

90933



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

1

SUPERVISOR'S USE ONLY

Level 1 Chemistry, 2017

90933 Demonstrate understanding of aspects of selected elements

9.30 a.m. Tuesday 14 November 2017
Credits: Four

Achievement	Achievement with Merit	Achievement with Excellence
Demonstrate understanding of aspects of selected elements.	Demonstrate in-depth understanding of aspects of selected elements.	Demonstrate comprehensive understanding of aspects of selected elements.

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 room for any answer, use the extra space 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

QUESTION ONE

- (a) Draw the electron arrangement for each of the atoms aluminium and sulfur in the boxes below. You may refer to the periodic table in the resource booklet.

Aluminium atom	Sulfur atom

- (b) Aluminium ions and sulfide ions have different charges.

Explain why this occurs.

In your answer, you should:

- include the electron arrangement for both ions
- relate the charges of the ions to the position of the atoms on the periodic table.

Aluminium ion	Sulfide ion

(c) Calcium and magnesium are both Group 2 metals.

Compare and contrast the chemical reactions of these two metals when reacted separately with water and dilute hydrochloric acid.

In your answer, you should include:

- observations that would be made when each metal reacts with water
- observations that would be made when each metal reacts with dilute hydrochloric acid
- balanced symbol equations for **calcium** reacting with water and dilute hydrochloric acid.

Balanced symbol equation for calcium reacting with water:

Balanced symbol equation for calcium reacting with dilute hydrochloric acid:

There is more space for your answer to this question on the following page.

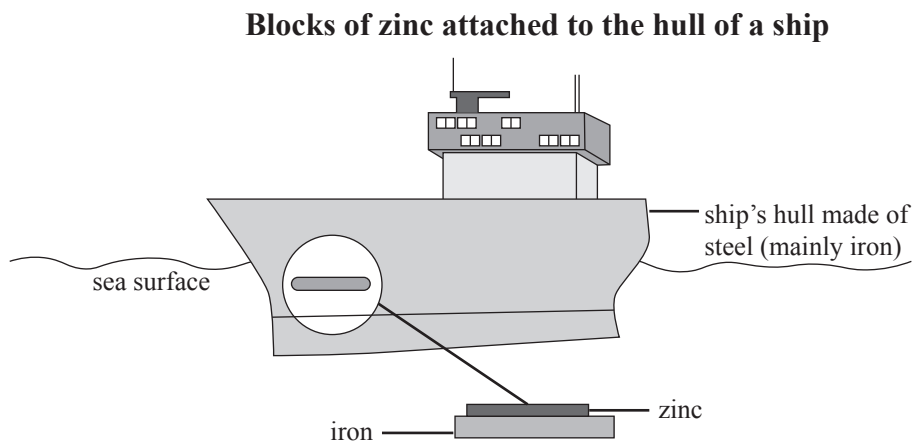
ASSESSOR'S
USE ONLY

--

QUESTION TWO

- (a) Give TWO physical properties for each of the elements sulfur and lead.

- (b) Zinc blocks are sometimes added to the hulls of steel (iron) ships, as shown in the diagram below.



Adapted from: http://demo.shuledirect.co.tz/notes/view_notes/y02Lp9A41tPKV-TIdE49kA/VFVU1c54ULfgMQQgLpxqZQ/AWyJ1HpuURzJiH-csFGUUA

Explain why these blocks are made from zinc and why they are used on the hull of a ship.
You may refer to the activity series in the resource booklet.

(c) **Zamak** is a family of alloys with a base metal of zinc, and with alloying elements of aluminium, magnesium, and copper.

(i) Explain why alloys are sometimes used instead of pure metals.

(ii) Zamak can be used to make jewellery.

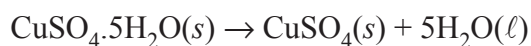
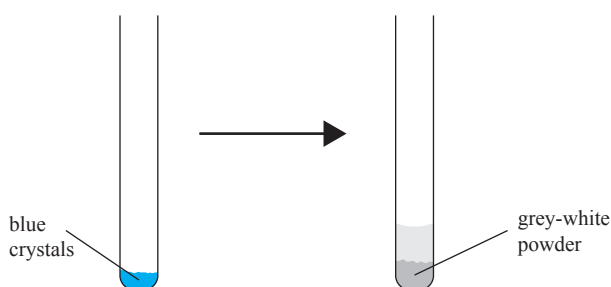
Elaborate on the advantages of adding the elements aluminium, magnesium, and copper to zinc to make the alloy zamak.

--

QUESTION THREE

- (a) Describe TWO properties of ammonia.

- (b) When concentrated sulfuric acid is added to a small amount of copper(II) sulfate, the colour changes from blue to grey-white.



Explain the role of the concentrated sulfuric acid in this reaction, linking the observations to the species involved.

You should refer to the diagrams and the equation given above.

**Extra paper if required.
Write the question number(s) if applicable.**

QUESTION
NUMBER

ASSESSOR'S
USE ONLY

90933