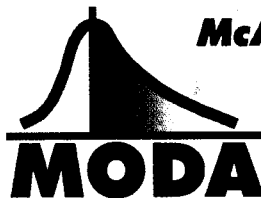


# **CMT Mt Lyell**

## **Cu CLAY MINERALOGY**

**SEPTEMBER 2005**



**McArthur Ore Deposit Assessments Pty Ltd**

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### Cu Clay Mineralogy September 2005

#### **Method**

6 composite samples from drillhole CMPKL02 were submitted by Roger Hill (CMT) for mineralogical assessment of Cu mineralogy. Each sample, representing 4m downhole, consisted of three size fractions: coarse +38 $\mu$ m, medium CS1+CS2 and fine CS3+CS4+CS5. These were mounted as polished thin sections by Australian Petrographics in Queanbeyan, N.S.W.

A revised version of the standard MODA technique for quantitative mineralogy was adopted.

For each of the 3 size fractions, 100 grains containing any Cu mineral were selected at random and the area % of each mineral present was visually estimated. The minerals logged were: pyrite  $FeS_2$  (Py), chalcopyrite  $CuFeS_2$  (Cp), bornite  $Cu_5FeS_4$  (Bn), chalcocite+digenite  $Cu_{2-x}S$  (Cc), covellite  $CuS$  (Cv), cuprite  $Cu_2O$  (Ct), native copper  $Cu$  (Cu) and gangue (i.e. all other minerals) (Ga).

Due to the limited number of actual grains mounted on the slide for the coarse fractions, 100 grains containing Cu could not be found. Actual grains logged for these fractions varied from 11-38.

The last 3 samples (the deepest in the drillhole) were found to be extremely low grade (0.01-0.05%Cu) and after discussions with Roger Hill, no mineralogical assessment of these samples was undertaken.

A tally was made from the summed area percentages for each mineral and these were converted to weight percentages using theoretical mineral densities. These were in turn converted to percentage of Cu metal using the following theoretical compositions. Fractions were weighted for the totals according to the product of size fraction weight % and the assayed Cu content.

Mineral	Py	Cp	Bn	Cc	Cv	Ct	Cu	Ga
Density	5.01	4.20	5.15	5.65	4.60	6.10	8.94	2.70
%Cu	0	35.9	63.3	79.9	66.5	88.8	100.0	0

## Results

### Cu Residence

The following tables summarise the mineral residence of Cu for each size fraction of each sample.

Sample	Fraction	Percentage of Cu metal residing in					
		Chalcopyrite	Bornite	Chalcocite	Covellite	Cuprite	Native Copper
<b>CMPKL02 43-47m 0.2%Cu</b>	Coarse	5.9	0.0	22.7	11.4	0.0	60.0
	Medium	0.3	0.0	1.4	0.1	4.4	93.9
	Fine	9.2	0.1	7.2	1.4	5.7	76.4
	<b>TOTAL</b>	<b>1.4</b>	<b>0.02</b>	<b>2.4</b>	<b>0.4</b>	<b>4.5</b>	<b>91.4</b>

Sample	Fraction	Percentage of Cu metal residing in					
		Chalcopyrite	Bornite	Chalcocite	Covellite	Cuprite	Native Copper
<b>CMPKL02 47-51m 1.3%Cu</b>	Coarse	0.1	0.0	0.0	0.0	2.9	97.1
	Medium	1.5	0.0	12.5	0.0	11.7	74.3
	Fine	1.4	0.0	89.1	0.5	4.6	4.4
	<b>TOTAL</b>	<b>0.5</b>	<b>0.0</b>	<b>10.3</b>	<b>0.04</b>	<b>4.7</b>	<b>84.4</b>

Sample	Fraction	Percentage of Cu metal residing in					
		Chalcopyrite	Bornite	Chalcocite	Covellite	Cuprite	Native Copper
<b>CMPKL02 51-55m 1.6%Cu</b>	Coarse	0.0	0.0	100.0	0.0	0.0	0.0
	Medium	9.0	0.0	26.1	0.0	64.8	0.0
	Fine	1.5	0.0	83.4	0.1	15.0	0.0
	<b>TOTAL</b>	<b>0.6</b>	<b>0.0</b>	<b>94.7</b>	<b>0.02</b>	<b>4.7</b>	<b>0.0</b>

Sample	Fraction	Percentage of Cu metal residing in					
		Chalcopyrite	Bornite	Chalcocite	Covellite	Cuprite	Native Copper
<b>CMPKL02 43-55m 1.0%Cu TOTAL</b>	Coarse	<b>0.3</b>	<b>0.0</b>	<b>53.6</b>	<b>0.5</b>	<b>1.2</b>	<b>44.4</b>
	Medium	<b>5.4</b>	<b>0.0</b>	<b>19.2</b>	<b>0.0</b>	<b>39.3</b>	<b>36.1</b>
	Fine	<b>1.8</b>	<b>0.0</b>	<b>82.4</b>	<b>0.3</b>	<b>10.1</b>	<b>5.4</b>
	<b>TOTAL</b>	<b>0.6</b>	<b>0.0</b>	<b>50.5</b>	<b>0.1</b>	<b>4.7</b>	<b>44.1</b>

### Mineral Associations

- Chalcopyrite – mostly liberated, but sometimes with pyrite
- Bornite – quite rare, but normally included in chalcocite
- Chalcocite - predominantly liberated, but occasionally hosting pyrite or covellite
- Covellite – quite rare, but always hosted by chalcocite
- Cuprite – mainly rimming native copper, but also commonly liberated, especially in the 51-55m sample
- Native copper – often liberated, but usually with narrow cuprite rims. In the coarse fractions it often occurs as small isolated grains hosted by gangue

### **Miscellaneous Comments**

Other minerals observed during this assessment were (in order of predominance):

- Quartz
- Ferruginous clays
- Sericite/clay
- Hematite
- Carbonate
- Sphalerite
- Magnetite
- Goethite
- Galena

Oxidised fragments of grinding media were also observed.

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