{x},x,z [\bar{u},u,w]$	$\bar{x},2\bar{x},z [\bar{u},2\bar{u},w]$	$2x,x,z [2u,u,w]$
6 d ..m'	$x,0,z [u,0,w]$	$0,x,z [0,u,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$
	$\bar{x},0,z [\bar{u},0,w]$	$0,\bar{x},z [0,\bar{u},w]$	$x,x,z [u,u,w]$
3 c 2m'm'	$1/2,0,z [0,0,w]$	$0,1/2,z [0,0,w]$	$1/2,1/2,z [0,0,w]$
2 b 3m'	$1/3,2/3,z [0,0,w]$	$2/3,1/3,z [0,0,w]$	
1 a 6m'm'	$0,0,z [0,0,w]$		

Symmetry of special projections

Along [001] $\rho 6m'm'$
 $a^* = a \quad b^* = b$
 Origin at 0,0,z

Along [100] $\rho 1m'1$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $\rho 1m'1$
 $a^* = b/2$
 Origin at x,x/2,0

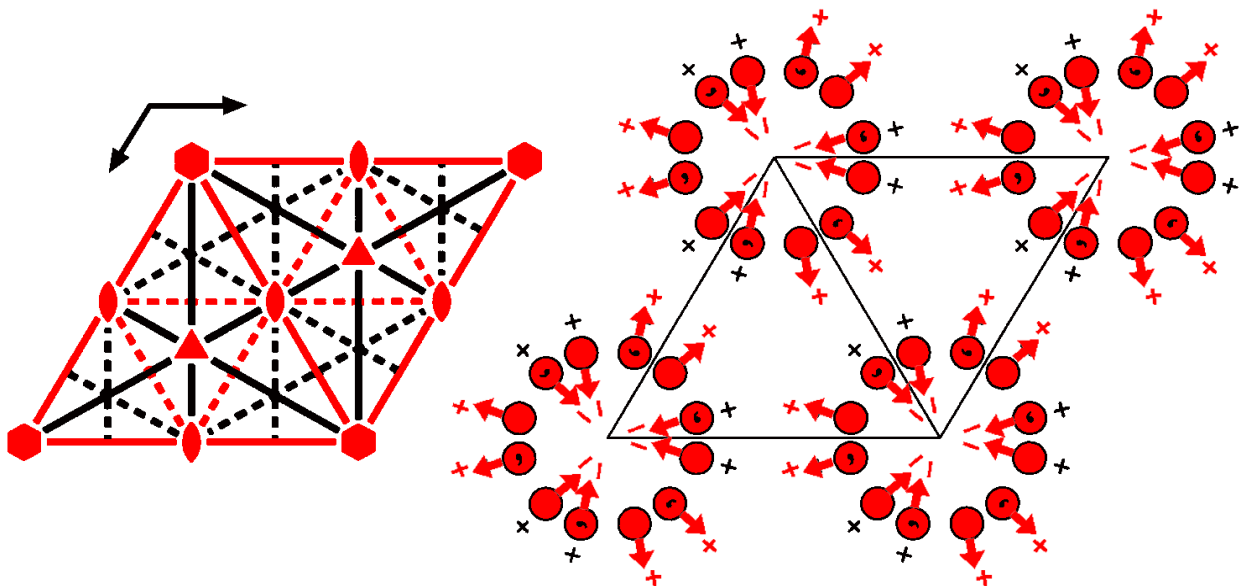
$p6'mm'$

$6'mm'$

Hexagonal/Hexagonal

No. 77.4.508

$p6'mm'$



Origin on $6'mm'$

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/3; x \leq (1 + y)/2; y \leq x/2$

Vertices $0,0; 1/2,0; 2/3,1/3$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) m x,\bar{x},z
(m_{xy} 0,0,0) | (8) m $x,2x,z$
(m_x 0,0,0) | (9) m $2x,x,z$
(m_y 0,0,0) |
| (10) m' x,x,z
(m_3 0,0,0)' | (11) m' $x,0,z$
(m_2 0,0,0)' | (12) m' $0,y,z$
(m_1 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 f 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $\bar{x},\bar{y},z [u,v,\bar{w}]$	(5) $y,\bar{x}+y,z [\bar{v},u-v,\bar{w}]$	(6) $x-y,x,z [\bar{u}+v,\bar{u},\bar{w}]$
	(7) $\bar{y},\bar{x},z [v,u,\bar{w}]$	(8) $\bar{x}+y,y,z [u-v,\bar{v},\bar{w}]$	(9) $x,x-y,z [\bar{u},\bar{u}+v,\bar{w}]$
	(10) $y,x,z [v,u,w]$	(11) $x-y,\bar{y},z [u-v,\bar{v},w]$	(12) $\bar{x},\bar{x}+y,z [\bar{u},\bar{u}+v,w]$
6 e .m.	$x,\bar{x},z [u,u,0]$	$x,2x,z [\bar{u},0,0]$	$2\bar{x},\bar{x},z [0,\bar{u},0]$
	$\bar{x},x,z [u,u,0]$	$\bar{x},2\bar{x},z [\bar{u},0,0]$	$2x,x,z [0,\bar{u},0]$
6 d ..m'	$x,0,z [u,0,w]$	$0,x,z [0,u,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$
	$\bar{x},0,z [u,0,\bar{w}]$	$0,\bar{x},z [0,u,\bar{w}]$	$x,x,z [\bar{u},\bar{u},\bar{w}]$
3 c 2'mm'	$1/2,0,z [u,0,0]$	$0,1/2,z [0,u,0]$	$1/2,1/2,z [\bar{u},\bar{u},0]$
2 b 3m.	$1/3,2/3,z [0,0,0]$	$2/3,1/3,z [0,0,0]$	
1 a 6'mm'	$0,0,z [0,0,0]$		

Symmetry of special projections

Along [001] $\rho 6'mm'$
 $a^* = a \quad b^* = b$
 Origin at 0,0,z

Along [100] $\rho 1m11'$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $\rho 1m1$
 $a^* = b/2$
 Origin at x,x/2,0

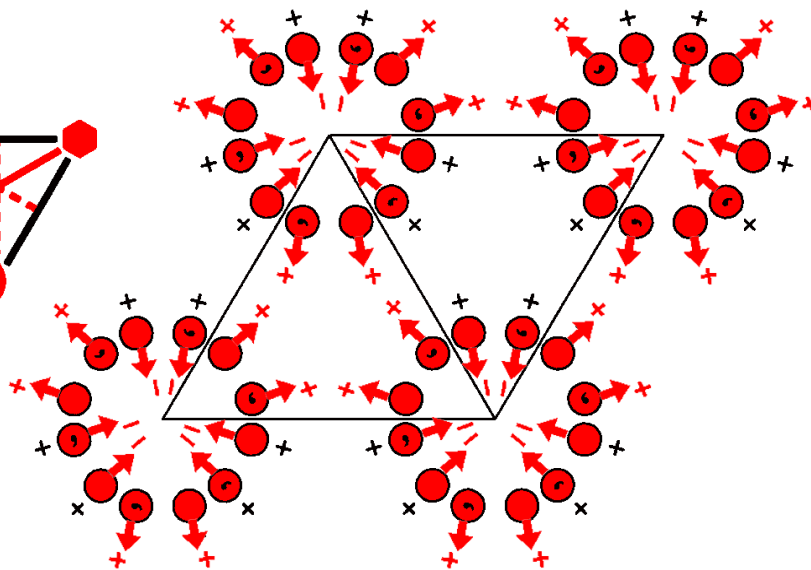
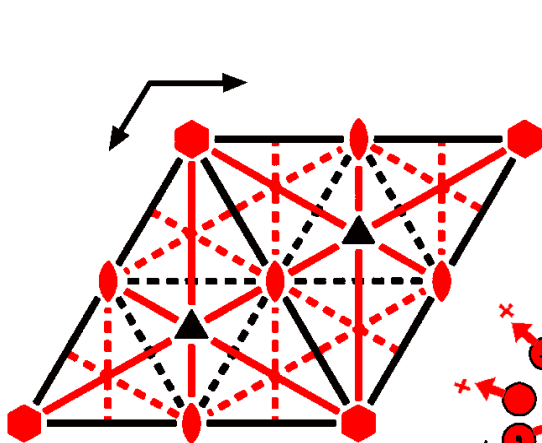
p6'm'm

6'm'm

Hexagonal/Hexagonal

No. 77.5.509

p6'm'm



Origin on 6'm'm

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/3; x \leq (1 + y)/2; y \leq x/2$

Vertices $0,0; 1/2,0; 2/3,1/3$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) $2'$ 0,0,z
(2_z |0,0,0)'

(5) 6^- 0,0,z
(6_z^{-1} |0,0,0)'

(6) 6^+ 0,0,z
(6_z |0,0,0)'

(7) m' x, \bar{x} ,z
(m_{xy} |0,0,0)'

(8) m' x,2x,z
(m_x |0,0,0)'

(9) m' 2x,x,z
(m_y |0,0,0)'

(10) m x,x,z
(m_3 |0,0,0)

(11) m x,0,z
(m_2 |0,0,0)

(12) m 0,y,z
(m_1 |0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 f 1	(1) $x, y, z [u, v, w]$	(2) $\bar{y}, x-y, z [\bar{v}, u-v, w]$	(3) $\bar{x}+y, \bar{x}, z [\bar{u}+v, \bar{u}, w]$
	(4) $\bar{x}, \bar{y}, z [u, v, \bar{w}]$	(5) $y, \bar{x}+y, z [\bar{v}, u-v, \bar{w}]$	(6) $x-y, x, z [\bar{u}+v, \bar{u}, \bar{w}]$
	(7) $\bar{y}, \bar{x}, z [\bar{v}, \bar{u}, w]$	(8) $\bar{x}+y, y, z [\bar{u}+v, v, w]$	(9) $x, x-y, z [u, u-v, w]$
	(10) $y, x, z [\bar{v}, \bar{u}, \bar{w}]$	(11) $x-y, \bar{y}, z [\bar{u}+v, v, \bar{w}]$	(12) $\bar{x}, \bar{x}+y, z [u, u-v, \bar{w}]$
6 e .m'	$x, \bar{x}, z [u, \bar{u}, w]$	$x, 2x, z [u, 2u, w]$	$2\bar{x}, \bar{x}, z [2\bar{u}, \bar{u}, w]$
	$\bar{x}, x, z [u, \bar{u}, \bar{w}]$	$\bar{x}, 2\bar{x}, z [u, 2u, \bar{w}]$	$2x, x, z [2\bar{u}, \bar{u}, \bar{w}]$
6 d ..m	$x, 0, z [u, 2u, 0]$	$0, x, z [2\bar{u}, \bar{u}, 0]$	$\bar{x}, \bar{x}, z [u, \bar{u}, 0]$
	$\bar{x}, 0, z [u, 2u, 0]$	$0, \bar{x}, z [2\bar{u}, \bar{u}, 0]$	$x, x, z [u, \bar{u}, 0]$
3 c 2'm'm	$1/2, 0, z [u, 2u, 0]$	$0, 1/2, z [2\bar{u}, \bar{u}, 0]$	$1/2, 1/2, z [u, \bar{u}, 0]$
2 b 3m'	$1/3, 2/3, z [0, 0, w]$	$2/3, 1/3, z [0, 0, \bar{w}]$	
1 a 6'm'm	$0, 0, z [0, 0, 0]$		

Symmetry of special projections

Along [001] $\rho 6'm'm$
 $a^* = a \quad b^* = b$
 Origin at 0,0,z

Along [100] $\rho 1m1$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $\rho 1m11'$
 $a^* = b/2$
 Origin at x,x/2,0

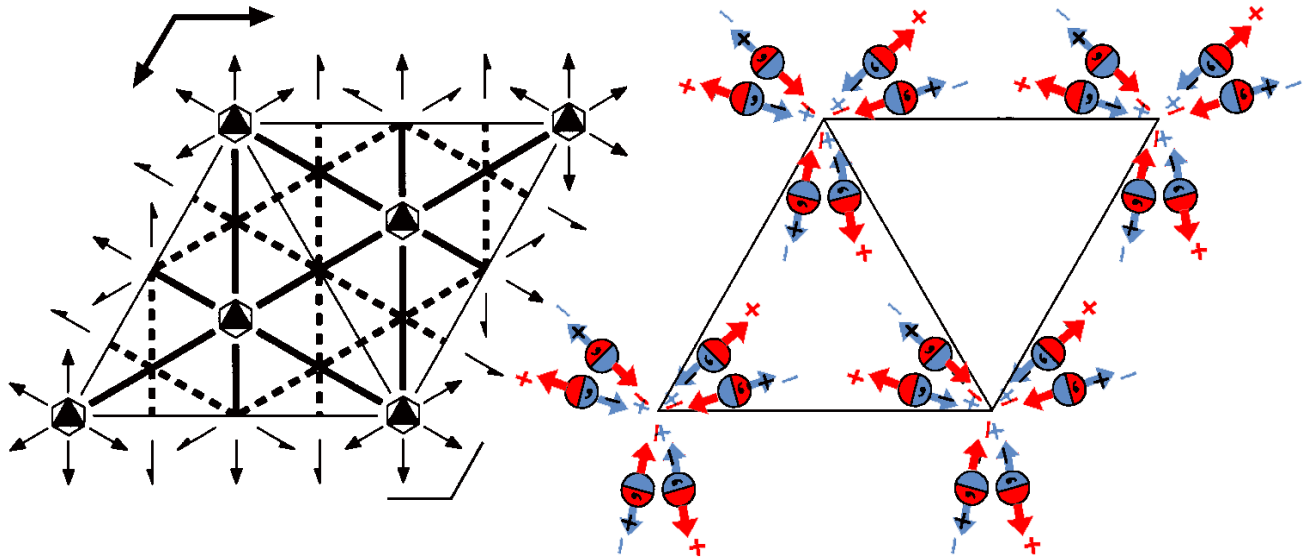
$p\bar{6}m2$

$\bar{6}m2$

Hexagonal/Hexagonal

No. 78.1.510

$p\bar{6}m2$



Origin at $\bar{6}m2$

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 2/3$; $x \leq 2y$;

$y \leq \min(1-x, 2x)$; $0 \leq z$

Vertices $0,0$; $2/3,1/3$; $1/3,2/3$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m x,y,0
(m_z 0,0,0) | (5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (7) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (8) m x,2x,z
(m_x 0,0,0) | (9) m 2x,x,z
(m_y 0,0,0) |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 j 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,u,w]$
	(4) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(5) $\bar{y},x-y,\bar{z} [v,\bar{u}+v,w]$	(6) $\bar{x}+y,\bar{x},\bar{z} [u-v,u,w]$
	(7) $\bar{y},\bar{x},z [v,u,\bar{w}]$	(8) $\bar{x}+y,y,z [u-v,\bar{v},\bar{w}]$	(9) $x,x-y,z [\bar{u},\bar{u}+v,\bar{w}]$
	(10) $\bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]$	(11) $\bar{x}+y,y,\bar{z} [\bar{u}+v,v,\bar{w}]$	(12) $x,x-y,\bar{z} [u,u-v,\bar{w}]$
6 i .m.	$x,\bar{x},z [u,u,0]$	$x,2x,z [\bar{u},0,0]$	$2\bar{x},\bar{x},z [0,\bar{u},0]$
	$x,\bar{x},\bar{z} [\bar{u},\bar{u},0]$	$x,2x,\bar{z} [u,0,0]$	$2\bar{x},\bar{x},\bar{z} [0,u,0]$
6 h m..	$x,y,0 [0,0,w]$	$\bar{y},x-y,0 [0,0,w]$	$\bar{x}+y,\bar{x},0 [0,0,w]$
	$\bar{y},\bar{x},0 [0,0,\bar{w}]$	$\bar{x}+y,y,0 [0,0,\bar{w}]$	$x,x-y,0 [0,0,\bar{w}]$
3 g mm2	$x,\bar{x},0 [0,0,0]$	$x,2x,0 [0,0,0]$	$2\bar{x},\bar{x},0 [0,0,0]$
2 f 3m.	$2/3,1/3,z [0,0,0]$	$2/3,1/3,\bar{z} [0,0,0]$	
2 e 3m.	$1/3,2/3,z [0,0,0]$	$1/3,2/3,\bar{z} [0,0,0]$	
2 d 3m.	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
1 c $\bar{6}m2$	$2/3,1/3,0 [0,0,0]$		
1 b $\bar{6}m2$	$1/3,2/3,0 [0,0,0]$		
1 a $\bar{6}m2$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p3m11'$ $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] $p11m1'$ $a^* = (a+2b)/2$

Origin at x,0,0

Along [210] $p2mm$ $a^* = b/2$

Origin at x,x/2,0

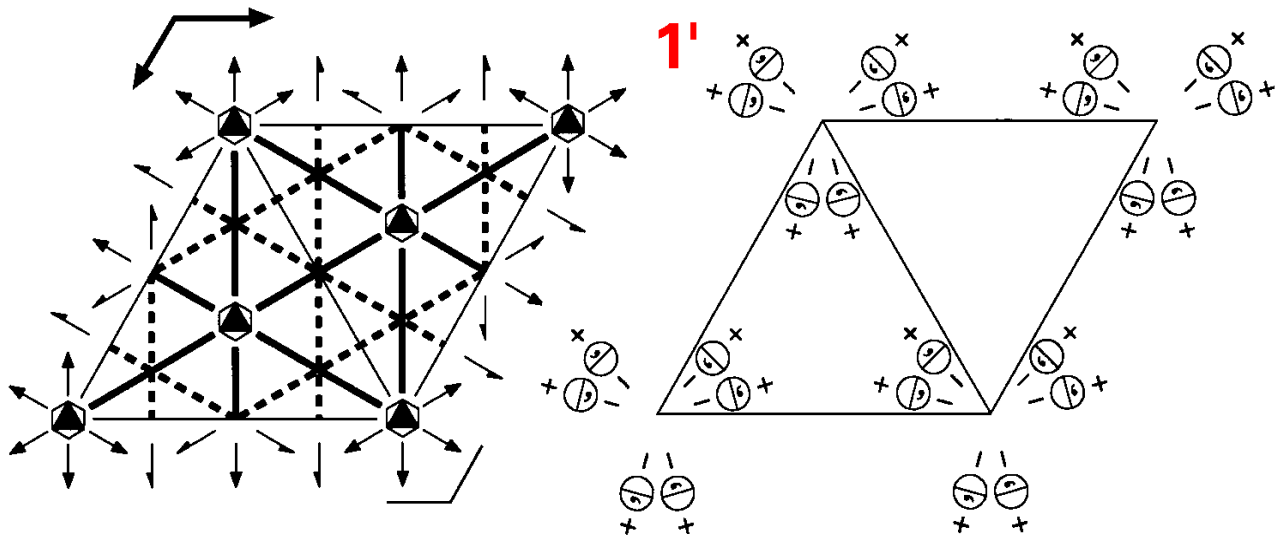
$p\bar{6}m21'$

$\bar{6}m21'$

Hexagonal/Hexagonal

No. 78.2.511

$p\bar{6}m21'$



Origin at $\bar{6}m21'$

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq 2y;$

$y \leq \min(1-x, 2x); 0 \leq z$

Vertices $0,0; 2/3,1/3; 1/3,2/3$

Symmetry operations

For 1 + set

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m x,y,0
(m_z 0,0,0) | (5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (7) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (8) m x,2x,z
(m_x 0,0,0) | (9) m 2x,x,z
(m_y 0,0,0) |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |

For 1' + set

- | | | |
|----------------------|--|---|
| (1) 1'
(1 0,0,0)' | (2) $3^{+'}$ 0,0,z
(3_z 0,0,0)' | (3) $3^{-'}$ 0,0,z
(3_z^{-1} 0,0,0)' |
|----------------------|--|---|

