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90640

NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Level 1 Chemistry, 2005

90640 Describe properties and reactions of metals, acids and bases

Credits: Four
9.30 am Wednesday 23 November 2005

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.

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

A metal activity series, solubility rules, a table of ions and a periodic table are provided in the Resource Booklet in your Level 1 Chemistry package.

Check that this booklet has pages 2–7 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 35 minutes answering the questions in this booklet.

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QUESTION ONE: GOLD

Gold is a metal that is often used to make jewellery.

(a) Name TWO properties of gold that make it suitable for this use.

(1) _____

(2) _____

(b) Explain why the TWO properties you named in part (a) help make gold suitable for making jewellery.

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QUESTION TWO: CHEMICAL VOLCANOES

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A very popular experiment for young science students is the baking soda – vinegar volcano.

(a) Write a balanced chemical equation for the reaction between baking soda, $NaHCO_3$, and ethanoic acid, CH_3COOH.

(b) (i) Describe, with reference to the photograph above, an observation you would make.

(ii) Explain why the observation you described in part (b)(i) occurred.

QUESTION THREE: IRON AND ALUMINIUM

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A piece of iron is placed in a test tube of dilute sulfuric acid.

(a) Describe ONE observation that could be made for this reaction.

(b) Write a balanced chemical equation for this reaction.

Although aluminium is considered a more reactive metal than iron, aluminium does not appear to react more vigorously than iron with oxygen, water or dilute acids.

(c) Explain fully, why aluminium metal does not appear to be as reactive as iron metal.

(d) Use your answer to (c) to justify TWO named uses of aluminium.

QUESTION FOUR: MAGNESIUM

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The following experiment was set up to investigate the rate of the reaction of magnesium metal with hydrochloric acid.

Tube A (Mg ribbon in hydrochloric acid)

Tube B (Mg powder in hydrochloric acid)

(a) Write a balanced chemical equation for the reaction between magnesium and hydrochloric acid.

In tube A, strips of magnesium ribbon were used. In tube B, the experiment was repeated with the same mass of powdered magnesium. The volume and concentration of the acid were the same in each experiment.

(b) Which tube would have shown a faster rate of reaction?

Explain your answer by referring to the particles involved.

QUESTION FIVE: UNIVERSAL INDICATOR

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A group of students were investigating the colour of universal indicator in solutions of acid or base.

(a) Complete the following table.

Solution	pH value	Colour when universal indicator added
Nitric acid	1	
Sodium hydroxide	13	
Sodium carbonate	8	

One of the students decided to mix equal volumes of the nitric acid and the sodium hydroxide together, and then add universal indicator. Both the chemicals have the same concentration.

(b) Name the type of reaction that would occur when these two solutions were mixed.

(c) Predict what colour the universal indicator would turn the solution.

(d) Discuss fully, why you chose your answers to parts (b) and (c) above. Include a balanced chemical equation for the reaction in your answer.

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

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Question number	