

90934



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

1

SUPERVISOR'S USE ONLY

Level 1 Chemistry, 2012

90934 Demonstrate understanding of aspects of chemical reactions

9.30 am Thursday 22 November 2012

Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of aspects of chemical reactions.	Demonstrate in-depth understanding of aspects of chemical reactions.	Demonstrate comprehensive understanding of aspects of chemical reactions.

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.

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 2–9 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.

TOTAL

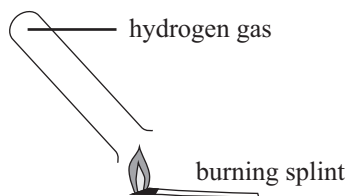
ASSESSOR'S USE ONLY

You are advised to spend 60 minutes answering the questions in this booklet.

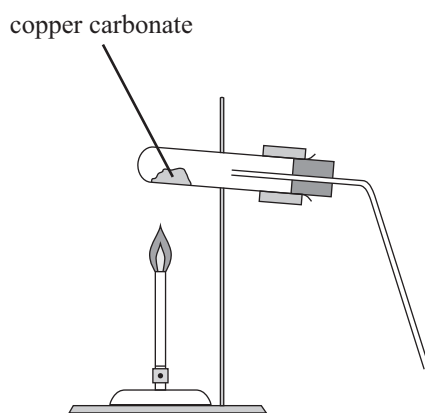
QUESTION ONE: HEATING SUBSTANCES USING A BUNSEN BURNER

Two reactions are carried out in the laboratory.

In **Reaction 1**, a teacher demonstrates a reaction between hydrogen gas and oxygen in the air.



In **Reaction 2**, a boiling tube with copper carbonate powder is heated over a Bunsen burner flame.



Analyse these reactions by completing BOTH (a) AND (b).

(a) Reaction 1

- (i) Identify the type of reaction that occurs: _____

Give a reason for your choice: _____

- (ii) Describe any observations that would be made of this reaction, and link these to the substances involved in the reaction.

Outline a test that could be used to confirm the presence of the product formed.

- (iii) Write a balanced symbol equation for this reaction.

(b) **Reaction 2**

- (i) Identify the type of reaction that occurs: _____

Give a reason for your choice: _____

- (ii) Describe any observations that would be made of this reaction, and link these to the substances involved in the reaction.

Outline a test that could be used to confirm the presence of ONE of the products formed.

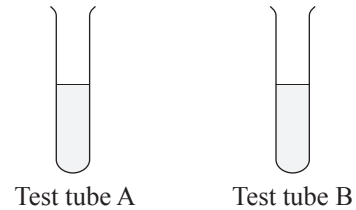
- (iii) Write a balanced symbol equation for this reaction.

QUESTION TWO: HYDROGEN PEROXIDE

Two test tubes were set up in a school laboratory. Both test tubes were half-filled with identical solutions of hydrogen peroxide (H_2O_2).

It was observed that a few small bubbles of a colourless gas formed on the sides of each test tube.

Some solid manganese dioxide (MnO_2) was added to test tube B.



- (a) Describe the observations you would make after manganese dioxide (MnO_2) was added to test tube B.

- (b) Explain the chemistry of this reaction.

In your answer you should:

- identify the type of reaction that happens in test tube B
- justify your choice of the type of reaction
- link the observations made for the reaction in test tube B to the substances involved in the reaction
- write a balanced symbol equation for the reaction involving hydrogen peroxide.

Balanced symbol equation:

QUESTION THREE: METALS

An experiment in the laboratory involves placing an iron nail in copper sulfate (CuSO_4) solution and a copper nail in iron(II) sulfate (FeSO_4) solution.

Both nails are cleaned with sandpaper, placed in each solution, and the test tubes are stoppered and left overnight.



- (a) Describe any observations that would be made the next day.

- (b) (i) Identify the type of reaction that occurs and give a reason for your choice.
You may refer to the activity series provided in the resource booklet.

- (ii) Write a balanced **ionic** equation for ONE reaction that occurs.

- (c) Cleaned pieces of the metals iron (Fe), lead (Pb) and tin (Sn) were placed in solutions of iron(II) sulfate (FeSO_4), lead nitrate ($\text{Pb}(\text{NO}_3)_2$) and tin sulfate (SnSO_4), as shown in the table below:

Metals	Solutions		
	iron(II) sulfate FeSO_4	lead nitrate $\text{Pb}(\text{NO}_3)_2$	tin sulfate SnSO_4
iron (Fe)	–	✓	✓
lead (Pb)	✗	–	✗
tin (Sn)	✗	✓	–

– not tested ✓ a reaction occurred ✗ no reaction was observed

Use the information provided in the table to place tin (Sn) in the activity series.

Explain your answer.

You may refer to the activity series provided in the resource booklet.

QUESTION FOUR: SWIMMING POOL WATER

The water in a swimming pool contains chloride ions as a result of adding chlorine to help keep the water safe to swim in.

Outline how you could test that there are chloride ions in the swimming pool. You may use the solubility rules provided in the resource booklet.

In your answer you should:

- describe what you would do to test for chloride ions
- identify the type of reaction and explain how this reaction helps identify the chloride ions
- describe all observations and link these to the chemical species involved
- write a balanced **ionic** equation for the reaction.

Balanced **ionic** equation:

90934