(4) m' x,y,0 (m _z 0,0,0)'	(5) $\bar{6}^-$ ' 0,0,z; 0,0,0 ($\bar{6}_z^{-1}$ 0,0,0)'	(6) $\bar{6}^+$ ' 0,0,z; 0,0,0 ($\bar{6}_z$ 0,0,0)'
(7) m' x, \bar{x} ,z (m _{xy} 0,0,0)'	(8) m' x,2x,z (m _x 0,0,0)'	(9) m' 2x,x,z (m _y 0,0,0)'
(10) 2' x, \bar{x} ,0 (2 ₃ 0,0,0)'	(11) 2' x,2x,0 (2 ₂ 0,0,0)'	(12) 2' 2x,x,0 (2 ₁ 0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	1+	1' +	
12 j 11'	(1) x,y,z [0,0,0]	(2) \bar{y} ,x-y,z [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0]
	(4) x,y, \bar{z} [0,0,0]	(5) \bar{y} ,x-y, \bar{z} [0,0,0]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [0,0,0]
	(7) \bar{y},\bar{x},z [0,0,0]	(8) $\bar{x}+y,y,z$ [0,0,0]	(9) x,x-y,z [0,0,0]
	(10) \bar{y},\bar{x},\bar{z} [0,0,0]	(11) $\bar{x}+y,y,\bar{z}$ [0,0,0]	(12) x,x-y, \bar{z} [0,0,0]
6 i .m.1'	x, \bar{x} ,z [0,0,0]	x,2x,z [0,0,0]	2 \bar{x},\bar{x},z [0,0,0]
	x, \bar{x},\bar{z} [0,0,0]	x,2x, \bar{z} [0,0,0]	2 \bar{x},\bar{x},\bar{z} [0,0,0]
6 h m..1'	x,y,0 [0,0,0]	\bar{y} ,x-y,0 [0,0,0]	$\bar{x}+y,\bar{x},0$ [0,0,0]
	$\bar{y},\bar{x},0$ [0,0,0]	$\bar{x}+y,y,0$ [0,0,0]	x,x-y,0 [0,0,0]
3 g mm21'	x, \bar{x} ,0 [0,0,0]	x,2x,0 [0,0,0]	2 $\bar{x},\bar{x},0$ [0,0,0]
2 f 3m.1'	2/3,1/3,z [0,0,0]	2/3,1/3, \bar{z} [0,0,0]	
2 e 3m.1'	1/3,2/3,z [0,0,0]	1/3,2/3, \bar{z} [0,0,0]	
2 d 3m.1'	0,0,z [0,0,0]	0,0, \bar{z} [0,0,0]	

Continued

No. 78.2.511

$\bar{p}6m21'$

1 c $\bar{6}m21'$ $2/3, 1/3, 0 [0,0,0]$

1 b $\bar{6}m21'$ $1/3, 2/3, 0 [0,0,0]$

1 a $\bar{6}m21'$ $0,0,0 [0,0,0]$

Symmetry of special projections

Along [001] $p3m1'$

$a^* = a \quad b^* = b$

Origin at $0,0,z$

Along [100] $p11m1'$

$a^* = (a+2b)/2$

Origin at $x,0,0$

Along [210] $p2mm1'$

$a^* = b/2$

Origin at $x,x/2,0$

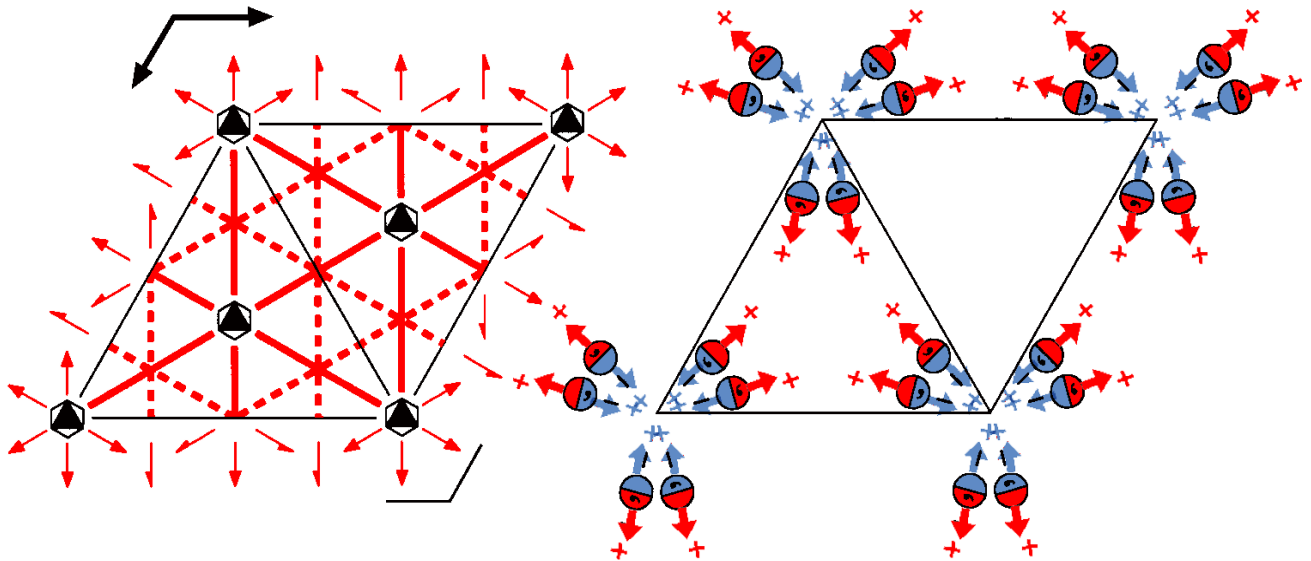
$\bar{p}6m'2'$

$\bar{6}m'2'$

Hexagonal/Hexagonal

No. 78.3.512

$\bar{p}6m'2'$



Origin at $\bar{6}m'2'$

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq 2y;$

$y \leq \min(1-x, 2x); 0 \leq z$

Vertices $0,0; 2/3,1/3; 1/3,2/3$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m $x,y,0$
(m_z 0,0,0) | (5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (7) m' x,\bar{x},z
(m_{xy} 0,0,0)' | (8) m' $x,2x,z$
(m_x 0,0,0)' | (9) m' $2x,x,z$
(m_y 0,0,0)' |
| (10) $2'$ $x,\bar{x},0$
(2_3 0,0,0)' | (11) $2'$ $x,2x,0$
(2_2 0,0,0)' | (12) $2'$ $2x,x,0$
(2_1 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 j 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $x,y,\bar{z} [\bar{u},\bar{v},w]$	(5) $\bar{y},x-y,\bar{z} [v,\bar{u}+v,w]$	(6) $\bar{x}+y,\bar{x},\bar{z} [u-v,u,w]$
	(7) $\bar{y},\bar{x},z [\bar{v},\bar{u},w]$	(8) $\bar{x}+y,y,z [\bar{u}+v,v,w]$	(9) $x,x-y,z [u,u-v,w]$
	(10) $\bar{y},\bar{x},\bar{z} [v,u,w]$	(11) $\bar{x}+y,y,\bar{z} [u-v,\bar{v},w]$	(12) $x,x-y,\bar{z} [\bar{u},\bar{u}+v,w]$
6 i .m'	$x,\bar{x},z [u,\bar{u},w]$	$x,2x,z [u,2u,w]$	$2\bar{x},\bar{x},z [2\bar{u},\bar{u},w]$
	$x,\bar{x},\bar{z} [\bar{u},u,w]$	$x,2x,\bar{z} [\bar{u},2\bar{u},w]$	$2\bar{x},\bar{x},\bar{z} [2u,u,w]$
6 h m..	$x,y,0 [0,0,w]$	$\bar{y},x-y,0 [0,0,w]$	$\bar{x}+y,\bar{x},0 [0,0,w]$
	$\bar{y},\bar{x},0 [0,0,w]$	$\bar{x}+y,y,0 [0,0,w]$	$x,x-y,0 [0,0,w]$
3 g mm'2'	$x,\bar{x},0 [0,0,w]$	$x,2x,0 [0,0,w]$	$2\bar{x},\bar{x},0 [0,0,w]$
2 f 3m'	$2/3,1/3,z [0,0,w]$	$2/3,1/3,\bar{z} [0,0,w]$	
2 e 3m'	$1/3,2/3,z [0,0,w]$	$1/3,2/3,\bar{z} [0,0,w]$	
2 d 3m'	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,w]$	
1 c $\bar{6}m'2'$	$2/3,1/3,0 [0,0,w]$		
1 b $\bar{6}m'2'$	$1/3,2/3,0 [0,0,w]$		
1 a $\bar{6}m'2'$	$0,0,0 [0,0,w]$		

Symmetry of special projections

Along [001] $p3m11'$ $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] $p11m$ $a^* = (a+2b)/2$

Origin at x,0,0

Along [210] $p2'm'm$ $a^* = b/2$

Origin at x,x/2,0

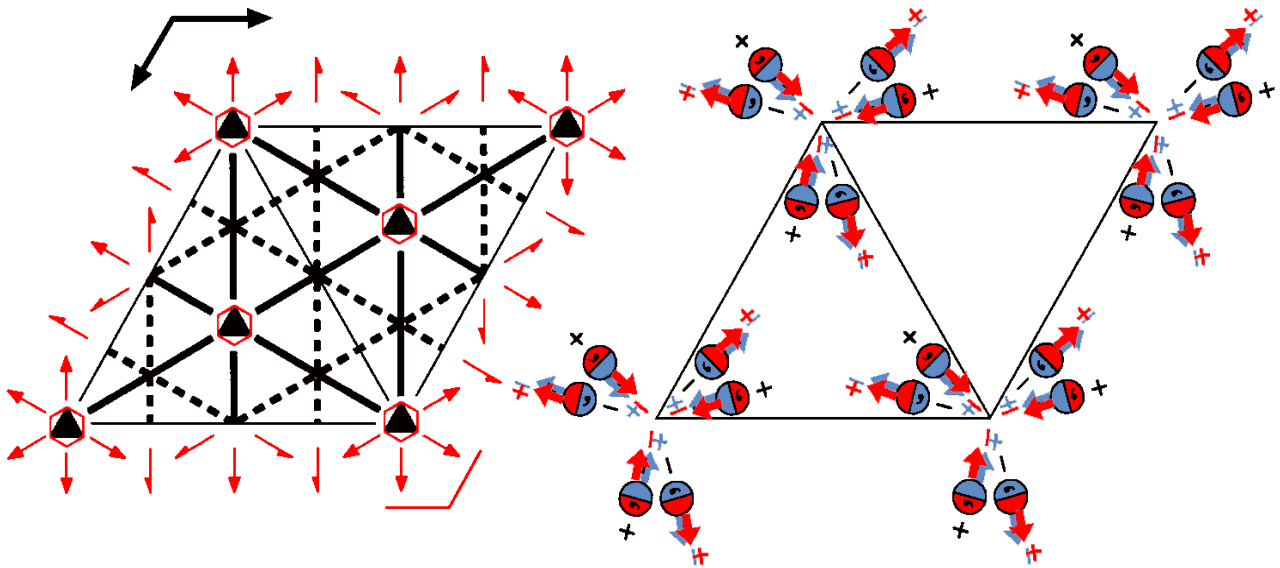
$p\bar{6}'m2'$

$\bar{6}'m2'$

Hexagonal/Hexagonal

No. 78.4.513

$p\bar{6}'m2'$



Origin at $\bar{6}'m2'$

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq 2y;$

$y \leq \min(1-x, 2x); 0 \leq z$

Vertices $0,0; 2/3,1/3; 1/3,2/3$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) m' x,y,0
(m_z |0,0,0)'

(5) $\bar{6}^-'$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ |0,0,0)'

(6) $\bar{6}^+'$ 0,0,z; 0,0,0
($\bar{6}_z$ |0,0,0)'

(7) m x, \bar{x} ,z
(m_{xy} |0,0,0)

(8) m x,2x,z
(m_x |0,0,0)

(9) m 2x,x,z
(m_y |0,0,0)

(10) $2'$ x, \bar{x} ,0
(2_3 |0,0,0)'

(11) $2'$ x,2x,0
(2_2 |0,0,0)'

(12) $2'$ 2x,x,0
(2_1 |0,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 j 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $x,y,\bar{z} [u,v,\bar{w}]$	(5) $\bar{y},x-y,\bar{z} [\bar{v},u-v,\bar{w}]$	(6) $\bar{x}+y,\bar{x},\bar{z} [\bar{u}+v,\bar{u},\bar{w}]$
	(7) $\bar{y},\bar{x},z [v,u,\bar{w}]$	(8) $\bar{x}+y,y,z [u-v,\bar{v},\bar{w}]$	(9) $x,x-y,z [\bar{u},\bar{u}+v,\bar{w}]$
	(10) $\bar{y},\bar{x},\bar{z} [v,u,w]$	(11) $\bar{x}+y,y,\bar{z} [u-v,\bar{v},w]$	(12) $x,x-y,\bar{z} [\bar{u},\bar{u}+v,w]$
6 i .m.	$x,\bar{x},z [u,u,0]$	$x,2x,z [\bar{u},0,0]$	$2\bar{x},\bar{x},z [0,\bar{u},0]$
	$x,\bar{x},\bar{z} [u,u,0]$	$x,2x,\bar{z} [\bar{u},0,0]$	$2\bar{x},\bar{x},\bar{z} [0,\bar{u},0]$
6 h m'..	$x,y,0 [u,v,0]$	$\bar{y},x-y,0 [\bar{v},u-v,0]$	$\bar{x}+y,\bar{x},0 [\bar{u}+v,\bar{u},0]$
	$\bar{y},\bar{x},0 [v,u,0]$	$\bar{x}+y,y,0 [u-v,\bar{v},0]$	$x,x-y,0 [\bar{u},\bar{u}+v,0]$
3 g m'm2'	$x,\bar{x},0 [u,u,0]$	$x,2x,0 [\bar{u},0,0]$	$2\bar{x},\bar{x},0 [0,\bar{u},0]$
2 f 3m.	$2/3,1/3,z [0,0,0]$	$2/3,1/3,\bar{z} [0,0,0]$	
2 e 3m.	$1/3,2/3,z [0,0,0]$	$1/3,2/3,\bar{z} [0,0,0]$	
2 d 3m.	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
1 c $\bar{6}m2'$	$2/3,1/3,0 [0,0,0]$		
1 b $\bar{6}m2'$	$1/3,2/3,0 [0,0,0]$		
1 a $\bar{6}m2'$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p3m1$ $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] $p11m1'$ $a^* = (a+2b)/2$

Origin at x,0,0

Along [210] $p2'mm'$ $a^* = b/2$

Origin at x,x/2,0

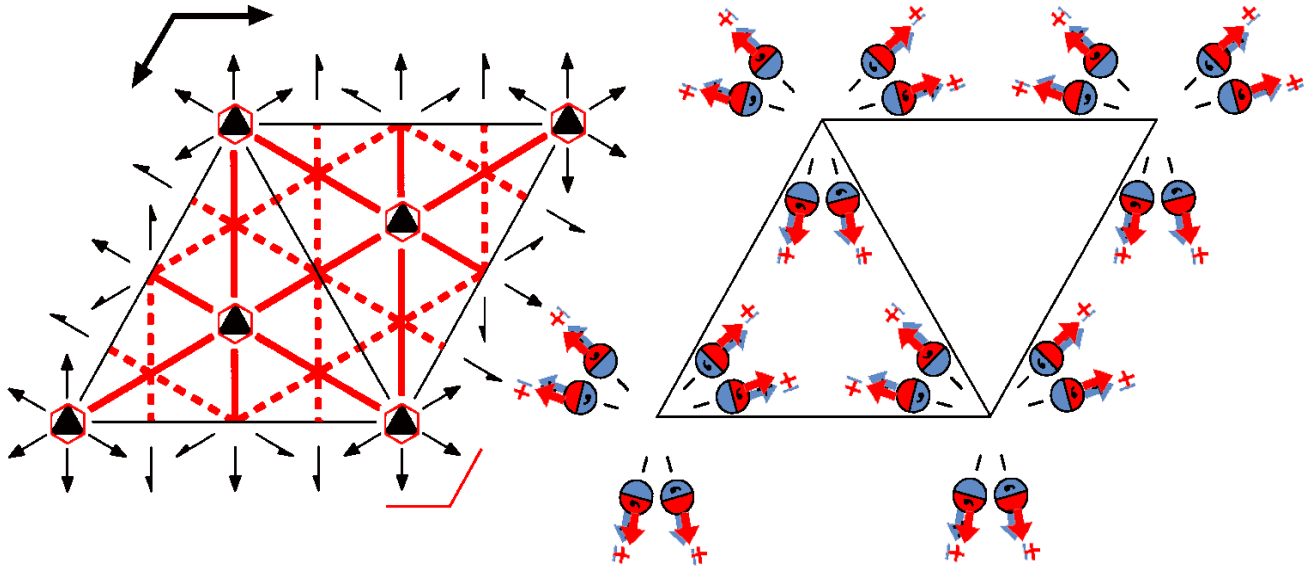
$p\bar{6}m'2$

$\bar{6}m'2$

Hexagonal/Hexagonal

No. 78.5.514

$p\bar{6}m'2$



Origin at $\bar{6}m'2$

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 2/3; x \leq 2y;$

$y \leq \min(1-x, 2x); 0 \leq z$

Vertices $0,0; 2/3,1/3; 1/3,2/3$

Symmetry operations

- | | | |
|---|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m' x,y,0
(m_z 0,0,0)' | (5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (7) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (8) m' x,2x,z
(m_x 0,0,0)' | (9) m' 2x,x,z
(m_y 0,0,0)' |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 j 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $x,y,\bar{z} [u,v,\bar{w}]$	(5) $\bar{y},x-y,\bar{z} [\bar{v},u-v,\bar{w}]$	(6) $\bar{x}+y,\bar{x},\bar{z} [\bar{u}+v,\bar{u},\bar{w}]$
	(7) $\bar{y},\bar{x},z [\bar{v},\bar{u},w]$	(8) $\bar{x}+y,y,z [\bar{u}+v,v,w]$	(9) $x,x-y,z [u,u-v,w]$
	(10) $\bar{y},\bar{x},\bar{z} [\bar{v},\bar{u},\bar{w}]$	(11) $\bar{x}+y,y,\bar{z} [\bar{u}+v,v,\bar{w}]$	(12) $x,x-y,\bar{z} [u,u-v,\bar{w}]$
6 i .m'	$x,\bar{x},z [u,\bar{u},w]$	$x,2x,z [u,2u,w]$	$2\bar{x},\bar{x},z [2\bar{u},\bar{u},w]$
	$x,\bar{x},\bar{z} [u,\bar{u},w]$	$x,2x,\bar{z} [u,2u,w]$	$2\bar{x},\bar{x},\bar{z} [2\bar{u},\bar{u},w]$
6 h m'.	$x,y,0 [u,v,0]$	$\bar{y},x-y,0 [\bar{v},u-v,0]$	$\bar{x}+y,\bar{x},0 [\bar{u}+v,\bar{u},0]$
	$\bar{y},\bar{x},0 [\bar{v},\bar{u},0]$	$\bar{x}+y,y,0 [\bar{u}+v,v,0]$	$x,x-y,0 [u,u-v,0]$
3 g m'm'2	$x,\bar{x},0 [u,\bar{u},0]$	$x,2x,0 [u,2u,0]$	$2\bar{x},\bar{x},0 [2\bar{u},\bar{u},0]$
2 f 3m'	$2/3,1/3,z [0,0,w]$	$2/3,1/3,\bar{z} [0,0,\bar{w}]$	
2 e 3m'	$1/3,2/3,z [0,0,w]$	$1/3,2/3,\bar{z} [0,0,\bar{w}]$	
2 d 3m'	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,\bar{w}]$	
1 c $\bar{6}'m'2$	$2/3,1/3,0 [0,0,0]$		
1 b $\bar{6}'m'2$	$1/3,2/3,0 [0,0,0]$		
1 a $\bar{6}'m'2$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p3m'1$ $a^* = a \quad b^* = b$

