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NZQA
NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

For Supervisor's use only

Level 1 Chemistry, 2007

90640 Describe properties and reactions of metals, acids and bases

Credits: Four
9.30 am Monday 19 November 2007

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 metal activity series, solubility rules, a table of ions and a periodic table are provided in 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 2–9 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			

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

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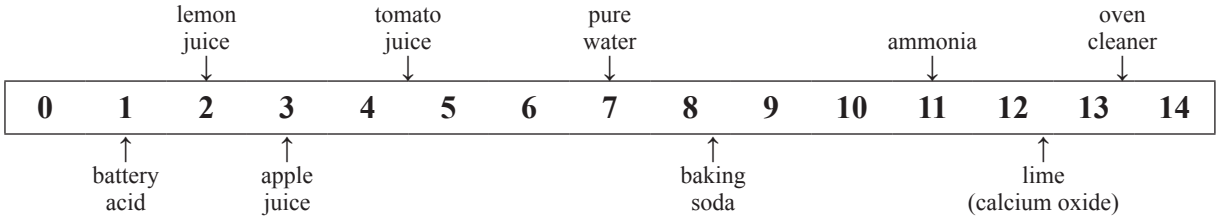
QUESTION ONE: HOUSEHOLD ACIDS AND ALKALIS

(a) Use the information on this pH scale to answer questions (i), (ii) and (iii) below.



(i) Name the **juice** from those shown above that is the least acidic.

_____

(ii) Name the substance that would turn universal indicator a green-blue colour.

_____

(iii) State the colour universal indicator would turn in the battery acid (sulfuric acid).

_____

(b) Explain why the pH of hydrochloric acid changes when 10 mL of a solution of sodium hydroxide is added to 10 mL of the solution of hydrochloric acid.
Assume both solutions have the same concentration.

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QUESTION TWO: REACTIONS IN THE LABORATORY

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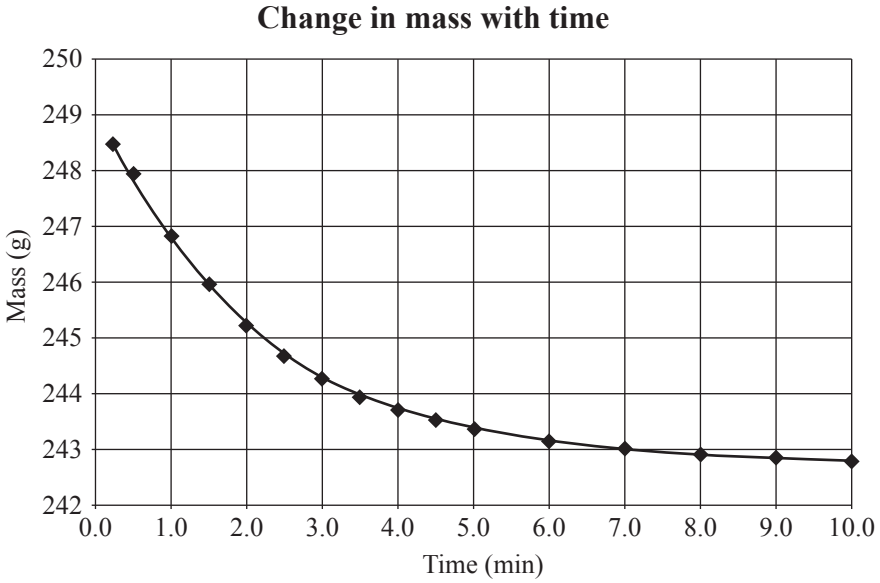
Calcium carbonate and hydrochloric acid react together in a conical flask. The mass of the flask contents is measured over time and recorded in the graph shown below.



(a) Describe one expected observation for this reaction.

(b) State the type of reaction that occurs between calcium carbonate and hydrochloric acid.

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

(d) Explain why the graph shows a **decrease** in mass over time.

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(e) This reaction is useful for investigating rates of reaction.

(i) State ONE way in which you could increase the rate of the reaction between calcium carbonate and dilute hydrochloric acid.

(ii) Discuss, in terms of the particles involved, why the reaction rate increases when this change is made.

QUESTION THREE: EXCITING SODIUM DEMONSTRATION!

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A popular demonstration in school science laboratories is the reaction of sodium in water.

(a) Write a balanced chemical equation for the reaction of sodium in water.

A teacher carrying out the demonstration added universal indicator to the water **before** putting sodium into the tank. This made the water turn a green colour.

(b) What colour could the water be after the reaction had finished.

(c) Explain why the water turned this colour.

(d) Sodium is not a metal that is usually used to make everyday objects, whereas aluminium is. For example, aluminium is used to make many objects from aeroplanes to soft drink cans.

Discuss reasons for the difference in the uses of sodium and aluminium. Refer to the chemical **and** physical properties of **both** sodium and aluminium in your answer.

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QUESTION FOUR: USEFUL METALS

(a) Silver is a metal that is popular in jewellery making. It has been used for thousands of years because it is easily extracted from the Earth.

Explain why silver is extracted easily from the Earth.

(b) Calcium is an important mineral in our diet. Calcium metal reacts vigorously with water and acid.

Discuss how we are able to safely obtain the calcium we require in our diet.

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

Assessor's use only

Question number	

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