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Level 1 Chemistry, 2018

90933 Demonstrate understanding of aspects of selected elements

2.00 p.m. Thursday 15 November 2018
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 2–8 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

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QUESTION ONE

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(a) Why do magnesium ions and sulfide ions have different charges?

In your answer, you should include the electron arrangement for both ions, and relate the charges of the ions to the position of the atoms on the periodic table.

(b) Sodium metal will react with cold water, while magnesium metal will react with steam.

Give observations for each reaction linked to the products of each reaction.

(c) Magnesium and sulfur both react with oxygen.

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Compare and contrast the reaction of these elements with oxygen.

In your answer, you should:

- refer to any conditions required
- give any observations that would be seen during these reactions linked to the species involved
- write balanced symbol equations for the reactions.

Balanced symbol equations:

QUESTION TWO

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(a) Gold is a soft, unreactive metal, which can be used in dentistry. Gold is more useful in dentistry when it is alloyed with other metals, such as silver, copper, or other suitable metals.

www.dansodentallab.com/labs/wp-content/uploads/2014/04/FMC-YGHighNoble.png

(i) What is an alloy?

(ii) Elaborate on possible reasons that silver, copper, or other suitable metals are added to gold.

In your answer, you should refer to their physical and chemical properties where appropriate.

(b) Aluminium is used to make many different things including drink cans, aeroplane parts, and electrical transmission wires.

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www.pixelsquid.com/png/aluminum

www.stuff.co.nz/travel/5812977/Dreamliner-flies-towards-Auckland

www.radionz.co.nz/news/business/320367/national-grid-pricing-change-ahead

Explain why aluminium is used to make these things rather than iron.

In your answer, you should refer to both the physical and the chemical properties of aluminium and iron.

QUESTION THREE

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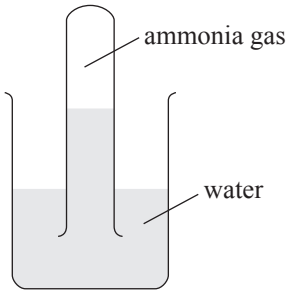
(a) Give two uses of nitrogen.

(b) A test tube of ammonia gas is placed upside down in a beaker of cold water, as shown in the diagram shown below. The water is seen to move up the test tube.



(i) Explain why water moves up the test tube.

(ii) A piece of damp litmus paper is used to test the ammonia gas in the test tube.

Describe an observation that would be made, and justify your reasoning for this observation by linking it to a chemical property of ammonia gas.

Support your answer with a balanced symbol equation.

Balanced symbol equation:

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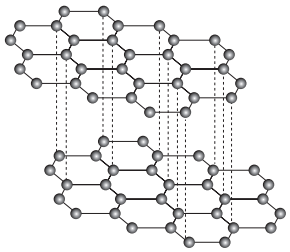
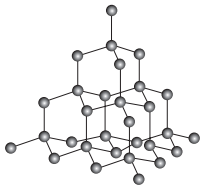
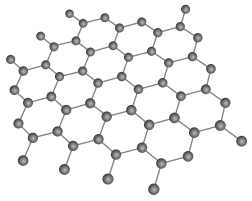
(c) Three allotropes of carbon are diamond, graphite, and graphene. Each form of carbon has a different structure, with different properties and uses.

(i) In the boxes below, identify each allotrope.

(ii) Graphene and graphite can conduct electricity, but diamond cannot.

Explain why graphene and graphite can both conduct electricity, but diamond cannot.

In your answer, you should link the structure and bonding of the three allotropes to electrical conductivity.

(iii) Explain why graphene might be more useful for making wires than graphite.

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

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