

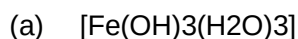
Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Mark Schemes

Q1.



1

Brown

M2: Allow red-brown

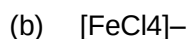
1



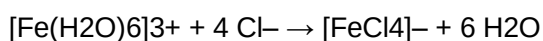
M3: Allow correct equations with Na_2CO_3

M3: Ignore State symbols

1

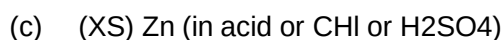


1



M2: Allow correct equations with HCl

1



Allow KI/potassium iodide

1



1

green

1

(e)

This question is marked using levels of response. Refer to the Mark Scheme Instructions for Examiners for guidance on how to mark this

question.	
Level 3 5-6 marks	All stages are covered and the description of each stage is generally correct and virtually complete. Answer is communicated coherently and shows a logical progression from stage 1 to stage 2 and stage 3 Answer is illustrated using diagrams of at least 2 specific examples of pairs of cobalt or platinum complex isomers.
Level 2 3-4 marks	All stages are covered but the description of each stage may be incomplete or may contain inaccuracies OR two stages are covered and the explanations are generally correct and virtually complete. Answer is mainly coherent and shows progression from stage 1 to stage 2 and/or stage 3. Answer is illustrated using diagrams of at least 1 specific example of a pair of cobalt or platinum complex isomers.
Level 1 1-2 marks	Two stages are covered but the description of each stage may be incomplete or may contain inaccuracies, OR only one stage is covered but the explanation is generally correct and virtually complete. Answer includes isolated statements and these are presented in a logical order. Answer is illustrated using at least 1 appropriate diagram or formula.
0 marks	Insufficient correct chemistry to gain a mark.

Indicative Chemistry content

Stage 1: shapes of complexes

1a octahedral or 6 co-ordinate diagram

1b tetrahedral or square planar or 4 co-ordinate diagram

Stage 2: cis/ trans isomerism (or E-Z or geometric)

2a cis/trans isomerism in either square planar and/or octahedral complexes

2b Diagrams showing cis and trans isomerism in a square planar complex

2c Diagrams showing cis and trans isomerism in both isomers of octahedral complexes eg draw cis and trans $M(H_2O)_4(OH)_2$ or $[M(NH_3)_4(H_2O)_2]^{2+}$

Stage 3: optical isomerism

3a optical isomerism / non superimposable mirror images in octahedral complexes

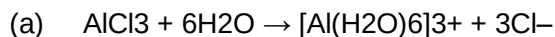
3b occurs with a specific bidentate ligands eg. $\text{C}_2\text{O}_4^{2-}$ or $\text{NH}_2\text{CH}_2\text{CH}_2\text{NH}_2$

3c draw both optical isomers of eg $[\text{M}(\text{NH}_2\text{CH}_2\text{CH}_2\text{NH}_2)_3]^{2+}$

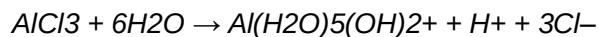
6

[14]

Q2.

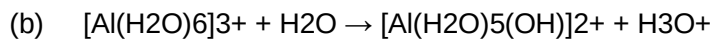


Allow



Or equation to form $\text{Al}(\text{H}_2\text{O})_4(\text{OH})_2^+$

1



allow equations to form $[\text{Al}(\text{H}_2\text{O})_4(\text{OH})_2]^+$

1

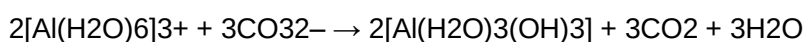


M1 and M2 in either order

1

effervescence/bubbles/fizzing

1



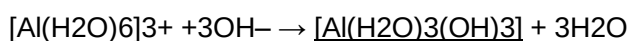
accept multiples

only allow spectator ions in a balanced equation

1



1

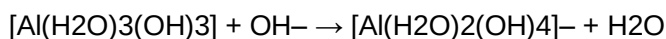


only allow spectator ions in a balanced equation

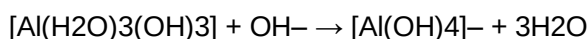
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Colourless solution forms / ppt or solid dissolves

1



OR



only allow 6 or 4 co-ordination

Allow $[\text{Al}(\text{OH})_6]^{3-}$ in a balanced equation

1

[9]