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

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Name of the Student:_____
Max. Marks : 8 Marks **Time : 8 Minutes**

Mark Schemes

Q1.

(a) (List of) electrode potentials/ $E^{\ominus}$ in (numerical) order

OR half cells/equations in (numerical) order of electrode potential/ $E^{\ominus}$

Do not allow EMF in order

1

(b) Any 2 from
298 K **or** 25 ^{o}C
$[H^{+}] = 1$ mol dm^{-3}
100 kPa

Ignore 1 atm

1

(c) $[Co(H_2O)_6]^{2+}$

Do not penalise absence of brackets

1

(d) $3\ VO_2^{+} + 6\ H^{+} + Fe + 3\ H_2O \rightarrow 3\ VO^{2+} + [Fe(H_2O)_6]^{3+}$

or

$3\ VO_2^{+} + 6\ H^{+} + Fe \rightarrow 3\ VO^{2+} + 3\ H_2O + Fe^{3+}$

1 mark for Fe^{3+} as product and one mark for equation.

Ignore state symbols
Allow 1 mark for balanced equation that gives Fe^{2+} as product
$2VO_2^{+} + 4H^{+} + Fe + 4H_2O \rightarrow 2VO^{2+} + [Fe(H_2O)_6]^{2+}$
or
$2VO_2^{+} + 4H^{+} + Fe \rightarrow 2VO^{2+} + Fe^{2+} + 2H_2O$

2

(e) $E^{\ominus}$ $Co^{3+}(/Co^{2+}) > Fe^{3+}(/Fe^{2+})$

*Allow electrode potential for Co^{3+} greater than for Fe^{3+} **OR** 1.81 > 0.77 / EMF cell = 1.04 V*

1

$[Co(H_2O)_6]^{3+} + [Fe(H_2O)_6]^{2+} \rightarrow [Co(H_2O)_6]^{2+} + [Fe(H_2O)_6]^{3+}$

Insist of reference to $E^{\ominus}$ in M1

1

(f) Different ligands

Penalise different concentrations/oxidation states

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