Origin at 0,0,z

Along [100] $p11m'$ $a^* = (a+2b)/2$

Origin at x,0,0

Along [210] $p2m'm'$ $a^* = b/2$

Origin at x,x/2,0

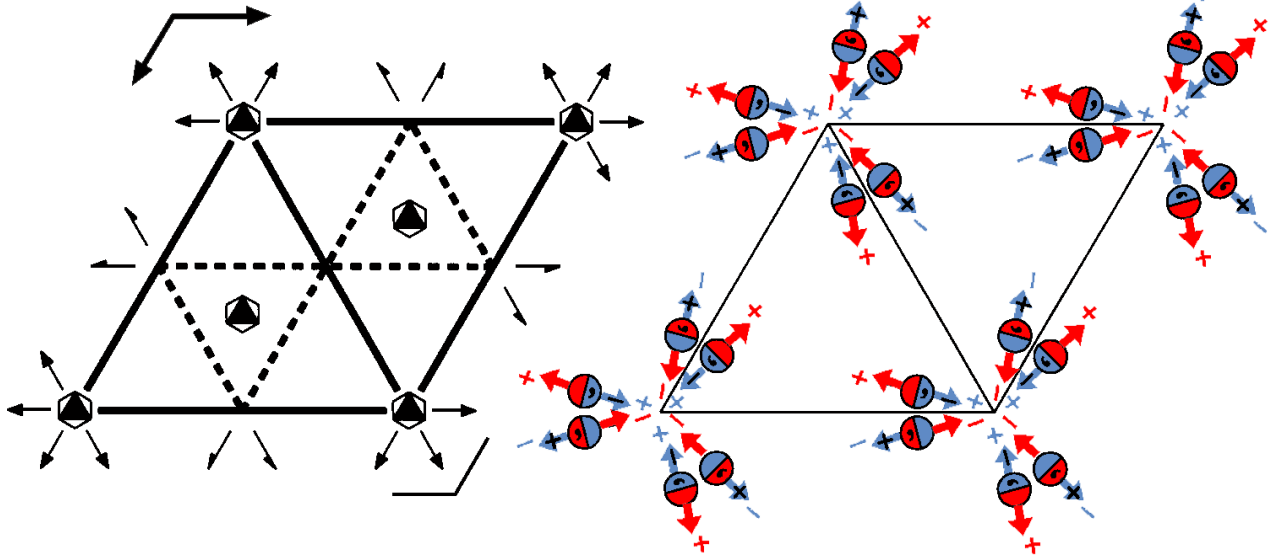
$p\bar{6}2m$

$\bar{6}2m$

Hexagonal/Hexagonal

No. 79.1.515

$p\bar{6}2m$



Origin at $\bar{6}2m$

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/2$; $x \leq (1+y)/2$;

$y \leq \min(1-x, x)$; $0 \leq z$

Vertices $0,0$; $1/2,0$; $2/3,1/3$; $1/2,1/2$

Symmetry operations

- | | | |
|-----------------------------------|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m x,y,0
(m_z 0,0,0) | (5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) m x,x,z
(m_3 0,0,0) | (11) m x,0,z
(m_2 0,0,0) | (12) m 0,y,z
(m_1 0,0,0) |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 h 1	(1) x,y,z [u,v,w]	(2) $\bar{y},x-y,z$ [$\bar{v},u-v,w$]	(3) $\bar{x}+y,\bar{x},z$ [$\bar{u}+v,\bar{u},w$]
	(4) x,y,\bar{z} [\bar{u},\bar{v},w]	(5) $\bar{y},x-y,\bar{z}$ [$v,\bar{u}+v,w$]	(6) $\bar{x}+y,\bar{x},\bar{z}$ [$u-v,u,w$]
	(7) y,x,\bar{z} [v,u,\bar{w}]	(8) $x-y,\bar{y},\bar{z}$ [$u-v,\bar{v},\bar{w}$]	(9) $\bar{x},\bar{x}+y,\bar{z}$ [$\bar{u},\bar{u}+v,\bar{w}$]
	(10) y,x,z [\bar{v},\bar{u},\bar{w}]	(11) $x-y,\bar{y},z$ [$\bar{u}+v,v,\bar{w}$]	(12) $\bar{x},\bar{x}+y,z$ [$u,u-v,\bar{w}$]
6 g m..	$x,y,0$ [$0,0,w$]	$\bar{y},x-y,0$ [$0,0,w$]	$\bar{x}+y,\bar{x},0$ [$0,0,w$]
	$y,x,0$ [$0,0,\bar{w}$]	$x-y,\bar{y},0$ [$0,0,\bar{w}$]	$\bar{x},\bar{x}+y,0$ [$0,0,\bar{w}$]
6 f ..m	$x,0,z$ [$u,2u,0$]	$0,x,z$ [$2\bar{u},\bar{u},0$]	\bar{x},\bar{x},z [$u,\bar{u},0$]
	$x,0,\bar{z}$ [$\bar{u},2\bar{u},0$]	$0,x,\bar{z}$ [$2u,u,0$]	\bar{x},\bar{x},\bar{z} [$\bar{u},u,0$]
4 e 3..	$1/3,2/3,z$ [$0,0,w$]	$1/3,2/3,\bar{z}$ [$0,0,w$]	
	$2/3,1/3,\bar{z}$ [$0,0,\bar{w}$]	$2/3,1/3,z$ [$0,0,\bar{w}$]	
3 d m2m	$x,0,0$ [$0,0,0$]	$0,x,0$ [$0,0,0$]	$\bar{x},\bar{x},0$ [$0,0,0$]
2 c 3.m	$0,0,z$ [$0,0,0$]	$0,0,\bar{z}$ [$0,0,0$]	
2 b $\bar{6}$..	$1/3,2/3,0$ [$0,0,w$]	$2/3,1/3,0$ [$0,0,\bar{w}$]	
1 a $\bar{6}2m$	$0,0,0$ [$0,0,0$]		

Symmetry of special projections

Along [001] $p31m1'$
 $a^* = a$ $b^* = b$
 Origin at $0,0,z$

Along [100] $p2mm$
 $a^* = (a+2b)/2$
 Origin at $x,0,0$

Along [210] $p11m1'$
 $a^* = b/2$
 Origin at $x,x/2,0$

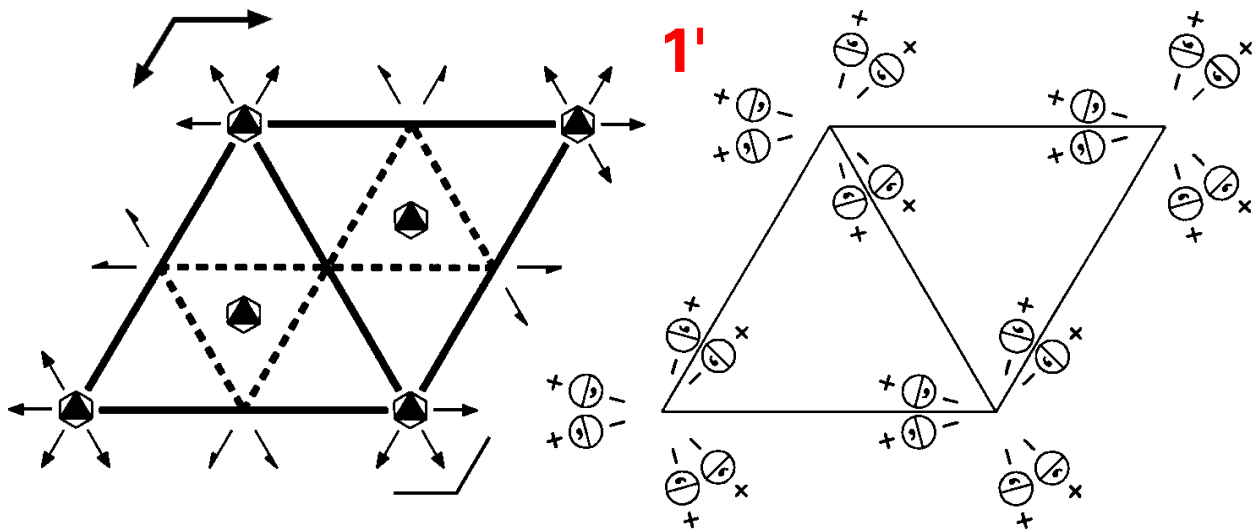
$p\bar{6}2m1'$

$\bar{6}2m1'$

Hexagonal/Hexagonal

No. 79.2.516

$p\bar{6}2m1'$



Origin at $\bar{6}2m1'$

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1+y)/2;$

$y \leq \min(1-x, x); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

For 1 + set

- | | | |
|-----------------------------------|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m x,y,0
(m_z 0,0,0) | (5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) m x,x,z
(m_3 0,0,0) | (11) m x,0,z
(m_2 0,0,0) | (12) m 0,y,z
(m_1 0,0,0) |

For 1' + set

- | | | |
|----------------------|--|---|
| (1) 1'
(1 0,0,0)' | (2) $3^{+'}$ 0,0,z
(3_z 0,0,0)' | (3) $3^{-'}$ 0,0,z
(3_z^{-1} 0,0,0)' |
|----------------------|--|---|

(4) m' $x,y,0$ ($m_z 0,0,0$)'	(5) $\bar{6}^-$ $0,0,z$; $0,0,0$ ($\bar{6}_z^{-1} 0,0,0$)'	(6) $\bar{6}^+$ $0,0,z$; $0,0,0$ ($\bar{6}_z 0,0,0$)'
(7) $2'$ $x,x,0$ ($2_{xy} 0,0,0$)'	(8) $2'$ $x,0,0$ ($2_x 0,0,0$)'	(9) $2'$ $0,y,0$ ($2_y 0,0,0$)'
(10) m' x,x,z ($m_3 0,0,0$)'	(11) m' $x,0,z$ ($m_2 0,0,0$)'	(12) m' $0,y,z$ ($m_1 0,0,0$)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7); $1'$

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	$1+$	$1' +$	
12 h $11'$	(1) x,y,z [0,0,0] (4) x,y,\bar{z} [0,0,0] (7) y,x,\bar{z} [0,0,0] (10) y,x,z [0,0,0]	(2) $\bar{y},x-y,z$ [0,0,0] (5) $\bar{y},x-y,\bar{z}$ [0,0,0] (8) $x-y,\bar{y},\bar{z}$ [0,0,0] (11) $x-y,\bar{y},z$ [0,0,0]	(3) $\bar{x}+y,\bar{x},z$ [0,0,0] (6) $\bar{x}+y,\bar{x},\bar{z}$ [0,0,0] (9) $\bar{x},\bar{x}+y,\bar{z}$ [0,0,0] (12) $\bar{x},\bar{x}+y,z$ [0,0,0]
6 g $m..1'$	$x,y,0$ [0,0,0] $y,x,0$ [0,0,0]	$\bar{y},x-y,0$ [0,0,0] $x-y,\bar{y},0$ [0,0,0]	$\bar{x}+y,\bar{x},0$ [0,0,0] $\bar{x},\bar{x}+y,0$ [0,0,0]
6 f $..m1'$	$x,0,z$ [0,0,0] $x,0,\bar{z}$ [0,0,0]	$0,x,z$ [0,0,0] $0,x,\bar{z}$ [0,0,0]	\bar{x},\bar{x},z [0,0,0] \bar{x},\bar{x},\bar{z} [0,0,0]
4 e $3..1'$	$1/3,2/3,z$ [0,0,0] $2/3,1/3,\bar{z}$ [0,0,0]	$1/3,2/3,\bar{z}$ [0,0,0] $2/3,1/3,z$ [0,0,0]	
3 d $m2m1'$	$x,0,0$ [0,0,0]	$0,x,0$ [0,0,0]	$\bar{x},\bar{x},0$ [0,0,0]
2 c $3.m1'$	$0,0,z$ [0,0,0]	$0,0,\bar{z}$ [0,0,0]	

Continued

No. 79.2.516

$\overline{p6}2m1'$

2 b $\overline{6}..1'$ $1/3, 2/3, 0 [0,0,0]$

$2/3, 1/3, 0 [0,0,0]$

1 a $\overline{6}2m1'$ $0,0,0 [0,0,0]$

Symmetry of special projections

Along [001] $\overline{p}31m1'$

$a^* = a \quad b^* = b$

Origin at $0,0,z$

Along [100] $\overline{p}2mm1'$

$a^* = (a+2b)/2$

Origin at $x,0,0$

Along [210] $\overline{p}11m1'$

$a^* = b/2$

Origin at $x,x/2,0$

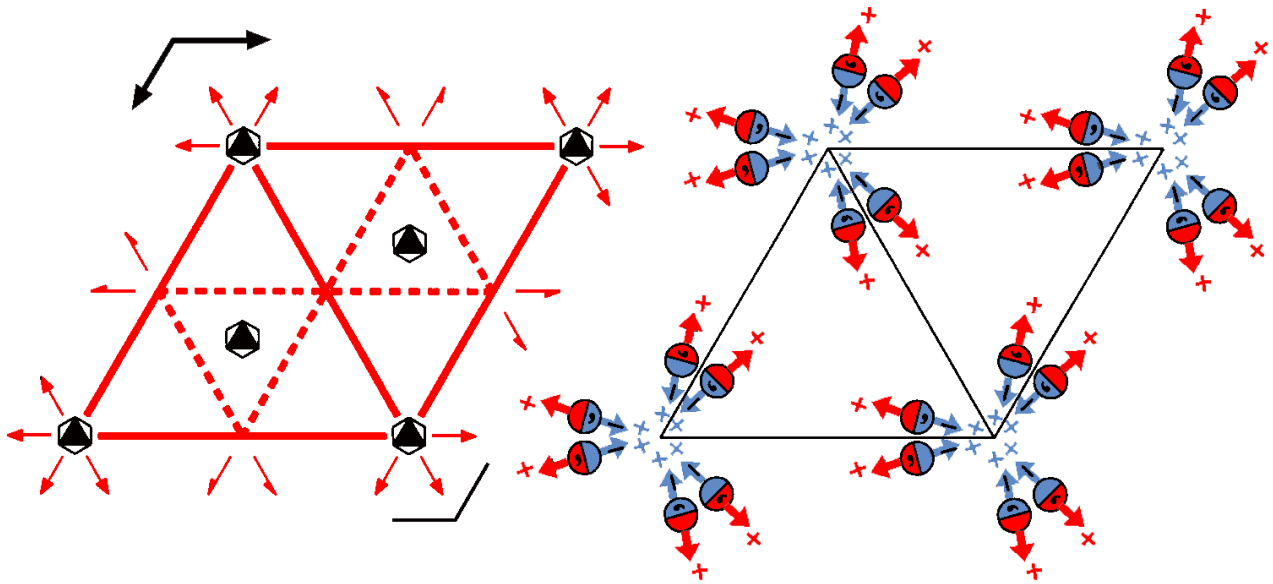
$p\bar{6}2'm'$

$\bar{6}2'm'$

Hexagonal/Hexagonal

No. 79.3.517

$p\bar{6}2'm'$



Origin at $\bar{6}2'm'$

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1+y)/2;$

$y \leq \min(1-x, x); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

- | | | |
|---------------------------------------|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) m x,y,0
(m_z 0,0,0) | (5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) m' x,x,z
(m_3 0,0,0)' | (11) m' x,0,z
(m_2 0,0,0)' | (12) m' 0,y,z
(m_1 0,0,0)' |

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
12 h 1	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z$ [$\bar{u}+v, \bar{u}, w$]
	(4) x, y, \bar{z} [\bar{u}, \bar{v}, w]	(5) $\bar{y}, x-y, \bar{z}$ [$v, \bar{u}+v, w$]	(6) $\bar{x}+y, \bar{x}, \bar{z}$ [$u-v, u, w$]
	(7) y, x, \bar{z} [\bar{v}, \bar{u}, w]	(8) $x-y, \bar{y}, \bar{z}$ [$\bar{u}+v, v, w$]	(9) $\bar{x}, \bar{x}+y, \bar{z}$ [$u, u-v, w$]
	(10) y, x, z [v, u, w]	(11) $x-y, \bar{y}, z$ [$u-v, \bar{v}, w$]	(12) $\bar{x}, \bar{x}+y, [\bar{u}, \bar{u}+v, w]$
6 g m..	$x, y, 0$ [0,0,w]	$\bar{y}, x-y, 0$ [0,0,w]	$\bar{x}+y, \bar{x}, 0$ [0,0,w]
	$y, x, 0$ [0,0,w]	$x-y, \bar{y}, 0$ [0,0,w]	$\bar{x}, \bar{x}+y, 0$ [0,0,w]
6 f ..m'	$x, 0, z$ [u,0,w]	$0, x, z$ [0,u,w]	\bar{x}, \bar{x}, z [\bar{u}, \bar{u}, w]
	$x, 0, \bar{z}$ [$\bar{u}, 0, w$]	$0, x, \bar{z}$ [0, \bar{u} ,w]	$\bar{x}, \bar{x}, \bar{z}$ [u, u, w]
4 e 3..	$1/3, 2/3, z$ [0,0,w]	$1/3, 2/3, \bar{z}$ [0,0,w]	
	$2/3, 1/3, \bar{z}$ [0,0,w]	$2/3, 1/3, z$ [0,0,w]	
3 d m2'm'	$x, 0, 0$ [0,0,w]	$0, x, 0$ [0,0,w]	$\bar{x}, \bar{x}, 0$ [0,0,w]
2 c 3.m'	$0, 0, z$ [0,0,w]	$0, 0, \bar{z}$ [0,0,w]	
2 b $\bar{6}$..	$1/3, 2/3, 0$ [0,0,w]	$2/3, 1/3, 0$ [0,0,w]	
1 a $\bar{6}2'm'$	$0, 0, 0$ [0,0,w]		

Symmetry of special projections

Along [001] $p31m1'$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p2'm'm$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $p11m$
 $a^* = b/2$
 Origin at x,x/2,0

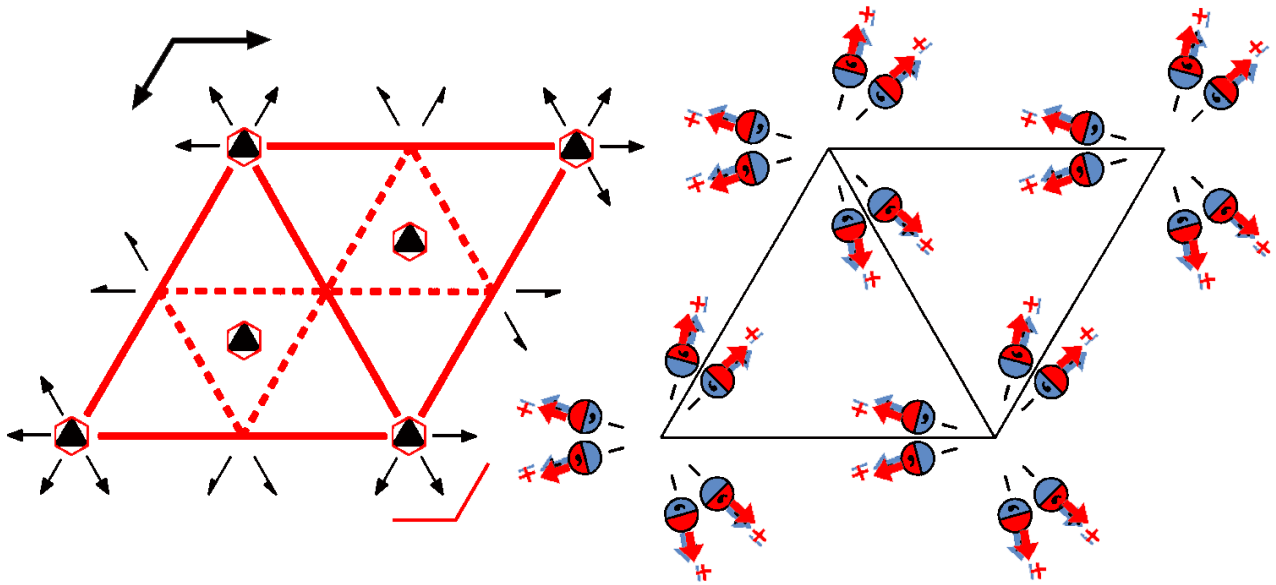
$p\bar{6}'2m'$

$\bar{6}'2m'$

Hexagonal/Hexagonal

No. 79.4.518

$p\bar{6}'2m'$



Origin at $\bar{6}'2m'$

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1+y)/2;$

$y \leq \min(1-x, x); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) m' x,y,0
(m_z |0,0,0)'

