## Metals and their Compounds Lecture 8.5 Uses of complexes

One example - illustrates that the formation of strong (stable) complexes is of practical use

Gold and silver ores usually have tiny percentages of gold and silver metal in large amounts of rock.

Metals extracted by forming a complex with cyanide ions

 $\begin{array}{rll} 4 \ \text{Au} & + \ \text{O}_2 & + \ 8 \ \text{CN}^{-} + 2 \text{H}_2 \text{O} \ \rightarrow \ 4 [\text{Au}(\text{CN})_2]^{-} + 4 \text{OH}^{-} \\ & \text{ soluble in water} \end{array}$ 

Complex has gold in +1 oxidation state. Recover the gold by electrochemical *reduction* 

 $[Au(CN)_2]^- + e^- \rightarrow Au (metal) + 2CN^$ separate recycle