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NZQA
NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

For Supervisor's use only

Level 1 Chemistry, 2009

90640 Describe characteristic properties and reactions of metals, acids and bases

Credits: Four
2.00 pm Friday 27 November 2009

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should answer ALL the questions in this booklet.

A periodic table and other reference material are provided in the Resource Booklet L1–CHEMR.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–8 in the correct order and that none of these pages is blank.

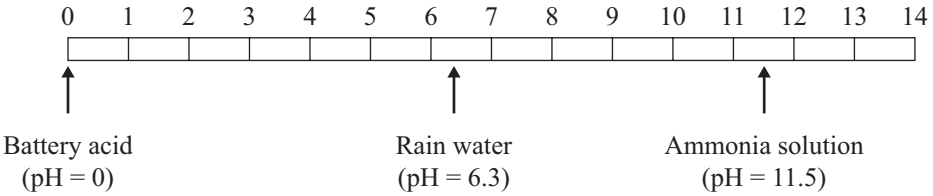
YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

For Assessor's use only	**Achievement Criteria**	
Achievement	**Achievement with Merit**	**Achievement with Excellence**
Describe characteristic properties and reactions of metals, acids and bases. ☐	Explain characteristic properties and reactions of metals, acids and bases. ☐	Apply an understanding of characteristic properties and reactions of metals, acids and bases. ☐
Overall Level of Performance ☐		

You are advised to spend 40 minutes answering the questions in this booklet.

Assessor's use only

QUESTION ONE: pH AND INDICATORS



Discuss the acidity of the THREE solutions shown on the diagram above: battery acid, rain water and ammonia solution.

Your answer should:

- describe what colour you would see when each solution is tested with universal indicator solution
- rank the solutions in order from **least** acidic to **most** acidic
- discuss why each solution has a different pH.

Solution	Universal Indicator Colour
Battery acid	
Rain water	
Ammonia solution	

QUESTION TWO: NEUTRALISATION REACTIONS

Assessor's use only

Discuss why the reactions of sulfuric acid, H_2SO_4, with sodium hydroxide, NaOH, and sodium hydrogen carbonate, $NaHCO_3$, are both considered neutralisation reactions.

Include in your answer:

- a definition of a neutralisation reaction
- any observations made during both reactions
- why **each** reaction is considered a neutralisation reaction
- any relevant balanced equations.

Equations:

QUESTION THREE: REACTION RATES

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Marble is often used in experiments to help students understand factors that affect reaction rates. Marble is made up of calcium carbonate, $CaCO_3$, which readily reacts with hydrochloric acid, HCl.

A laboratory experiment involved adding 1.00 gram of marble **chips** to 10.0 mL of hydrochloric acid in test tube A and 1.00 gram of **smaller** marble chips to 10.0 mL of the same concentration of hydrochloric acid in test tube B. The rates of the two reactions are shown on the graph below.

adapted from: http://schools.look4.net.nz/science/chemistry/patterns_of_behaviour/rates_of_reactions/

Discuss, in terms of **particles**, the effect of changing the surface area of the marble on the rate of the reaction.

Include in your answer:

- any observations you would make during this reaction
- reference to the curves on the graph
- a balanced equation.

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Balanced equation:

QUESTION FOUR: METALS AND WATER

Assessor's use only

Discuss the similarities and differences in the reactivity of sodium and magnesium with water.

Include in your answer:

- any observations made during both reactions
- an explanation of why these similarities and differences occur
- any relevant balanced equations.

Balanced equations:

QUESTION FIVE: MATERIALS FOR BODY JEWELLERY

Assessor's use only

A craftsperson uses silver metal rather than iron metal to make body jewellery.

Justify why the metal silver is more suitable for body jewellery than the metal iron.

Include in your answer:

- the relevant physical and chemical properties of silver metal
- the relevant physical and chemical properties of iron metal
- a justification as to why silver is preferable to iron for body jewellery.

Extra paper for continuation of answers if required.
Clearly number the question.

Assessor's use only

Question number