Assessment Schedule – 2005

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

Evidence Statement

Q	Evidence	Evidence contributing to Achievement	Evidence contributing to Achievement with Merit	Evidence contributing to Achievement with Excellence
1(a)	Malleable. (High) lustre / lustrous / shiny Unreactive / Non-reactive (in oxygen / water / acid).	TWO properties correct.		
1(b)	Malleable – able to shape : without breaking / into a suitable shape (*eg ring shaped)* Lustre / shine – attractive to customers. Non-reactive in oxygen : won't react in air / corrode / tarnish. Non-reactive in water : won't react in rain or dishwashing water or in the shower. Non-reactive in acid : won't react with common substances such as lemon juice, vinegar, soft drinks.		ONE property explained. Rust negates	
2(a)	$NaHCO_3 + CH_3COOH \rightarrow CH_3COONa + H_2O + CO_2$ (Accept $NaCH_3COO$ also)	Correct formulae for products given. States not required.	Correctly balanced equation. States not required.	
2(b)	(i) The mixture will bubble / fizz / effervesce / froth / foam	Gives ONE correct observation.		
	(ii) The bubbles are caused by the production of CO_2 gas, when carbonate / hydrogen carbonate reacts with acid	Explanation correctly identifies CO_2 as the gas formed.	Explanation correctly identifies **CO_2** as the gas formed AND recognises that $NaHCO_3$ is a **carbonate** OR **hydrogen carbonate** is reacting with an **acid.**	
3(a)	Bubbles / effervescence / fizzing / colourless gas. Pale green solution forms. Heat is released. Piece of iron dissolves / disappears / gets smaller.	ONE observation correct.		
3(b)	$Fe + H_2SO_4 \rightarrow FeSO_4 + H_2$	Correct formulae of reactants OR products. States not required. OR correct word equation.	Correct formulae of reactants AND products. States not required.	
3(c) 3(d)	Aluminium has already reacted with oxygen / oxidised and now has an oxide layer on it, which protects against further reaction. Uses include (but are not limited to) window frames, boat frames, soft drink cans, 'tin' foil. Due to the oxide layer, the window / boat frames won't oxidise or corrode; food / drink won't be contaminated / food / drink won't react with the metal.	Al reacts with oxygen to form an oxide layer / Al has an oxide layer / Al is coated with aluminium oxide.	Al reacts with oxygen / is oxidised to form an oxide layer / aluminium oxide PLUS The oxide layer protects Al against further reaction / prevents further reaction.	As for Merit PLUS Application of TWO uses of Al are clearly linked to the oxide layer. (Rusting negates.)

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Q	Evidence	Evidence contributing to Achievement	Evidence contributing to Achievement with Merit	Evidence contributing to Achievement with Excellence
4(a)	$Mg + 2HCl \rightarrow MgCl_2 + H_2$	Correct formulae of reactants OR products. States not required. OR correct word equation	Correct formulae of reactants AND products. (incorrect or no balancing) States not required.	Correctly balanced equation. States not required.
4(b)	The powdered Mg would react faster initially because it has a larger surface area. This means there are more exposed magnesium particles available to react with the acid particles and there are more frequent collisions.	Identify the powdered form/B AND the factor of **surface area** OR more particles exposed	Identify the powdered form / B AND the factor of **surface area** OR more particles exposed AND more collisions between magnesium particles / atoms and acid particles / molecules / ions.	Provide an explanation of how surface area affects rate in terms of more Mg exposed to acid and therefore there are more frequent collisions / more collisions per unit time.
5(a) 5(b)	Red / pink-red / red-pink *(NOT pink)* Purple / violet or blue-purple *(NOT blue)* Blue or green-blue *(NOT green)* Neutralisation / Acid-Base reaction.	THREE correct answers		
5(c) 5(d)	Green When the acid and base are mixed in equal volumes, the result is a neutral solution of a salt and water. The pH is about 7. The acid and base have completely neutralised (completely reacted with) each other. $HNO_3 + NaOH \rightarrow NaNO_3 + H_2O$ OR $H^+ + OH^- \rightarrow H_2O$ OR $H_3O^+ + OH^- \rightarrow 2H_2O$	Universal indicator turns the solution **green** AND Correct formulae of reactants or products are given.	Green AND The pH is 7 / green is the colour of neutral solutions AND Equation is correctly balanced.	Green AND The pH is 7 AND Shows an understanding that the equal volumes and concentrations of acid and base have **completely reacted** with each other and **neutralised** each other AND Equation is correctly balanced.

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Judgement Statement

Achievement	Achievement with Merit	Achievement with Excellence
SEVEN opportunities answered at Achievement level or higher. 7 × A	EIGHT opportunities answered with FIVE at Merit level or higher. 5 × M *plus* 3 × A	EIGHT opportunities answered with TWO at Excellence level and THREE at Merit level or higher. 2 × E *plus* 3 × M *plus* 3 × A

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