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NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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SUPERVISOR'S USE ONLY

Level 1 Chemistry, 2013

90934 Demonstrate understanding of aspects of chemical reactions

9.30 am Thursday 21 November 2013

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 2–11 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.

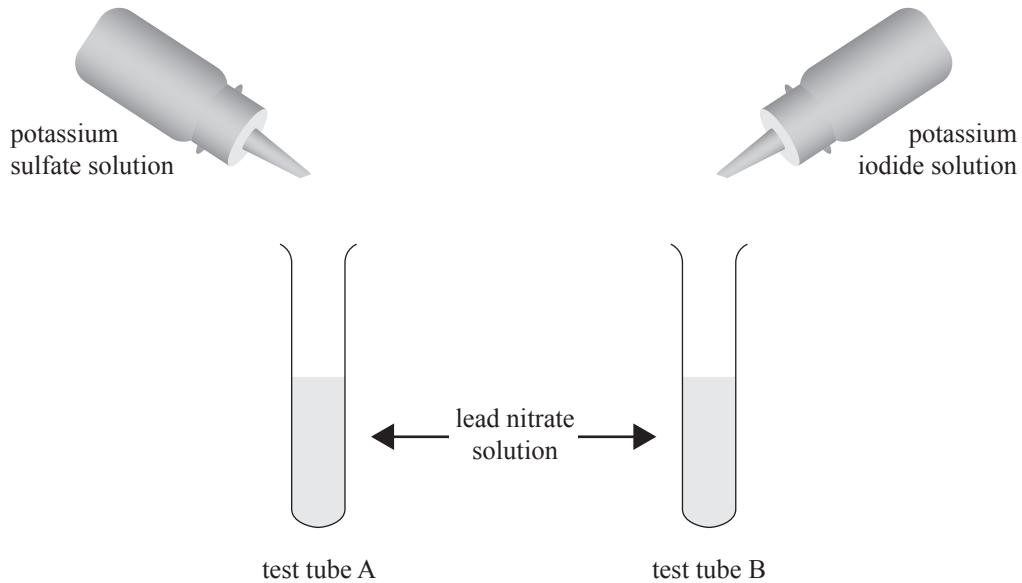
TOTAL

ASSESSOR'S USE ONLY

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

QUESTION ONE: MIXING SOLUTIONS

An experiment in a school laboratory involves adding colourless solutions together as shown in the diagram below.



Analyse the reactions that occur in test tube A and test tube B.

In your answer:

- record any observations you would make, and link these observations to the products formed in each reaction
- identify the type of reaction occurring in test tube A and test tube B, and justify your choices
- write a balanced ionic equation for each reaction.

You may refer to the solubility rules in the resource booklet.

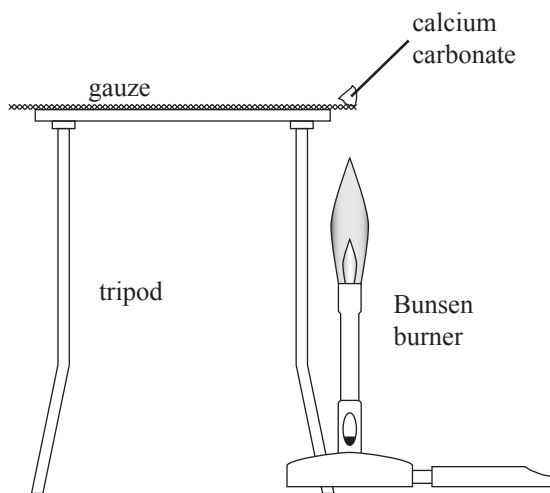
Balanced ionic equation for the reaction in test tube A:

Balanced ionic equation for the reaction in test tube B:

QUESTION TWO: CALCIUM COMPOUNDS

Two calcium compounds were heated over a Bunsen burner in a school laboratory. In the first experiment, shown in the diagram below, **calcium carbonate** was heated.

In the second experiment, **calcium hydroxide** was heated.