(5) $\bar{6}^-$ ' 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ |0,0,0)'

(6) $\bar{6}^+$ ' 0,0,z; 0,0,0
($\bar{6}_z$ |0,0,0)'

(7) 2 x,x,0
(2_{xy} |0,0,0)

(8) 2 x,0,0
(2_x |0,0,0)

(9) 2 0,y,0
(2_y |0,0,0)

(10) m' x,x,z
(m_3 |0,0,0)'

(11) m' x,0,z
(m_2 |0,0,0)'

(12) m' 0,y,z
(m_1 |0,0,0)'

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $x,y,\bar{z} [u,v,\bar{w}]$	(5) $\bar{y},x-y,\bar{z} [\bar{v},u-v,\bar{w}]$	(6) $\bar{x}+y,\bar{x},\bar{z} [\bar{u}+v,\bar{u},\bar{w}]$
	(7) $y,x,\bar{z} [v,u,\bar{w}]$	(8) $x-y,\bar{y},\bar{z} [u-v,\bar{v},\bar{w}]$	(9) $\bar{x},\bar{x}+y,\bar{z} [\bar{u},\bar{u}+v,\bar{w}]$
	(10) $y,x,z [v,u,w]$	(11) $x-y,\bar{y},z [u-v,\bar{v},w]$	(12) $\bar{x},\bar{x}+y,z [\bar{u},\bar{u}+v,w]$
6 g $m'..$	$x,y,0 [u,v,0]$	$\bar{y},x-y,0 [\bar{v},u-v,0]$	$\bar{x}+y,\bar{x},0 [\bar{u}+v,\bar{u},0]$
	$y,x,0 [v,u,0]$	$x-y,\bar{y},0 [u-v,\bar{v},0]$	$\bar{x},\bar{x}+y,0 [\bar{u},\bar{u}+v,0]$
6 f $..m'$	$x,0,z [u,0,w]$	$0,x,z [0,u,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$
	$x,0,\bar{z} [u,0,\bar{w}]$	$0,x,\bar{z} [0,u,\bar{w}]$	$\bar{x},\bar{x},\bar{z} [\bar{u},\bar{u},\bar{w}]$
4 e 3..	$1/3,2/3,z [0,0,w]$	$1/3,2/3,\bar{z} [0,0,\bar{w}]$	
	$2/3,1/3,\bar{z} [0,0,\bar{w}]$	$2/3,1/3,z [0,0,w]$	
3 d $m'2m'$	$x,0,0 [u,0,0]$	$0,x,0 [0,u,0]$	$\bar{x},\bar{x},0 [\bar{u},\bar{u},0]$
2 c $3.m'$	$0,0,z [u,0,w]$	$0,0,\bar{z} [0,0,\bar{w}]$	
2 b $\bar{6}'..$	$1/3,2/3,0 [0,0,0]$	$2/3,1/3,0 [0,0,0]$	
1 a $\bar{6}'2m'$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p31m'$
 $a^* = a \quad b^* = b$
 Origin at 0,0,z

Along [100] $p2m'm'$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $p11m'$
 $a^* = b/2$
 Origin at x,x/2,0

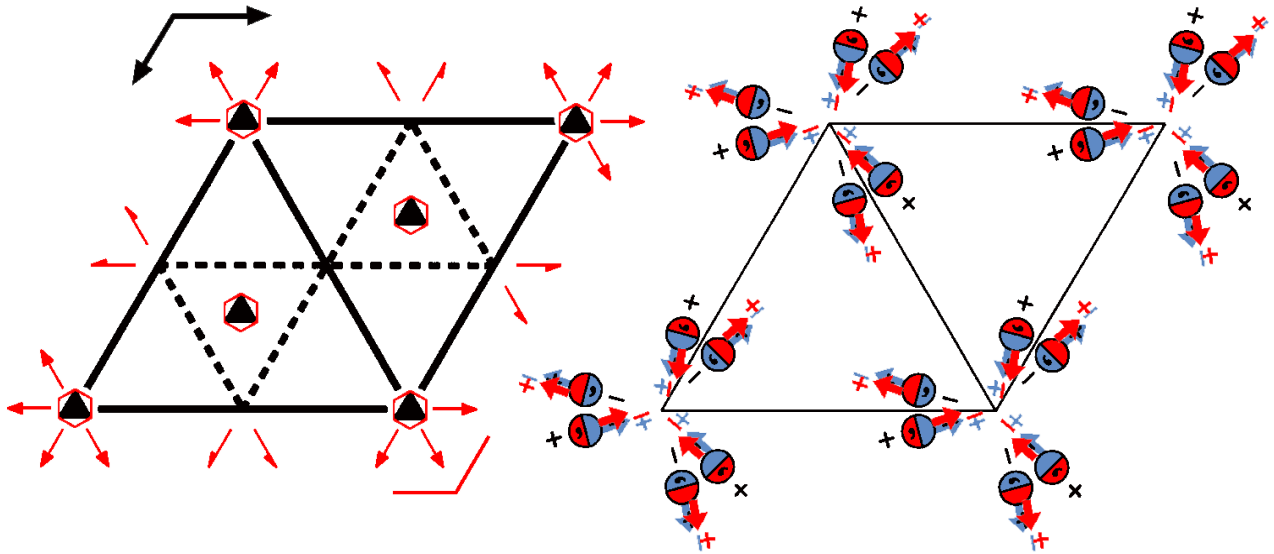
$\bar{6}2'm$

$\bar{6}2'm$

Hexagonal/Hexagonal

No. 79.5.519

$\bar{6}2'm$



Origin at $\bar{6}2'm$

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/2; x \leq (1+y)/2;$

$y \leq \min(1-x, x); 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3; 1/2,1/2$

Symmetry operations

(1) 1
(1|0,0,0)

(2) 3^+ 0,0,z
(3_z |0,0,0)

(3) 3^- 0,0,z
(3_z^{-1} |0,0,0)

(4) m' x,y,0
(m_z |0,0,0)'

(5) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ |0,0,0)'

(6) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ |0,0,0)'

(7) $2'$ x,x,0
(2_{xy} |0,0,0)'

(8) $2'$ x,0,0
(2_x |0,0,0)'

(9) $2'$ 0,y,0
(2_y |0,0,0)'

(10) m x,x,z
(m_3 |0,0,0)

(11) m x,0,z
(m_2 |0,0,0)

(12) m 0,y,z
(m_1 |0,0,0)

Generators selected (1); $t(1,0,0)$; $t(0,1,0)$; (2); (4); (7)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
12 h 1	(1) $x,y,z [u,v,w]$	(2) $\bar{y},x-y,z [\bar{v},u-v,w]$	(3) $\bar{x}+y,\bar{x},z [\bar{u}+v,\bar{u},w]$
	(4) $x,y,\bar{z} [u,v,\bar{w}]$	(5) $\bar{y},x-y,\bar{z} [\bar{v},u-v,\bar{w}]$	(6) $\bar{x}+y,\bar{x},\bar{z} [\bar{u}+v,\bar{u},\bar{w}]$
	(7) $y,x,\bar{z} [\bar{v},\bar{u},w]$	(8) $x-y,\bar{y},\bar{z} [\bar{u}+v,v,w]$	(9) $\bar{x},\bar{x}+y,\bar{z} [u,u-v,w]$
	(10) $y,x,z [\bar{v},\bar{u},\bar{w}]$	(11) $x-y,\bar{y},z [\bar{u}+v,v,\bar{w}]$	(12) $\bar{x},\bar{x}+y,z [u,u-v,\bar{w}]$
6 g $m'\bar{1}$	$x,y,0 [u,v,0]$	$\bar{y},x-y,0 [\bar{v},u-v,0]$	$\bar{x}+y,\bar{x},0 [\bar{u}+v,\bar{u},0]$
	$y,x,0 [\bar{v},\bar{u},0]$	$x-y,\bar{y},0 [\bar{u}+v,v,0]$	$\bar{x},\bar{x}+y,0 [u,u-v,0]$
6 f $\bar{1}m$	$x,0,z [u,2u,0]$	$0,x,z [2\bar{u},\bar{u},0]$	$\bar{x},\bar{x},z [u,\bar{u},0]$
	$x,0,\bar{z} [u,2u,0]$	$0,x,\bar{z} [2\bar{u},\bar{u},0]$	$\bar{x},\bar{x},\bar{z} [u,\bar{u},0]$
4 e $3\bar{1}$	$1/3,2/3,z [0,0,w]$	$1/3,2/3,\bar{z} [0,0,\bar{w}]$	
	$2/3,1/3,\bar{z} [0,0,w]$	$2/3,1/3,z [0,0,\bar{w}]$	
3 d $m'2'm$	$x,0,0 [u,v,0]$	$0,x,0 [\bar{v},u-v,0]$	$\bar{x},\bar{x},0 [\bar{u}+v,\bar{u},0]$
2 c $3m$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
2 b $\bar{6}'\bar{1}$	$1/3,2/3,0 [0,0,0]$	$2/3,1/3,0 [0,0,0]$	
1 a $\bar{6}'2'm$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p31m$
 $a^* = a \quad b^* = b$
 Origin at 0,0,z

Along [100] $p2'mm'$
 $a^* = (a+2b)/2$
 Origin at x,0,0

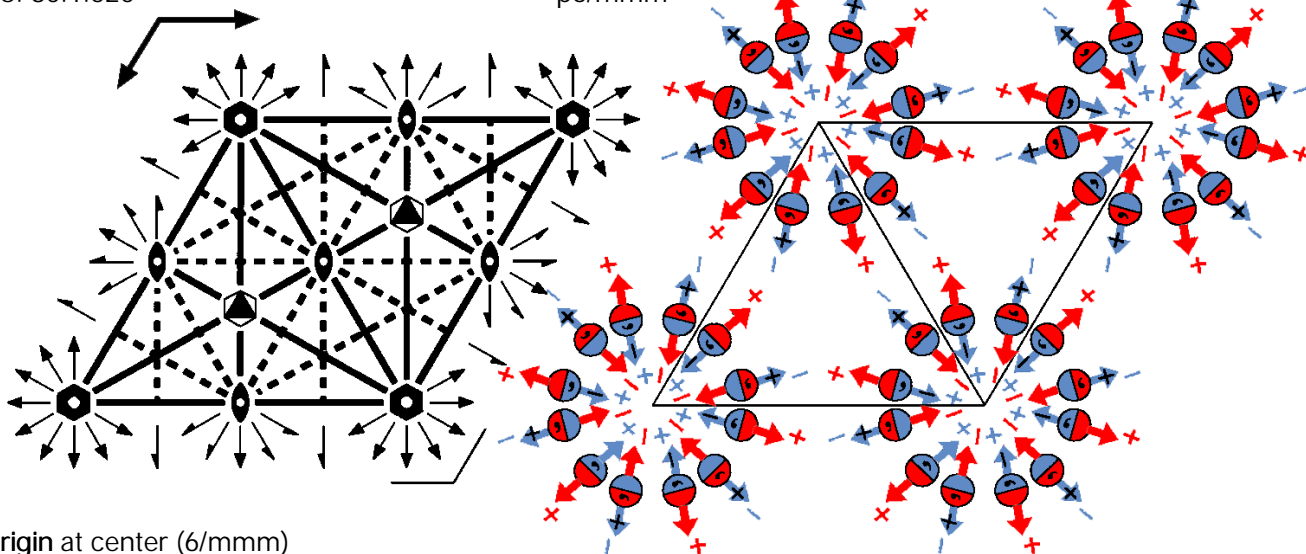
Along [210] $p11m1'$
 $a^* = b/2$
 Origin at x,x/2,0

p6/mmm

6/mmm

Hexagonal/Hexagonal

No. 80.1.520



Origin at center (6/mmm)

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/3; x \leq (1 + y)/2; y \leq x/2; 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3$

Symmetry operations

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m x,y,0
(m_z 0,0,0) | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (19) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (20) m x,2x,z
(m_x 0,0,0) | (21) m 2x,x,z
(m_y 0,0,0) |
| (22) m x,x,z
(m_3 0,0,0) | (23) m x,0,z
(m_2 0,0,0) | (24) m 0,y,z
(m_1 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 l 1	(1) x,y,z [u,v,w]	(2) \bar{y} ,x-y,z [\bar{v} ,u-v,w]	(3) \bar{x} +y, \bar{x} ,z [\bar{u} +v, \bar{u} ,w]
	(4) \bar{x} , \bar{y} ,z [\bar{u} , \bar{v} ,w]	(5) y, \bar{x} +y,z [v, \bar{u} +v,w]	(6) x-y,x,z [u-v,u,w]
	(7) y,x, \bar{z} [v,u, \bar{w}]	(8) x-y, \bar{y} , \bar{z} [u-v, \bar{v} , \bar{w}]	(9) \bar{x} , \bar{x} +y, \bar{z} [\bar{u} , \bar{u} +v, \bar{w}]
	(10) \bar{y} , \bar{x} , \bar{z} [\bar{v} , \bar{u} , \bar{w}]	(11) \bar{x} +y,y, \bar{z} [\bar{u} +v,v, \bar{w}]	(12) x,x-y, \bar{z} [u,u-v, \bar{w}]
	(13) \bar{x} , \bar{y} , \bar{z} [u,v,w]	(14) y, \bar{x} +y, \bar{z} [\bar{v} ,u-v,w]	(15) x-y,x, \bar{z} [\bar{u} +v, \bar{u} ,w]
	(16) x,y, \bar{z} [\bar{u} , \bar{v} ,w]	(17) \bar{y} ,x-y, \bar{z} [v, \bar{u} +v,w]	(18) \bar{x} +y, \bar{x} , \bar{z} [u-v,u,w]
	(19) \bar{y} , \bar{x} ,z [v,u, \bar{w}]	(20) \bar{x} +y,y,z [u-v, \bar{v} , \bar{w}]	(21) x,x-y,z [\bar{u} , \bar{u} +v, \bar{w}]
	(22) y,x,z [\bar{v} , \bar{u} , \bar{w}]	(23) x-y, \bar{y} ,z [\bar{u} +v,v, \bar{w}]	(24) \bar{x} , \bar{x} +y,z [u,u-v, \bar{w}]
12 k m..	x,y,0 [u,v,0]	\bar{y} ,x-y,0 [\bar{v} ,u-v,0]	\bar{x} +y, \bar{x} ,0 [\bar{u} +v, \bar{u} ,0]
	\bar{x} , \bar{y} ,0 [\bar{u} , \bar{v} ,0]	y, \bar{x} +y,0 [v, \bar{u} +v,0]	x-y,x,0 [u-v,u,0]
	y,x,0 [v,u,0]	x-y, \bar{y} ,0 [u-v, \bar{v} ,0]	\bar{x} , \bar{x} +y,0 [\bar{u} , \bar{u} +v,0]
	\bar{y} , \bar{x} ,0 [\bar{v} , \bar{u} ,0]	\bar{x} +y,y,0 [\bar{u} +v,v,0]	x,x-y,0 [u,u-v,0]
12 j .m.	x,2x,z [u,0,0]	2 \bar{x} , \bar{x} ,z [0,u,0]	x, \bar{x} ,z [\bar{u} , \bar{u} ,0]
	\bar{x} ,2 \bar{x} ,z [\bar{u} ,0,0]	2x,x,z [0, \bar{u} ,0]	\bar{x} ,x,z [u,u,0]
	2x,x, \bar{z} [0,u,0]	\bar{x} ,2 \bar{x} , \bar{z} [u,0,0]	\bar{x} ,x, \bar{z} [\bar{u} , \bar{u} ,0]
	2 \bar{x} , \bar{x} , \bar{z} [0, \bar{u} ,0]	x,2x, \bar{z} [\bar{u} ,0,0]	x, \bar{x} , \bar{z} [u,u,0]

Continued		No. 80.1.520	p6/mmm
12 i ..m	x,0,z [u,2u,0] x̄,0,z [ū,2ū,0] 0,x,z̄ [2u,u,0] 0,x̄,z̄ [2ū,ū,0]	0,x,z [2ū,ū,0] 0,x̄,z [2u,u,0] x,0,z̄ [ū,2ū,0] x̄,0,z̄ [u,2u,0]	x̄,x,z [u,ū,0] x,x,z [ū,u,0] x̄,x,z̄ [ū,u,0] x,x,z̄ [u,ū,0]
6 h mm2	x,2x,0 [0,0,0] x̄,2x̄,0 [0,0,0]	2x̄,x̄,0 [0,0,0] 2x,x,0 [0,0,0]	x,x̄,0 [0,0,0] x̄,x,0 [0,0,0]
6 g m2m	x,0,0 [0,0,0] x̄,0,0 [0,0,0]	0,x,0 [0,0,0] 0,x̄,0 [0,0,0]	x̄,x̄,0 [0,0,0] x,x,0 [0,0,0]
6 f 2mm	1/2,0,z [0,0,0] 0,1/2,z̄ [0,0,0]	0,1/2,z [0,0,0] 1/2,0,z̄ [0,0,0]	1/2,1/2,z [0,0,0] 1/2,1/2,z̄ [0,0,0]
4 e 3m.	1/3,2/3,z [0,0,0] 2/3,1/3,z̄ [0,0,0]	2/3,1/3,z [0,0,0] 1/3,2/3,z̄ [0,0,0]	
3 d mmm	1/2,0,0 [0,0,0]	0,1/2,0 [0,0,0]	1/2,1/2,0 [0,0,0]
2 c 6mm	0,0,z [0,0,0]	0,0,z̄ [0,0,0]	
2 b 6m2	1/3,2/3,0 [0,0,0]	2/3,1/3,0 [0,0,0]	
1 a 6/mmm	0,0,0 [0,0,0]		

Symmetry of special projections

Along [001] p6mm
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] p2mm1'
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] p2mm1'
 $a^* = b/2$
 Origin at x,x/2,0

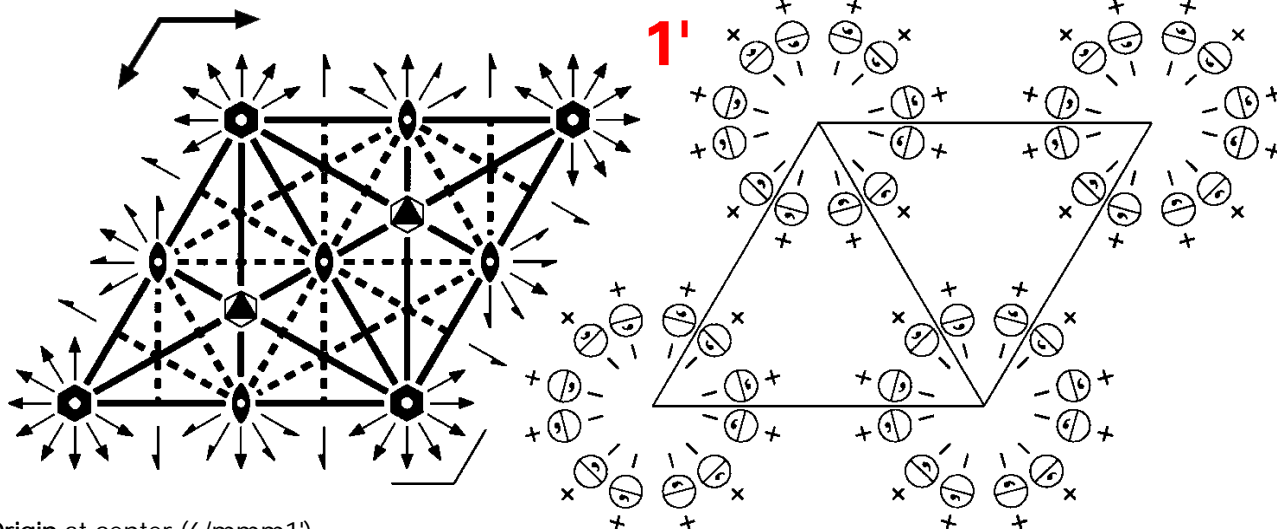
p6/mmm1'

