Practice Question Set For A-Level
Subject : Chemistry
Paper-1 Topic: Physical 1

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Name of the Student:_____
Max. Marks : 16 Marks **Time : 16 Minutes**

Mark Schemes

Q1.

(a) Covalent

Do not allow dative covalent or coordinate (covalent)

1

(b) $Cl^{(-)}$ not donating lone pair (to $Cu^{(2+)}$)

$Cl^{(-)}$ does not form a coordinate/dative bond (to $Cu^{(2+)}$)

Allow without charges but penalise incorrect charges
Cl^-/it is bonded ionically (to Cu^{2+})

1

(c) $[Cu(H_2O)_6]^{2+} + 4NH_3 \longrightarrow [Cu(NH_3)_4(H_2O)_2]^{2+} + 4H_2O$

1

Deep blue / Royal blue / Dark blue (solution)

1

Allow combination of:

$[Cu(H_2O)_6]^{2+} + 2NH_3 \longrightarrow [Cu(H_2O)_4(OH)_2] + 2NH_4^+$

$[Cu(H_2O)_4(OH)_2] + 4NH_3 \longrightarrow [Cu(NH_3)_4(H_2O)_2]^{2+} + 2H_2O + 2OH^-$

Do not penalise missing square brackets

Ignore initial colour of Cu^{2+} (aq)

(d) $CuCO_3$ or copper carbonate

Penalise incorrect oxidation state

Allow correct formula for basic copper carbonate

1

(e) HCl/ hydrochloric acid

Ignore concentration

Allow soluble chloride salt

Also allow any reagent which leads to a change in colour of solution due to a change in ligands (e.g. $NH_2CH_2CH_2NH_2$) or change in oxidation state (e.g. SO_2) and associated correct equations.

1

$[Cu(H_2O)_6]^{2+} + 4Cl^- \longrightarrow [CuCl_4]^{2-} + 6H_2O$

$[Cu(H_2O)_6]^{2+} + 4HCl \longrightarrow [CuCl_4]^{2-} + 6H_2O + 4H^+$

Mark independently

1

(f) $(3)d^{10}$ or has full (3)d (sub) shell/orbital

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Penalise incorrect principal quantum number

1

It is colourless/cannot absorb (frequencies of) visible light

Ignore clear

1

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Q2.

(a) $Ca + 2H_2O \longrightarrow Ca(OH)_2 + H_2$

1

8 − 12

1

(b) Decrease

1

(c) $BaCl_2$

Allow $Ba(NO_3)_2$ or other soluble barium salt

1

$Ba^{2+} + SO_4^{2-} \longrightarrow BaSO_4$

Allow equation if state symbols missing but penalise if state symbols are incorrect

1

(d) Strong attraction

1

Between positive and negative ions

1

[7]

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