

Name of the Student: _____

Max. Marks : 17 Marks

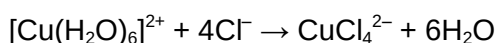
Time : 17 Minutes

Mark Schemes

Q1.

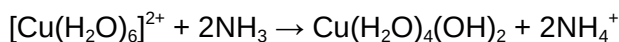
- (a) W is CuCl_4^{2-} 1

Yellow-green/yellow/green

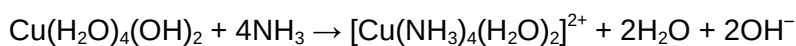
*Not necessary to indicate solution**Do not allow precipitate/solid* 1*Allow + 4HCl → 4H⁺* 1

- (b) X is $\text{Cu}(\text{H}_2\text{O})_4(\text{OH})_2$ 1
Allow Cu(OH)₂/copper hydroxide

Blue precipitate/solid

Ignore shades 1*Allow any balanced equation/equations leading to this hydroxide or Cu(OH)₂**But must use ammonia* 1

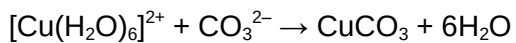
- (c) Y is $[\text{Cu}(\text{NH}_3)_4(\text{H}_2\text{O})_2]^{2+}$ 1

Deep/dark/royal blue solution*QoL* 1*Accept equation for formation from Cu(OH)₂* 1

- (d) Z is CuCO_3 1
Allow copper carbonate

Green solid/precipitate

Allow blue-green precipitate 1



1



Allow hydrated ions

State symbols not essential but penalise if wrong

1

Blue

Do not allow description of solids

1

Green

Allow yellow/(red-)brown/orange

1

- (ii) Any two correct points about copper extraction from two of these three categories:

Any relevant mention of lower energy consumption

Do not allow reference to electricity alone or to temperature alone.

Any relevant mention of benefits of less mining (of copper ore)

Allow avoids depletion of (copper ore) resources

Less release of CO_2 (or CO) into the atmosphere

Not just greenhouse gases. Must mention CO_2 or CO

Max 2

[17]