

90944



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

1

SUPERVISOR'S USE ONLY

Level 1 Science, 2013

90944 Demonstrate understanding of aspects of acids and bases

9.30 am Monday 18 November 2013

Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of aspects of acids and bases.	Demonstrate in-depth understanding of aspects of acids and bases.	Demonstrate comprehensive understanding of aspects of acids and bases.

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 attempt ALL the questions in this booklet.

Pull out Resource Booklet 90944R from the centre of 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.

Check that this booklet has pages 2–12 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.

TOTAL

ASSESSOR'S USE ONLY

QUESTION TWO: ACIDS AND BASES

Potassium hydroxide (KOH) was added to a solution of sulfuric acid containing universal indicator until no further change was observed.

The experiment was repeated, but a piece of red litmus paper and a piece of blue litmus paper were each dipped into the solution after each 5 mL of potassium hydroxide was added.

The results of the experiments are shown in the table below.

Volume of KOH added (mL)	Colour of solution with universal indicator	Colour of red litmus paper	Colour of blue litmus paper
0	red	stays red	turns red
5	orange-yellow	stays red	turns red
10	green	stays red	stays blue
15	blue	turns blue	stays blue
20	purple	turns blue	stays blue

- (a) Write a word equation AND a balanced symbol equation for the reaction between sulfuric acid and potassium hydroxide.

Word equation:

Balanced symbol equation:

QUESTION THREE: REACTION RATES

The table below shows the size of marble chips (calcium carbonate) used in a chemical investigation into factors affecting rate of reaction.

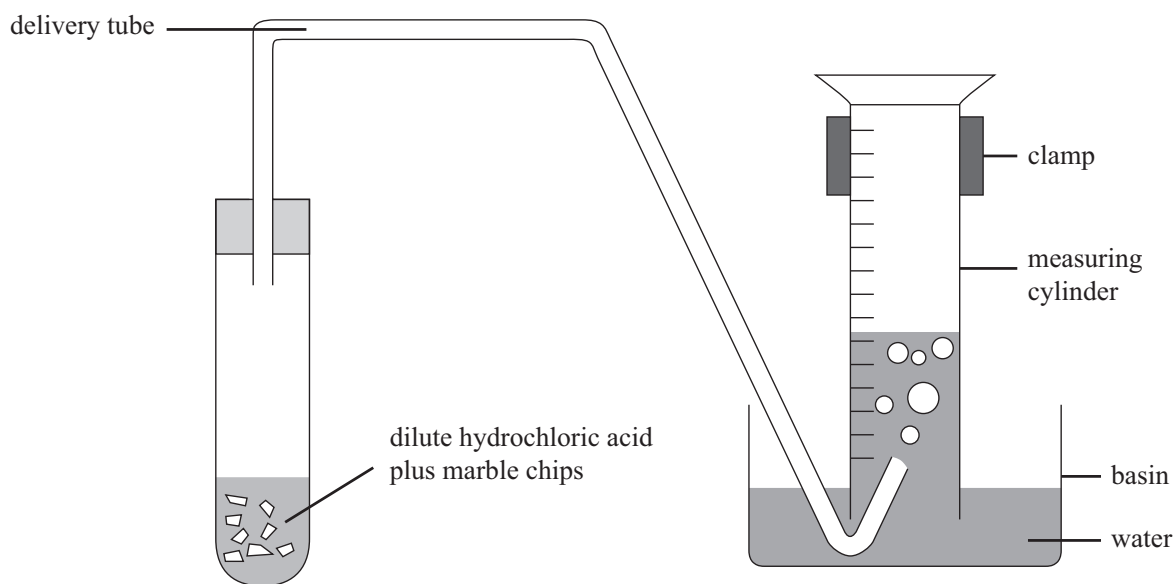
Experiment	Size of marble chips (calcium carbonate)
Experiment 1	small marble chips
Experiment 2	large marble chips

Experiment 1: 10 mL of hydrochloric acid was added to a boiling tube containing small marble chips.

Experiment 2: 10 mL of hydrochloric acid of the same concentration as in Experiment 1 was added to another boiling tube containing large marble chips.

In both experiments the total mass of the marble chips was the same.

The boiling tubes were connected to an inverted measuring cylinder in a basin of water, as shown in the diagram below.



QUESTION FOUR: INVESTIGATING REACTIONS**Experiment One**

A student carried out an experiment in the lab using the following method:

Step one: Universal indicator was added to a solution of hydrochloric acid in a beaker.

Step two: Calcium hydroxide was added slowly until the solution turned green.

Step three: The contents of the beaker were then poured into an evaporating dish and left in a sunny place for several days.

- (a) Write a scientific aim for this experiment.

- (b) Explain the purpose of each step in the method and how the equipment and chemicals used achieve that purpose.

Step one

Purpose:

Explanation:

Step two

Purpose:

Explanation:

Step three

Purpose:

Explanation:

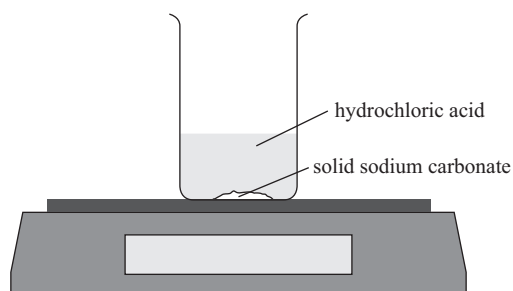
Experiment Two

In another experiment the following method was used:

Step one: A beaker was placed on a balance as shown in the diagram below.

Step two: Hydrochloric acid was added to solid sodium carbonate in the beaker.

Step three: The mass was recorded over time.



- (c) Write a word equation AND a balanced symbol equation for the reaction between hydrochloric acid and sodium carbonate.

Word equation:

Balanced symbol equation:

(d) Explain why the mass of the beaker and contents would decrease over time.

In your answer you should:

- state any other observations that would be made as hydrochloric acid reacts with the sodium carbonate
- explain how the products formed by the reaction lead to the decrease in mass of the beaker and contents.