6/mmm1'

Hexagonal/Hexagonal

No. 80.2.521

p6/mmm1'



Origin at center (6/mmm1')

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/3$; $x \leq (1 + y)/2$; $y \leq x/2$; $0 \leq z$

Vertices $0,0$; $1/2,0$; $2/3,1/3$

Symmetry operations

For 1 + set

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m x,y,0
(m_z 0,0,0) | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (19) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (20) m x,2x,z
(m_x 0,0,0) | (21) m 2x,x,z
(m_y 0,0,0) |
| (22) m x,x,z
(m_3 0,0,0) | (23) m x,0,z
(m_2 0,0,0) | (24) m 0,y,z
(m_1 0,0,0) |

For 1' + set

(1) 1' (1 0,0,0)'	(2) 3 ⁺ ' 0,0,z (3 _z 0,0,0)'	(3) 3 ⁻ ' 0,0,z (3 _z ⁻¹ 0,0,0)'
(4) 2' 0,0,z (2 _z 0,0,0)'	(5) 6 ⁻ ' 0,0,z (6 _z ⁻¹ 0,0,0)'	(6) 6 ⁺ ' 0,0,z (6 _z 0,0,0)'
(7) 2' x,x,0 (2 _{xy} 0,0,0)'	(8) 2' x,0,0 (2 _x 0,0,0)'	(9) 2' 0,y,0 (2 _y 0,0,0)'
(10) 2' x,x̄,0 (2 ₃ 0,0,0)'	(11) 2' x,2x,0 (2 ₂ 0,0,0)'	(12) 2' 2x,x,0 (2 ₁ 0,0,0)'
(13) 1̄ 0,0,0 (1̄ 0,0,0)'	(14) 3̄ ⁺ ' 0,0,z; 0,0,0 (3̄ _z 0,0,0)'	(15) 3̄ ⁻ ' 0,0,z; 0,0,0 (3̄ _z ⁻¹ 0,0,0)'
(16) m' x,y,0 (m _z 0,0,0)'	(17) 6̄ ⁻ ' 0,0,z; 0,0,0 (6̄ _z ⁻¹ 0,0,0)'	(18) 6̄ ⁺ ' 0,0,z; 0,0,0 (6̄ _z 0,0,0)'
(19) m' x,x̄,z (m _{xy} 0,0,0)'	(20) m' x,2x,z (m _x 0,0,0)'	(21) m' 2x,x,z (m _y 0,0,0)'
(22) m' x,x,z (m ₃ 0,0,0)'	(23) m' x,0,z (m ₂ 0,0,0)'	(24) m' 0,y,z (m ₁ 0,0,0)'

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7); (13); 1'

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
	1+	1' +	
24 I 11'	(1) x,y,z [0,0,0]	(2) \bar{y} ,x-y,z [0,0,0]	(3) $\bar{x}+y$, \bar{x} ,z [0,0,0]
	(4) \bar{x} , \bar{y} ,z [0,0,0]	(5) y, $\bar{x}+y$,z [0,0,0]	(6) x-y,x,z [0,0,0]
	(7) y,x, \bar{z} [0,0,0]	(8) x-y, \bar{y} , \bar{z} [0,0,0]	(9) \bar{x} , $\bar{x}+y$, \bar{z} [0,0,0]
	(10) \bar{y} , \bar{x} , \bar{z} [0,0,0]	(11) $\bar{x}+y$,y, \bar{z} [0,0,0]	(12) x,x-y, \bar{z} [0,0,0]
	(13) \bar{x} , \bar{y} , \bar{z} [0,0,0]	(14) y, $\bar{x}+y$, \bar{z} [0,0,0]	(15) x-y,x, \bar{z} [0,0,0]
	(16) x,y, \bar{z} [0,0,0]	(17) \bar{y} ,x-y, \bar{z} [0,0,0]	(18) $\bar{x}+y$, \bar{x} , \bar{z} [0,0,0]
	(19) \bar{y} , \bar{x} ,z [0,0,0]	(20) $\bar{x}+y$,y,z [0,0,0]	(21) x,x-y,z [0,0,0]
	(22) y,x,z [0,0,0]	(23) x-y, \bar{y} ,z [0,0,0]	(24) \bar{x} , $\bar{x}+y$,z [0,0,0]

12 k m..1'	$x,y,0 [0,0,0]$	$\bar{y},x-y,0 [0,0,0]$	$\bar{x}+y,\bar{x},0 [0,0,0]$
	$\bar{x},\bar{y},0 [0,0,0]$	$y,\bar{x}+y,0 [0,0,0]$	$x-y,x,0 [0,0,0]$
	$y,x,0 [0,0,0]$	$x-y,\bar{y},0 [0,0,0]$	$\bar{x},\bar{x}+y,0 [0,0,0]$
	$\bar{y},\bar{x},0 [0,0,0]$	$\bar{x}+y,y,0 [0,0,0]$	$x,x-y,0 [0,0,0]$
12 j .m.1'	$x,2x,z [0,0,0]$	$2\bar{x},\bar{x},z [0,0,0]$	$x,\bar{x},z [0,0,0]$
	$\bar{x},2\bar{x},z [0,0,0]$	$2x,x,z [0,0,0]$	$\bar{x},x,z [0,0,0]$
	$2x,x,\bar{z} [0,0,0]$	$\bar{x},2\bar{x},\bar{z} [0,0,0]$	$\bar{x},x,\bar{z} [0,0,0]$
	$2\bar{x},\bar{x},\bar{z} [0,0,0]$	$x,2x,\bar{z} [0,0,0]$	$x,\bar{x},\bar{z} [0,0,0]$
12 i ..m1'	$x,0,z [0,0,0]$	$0,x,z [0,0,0]$	$\bar{x},\bar{x},z [0,0,0]$
	$\bar{x},0,z [0,0,0]$	$0,\bar{x},z [0,0,0]$	$x,x,z [0,0,0]$
	$0,x,\bar{z} [0,0,0]$	$x,0,\bar{z} [0,0,0]$	$\bar{x},\bar{x},\bar{z} [0,0,0]$
	$0,\bar{x},\bar{z} [0,0,0]$	$\bar{x},0,\bar{z} [0,0,0]$	$x,x,\bar{z} [0,0,0]$
6 h mm21'	$x,2x,0 [0,0,0]$	$2\bar{x},\bar{x},0 [0,0,0]$	$x,\bar{x},0 [0,0,0]$
	$\bar{x},2\bar{x},0 [0,0,0]$	$2x,x,0 [0,0,0]$	$\bar{x},x,0 [0,0,0]$
6 g m2m1'	$x,0,0 [0,0,0]$	$0,x,0 [0,0,0]$	$\bar{x},\bar{x},0 [0,0,0]$
	$\bar{x},0,0 [0,0,0]$	$0,\bar{x},0 [0,0,0]$	$x,x,0 [0,0,0]$
6 f 2mm1'	$1/2,0,z [0,0,0]$	$0,1/2,z [0,0,0]$	$1/2,1/2,z [0,0,0]$
	$0,1/2,\bar{z} [0,0,0]$	$1/2,0,\bar{z} [0,0,0]$	$1/2,1/2,\bar{z} [0,0,0]$
4 e 3m.1'	$1/3,2/3,z [0,0,0]$	$2/3,1/3,z [0,0,0]$	
	$2/3,1/3,\bar{z} [0,0,0]$	$1/3,2/3,\bar{z} [0,0,0]$	
3 d mmm1'	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$

Continued

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$p6/mmm1'$

2 c $6mm1'$ 0,0,z [0,0,0]

0,0, \bar{z} [0,0,0]

2 b $\bar{6}m21'$ 1/3,2/3,0 [0,0,0]

2/3,1/3,0 [0,0,0]

1 a $6/mmm1'$ 0,0,0 [0,0,0]

Symmetry of special projections

Along [001] $p6mm1'$

$a^* = a$ $b^* = b$

Origin at 0,0,z

Along [100] $p2mm1'$

$a^* = (a+2b)/2$

Origin at x,0,0

Along [210] $p2mm1'$

$a^* = b/2$

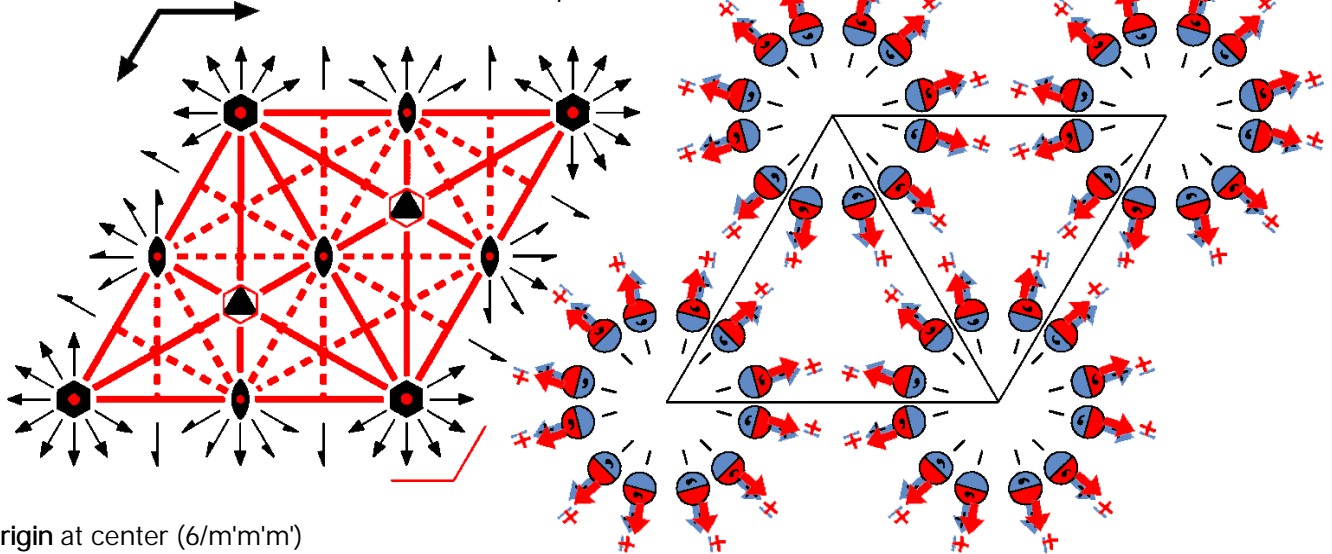
Origin at x,x/2,0

p6/m'm'm'

6/m'm'm'

Hexagonal/Hexagonal

No. 80.3.522



Origin at center (6/m'm'm')

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/3$; $x \leq (1 + y)/2$; $y \leq x/2$; $0 \leq z$

Vertices $0,0$; $1/2,0$; $2/3,1/3$

Symmetry operations

- | | | |
|--|--|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (16) m' x,y,0
(m_z 0,0,0)' | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (19) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (20) m' x,2x,z
(m_x 0,0,0)' | (21) m' 2x,x,z
(m_y 0,0,0)' |
| (22) m' x,x,z
(m_3 0,0,0)' | (23) m' x,0,z
(m_2 0,0,0)' | (24) m' 0,y,z
(m_1 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7); (13)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
24 l 1	(1) $x, y, z [u, v, w]$	(2) $\bar{y}, x-y, z [\bar{v}, u-v, w]$	(3) $\bar{x}+y, \bar{x}, z [\bar{u}+v, \bar{u}, w]$
	(4) $\bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]$	(5) $y, \bar{x}+y, z [v, \bar{u}+v, w]$	(6) $x-y, x, z [u-v, u, w]$
	(7) $y, x, \bar{z} [v, u, \bar{w}]$	(8) $x-y, \bar{y}, \bar{z} [u-v, \bar{v}, \bar{w}]$	(9) $\bar{x}, \bar{x}+y, \bar{z} [\bar{u}, \bar{u}+v, \bar{w}]$
	(10) $\bar{y}, \bar{x}, \bar{z} [\bar{v}, \bar{u}, \bar{w}]$	(11) $\bar{x}+y, y, \bar{z} [\bar{u}+v, v, \bar{w}]$	(12) $x, x-y, \bar{z} [u, u-v, \bar{w}]$
	(13) $\bar{x}, \bar{y}, \bar{z} [\bar{u}, \bar{v}, \bar{w}]$	(14) $y, \bar{x}+y, \bar{z} [v, \bar{u}+v, \bar{w}]$	(15) $x-y, x, \bar{z} [u-v, u, \bar{w}]$
	(16) $x, y, \bar{z} [u, v, \bar{w}]$	(17) $\bar{y}, x-y, \bar{z} [\bar{v}, u-v, \bar{w}]$	(18) $\bar{x}+y, \bar{x}, \bar{z} [\bar{u}+v, \bar{u}, \bar{w}]$
	(19) $\bar{y}, \bar{x}, z [\bar{v}, \bar{u}, w]$	(20) $\bar{x}+y, y, z [\bar{u}+v, v, w]$	(21) $x, x-y, z [u, u-v, w]$
	(22) $y, x, z [v, u, w]$	(23) $x-y, \bar{y}, z [u-v, \bar{v}, w]$	(24) $\bar{x}, \bar{x}+y, z [\bar{u}, \bar{u}+v, w]$
12 k m'..	$x, y, 0 [u, v, 0]$	$\bar{y}, x-y, 0 [\bar{v}, u-v, 0]$	$\bar{x}+y, \bar{x}, 0 [\bar{u}+v, \bar{u}, 0]$
	$\bar{x}, \bar{y}, 0 [\bar{u}, \bar{v}, 0]$	$y, \bar{x}+y, 0 [v, \bar{u}+v, 0]$	$x-y, x, 0 [u-v, u, 0]$
	$y, x, 0 [v, u, 0]$	$x-y, \bar{y}, 0 [u-v, \bar{v}, 0]$	$\bar{x}, \bar{x}+y, 0 [\bar{u}, \bar{u}+v, 0]$
	$\bar{y}, \bar{x}, 0 [\bar{v}, \bar{u}, 0]$	$\bar{x}+y, y, 0 [\bar{u}+v, v, 0]$	$x, x-y, 0 [u, u-v, 0]$
12 j .m'.	$x, 2x, z [u, 2u, w]$	$2\bar{x}, \bar{x}, z [2\bar{u}, \bar{u}, w]$	$x, \bar{x}, z [u, \bar{u}, w]$
	$\bar{x}, 2\bar{x}, z [\bar{u}, 2\bar{u}, w]$	$2x, x, z [2u, u, w]$	$\bar{x}, x, z [\bar{u}, u, w]$
	$2x, x, \bar{z} [2u, u, \bar{w}]$	$\bar{x}, 2\bar{x}, \bar{z} [2\bar{u}, \bar{u}, \bar{w}]$	$\bar{x}, x, \bar{z} [\bar{u}, u, \bar{w}]$
	$2\bar{x}, \bar{x}, \bar{z} [2\bar{u}, \bar{u}, \bar{w}]$	$x, 2x, \bar{z} [u, 2u, \bar{w}]$	$x, \bar{x}, \bar{z} [u, \bar{u}, \bar{w}]$

Continued		No. 80.3.522	$p6/m'm'm'$
12 i $..m'$	$x,0,z [u,0,w]$ $\bar{x},0,z [\bar{u},0,w]$ $0,x,\bar{z} [0,u,\bar{w}]$ $0,\bar{x},\bar{z} [0,\bar{u},\bar{w}]$	$0,x,z [0,u,w]$ $0,\bar{x},z [\bar{u},0,w]$ $x,0,\bar{z} [u,0,\bar{w}]$ $\bar{x},0,\bar{z} [\bar{u},0,\bar{w}]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$ $x,x,z [u,u,w]$ $\bar{x},\bar{x},\bar{z} [\bar{u},\bar{u},\bar{w}]$ $x,x,\bar{z} [u,u,\bar{w}]$
6 h $m'm'^2$	$x,2x,0 [u,2u,0]$ $\bar{x},2\bar{x},0 [\bar{u},2\bar{u},0]$	$2\bar{x},\bar{x},0 [2\bar{u},\bar{u},0]$ $2x,x,0 [2u,u,0]$	$x,\bar{x},0 [u,\bar{u},0]$ $\bar{x},x,0 [\bar{u},u,0]$
6 g m'^2m'	$x,0,0 [u,0,0]$ $\bar{x},0,0 [\bar{u},0,0]$	$0,x,0 [0,u,0]$ $0,\bar{x},0 [0,\bar{u},0]$	$\bar{x},\bar{x},0 [\bar{u},\bar{u},0]$ $x,x,0 [u,u,0]$
6 f $2m'm'$	$1/2,0,z [0,0,w]$ $0,1/2,\bar{z} [0,0,\bar{w}]$	$0,1/2,z [0,0,w]$ $1/2,0,\bar{z} [0,0,\bar{w}]$	$1/2,1/2,z [0,0,w]$ $1/2,1/2,\bar{z} [0,0,\bar{w}]$
4 e $3m'$	$1/3,2/3,z [0,0,w]$ $2/3,1/3,\bar{z} [0,0,\bar{w}]$	$2/3,1/3,z [0,0,w]$ $1/3,2/3,\bar{z} [0,0,\bar{w}]$	
3 d $m'm'm'$	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$
2 c $6m'm'$	$0,0,z [0,0,w]$	$0,0,\bar{z} [0,0,\bar{w}]$	
2 b $\bar{6}m'^2$	$1/3,2/3,0 [0,0,0]$	$2/3,1/3,0 [0,0,0]$	
1 a $6/m'm'm'$	$0,0,0 [0,0,0]$		

Symmetry of special projections

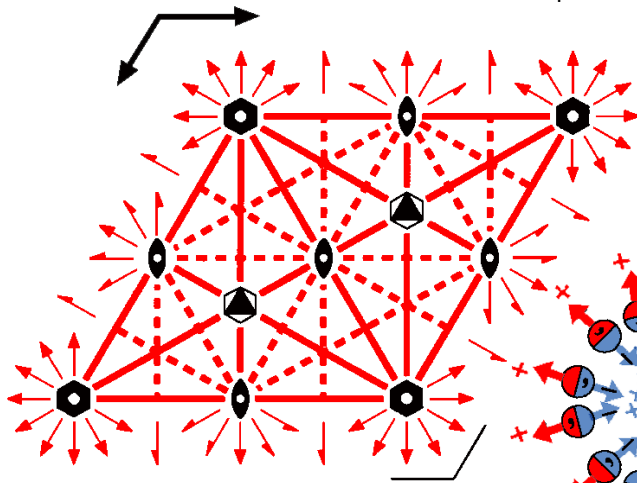
Along [001] $p6mm1'$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p2m'm'$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $p2m'm'$
 $a^* = b/2$
 Origin at x,x/2,0

p6/mm'm'

