

90933



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

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SUPERVISOR'S USE ONLY

Level 1 Chemistry, 2011

90933 Demonstrate understanding of aspects of selected elements

9.30 am Tuesday 22 November 2011
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.

Check that this booklet has pages 2–8 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: PERIODIC TRENDS

(a) Using the Periodic Table in the Resource Booklet, give the electron arrangements of sodium and nitrogen.

(i) Sodium: _____

(ii) Nitrogen: _____

(iii) Using these electron arrangements, explain how sodium and nitrogen differ in their ability to form ions.

(b) Compare and contrast the electron arrangements of the Group 1 metals, **sodium** and **lithium**.

(c) Lithium and sodium are both Group 1 metals.

Analyse the type of reaction that these metals have with water.

In your answer include:

- observations of lithium and sodium reacting with water
- a word and balanced symbol equation of ONE of these reactions
- a comparison of the reactivity of lithium and sodium, with water.

Word equation

Balanced symbol equation

QUESTION THREE: SULFUR AND SULFURIC ACID

Sulfur in its pure form reacts with oxygen.

- (a) Describe an observation made of the product formed in the reaction of sulfur with oxygen.

- (b) Write a balanced equation for this reaction.

- (c) (i) Complete the following table for the reactions of sulfuric acid, H_2SO_4 , with a cleaned piece of lead metal, and with a cleaned piece of zinc metal.

You may refer to the Activity series in the Resource Booklet.

Metal	Observations of the reaction with sulfuric acid	Balanced equation
lead		
zinc		

- (ii) Pure water is a poor conductor of electricity, but a solution of sulfuric acid in water is a good electrical conductor.

Explain why the sulfuric acid solution conducts electricity so well.

Include a balanced equation in your answer.

Balanced equation

QUESTION FOUR: USES OF METALS

	Electrical conductivity	Density g/cm ³	Chemical reactivity	Melting point	Ductility
copper	very high	9.0	low	1 100°C	good
aluminium	high	2.7	low	660°C	excellent

Although copper is widely used throughout households for electrical wiring, aluminium is the metal used for long-distance power lines.

Evaluate the advantages and disadvantages of using copper and aluminium in these roles.

Refer to BOTH physical and chemical properties in your answer.

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<http://physics503.one-school.net/2008/06/transmission-of-electricity.html>

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

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