Assessment Schedule – 2006

Chemistry: Describe properties and reactions of metals, acids and bases (90640)

Evidence Statement

Question	Evidence	Achievement	Merit	Excellence
1(a)(i)	• bright or white light • smoke or white smoke • formation of grey/white powder or ash • heat produced or released • magnesium or metal disappears • grey to white colour change • white or bright sparks.	**TWO** correct answers.		
1(a)(ii)	$2Mg + O_2 \rightarrow 2MgO$	Correct formulae of **BOTH** reactants and products.	Correctly balanced equation.	
1(b)(i)	• metal disappears or metal dissolves or metal gets smaller • fizzing or effervescence or bubbles or gas • fizzy sound or hiss of bubbles or bubbling noise • heat produced or temperature increases or tube feels warm.	**TWO** correct answers.		
1(b)(ii)	$Mg + 2HNO_3 \rightarrow Mg(NO_3)_2 + H_2$	Correct formulae of reactants or products or correct word equation	Correct equation (reactants and products) but unbalanced or incorrectly balanced.	Correctly balanced equation
2	Relevant physical property of metals: malleable Comparison of metals links to chemical property, eg: Copper is resistant to reaction with oxygen, water or acid so will be long lasting Iron is more reactive and would rust or react if in contact with oxygen or water. Iron would rust would weaken the roof or make holes in roof .	Both are malleable **PLUS** Iron rusts or oxidizes or corrodes **AND** Copper doesn't corrode much and reacts only slightly.	Both are malleable **PLUS** Iron rusts or oxidises or corrodes when in contact with water and air/O_2 **AND** Copper does not react as much with these substances. **AND** Clear statement or implication that Fe is more reactive than Cu.	As for Merit **PLUS** Properties for at least one metal are related to suitability or lack of for use as roof (eg rust forms and flakes off exposing more metal beneath which then rusts weakening the roof).
3 (a)(i)	E	Correct answer.		

<table>
<tr><td>3 (a)(ii)</td><td>The most concentrated solution of sodium thiosulfate is the one that reacts at the fastest rate It contains more particles that are available to collide with the acid particles and therefore react at a faster rate.</td><td>Fastest reaction rate

Least or smallest or shortest or fastest or quickest time for concentration to disappear or be concealed.</td><td>As for Achievement level
PLUS
Idea of more particles or thiosulfate particles to collide with the acid resulting in the fastest rate.</td><td></td></tr>
<tr><td>3 (b)</td><td>It will run out of reactants or named particles to collide or react.</td><td>Named particles or reactant(s) run out or used up or have all reacted</td><td></td><td></td></tr>
<tr><td>3 (c)(i)</td><td>Use a water bath or water bath technique described
OR
Heat on a heating element or hotplate
OR
Warm/heat slowly or gently or carefully with a Bunsen
OR
Heat with a Bunsen using a thermometer to check or monitor the temperature.</td><td>Correctly states how to increase temperature safely.</td><td></td><td></td></tr>
<tr><td>3c(ii)</td><td>Particles will:
• be moving faster,
• have more energy,
• collide more frequently
• collisions will be more effective or successful or have energy equal or greater to activation energy.</td><td></td><td>Presents three ideas.</td><td>Links all four ideas.</td></tr>
<tr><td>4 (a)</td><td><table><tr><td></td><td colspan="2">Colour when indicator added</td></tr><tr><td></td><td>Litmus</td><td>Universal indicator</td></tr><tr><td>HCl</td><td>Red</td><td>Red/pink / red-pink</td></tr><tr><td>$Mg(OH)_2$</td><td>Blue</td><td>Blue or blue-green</td></tr></table></td><td>THREE answers correct.</td><td></td><td></td></tr>
<tr><td>4 (b)(i)</td><td>Magnesium hydroxide + hydrochloric acid → magnesium chloride + water</td><td>Correct word equation OR a correctly balanced symbol equation.</td><td></td><td></td></tr>
<tr><td>4 (b)(ii)</td><td>Green</td><td>Correct answer.</td><td></td><td></td></tr>
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4 (b)(iii)	This is an acid-base reaction. When an acid reacts with a base, a salt and water are formed: Base + acid → salt + water. The products are neutral (have a pH of 7). The H^+ (H_3O^+) concentration is equal to the concentration of the OH^- ($[H_3O^+] = [OH^-]$). When the acid and the base have completely reacted with each other, the reactants have been neutralised and the products are neutral.	An understanding that this is an acid + base or alkali reaction **AND** Product(s) is/are neutral or product(s) has/have pH 7 or water is neutral or pH7. **OR** Understanding that acid & base "cancel each other out". **OR** Acid + base → salt + water and water is neutral or water has pH7.	As for Achievement level, **PLUS** An understanding that the salt and water are both neutral or pH7. **OR** Magnesium chloride & water are (both) neutral/pH7.	As for Merit level **PLUS** An understanding of what neutral or pH7 means in terms of $[H_3O^+] = [OH^-]$ being equal.

Judgement Statement

Chemistry: Describe properties and reactions of metals, acids and bases (90640)

Achievement	Achievement with Merit	Achievement with Excellence
EIGHT questions answered correctly. Minimum of 8 × A	EIGHT questions answered correctly, including at least FOUR at Merit level. Minimum of 4 × M + 4 × A	NINE questions answered correctly, including at least TWO at Merit level and at least TWO at Excellence level. Minimum of 2 × E + 2 × M + 5 × A