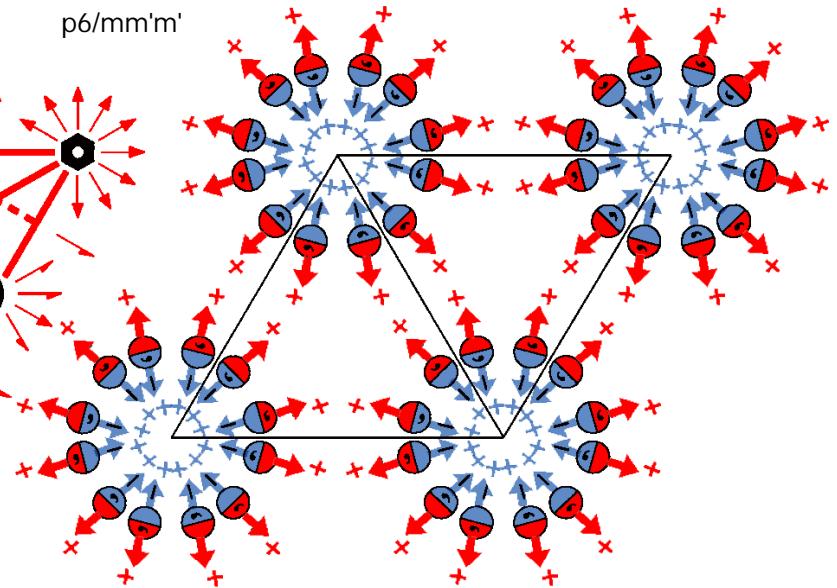
No. 80.4.523



6/mm'm'

p6/mm'm'

Hexagonal/Hexagonal



Origin at center (6/mm'm')

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/3$; $x \leq (1 + y)/2$; $y \leq x/2$; $0 \leq z$

Vertices $0,0$; $1/2,0$; $2/3,1/3$

Symmetry operations

- | | | |
|--|---|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) $2'$ x, \bar{x} ,0
(2_3 0,0,0)' | (11) $2'$ x,2x,0
(2_2 0,0,0)' | (12) $2'$ 2x,x,0
(2_1 0,0,0)' |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m x,y,0
(m_z 0,0,0) | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (19) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (20) m' x,2x,z
(m_x 0,0,0)' | (21) m' 2x,x,z
(m_y 0,0,0)' |
| (22) m' x,x,z
(m_3 0,0,0)' | (23) m' x,0,z
(m_2 0,0,0)' | (24) m' 0,y,z
(m_1 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 l 1	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z$ [$\bar{u}+v, \bar{u}, w$]
	(4) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]	(5) $y, \bar{x}+y, z$ [$v, \bar{u}+v, w$]	(6) $x-y, x, z$ [$u-v, u, w$]
	(7) y, x, \bar{z} [\bar{v}, \bar{u}, w]	(8) $x-y, \bar{y}, \bar{z}$ [$\bar{u}+v, v, w$]	(9) $\bar{x}, \bar{x}+y, \bar{z}$ [$u, u-v, w$]
	(10) $\bar{y}, \bar{x}, \bar{z}$ [v, u, w]	(11) $\bar{x}+y, y, \bar{z}$ [$u-v, \bar{v}, w$]	(12) $x, x-y, \bar{z}$ [$\bar{u}, \bar{u}+v, w$]
	(13) $\bar{x}, \bar{y}, \bar{z}$ [u,v,w]	(14) $y, \bar{x}+y, \bar{z}$ [$\bar{v}, u-v, w$]	(15) $x-y, x, \bar{z}$ [$\bar{u}+v, \bar{u}, w$]
	(16) x, y, \bar{z} [\bar{u}, \bar{v}, w]	(17) $\bar{y}, x-y, \bar{z}$ [$v, \bar{u}+v, w$]	(18) $\bar{x}+y, \bar{x}, \bar{z}$ [$u-v, u, w$]
	(19) \bar{y}, \bar{x}, z [\bar{v}, \bar{u}, w]	(20) $\bar{x}+y, y, z$ [$\bar{u}+v, v, w$]	(21) $x, x-y, z$ [$u, u-v, w$]
	(22) y, x, z [v, u, w]	(23) $x-y, \bar{y}, z$ [$u-v, \bar{v}, w$]	(24) $\bar{x}, \bar{x}+y, z$ [$\bar{u}, \bar{u}+v, w$]
12 k m..	$x, y, 0$ [0,0,w]	$\bar{y}, x-y, 0$ [0,0,w]	$\bar{x}+y, \bar{x}, 0$ [0,0,w]
	$\bar{x}, \bar{y}, 0$ [0,0,w]	$y, \bar{x}+y, 0$ [0,0,w]	$x-y, x, 0$ [0,0,w]
	$y, x, 0$ [0,0,w]	$x-y, \bar{y}, 0$ [0,0,w]	$\bar{x}, \bar{x}+y, 0$ [0,0,w]
	$\bar{y}, \bar{x}, 0$ [0,0,w]	$\bar{x}+y, y, 0$ [0,0,w]	$x, x-y, 0$ [0,0,w]
12 j .m'.	$x, 2x, z$ [u,2u,w]	$2\bar{x}, \bar{x}, z$ [$2\bar{u}, \bar{u}, w$]	x, \bar{x}, z [u, \bar{u} ,w]
	$\bar{x}, 2\bar{x}, z$ [$\bar{u}, 2\bar{u}, w$]	$2x, x, z$ [2u,u,w]	\bar{x}, x, z [\bar{u}, u, w]
	$2x, x, \bar{z}$ [$2\bar{u}, \bar{u}, w$]	$\bar{x}, 2\bar{x}, \bar{z}$ [u,2u,w]	\bar{x}, x, \bar{z} [u, \bar{u} ,w]
	$2\bar{x}, \bar{x}, \bar{z}$ [2u,u,w]	$x, 2x, \bar{z}$ [$\bar{u}, 2\bar{u}, w$]	x, \bar{x}, \bar{z} [\bar{u}, u, w]

Continued

No. 80.4.523

 $p6/mm'm'$

12 i ..m'	x,0,z [u,0,w]	0,x,z [0,u,w]	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$
	$\bar{x},0,z [\bar{u},0,w]$	0, $\bar{x},z [0,\bar{u},w]$	x,x,z [u,u,w]
	0,x, $\bar{z} [0,\bar{u},w]$	x,0, $\bar{z} [\bar{u},0,w]$	$\bar{x},\bar{x},\bar{z} [u,u,w]$
	0, $\bar{x},\bar{z} [0,u,w]$	$\bar{x},0,\bar{z} [u,0,w]$	x,x, $\bar{z} [\bar{u},\bar{u},w]$
6 h mm'2'	x,2x,0 [0,0,w]	2 $\bar{x},\bar{x},0 [0,0,w]$	x, $\bar{x},0 [0,0,w]$
	$\bar{x},2\bar{x},0 [0,0,w]$	2x,x,0 [0,0,w]	$\bar{x},x,0 [0,0,w]$
6 g m2'm'	x,0,0 [0,0,w]	0,x,0 [0,0,w]	$\bar{x},\bar{x},0 [0,0,w]$
	$\bar{x},0,0 [0,0,w]$	0, $\bar{x},0 [0,0,w]$	x,x,0 [0,0,w]
6 f 2m'm'	1/2,0,z [0,0,w]	0,1/2,z [0,0,w]	1/2,1/2,z [0,0,w]
	0,1/2, $\bar{z} [0,0,w]$	1/2,0, $\bar{z} [0,0,w]$	1/2,1/2, $\bar{z} [0,0,w]$
4 e 3m'	1/3,2/3,z [0,0,w]	2/3,1/3,z [0,0,w]	
	2/3,1/3, $\bar{z} [0,0,w]$	1/3,2/3, $\bar{z} [0,0,w]$	
3 d mm'm'	1/2,0,0 [0,0,w]	0,1/2,0 [0,0,w]	1/2,1/2,0 [0,0,w]
2 c 6m'm'	0,0,z [0,0,w]	0,0, $\bar{z} [0,0,w]$	
2 b $\bar{6}m'2'$	1/3,2/3,0 [0,0,w]	2/3,1/3,0 [0,0,w]	
1 a 6/mm'm'	0,0,0 [0,0,w]		

Symmetry of special projections

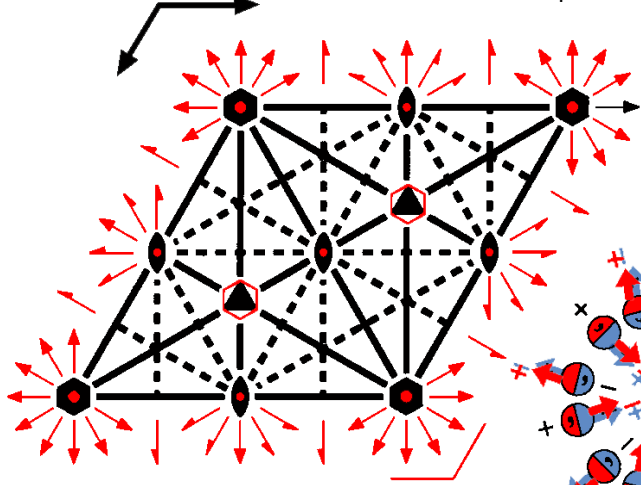
Along [001] $p6m'm'$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p2'm'm'$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $p2'm'm'$
 $a^* = b/2$
 Origin at x,x/2,0

p6/m'mm

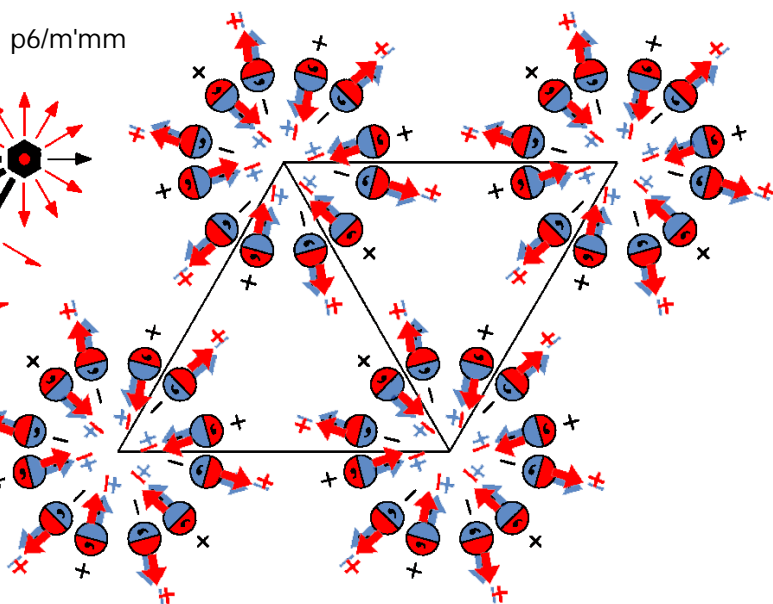
No. 80.5.524



6/m'mm

p6/m'mm

Hexagonal/Hexagonal



Origin at center (6/m'mm)

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/3$; $x \leq (1 + y)/2$; $y \leq x/2$; $0 \leq z$

Vertices $0,0$; $1/2,0$; $2/3,1/3$

Symmetry operations

- | | | |
|--|--|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) 2 0,0,z
(2_z 0,0,0) | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0) | (6) 6^+ 0,0,z
(6_z 0,0,0) |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) $2'$ x, \bar{x} ,0
(2_3 0,0,0)' | (11) $2'$ x,2x,0
(2_2 0,0,0)' | (12) $2'$ 2x,x,0
(2_1 0,0,0)' |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (16) m' x,y,0
(m_z 0,0,0)' | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (19) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (20) m x,2x,z
(m_x 0,0,0) | (21) m 2x,x,z
(m_y 0,0,0) |
| (22) m x,x,z
(m_3 0,0,0) | (23) m x,0,z
(m_2 0,0,0) | (24) m 0,y,z
(m_1 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 l 1	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z$ [$\bar{u}+v, \bar{u}, w$]
	(4) \bar{x}, \bar{y}, z [\bar{u}, \bar{v}, w]	(5) $y, \bar{x}+y, z$ [$v, \bar{u}+v, w$]	(6) $x-y, x, z$ [$u-v, u, w$]
	(7) y, x, \bar{z} [\bar{v}, \bar{u}, w]	(8) $x-y, \bar{y}, \bar{z}$ [$\bar{u}+v, v, w$]	(9) $\bar{x}, \bar{x}+y, \bar{z}$ [$u, u-v, w$]
	(10) $\bar{y}, \bar{x}, \bar{z}$ [v, u, w]	(11) $\bar{x}+y, y, \bar{z}$ [$u-v, \bar{v}, w$]	(12) $x, x-y, \bar{z}$ [$\bar{u}, \bar{u}+v, w$]
	(13) $\bar{x}, \bar{y}, \bar{z}$ [$\bar{u}, \bar{v}, \bar{w}$]	(14) $y, \bar{x}+y, \bar{z}$ [$v, \bar{u}+v, \bar{w}$]	(15) $x-y, x, \bar{z}$ [$u-v, u, \bar{w}$]
	(16) x, y, \bar{z} [u, v, \bar{w}]	(17) $\bar{y}, x-y, \bar{z}$ [$\bar{v}, u-v, \bar{w}$]	(18) $\bar{x}+y, \bar{x}, \bar{z}$ [$\bar{u}+v, \bar{u}, \bar{w}$]
	(19) \bar{y}, \bar{x}, z [v, u, \bar{w}]	(20) $\bar{x}+y, y, z$ [$u-v, \bar{v}, \bar{w}$]	(21) $x, x-y, z$ [$\bar{u}, \bar{u}+v, \bar{w}$]
	(22) y, x, z [$\bar{v}, \bar{u}, \bar{w}$]	(23) $x-y, \bar{y}, z$ [$\bar{u}+v, v, \bar{w}$]	(24) $\bar{x}, \bar{x}+y, z$ [$u, u-v, \bar{w}$]
12 k m'..	$x, y, 0$ [u,v,0]	$\bar{y}, x-y, 0$ [$\bar{v}, u-v, 0$]	$\bar{x}+y, \bar{x}, 0$ [$\bar{u}+v, \bar{u}, 0$]
	$\bar{x}, \bar{y}, 0$ [$\bar{u}, \bar{v}, 0$]	$y, \bar{x}+y, 0$ [$v, \bar{u}+v, 0$]	$x-y, x, 0$ [$u-v, u, 0$]
	$y, x, 0$ [$\bar{v}, \bar{u}, 0$]	$x-y, \bar{y}, 0$ [$\bar{u}+v, v, 0$]	$\bar{x}, \bar{x}+y, 0$ [$u, u-v, 0$]
	$\bar{y}, \bar{x}, 0$ [$v, u, 0$]	$\bar{x}+y, y, 0$ [$u-v, \bar{v}, 0$]	$x, x-y, 0$ [$\bar{u}, \bar{u}+v, 0$]
12 j .m.	$x, 2x, z$ [u,0,0]	$2\bar{x}, \bar{x}, z$ [0,u,0]	x, \bar{x}, z [$\bar{u}, \bar{u}, 0$]
	$\bar{x}, 2\bar{x}, z$ [$\bar{u}, 0, 0$]	$2x, x, z$ [0, $\bar{u}, 0$]	\bar{x}, x, z [$u, u, 0$]
	$2x, x, \bar{z}$ [0, $\bar{u}, 0$]	$\bar{x}, 2\bar{x}, \bar{z}$ [$\bar{u}, 0, 0$]	\bar{x}, x, \bar{z} [$u, u, 0$]
	$2\bar{x}, \bar{x}, \bar{z}$ [0,u,0]	$x, 2x, \bar{z}$ [u,0,0]	x, \bar{x}, \bar{z} [$\bar{u}, \bar{u}, 0$]

Continued		No. 80.5.524	$p6/m'mm$
12 i $..m$	$x,0,z [u,2u,0]$ $\bar{x},0,z [\bar{u},2\bar{u},0]$ $0,x,\bar{z} [2\bar{u},\bar{u},0]$ $0,\bar{x},\bar{z} [2u,u,0]$	$0,x,z [2\bar{u},\bar{u},0]$ $0,\bar{x},z [2u,u,0]$ $x,0,\bar{z} [u,2u,0]$ $\bar{x},0,\bar{z} [\bar{u},2\bar{u},0]$	$\bar{x},\bar{x},z [u,\bar{u},0]$ $x,x,z [\bar{u},u,0]$ $\bar{x},\bar{x},\bar{z} [u,\bar{u},0]$ $x,x,\bar{z} [\bar{u},u,0]$
6 h $m'm2'$	$x,2x,0 [u,0,0]$ $\bar{x},2\bar{x},0 [\bar{u},0,0]$	$2\bar{x},\bar{x},0 [0,u,0]$ $2x,x,0 [0,\bar{u},0]$	$x,\bar{x},0 [\bar{u},\bar{u},0]$ $\bar{x},x,0 [u,u,0]$
6 g $m'2'm$	$x,0,0 [u,2u,0]$ $\bar{x},0,0 [\bar{u},2\bar{u},0]$	$0,x,0 [2\bar{u},\bar{u},0]$ $0,\bar{x},0 [2u,u,0]$	$\bar{x},\bar{x},0 [u,\bar{u},0]$ $x,x,0 [\bar{u},u,0]$
6 f $2mm$	$1/2,0,z [0,0,0]$ $0,1/2,\bar{z} [0,0,0]$	$0,1/2,z [0,0,0]$ $1/2,0,\bar{z} [0,0,0]$	$1/2,1/2,z [0,0,0]$ $1/2,1/2,\bar{z} [0,0,0]$
4 e $3m.$	$1/3,2/3,z [0,0,0]$ $2/3,1/3,\bar{z} [0,0,0]$	$2/3,1/3,z [0,0,0]$ $1/3,2/3,\bar{z} [0,0,0]$	
3 d $m'mm$	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$
2 c $6mm$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
2 b $\bar{6}'m2'$	$1/3,2/3,0 [0,0,0]$	$2/3,1/3,0 [0,0,0]$	
1 a $6/m'mm$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p6mm1'$
 $a^* = a \quad b^* = b$
 Origin at $0,0,z$

Along [100] $p2mm1'$
 $a^* = (a+2b)/2$
 Origin at $x,0,0$

Along [210] $p2mm1'$
 $a^* = b/2$
 Origin at $x,x/2,0$

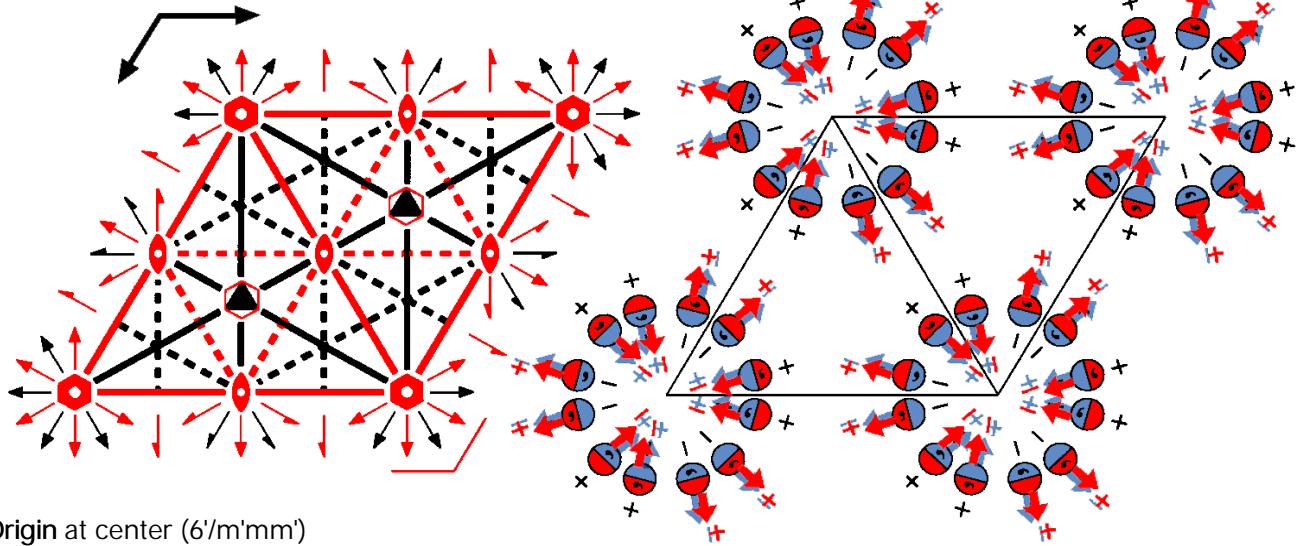
$p6'/m'mm'$

$6'/m'mm'$

Hexagonal/Hexagonal

No. 80.6.525

$p6'/m'mm'$



Origin at center ($6'/m'mm'$)

