Practice Question Set For A-Level
Subject : Chemistry
Paper-1 Topic: Inorganic 2

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Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

Mark Schemes

Q1.

(a) **M1** Amount of $S_2O_3^{2-} = \frac{9.00 \times 0.0800}{1000} = 7.20 \times 10^{-4}$ mol

1

(From equations mol $S_2O_3^{2-}$ = mol Cu^{2+})
M2 Amount of Cu^{2+} in 25 cm^3 = 7.20×10^{-4} mol
M2 *= answer to* ***M1*** *(1:1 ratio)*

1

M3 Amount of Cu^{2+} in 250 cm^3 = 7.20 v 10^{-4} **× 10** = 7.20×10^{-3} mol
M3 *=* ***M2*** *× 10*

1

M4 Mass of copper = 7.20×10^{-3} mol **× 63.5** = 0.457 g
M4 *=* ***M3*** *× 63.5*

1

M5 mass = 0.985 g
M5 *converting 985 mg to g*

1

M6 $\%\ Cu = 0.457 \times \frac{100}{0.985} = 46.4\ \%$

M6 *is for the answer to* ***3 sf***
Allow $\%\ Cu = 457 \times \frac{100}{985} = 46.4\ \%$ *for* ***M5*** *and* ***M6***
*Allow (****M4*** *×1000)/985 v 100 for* ***M5*** *and* ***M6***

1

(b) Use more of the alloy

1

Use a lower concentration of the thiosulfate solution/lower mass of $Na_2S_2O_3$ to make solution

1

(c) Oxidizing agent
Allow electron acceptor

1

(d) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^9$
Do not allow [Ar]3d ^{9}

1

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(e) Full (3)d (sub)shell or (3)d^{10}

1

No (d-d) transitions possible/ cannot absorb visible/white light

M2** is dependent on **M1

Ignore reflects visible/white light

1

(f) **M1**: n = (5.00/253.8) = 0.0197 mol

Allow 254

*If 126.9 or 127 used lose **M1** only*

1

M2: T = 458 K and P = 100 000 Pa

1

M3 $V = \frac{nRT}{P}$ or $\frac{0.0197 \times 8.31 \times 458}{100\,000}$ or 7.50×10^{-4} (m^3)

M3** If rearrangement incorrect can only score **M1** and **M2

1

M4: V = 750 (cm^3)

***M4**: Allow **M3** × 10^6*

***M4**: Allow 749*

1

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Q2.

(a) $Fe + H_2SO_4 \rightarrow FeSO_4 + H_2$

Allow $Fe + 2H^+ \rightarrow Fe^{2+} + H_2$

Allow $Fe + 2H^+ + SO_4^{2-} \rightarrow Fe^{2+} + SO_4^{2-} + H_2$

Allow $Fe + H_2SO_4 \rightarrow Fe^{2+} + SO_4^{2-} + H_2$

Allow $Fe + 2H^+ + SO_4^{2-} \rightarrow FeSO_4 + H_2$

Allow multiples

Ignore state symbols

1

(b) 22.65 (cm^3)

1

(c) $5\ Fe^{2+} + MnO_4^- + 8\ H^+ \rightarrow 5\ Fe^{3+} + Mn^{2+} + 4\ H_2O$

Allow multiples

Ignore state symbols

NOT if electrons shown

1

(d) colourless / (pale) green to (hint of) pink

NOT …. to purple

Allow …. to pale / hint of purple

1

(e) pipette

burette

both needed

Allow (graduated/volumetric) pipette

Allow (graduated/volumetric) burette

NOT dropping pipette

1

(f) 1.47(%)

Allow 1.5(%)

1

[6]

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