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

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Name of the Student:_____
Max. Marks : 23 Marks **Time : 23 Minutes**

Mark Schemes

Q1.

(a) $[Fe(H_2O)_6]^{3+} + 4Cl^- \longrightarrow FeCl_4^- + 6H_2O$

1

(b) Cl^- is a bigger ligand

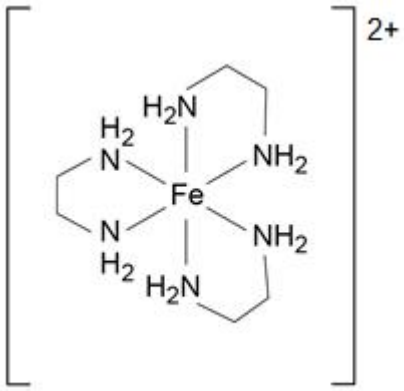
1

So only $4Cl^-$ can fit around the metal

Allow fewer Cl^- can fit around the metal

1

(c)



M1 for structure of complex
M2 for correct charge

1
1

(d) Change in entropy is positive

1

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

1

(f) Amount of manganate (VII) = 6.50×10^{-4} mol

1

Amount of iron(II) = 3.25×10^{-3} mol

ie M1 × 5

1

Mass of iron = 0.181 g = 181 mg

Allow M2 × 55.8

1

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Percentage Fe = 181/1980 × 100 = 9.14(%) 3 sf

1

(g) Colourless to pale pink

1

[12]

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Q2.

(a) Multidentate − EDTA can form many / six dative bonds with central cation.

1

Ligand − lone pair (on N or O of EDTA) can form dative bond with copper(II) ions.

1

6 circles drawn on $EDTA^{4-}$ structure − 2 × N and 4 × −O

1

(b) Calibrate a colorimeter / produce a calibration curve.

1

By testing the colorimeter with solutions of copper-EDTA complex of known concentration.

1

Add excess EDTA salt to the sample.

1

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

1

Amount of copper(II) = $(25.0 \times 7.56 \times 10^{-5}) / 1000 = 1.89 \times 10^{-6}$ mol

1

Volume of $EDTA^{4-} = (1.89 \times 10^{-6} / 0.001) \times 1000 = 1.89\ cm^3$

1

This is too small to be accurate.

1

Dilute the $EDTA^{4-}$ solution / use larger volume of river water.

1

[11]

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