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/3; x \leq (1 + y)/2; y \leq x/2; 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3$

Symmetry operations

- | | | |
|---|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) $2'$ x, \bar{x} ,0
(2_3 0,0,0)' | (11) $2'$ x,2x,0
(2_2 0,0,0)' | (12) $2'$ 2x,x,0
(2_1 0,0,0)' |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m' x,y,0
(m_z 0,0,0)' | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (19) m x, \bar{x} ,z
(m_{xy} 0,0,0) | (20) m x,2x,z
(m_x 0,0,0) | (21) m 2x,x,z
(m_y 0,0,0) |
| (22) m' x,x,z
(m_3 0,0,0)' | (23) m' x,0,z
(m_2 0,0,0)' | (24) m' 0,y,z
(m_1 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 l 1	(1) x,y,z [u,v,w]	(2) \bar{y} ,x-y,z [\bar{v} ,u-v,w]	(3) \bar{x} +y, \bar{x} ,z [\bar{u} +v, \bar{u} ,w]
	(4) \bar{x} , \bar{y} ,z [u,v, \bar{w}]	(5) y, \bar{x} +y,z [\bar{v} ,u-v, \bar{w}]	(6) x-y,x,z [\bar{u} +v, \bar{u} , \bar{w}]
	(7) y,x, \bar{z} [v,u, \bar{w}]	(8) x-y, \bar{y} , \bar{z} [u-v, \bar{v} , \bar{w}]	(9) \bar{x} , \bar{x} +y, \bar{z} [\bar{u} , \bar{u} +v, \bar{w}]
	(10) \bar{y} , \bar{x} , \bar{z} [v,u,w]	(11) \bar{x} +y,y, \bar{z} [u-v, \bar{v} ,w]	(12) x,x-y, \bar{z} [\bar{u} , \bar{u} +v,w]
	(13) \bar{x} , \bar{y} , \bar{z} [u,v,w]	(14) y, \bar{x} +y, \bar{z} [\bar{v} ,u-v,w]	(15) x-y,x, \bar{z} [\bar{u} +v, \bar{u} ,w]
	(16) x,y, \bar{z} [u,v, \bar{w}]	(17) \bar{y} ,x-y, \bar{z} [\bar{v} ,u-v, \bar{w}]	(18) \bar{x} +y, \bar{x} , \bar{z} [\bar{u} +v, \bar{u} , \bar{w}]
	(19) \bar{y} , \bar{x} ,z [v,u, \bar{w}]	(20) \bar{x} +y,y,z [u-v, \bar{v} , \bar{w}]	(21) x,x-y,z [\bar{u} , \bar{u} +v, \bar{w}]
	(22) y,x,z [v,u,w]	(23) x-y, \bar{y} ,z [u-v, \bar{v} ,w]	(24) \bar{x} , \bar{x} +y,z [\bar{u} , \bar{u} +v,w]
12 k m'..	x,y,0 [u,v,0]	\bar{y} ,x-y,0 [\bar{v} ,u-v,0]	\bar{x} +y, \bar{x} ,0 [\bar{u} +v, \bar{u} ,0]
	\bar{x} , \bar{y} ,0 [u,v,0]	y, \bar{x} +y,0 [\bar{v} ,u-v,0]	x-y,x,0 [\bar{u} +v, \bar{u} ,0]
	y,x,0 [v,u,0]	x-y, \bar{y} ,0 [u-v, \bar{v} ,0]	\bar{x} , \bar{x} +y,0 [\bar{u} , \bar{u} +v,0]
	\bar{y} , \bar{x} ,0 [v,u,0]	\bar{x} +y,y,0 [u-v, \bar{v} ,0]	x,x-y,0 [\bar{u} , \bar{u} +v,0]
12 j .m.	x,2x,z [u,0,0]	2 \bar{x} , \bar{x} ,z [0,u,0]	x, \bar{x} ,z [\bar{u} , \bar{u} ,0]
	\bar{x} ,2 \bar{x} ,z [u,0,0]	2x,x,z [0,u,0]	\bar{x} ,x,z [\bar{u} , \bar{u} ,0]
	2x,x, \bar{z} [0,u,0]	\bar{x} ,2 \bar{x} , \bar{z} [u,0,0]	\bar{x} ,x, \bar{z} [\bar{u} , \bar{u} ,0]
	2 \bar{x} , \bar{x} , \bar{z} [0,u,0]	x,2x, \bar{z} [u,0,0]	x, \bar{x} , \bar{z} [\bar{u} , \bar{u} ,0]

Continued		No. 80.6.525	$p6'/m'mm'$
12 i $..m'$	$x,0,z [u,0,w]$	$0,x,z [0,u,w]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$
	$\bar{x},0,z [u,0,\bar{w}]$	$0,\bar{x},z [0,u,\bar{w}]$	$x,x,z [\bar{u},\bar{u},\bar{w}]$
	$0,x,\bar{z} [0,u,\bar{w}]$	$x,0,\bar{z} [u,0,\bar{w}]$	$\bar{x},\bar{x},\bar{z} [\bar{u},\bar{u},\bar{w}]$
	$0,\bar{x},\bar{z} [0,u,w]$	$\bar{x},0,\bar{z} [u,0,w]$	$x,x,\bar{z} [\bar{u},\bar{u},w]$
6 h $m'm2'$	$x,2x,0 [u,0,0]$	$2\bar{x},\bar{x},0 [0,u,0]$	$x,\bar{x},0 [\bar{u},\bar{u},0]$
	$\bar{x},2\bar{x},0 [u,0,0]$	$2x,x,0 [0,u,0]$	$\bar{x},x,0 [\bar{u},\bar{u},0]$
6 g $m'2m'$	$x,0,0 [u,0,0]$	$0,x,0 [0,u,0]$	$\bar{x},\bar{x},0 [\bar{u},\bar{u},0]$
	$\bar{x},0,0 [u,0,0]$	$0,\bar{x},0 [0,u,0]$	$x,x,0 [\bar{u},\bar{u},0]$
6 f $2'mm'$	$1/2,0,z [u,0,0]$	$0,1/2,z [0,u,0]$	$1/2,1/2,z [\bar{u},\bar{u},0]$
	$0,1/2,\bar{z} [u,0,0]$	$1/2,0,\bar{z} [u,0,0]$	$1/2,1/2,\bar{z} [\bar{u},\bar{u},0]$
4 e $3m.$	$1/3,2/3,z [0,0,0]$	$2/3,1/3,z [0,0,0]$	
	$2/3,1/3,\bar{z} [0,0,0]$	$1/3,2/3,\bar{z} [0,0,0]$	
3 d $m'mm'$	$1/2,0,0 [u,0,0]$	$0,1/2,0 [0,u,0]$	$1/2,1/2,0 [\bar{u},\bar{u},0]$
2 c $6'mm'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
2 b $\bar{6}'m2'$	$1/3,2/3,0 [0,0,0]$	$2/3,1/3,0 [0,0,0]$	
1 a $6'/m'mm'$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p6mm1'$
 $a^* = a \quad b^* = b$
 Origin at 0,0,z

Along [100] $p2mm1'$
 $a^* = (a+2b)/2$
 Origin at x,0,0

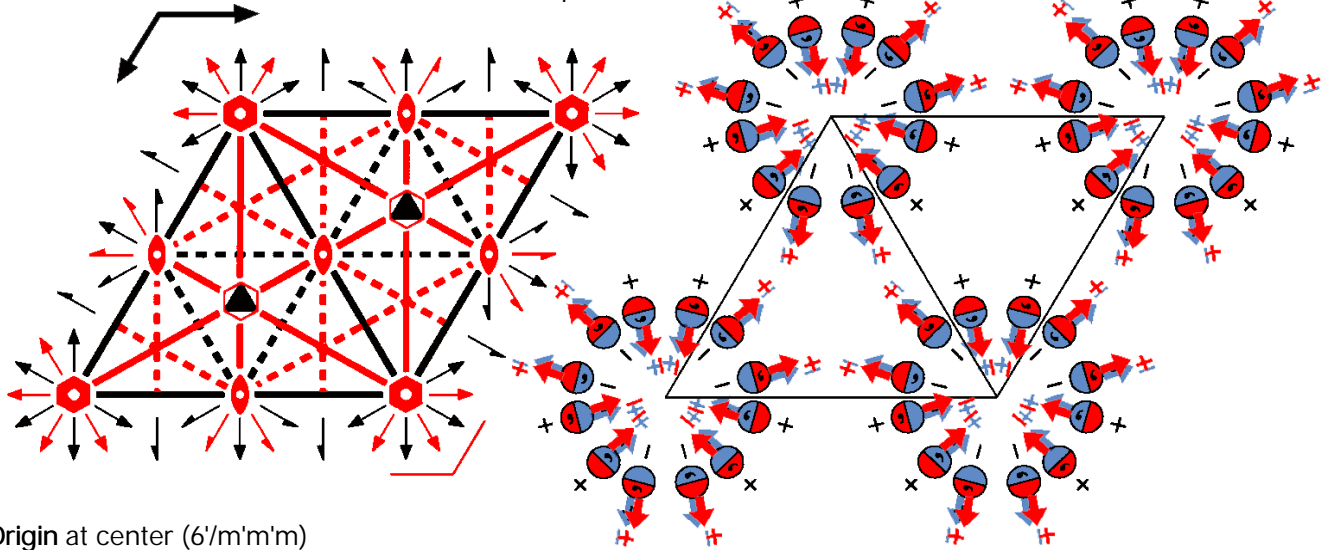
Along [210] $p2'mm'$
 $a^* = b/2$
 Origin at x,x/2,0

p6'/m'm'm

6'/m'm'm

Hexagonal/Hexagonal

No. 80.7.526



Origin at center (6'/m'm'm)

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/3; x \leq (1 + y)/2; y \leq x/2; 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3$

Symmetry operations

- | | | |
|--|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- ' 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ ' 0,0,z
(6_z 0,0,0)' |
| (7) $2'$ x,x,0
(2_{xy} 0,0,0)' | (8) $2'$ x,0,0
(2_x 0,0,0)' | (9) $2'$ 0,y,0
(2_y 0,0,0)' |
| (10) 2 x, \bar{x} ,0
(2_3 0,0,0) | (11) 2 x,2x,0
(2_2 0,0,0) | (12) 2 2x,x,0
(2_1 0,0,0) |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0) | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0) | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0) |
| (16) m' x,y,0
(m_z 0,0,0)' | (17) $\bar{6}^-$ ' 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0)' | (18) $\bar{6}^+$ ' 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0)' |
| (19) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (20) m' x,2x,z
(m_x 0,0,0)' | (21) m' 2x,x,z
(m_y 0,0,0)' |
| (22) m x,x,z
(m_3 0,0,0) | (23) m x,0,z
(m_2 0,0,0) | (24) m 0,y,z
(m_1 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7); (13)

Positions

Multiplicity, Wyckoff letter, Site symmetry	Coordinates		
24 l 1	(1) x, y, z [u,v,w]	(2) $\bar{y}, x-y, z$ [$\bar{v}, u-v, w$]	(3) $\bar{x}+y, \bar{x}, z$ [$\bar{u}+v, \bar{u}, w$]
	(4) \bar{x}, \bar{y}, z [u,v, \bar{w}]	(5) $y, \bar{x}+y, z$ [$\bar{v}, u-v, \bar{w}$]	(6) $x-y, x, z$ [$\bar{u}+v, \bar{u}, \bar{w}$]
	(7) y, x, \bar{z} [\bar{v}, \bar{u}, w]	(8) $x-y, \bar{y}, \bar{z}$ [$\bar{u}+v, v, w$]	(9) $\bar{x}, \bar{x}+y, \bar{z}$ [u,u-v,w]
	(10) $\bar{y}, \bar{x}, \bar{z}$ [$\bar{v}, \bar{u}, \bar{w}$]	(11) $\bar{x}+y, y, \bar{z}$ [$\bar{u}+v, v, \bar{w}$]	(12) $x, x-y, \bar{z}$ [u,u-v, \bar{w}]
	(13) $\bar{x}, \bar{y}, \bar{z}$ [u,v,w]	(14) $y, \bar{x}+y, \bar{z}$ [$\bar{v}, u-v, w$]	(15) $x-y, x, \bar{z}$ [$\bar{u}+v, \bar{u}, w$]
	(16) x, y, \bar{z} [u,v, \bar{w}]	(17) $\bar{y}, x-y, \bar{z}$ [$\bar{v}, u-v, \bar{w}$]	(18) $\bar{x}+y, \bar{x}, \bar{z}$ [$\bar{u}+v, \bar{u}, \bar{w}$]
	(19) \bar{y}, \bar{x}, z [\bar{v}, \bar{u}, w]	(20) $\bar{x}+y, y, z$ [$\bar{u}+v, v, w$]	(21) $x, x-y, z$ [u,u-v,w]
	(22) y, x, z [$\bar{v}, \bar{u}, \bar{w}$]	(23) $x-y, \bar{y}, z$ [$\bar{u}+v, v, \bar{w}$]	(24) $\bar{x}, \bar{x}+y, z$ [u,u-v, \bar{w}]
12 k m'..	$x, y, 0$ [u,v,0]	$\bar{y}, x-y, 0$ [$\bar{v}, u-v, 0$]	$\bar{x}+y, \bar{x}, 0$ [$\bar{u}+v, \bar{u}, 0$]
	$\bar{x}, \bar{y}, 0$ [u,v,0]	$y, \bar{x}+y, 0$ [$\bar{v}, u-v, 0$]	$x-y, x, 0$ [$\bar{u}+v, \bar{u}, 0$]
	$y, x, 0$ [$\bar{v}, \bar{u}, 0$]	$x-y, \bar{y}, 0$ [$\bar{u}+v, v, 0$]	$\bar{x}, \bar{x}+y, 0$ [u,u-v,0]
	$\bar{y}, \bar{x}, 0$ [$\bar{v}, \bar{u}, 0$]	$\bar{x}+y, y, 0$ [$\bar{u}+v, v, 0$]	$x, x-y, 0$ [u,u-v,0]
12 j .m'.	$x, 2x, z$ [u,2u,w]	$2\bar{x}, \bar{x}, z$ [$2\bar{u}, \bar{u}, w$]	x, \bar{x}, z [u, \bar{u}, w]
	$\bar{x}, 2\bar{x}, z$ [u,2u,w]	$2x, x, z$ [$2\bar{u}, \bar{u}, w$]	\bar{x}, x, z [u, \bar{u}, w]
	$2x, x, \bar{z}$ [$2\bar{u}, \bar{u}, w$]	$\bar{x}, 2\bar{x}, \bar{z}$ [u,2u,w]	\bar{x}, x, \bar{z} [u, \bar{u}, w]
	$2\bar{x}, \bar{x}, \bar{z}$ [$2\bar{u}, \bar{u}, w$]	$x, 2x, \bar{z}$ [u,2u,w]	x, \bar{x}, \bar{z} [u, \bar{u}, w]

Continued		No. 80.7.526	$p6'/m'm'm$
12 i $\dots m$	$x,0,z [u,2u,0]$	$0,x,z [2\bar{u},\bar{u},0]$	$\bar{x},\bar{x},z [u,\bar{u},0]$
	$\bar{x},0,z [u,2u,0]$	$0,\bar{x},z [2\bar{u},\bar{u},0]$	$x,x,z [u,\bar{u},0]$
	$0,x,\bar{z} [2\bar{u},\bar{u},0]$	$x,0,\bar{z} [u,2u,0]$	$\bar{x},\bar{x},\bar{z} [u,\bar{u},0]$
	$0,\bar{x},\bar{z} [2\bar{u},\bar{u},0]$	$\bar{x},0,\bar{z} [u,2u,0]$	$x,x,\bar{z} [u,\bar{u},0]$
6 h $m'm'2$	$x,2x,0 [u,2u,0]$	$2\bar{x},\bar{x},0 [2\bar{u},\bar{u},0]$	$x,\bar{x},0 [u,\bar{u},0]$
	$\bar{x},2\bar{x},0 [u,2u,0]$	$2x,x,0 [2\bar{u},\bar{u},0]$	$\bar{x},x,0 [u,\bar{u},0]$
6 g $m'2'm$	$x,0,0 [u,2u,0]$	$0,x,0 [2\bar{u},\bar{u},0]$	$\bar{x},\bar{x},0 [u,\bar{u},0]$
	$\bar{x},0,0 [u,2u,0]$	$0,\bar{x},0 [2\bar{u},\bar{u},0]$	$x,x,0 [u,\bar{u},0]$
6 f $2'm'm$	$1/2,0,z [u,2u,0]$	$0,1/2,z [2\bar{u},\bar{u},0]$	$1/2,1/2,z [u,\bar{u},0]$
	$0,1/2,\bar{z} [2\bar{u},\bar{u},0]$	$1/2,0,\bar{z} [u,2u,0]$	$1/2,1/2,\bar{z} [u,\bar{u},0]$
4 e $3m'$	$1/3,2/3,z [0,0,w]$	$2/3,1/3,z [0,0,\bar{w}]$	
	$2/3,1/3,\bar{z} [0,0,w]$	$1/3,2/3,\bar{z} [0,0,\bar{w}]$	
3 d $m'm'm$	$1/2,0,0 [u,2u,0]$	$0,1/2,0 [2\bar{u},\bar{u},0]$	$1/2,1/2,0 [u,\bar{u},0]$
2 c $6'm'm$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
2 b $\bar{6}'m'2$	$1/3,2/3,0 [0,0,0]$	$2/3,1/3,0 [0,0,0]$	
1 a $6'/m'm'm$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p6mm1'$
 $a^* = a \quad b^* = b$
 Origin at 0,0,z

Along [100] $p2'mm'$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $p2mm1'$
 $a^* = b/2$
 Origin at x,x/2,0

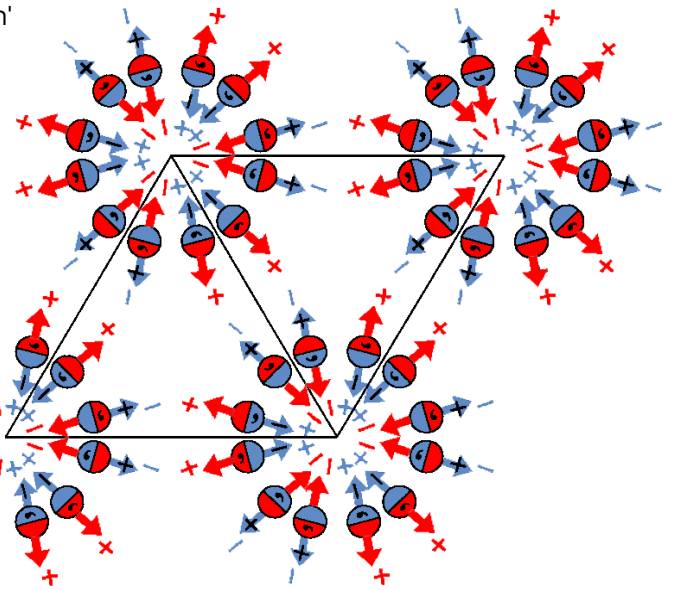
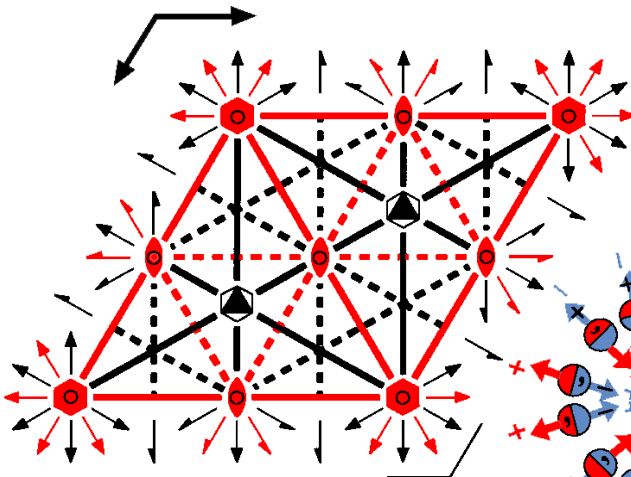
$p6'/mmm'$