Compare and contrast the reaction that occurs when solid calcium carbonate is strongly heated, with the reaction that occurs when solid calcium hydroxide is strongly heated.

In your answer:

- identify the type of reaction that occurs when each substance is strongly heated, and justify your choice
- describe any observations that would be made in each reaction, and link these observations to the reactants and products involved
- explain how the gas formed in **each** reaction could be identified
- write a balanced symbol equation for **each** reaction.

Balanced symbol equation for the strong heating of calcium carbonate:

Balanced symbol equation for the strong heating of calcium hydroxide:

QUESTION THREE: REACTIONS OF CHLORINE GAS

A teacher showed her class two video clips of chemical reactions.

One was of a reaction between sodium metal and chlorine gas. The second was of a reaction between solid sulfur and chlorine gas.

- (a) When the sodium metal reacted with chlorine gas, the video clip showed a shiny grey solid reacting with a yellow-green gas. The reaction resulted in the formation of white crystals.

Link these observations to the reactants and products involved in this reaction.

- (b) (i) Name the product that will be formed when solid sulfur reacts with chlorine gas.

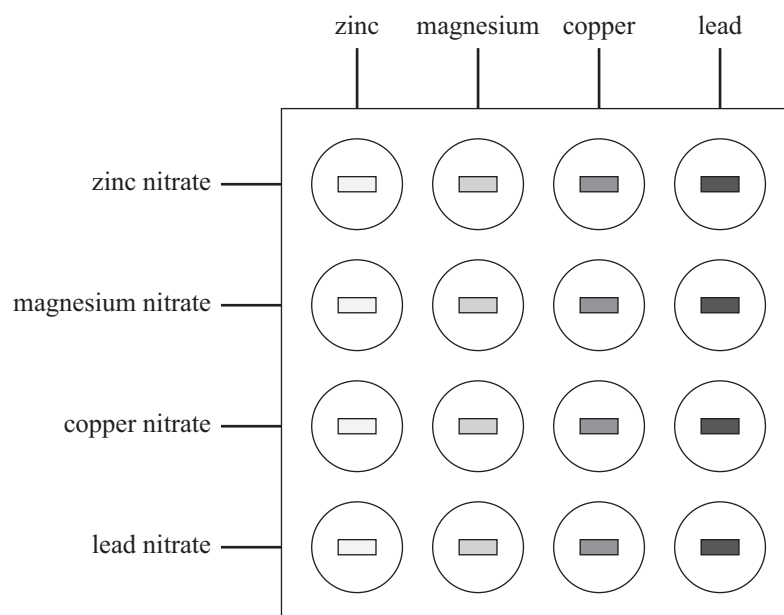
- (ii) Identify the type of reaction that is occurring, and give a reason for your choice.

- (c) (i) Write a balanced symbol equation for the reaction between sodium and chlorine.

- (ii) Write a balanced symbol equation for the reaction between sulfur and chlorine.

QUESTION FOUR: REACTIONS OF METALS IN NITRATE SOLUTIONS

A spotting tile was set up, as shown in the diagram below, to investigate the reaction of small pieces of cleaned metals with a small volume of different metal nitrate solutions.



- (a) Complete the table below to identify which reactions will occur. The first two lines have been completed for you.

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

✓ = reaction occurs

✗ = no reaction

Solutions	Metals			
	Zinc	Magnesium	Copper	Lead
zinc nitrate	✗	✓	✗	✗
magnesium nitrate	✗	✗	✗	✗
copper nitrate				
lead nitrate				

- (b) Identify the type of reaction that is occurring on the spotting tile, and justify your choice by referring to ONE specific example from the reactions on the previous page.

In your answer:

- identify the reaction you have selected
- describe any observations that would be made in the selected reaction, and link your observations to the reactants and products involved in the reaction
- identify the type of reaction occurring, and justify your choice
- write a balanced symbol equation for your reaction.

Balanced symbol equation:

**Question Four continues
on the following page.**

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