SUPERVISOR'S USE ONLY

90933



# Level 1 Chemistry, 2013

# 90933 Demonstrate understanding of aspects of selected elements

9.30 am Thursday 21 November 2013 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 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

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

#### ASSESSOR'S USE ONLY

# **QUESTION ONE: PERIODIC TRENDS**

Calcium, chlorine, fluorine and magnesium are all elements of the periodic table.

he number of valence electrons for bromine and iodine, and give an explanation force.
how the formation of the calcium ion differs from the formation of the chloride io
how the formation of the calcium ion differs from the formation of the chloride ions to the location of the elements on the periodic table.

Cal	cium and magnesium are Group 2 metals.		
Analyse the reactions these metals have with cold water.  In your answer include:			
•	any links these observations would have to the products formed in each reaction		
•	an explanation of any similarities and differences in the reactivity of these two metals in water		
•	a balanced symbol equation for ONE of these reactions.		

## QUESTION TWO: ALLOTROPES OF OXYGEN

ASSESSOR'S
USE ONLY

Desc	cribe what an allotrope is.
	ne is formed when an oxygen molecule breaks down into two atoms of oxygen. These gen atoms then react with oxygen molecules to form ozone.
Writ	te the TWO balanced symbol equations for the reactions that form ozone.
Equ	uation 1:
Eq	uation 2:
Ozo	ne can be used to disinfect water.
Eval	luate the use of ozone for disinfecting water.
In yo	our answer include explanations of:
•	how ozone acts to disinfect water
•	two advantages of using ozone
•	one disadvantage of using ozone.

		ASSESSO USE ONL

#### **QUESTION THREE: METALS**

Body piercing jewellery can be made from an alloy called 'surgical steel'.

Surgical steel is made from steel (iron and carbon) with nickel, molybdenum and chromium.

Each of the metals used to make surgical steel, shown in the table below, contributes to its final properties. For copyright reasons, this resource cannot be reproduced here.

http://elanora.co.nz/catalog/bodyjewellery-horseshoes-cat-152\_158.html

Substance	Properties
Steel (iron/carbon)	Corrosion resistant, poor conductor of electricity
Nickel	Corrosion resistant, high lustre and polish, hard
Molybdenum	Very high melting point, corrosion resistant, malleable but high tensile strength
Chromium	High lustre, corrosion resistant, hard, malleable, odourless, tasteless

Evaluate why each of the metals listed in the table above is used to make surgical steel alloy suitable for use as body piercing jewellery.

In your answer link ONE physical and ONE chemical property of <b>each</b> of these metals to its fina use as body piercing jewellery.

ASSESSOR'S
USE ONLY
1

## **QUESTION FOUR: SULFURIC ACID**

ASSESSOR'S
USE ONLY

Describe the observations you would make of this reaction.
Compare and contrast the reaction of zinc in dilute sulfuric acid solution with the reaction of
iron in dilute sulfuric acid solution.
In your answer include the relevant balanced symbol equations.  You may refer to the activity series in the resource booklet.
Tou may refer to the activity series in the resource bookiet.

	$-PbO_2 + 2H_2SO_4 \rightarrow 2PbSO_4 + 2H_2O$
	ate, $PbSO_4$ , forms as the battery discharges.
	For copyright reasons, this resource cannot be reproduced here.
n your an	Adapted from: www.sasol.com/learners/html/quizzes/Batteries/Discharge_overview.htm  ne role of the sulfuric acid solution in the reactions of the lead-acid battery.  swer include:  properties of sulfuric acid solution that make it a good conductor of electricity  the concentration of sulfuric acid changes while the battery is discharging AND
Whil	le it is charging.

the next page to complete your answer, if required.

ASSESSO USE ON
USE ON

Extra paper if required.	ASSESSOR USE ONLY
Write the question number(s) if applicable.	USE ONLY
	Multa the more than a market and the second section is a self-