$6'/mmm'$

Hexagonal/Hexagonal

No. 80.8.527

$p6'/mmm'$



Origin at center ($6'/mmm'$)

Asymmetric unit $0 \leq x \leq 2/3$; $0 \leq y \leq 1/3$; $x \leq (1 + y)/2$; $y \leq x/2$; $0 \leq z$

Vertices $0,0$; $1/2,0$; $2/3,1/3$

Symmetry operations

- | | | |
|--|--|---|
| (1) 1
(1 0,0,0) | (2) 3^+ $0,0,z$
(3_z 0,0,0) | (3) 3^- $0,0,z$
(3_z^{-1} 0,0,0) |
| (4) $2'$ $0,0,z$
(2_z 0,0,0)' | (5) 6^- $0,0,z$
(6_z^{-1} 0,0,0)' | (6) 6^+ $0,0,z$
(6_z 0,0,0)' |
| (7) $2'$ $x,x,0$
(2_{xy} 0,0,0)' | (8) $2'$ $x,0,0$
(2_x 0,0,0)' | (9) $2'$ $0,y,0$
(2_y 0,0,0)' |
| (10) 2 $x,\bar{x},0$
(2_3 0,0,0) | (11) 2 $x,2x,0$
(2_2 0,0,0) | (12) 2 $2x,x,0$
(2_1 0,0,0) |
| (13) $\bar{1}$ $0,0,0$
($\bar{1}$ 0,0,0)' | (14) $\bar{3}^+$ $0,0,z$; $0,0,0$
($\bar{3}_z$ 0,0,0)' | (15) $\bar{3}^-$ $0,0,z$; $0,0,0$
($\bar{3}_z^{-1}$ 0,0,0)' |
| (16) m $x,y,0$
(m_z 0,0,0) | (17) $\bar{6}^-$ $0,0,z$; $0,0,0$
($\bar{6}_z^{-1}$ 0,0,0) | (18) $\bar{6}^+$ $0,0,z$; $0,0,0$
($\bar{6}_z$ 0,0,0) |
| (19) m x,\bar{x},z
(m_{xy} 0,0,0) | (20) m $x,2x,z$
(m_x 0,0,0) | (21) m $2x,x,z$
(m_y 0,0,0) |
| (22) m' x,x,z
(m_3 0,0,0)' | (23) m' $x,0,z$
(m_2 0,0,0)' | (24) m' $0,y,z$
(m_1 0,0,0)' |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 l 1	(1) x,y,z [u,v,w]	(2) \bar{y} ,x-y,z [\bar{v} ,u-v,w]	(3) \bar{x} +y, \bar{x} ,z [\bar{u} +v, \bar{u} ,w]
	(4) \bar{x} , \bar{y} ,z [u,v, \bar{w}]	(5) y, \bar{x} +y,z [\bar{v} ,u-v, \bar{w}]	(6) x-y,x,z [\bar{u} +v, \bar{u} , \bar{w}]
	(7) y,x, \bar{z} [\bar{v} , \bar{u} ,w]	(8) x-y, \bar{y} , \bar{z} [\bar{u} +v,v,w]	(9) \bar{x} , \bar{x} +y, \bar{z} [u,u-v,w]
	(10) \bar{y} , \bar{x} , \bar{z} [\bar{v} , \bar{u} , \bar{w}]	(11) \bar{x} +y,y, \bar{z} [\bar{u} +v,v, \bar{w}]	(12) x,x-y, \bar{z} [u,u-v, \bar{w}]
	(13) \bar{x} , \bar{y} , \bar{z} [\bar{u} , \bar{v} , \bar{w}]	(14) y, \bar{x} +y, \bar{z} [v, \bar{u} +v, \bar{w}]	(15) x-y,x, \bar{z} [u-v,u, \bar{w}]
	(16) x,y, \bar{z} [\bar{u} , \bar{v} ,w]	(17) \bar{y} ,x-y, \bar{z} [v, \bar{u} +v,w]	(18) \bar{x} +y, \bar{x} , \bar{z} [u-v,u,w]
	(19) \bar{y} , \bar{x} ,z [v,u, \bar{w}]	(20) \bar{x} +y,y,z [u-v, \bar{v} , \bar{w}]	(21) x,x-y,z [\bar{u} , \bar{u} +v, \bar{w}]
	(22) y,x,z [v,u,w]	(23) x-y, \bar{y} ,z [u-v, \bar{v} ,w]	(24) \bar{x} , \bar{x} +y,z [\bar{u} , \bar{u} +v,w]
12 k m..	x,y,0 [0,0,w]	\bar{y} ,x-y,0 [0,0,w]	\bar{x} +y, \bar{x} ,0 [0,0,w]
	\bar{x} , \bar{y} ,0 [0,0, \bar{w}]	y, \bar{x} +y,0 [0,0, \bar{w}]	x-y,x,0 [0,0, \bar{w}]
	y,x,0 [0,0,w]	x-y, \bar{y} ,0 [0,0,w]	\bar{x} , \bar{x} +y,0 [0,0,w]
	\bar{y} , \bar{x} ,0 [0,0, \bar{w}]	\bar{x} +y,y,0 [0,0, \bar{w}]	x,x-y,0 [0,0, \bar{w}]
12 j .m.	x,2x,z [u,0,0]	2 \bar{x} , \bar{x} ,z [0,u,0]	x, \bar{x} ,z [\bar{u} , \bar{u} ,0]
	\bar{x} ,2 \bar{x} ,z [u,0,0]	2x,x,z [0,u,0]	\bar{x} ,x,z [\bar{u} , \bar{u} ,0]
	2x,x, \bar{z} [0, \bar{u} ,0]	\bar{x} ,2 \bar{x} , \bar{z} [\bar{u} ,0,0]	\bar{x} ,x, \bar{z} [u,u,0]
	2 \bar{x} , \bar{x} , \bar{z} [0, \bar{u} ,0]	x,2x, \bar{z} [\bar{u} ,0,0]	x, \bar{x} , \bar{z} [u,u,0]

Continued		No. 80.8.527	$p6'/mmm'$
12 i $..m'$	$x,0,z [u,0,w]$ $\bar{x},0,z [u,0,\bar{w}]$ $0,x,\bar{z} [0,\bar{u},w]$ $0,\bar{x},\bar{z} [0,\bar{u},\bar{w}]$	$0,x,z [0,u,w]$ $0,\bar{x},z [0,u,\bar{w}]$ $x,0,\bar{z} [\bar{u},0,w]$ $\bar{x},0,\bar{z} [\bar{u},0,\bar{w}]$	$\bar{x},\bar{x},z [\bar{u},\bar{u},w]$ $x,x,z [\bar{u},\bar{u},\bar{w}]$ $\bar{x},\bar{x},\bar{z} [u,u,w]$ $x,x,\bar{z} [u,u,\bar{w}]$
6 h $mm2$	$x,2x,0 [0,0,0]$ $\bar{x},2\bar{x},0 [0,0,0]$	$2\bar{x},\bar{x},0 [0,0,0]$ $2x,x,0 [0,0,0]$	$x,\bar{x},0 [0,0,0]$ $\bar{x},x,0 [0,0,0]$
6 g $m2'm'$	$x,0,0 [0,0,w]$ $\bar{x},0,0 [0,0,\bar{w}]$	$0,x,0 [0,0,w]$ $0,\bar{x},0 [0,0,\bar{w}]$	$\bar{x},\bar{x},0 [0,0,w]$ $x,x,0 [0,0,\bar{w}]$
6 f $2'mm'$	$1/2,0,z [u,0,0]$ $0,1/2,\bar{z} [0,\bar{u},0]$	$0,1/2,z [0,u,0]$ $1/2,0,\bar{z} [\bar{u},0,0]$	$1/2,1/2,z [\bar{u},\bar{u},0]$ $1/2,1/2,\bar{z} [u,u,0]$
4 e $3m.$	$1/3,2/3,z [0,0,0]$ $2/3,1/3,\bar{z} [0,0,0]$	$2/3,1/3,z [0,0,0]$ $1/3,2/3,\bar{z} [0,0,0]$	
3 d mmm'	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$
2 c $6'mm'$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
2 b $\bar{6}m2$	$1/3,2/3,0 [0,0,0]$	$2/3,1/3,0 [0,0,0]$	
1 a $6'/mmm'$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p6'mm'$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p2mm1'$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $p2mm$
 $a^* = b/2$
 Origin at x,x/2,0

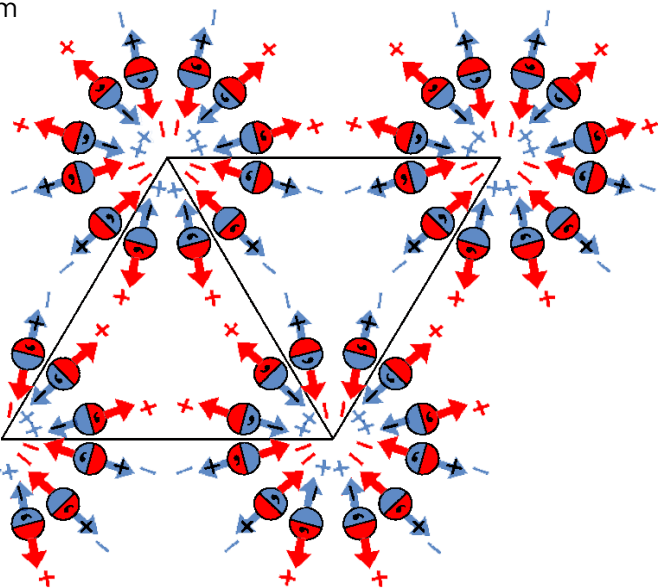
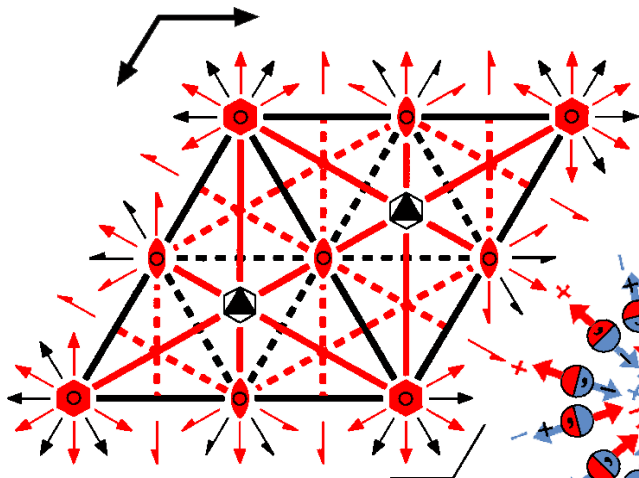
p6'/mm'm

6'/mm'm

Hexagonal/Hexagonal

No. 80.9.528

p6'/mm'm



Origin at center (6'/mm'm)

Asymmetric unit $0 \leq x \leq 2/3; 0 \leq y \leq 1/3; x \leq (1 + y)/2; y \leq x/2; 0 \leq z$

Vertices $0,0; 1/2,0; 2/3,1/3$

Symmetry operations

- | | | |
|--|---|--|
| (1) 1
(1 0,0,0) | (2) 3^+ 0,0,z
(3_z 0,0,0) | (3) 3^- 0,0,z
(3_z^{-1} 0,0,0) |
| (4) $2'$ 0,0,z
(2_z 0,0,0)' | (5) 6^- 0,0,z
(6_z^{-1} 0,0,0)' | (6) 6^+ 0,0,z
(6_z 0,0,0)' |
| (7) 2 x,x,0
(2_{xy} 0,0,0) | (8) 2 x,0,0
(2_x 0,0,0) | (9) 2 0,y,0
(2_y 0,0,0) |
| (10) $2'$ x, \bar{x} ,0
(2_3 0,0,0)' | (11) $2'$ x,2x,0
(2_2 0,0,0)' | (12) $2'$ 2x,x,0
(2_1 0,0,0)' |
| (13) $\bar{1}$ 0,0,0
($\bar{1}$ 0,0,0)' | (14) $\bar{3}^+$ 0,0,z; 0,0,0
($\bar{3}_z$ 0,0,0)' | (15) $\bar{3}^-$ 0,0,z; 0,0,0
($\bar{3}_z^{-1}$ 0,0,0)' |
| (16) m x,y,0
(m_z 0,0,0) | (17) $\bar{6}^-$ 0,0,z; 0,0,0
($\bar{6}_z^{-1}$ 0,0,0) | (18) $\bar{6}^+$ 0,0,z; 0,0,0
($\bar{6}_z$ 0,0,0) |
| (19) m' x, \bar{x} ,z
(m_{xy} 0,0,0)' | (20) m' x,2x,z
(m_x 0,0,0)' | (21) m' 2x,x,z
(m_y 0,0,0)' |
| (22) m x,x,z
(m_3 0,0,0) | (23) m x,0,z
(m_2 0,0,0) | (24) m 0,y,z
(m_1 0,0,0) |

Generators selected (1); t(1,0,0); t(0,1,0); (2); (4); (7); (13)

Positions

	Coordinates		
Multiplicity, Wyckoff letter, Site symmetry			
24 l 1	(1) x,y,z [u,v,w]	(2) \bar{y} ,x-y,z [\bar{v} ,u-v,w]	(3) \bar{x} +y, \bar{x} ,z [\bar{u} +v, \bar{u} ,w]
	(4) \bar{x} , \bar{y} ,z [u,v, \bar{w}]	(5) y, \bar{x} +y,z [\bar{v} ,u-v, \bar{w}]	(6) x-y,x,z [\bar{u} +v, \bar{u} , \bar{w}]
	(7) y,x, \bar{z} [v,u, \bar{w}]	(8) x-y, \bar{y} , \bar{z} [u-v, \bar{v} , \bar{w}]	(9) \bar{x} , \bar{x} +y, \bar{z} [\bar{u} , \bar{u} +v, \bar{w}]
	(10) \bar{y} , \bar{x} , \bar{z} [v,u,w]	(11) \bar{x} +y,y, \bar{z} [u-v, \bar{v} ,w]	(12) x,x-y, \bar{z} [\bar{u} , \bar{u} +v,w]
	(13) \bar{x} , \bar{y} , \bar{z} [\bar{u} , \bar{v} , \bar{w}]	(14) y, \bar{x} +y, \bar{z} [v, \bar{u} +v, \bar{w}]	(15) x-y,x, \bar{z} [u-v,u, \bar{w}]
	(16) x,y, \bar{z} [\bar{u} , \bar{v} ,w]	(17) \bar{y} ,x-y, \bar{z} [v, \bar{u} +v,w]	(18) \bar{x} +y, \bar{x} , \bar{z} [u-v,u,w]
	(19) \bar{y} , \bar{x} ,z [\bar{v} , \bar{u} ,w]	(20) \bar{x} +y,y,z [\bar{u} +v,v,w]	(21) x,x-y,z [u,u-v,w]
	(22) y,x,z [\bar{v} , \bar{u} , \bar{w}]	(23) x-y, \bar{y} ,z [\bar{u} +v,v, \bar{w}]	(24) \bar{x} , \bar{x} +y,z [u,u-v, \bar{w}]
12 k m..	x,y,0 [0,0,w]	\bar{y} ,x-y,0 [0,0,w]	\bar{x} +y, \bar{x} ,0 [0,0,w]
	\bar{x} , \bar{y} ,0 [0,0, \bar{w}]	y, \bar{x} +y,0 [0,0, \bar{w}]	x-y,x,0 [0,0, \bar{w}]
	y,x,0 [0,0, \bar{w}]	x-y, \bar{y} ,0 [0,0, \bar{w}]	\bar{x} , \bar{x} +y,0 [0,0, \bar{w}]
	\bar{y} , \bar{x} ,0 [0,0,w]	\bar{x} +y,y,0 [0,0,w]	x,x-y,0 [0,0,w]
12 j .m'.	x,2x,z [u,2u,w]	2 \bar{x} , \bar{x} ,z [2 \bar{u} , \bar{u} ,w]	x, \bar{x} ,z [u, \bar{u} ,w]
	\bar{x} ,2 \bar{x} ,z [u,2u,w]	2x,x,z [2 \bar{u} , \bar{u} ,w]	\bar{x} ,x,z [u, \bar{u} ,w]
	2x,x, \bar{z} [2u,u, \bar{w}]	\bar{x} ,2 \bar{x} , \bar{z} [\bar{u} ,2 \bar{u} , \bar{w}]	\bar{x} ,x, \bar{z} [\bar{u} ,u, \bar{w}]
	2 \bar{x} , \bar{x} , \bar{z} [2u,u, \bar{w}]	x,2x, \bar{z} [\bar{u} ,2 \bar{u} , \bar{w}]	x, \bar{x} , \bar{z} [\bar{u} ,u, \bar{w}]

Continued		No. 80.9.528	$p6'/mm'm$
12 i $\dots m$	$x,0,z [u,2u,0]$ $\bar{x},0,z [u,2u,0]$ $0,x,\bar{z} [2u,u,0]$ $0,\bar{x},\bar{z} [2u,u,0]$	$0,x,z [2\bar{u},\bar{u},0]$ $0,\bar{x},z [2\bar{u},\bar{u},0]$ $x,0,\bar{z} [\bar{u},2\bar{u},0]$ $\bar{x},0,\bar{z} [\bar{u},2\bar{u},0]$	$\bar{x},\bar{x},z [u,\bar{u},0]$ $x,x,z [u,\bar{u},0]$ $\bar{x},\bar{x},\bar{z} [\bar{u},u,0]$ $x,x,\bar{z} [\bar{u},u,0]$
6 h $mm'2'$	$x,2x,0 [0,0,w]$ $\bar{x},2\bar{x},0 [0,0,\bar{w}]$	$2\bar{x},\bar{x},0 [0,0,w]$ $2x,x,0 [0,0,\bar{w}]$	$x,\bar{x},0 [0,0,w]$ $\bar{x},x,0 [0,0,\bar{w}]$
6 g $m2m$	$x,0,0 [0,0,0]$ $\bar{x},0,0 [0,0,0]$	$0,x,0 [0,0,0]$ $0,\bar{x},0 [0,0,0]$	$\bar{x},\bar{x},0 [0,0,0]$ $x,x,0 [0,0,0]$
6 f $2'm'm$	$1/2,0,z [u,2u,0]$ $0,1/2,\bar{z} [2u,u,0]$	$0,1/2,z [2\bar{u},\bar{u},0]$ $1/2,0,\bar{z} [\bar{u},2\bar{u},0]$	$1/2,1/2,z [u,\bar{u},0]$ $1/2,1/2,\bar{z} [\bar{u},u,0]$
4 e $3m'$	$1/3,2/3,z [0,0,w]$ $2/3,1/3,\bar{z} [0,0,\bar{w}]$	$2/3,1/3,z [0,0,\bar{w}]$ $1/3,2/3,\bar{z} [0,0,w]$	
3 d $mm'm$	$1/2,0,0 [0,0,0]$	$0,1/2,0 [0,0,0]$	$1/2,1/2,0 [0,0,0]$
2 c $6'm'm$	$0,0,z [0,0,0]$	$0,0,\bar{z} [0,0,0]$	
2 b $\bar{6}m'2'$	$1/3,2/3,0 [0,0,w]$	$2/3,1/3,0 [0,0,\bar{w}]$	
1 a $6'/mm'm$	$0,0,0 [0,0,0]$		

Symmetry of special projections

Along [001] $p6'm'm$
 $a^* = a$ $b^* = b$
 Origin at 0,0,z

Along [100] $p2mm$
 $a^* = (a+2b)/2$
 Origin at x,0,0

Along [210] $p2mm1'$
 $a^* = b/2$
 Origin at x,x/2,0