Question	Marking Guidance	Mark	Comments
7(a)	Iron(II): green (solution) gives a green precipitate	1	Apply list principle throughout if extra colours and/or extra observations given. Ignore state symbols in equations. Not blue-green ppt.
	$[Fe(H_2O)_6]^{2+} + CO_3^{2-} \rightarrow FeCO_3 + 6H_2O$	1	Must start from $[Fe(H_2O)_6]^{2+}$ Allow equations with Na_2CO_3
	Iron(III):: yellow / purple / brown / lilac / violet (solution) gives a brown / rusty precipitate	1	
	Effervescence / gas / bubbles	1	Allow CO_2 evolved but not just CO_2
	$2[Fe(H_2O)_6]^{3+} + 3CO_3^{2-} \rightarrow 2[Fe(H_2O)_3(OH)_3] + 3CO_2 + 3H_2O$	1	
7(b)	Copper(II): blue (solution) gives a green / yellow solution **OR** blue solution (turns) to green / yellow / olive green	1	Apply list principle throughout if extra colours and/or extra observations given. Ignore state symbols in equations.
	$[Cu(H_2O)_6]^{2+} + 4Cl^- \rightarrow [CuCl_4]^{2-} + 6H_2O$	1	Allow equations with HCl
	Cobalt(II): pink (solution) gives a blue solution **OR** pink solution turns blue	1	
	$[Co(H_2O)_6]^{2+} + 4Cl^- \rightarrow [CoCl_4]^{2-} + 6H_2O$	1	

7(c)	Iron(II): green (solution) gives a green precipitate	1	Apply list principle throughout if extra colours and/or extra observations given. Ignore state symbols in equations.
	$[Fe(H_2O)_6]^{2+}$ + 2OH⁻ → $Fe(H_2O)_4(OH)_2$ + $2H_2O$	1	Allow equations with NaOH
	Chromium(III): green / ruby / purple / violet / red-violet (solution) gives a green solution **OR** green / ruby / purple / violet / red-violet solution turns green	1	Ignore green ppt.
	$[Cr(H_2O)_6]^{3+}$ + 6OH⁻ → $[Cr(OH)_6]^{3-}$ + $6H_2O$	1	Allow also with 4 or 5 OH balanced with 2 or 1 waters. Also allow two correct equations showing $Cr(H_2O)_3(OH)_3$ as intermediate.
7(d)	Al: colourless (solution) gives a white ppt	1	Apply list principle throughout if extra colours and/or extra observations given. Ignore state symbols in equations.
	$[Al(H_2O)_6]^{3+}$ + $3NH_3$ → $Al(H_2O)_3(OH)_3$ + $3NH_4^+$	1	Allow + 3OH⁻ → $3H_2O$ if NH_3 + H_2O → NH_4^+ + OH⁻ also
	Ag: colourless (solution) remains a colourless solution / no visible change	1	Ignore brown ppt.
	$[Ag(H_2O)_2]^+$ + $2NH_3$ → $[Ag(NH_3)_2]^+$ + $2H_2O$	1	Allow 2 / 3 equations involving Ag_2O or $Ag(OH)_2$