Assessment Schedule – 2005

Chemistry: Describe chemical reactions (90171)

Evidence Statement

Q	Evidence	Evidence contributing to Achievement	Evidence contributing to Achievement with Merit	Evidence contributing to Achievement with Excellence
1(a) 1(b) 1(c) 1(d)	P T O O	THREE correct answers.		
2(a)	(i) Calcium sulfate (ii) Copper hydroxide (iii) No precipitate	TWO correct answers. (name or formulae)		
2(b)	$Ca^{2+}(aq) + SO_4^{2-}(aq) \rightarrow CaSO_4(s)$ $Cu^{2+}(aq) + 2OH^-(aq) \rightarrow Cu(OH)_2(s)$ **OR** $Ca(NO_3)_2(aq) + Na_2SO_4(aq) \rightarrow$ $\qquad CaSO_4(s) + 2NaNO_3(aq)$ $CuCl_2(aq) + 2KOH(aq) \rightarrow$ $\qquad Cu(OH)_2(s) + 2KCl(aq)$	Correct formulae of reactants and products for ONE reaction. States not required.	ONE correctly balanced equation. States not required. Precipitate must be identified either in 2(a) or 2(b).	
3(a) 3(b) 3(c)	silver + aluminium nitrate magnesium hydroxide + sodium chloride lead oxide + water	TWO correct answers (if symbols used, formulae must be correct).		
4(a) 4(b)	Expt 1: (i) **green precipitate (**or **solid) forms** (ii) Iron II ions form an <u>insoluble</u> substance with hydroxide ions. (The resulting precipitate is green.) (iii) $Fe^{2+}(aq) + 2OH^-(aq)$ $\qquad \rightarrow Fe(OH)_2(s)$ **OR** $Fe(NO_3)_2(aq) + 2NaOH(aq) \rightarrow$ $\qquad Fe(OH)_2(s) + 2NaNO_3(aq)$ Expt 2: (i) **pink or brown or black coating** on zinc (ii) **blue colour of solution fades** or **zinc foil disappears** **pink or brown deposit** on zinc can be accepted if not used in part (i) (iii) This is an oxidation-reduction reaction. Electrons have been transferred. Zinc has provided electrons to the copper ions (blue solution) so they have been displaced out of solution. Zinc ions are now in solution and they are colourless. Pink-brown copper metal (solid) has been deposited. (iv) $Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s)$ **OR** $Zn(s) + Cu(NO_3)_2(aq) \rightarrow$ $\qquad Zn(NO_3)_2(aq) + Cu(s)$	TWO observations in **bold** correct. Correct formulae of reactants and products for ONE of the reactions. States not required.	Explanation of an observation for ONE of the experiments. Incorrect statements will negate. TWO correctly balanced equations. Precipitates must be identified if present. States not required.	Explanation of an observation for BOTH of the experiments. Link back to at least one observation must be made.

Q	Evidence	Evidence contributing to Achievement	Evidence contributing to Achievement with Merit	Evidence contributing to Achievement with Excellence
5(a) 5(b) 5(c)	159.6 106 261	TWO answers correct		
6	$\dfrac{0.500 \text{ g}}{2 \times 84} = \dfrac{x}{106}$ $(2x = 0.631)$ $x = 0.315 \text{ g (3sf)}$	Molar mass of $NaHCO_3$ is calculated correctly.	Evidence of correct use of ratio of molecular masses.	Correct answer and working. (accept 2–4 sf) No errors allowed. (If running arithmetic is used and this leads to an incorrect statement, E can NOT be achieved.)
7	$Fe = 159.6 \times \dfrac{8.65}{12.37} = 111.6$ $Fe = \dfrac{111.6}{55.8} = 2$ $O = 159.6 \times \dfrac{3.72}{12.37} = 48.00$ $O = \dfrac{48.00}{16} = 3$ Fe_2O_3 Alternative methods (eg using moles) can be used.	Total mass of the compound calculated OR molar masses of iron and oxygen used to identify Fe_2O_3 as the correct answer. Allow follow-on error as long as **ONE calculation process is correct**.	Total mass of iron AND oxygen calculated. OR 1Fe: 1.5O ratio calculated correctly. **TWO calculation processes must be correct.**	Correct answer and working. Working must be **complete** with no errors. (If running arithmetic is used and this leads to an incorrect statement, E can NOT be achieved.)

Judgement Statement

Achievement	Achievement with Merit	Achievement with Excellence
SIX opportunities answered at Achievement level or higher.	SEVEN opportunities answered with THREE at Merit level or higher.	EIGHT opportunities answered with TWO at Excellence level and ONE at Merit level or higher.
6 × A	3 × M *plus* 4 × A	2 × E *plus* 1 × M *plus* 5 × A