



Centre Number

71

Candidate Number

General Certificate of Secondary Education
2009–2010

Science: Double Award (Modular)

Using Materials and Understanding Reactions
End of Module Test
Foundation Tier

B

[GDB01]



THURSDAY 20 MAY 2010, MORNING

TIME

45 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

Write your answers in the spaces provided in this question paper.
Answer **all thirteen** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 50.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

A Data Leaflet, which includes a Periodic Table of the elements, is provided for your use.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	

Total Marks	

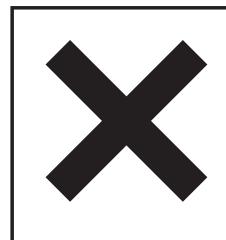
- 1 Sulphuric acid is a **corrosive** liquid.

Examiner Only	
Marks	Remark

This bottle of sulphuric acid should have a hazard symbol on it.



- (a) Circle the hazard symbol below which should be placed on the bottle of sulphuric acid.



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Hazard symbols are used to warn people about the dangers of a substance.

- (b) Give two **other** reasons why a hazard symbol should be placed on the container of sulphuric acid.

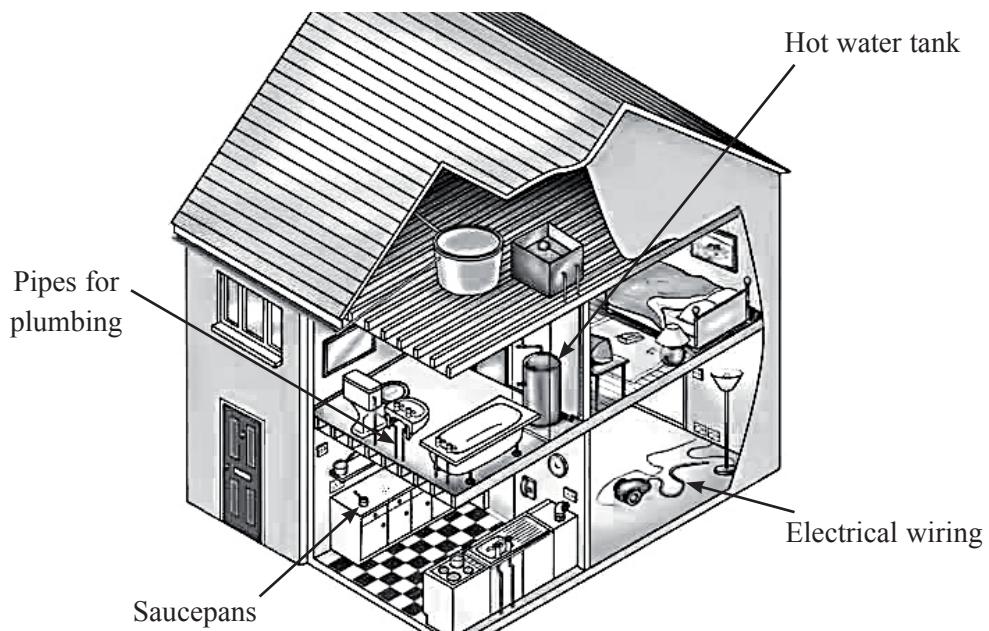
Reason 1 _____

Reason 2 _____

_____ [2]

- 2 Copper metal is used in many different ways in our homes. The picture below shows some of the uses of copper in the home.

Examiner Only	
Marks	Remark



© Copper Development Association

Using the diagram as a guide, give four reasons why copper has so many different uses.

Reason 1 _____

Reason 2 _____

Reason 3 _____

Reason 4 _____

[4]

- 3 Cobalt chloride crystals contain water of crystallisation and are pink in colour. When heated, the crystals turn to a blue powder. When dissolved in water the solution is pink.

Examiner Only	
Marks	Remark

- (a) What colour is **hydrated** cobalt chloride?

_____ [1]

- (b) Name the **solvent** in the solution of cobalt chloride.

_____ [1]

- (c) What word describes a solid which **will not** dissolve in water?

Circle the correct answer.

soluble

insoluble

saturated

[1]

- 4 Use your Data Leaflet to help you answer this question.

Circle the correct answer in each part.

- (a) The chemical symbol for potassium is:

K

Po

P

[1]

- (b) The formula for the sulphate ion is:

SO₃⁻

SO₄²⁻

S²⁻

[1]

- (c) Cu is the chemical symbol for:

calcium

copper

carbon

[1]

- (d) The Periodic Table is a list of all the known:

elements

compounds

solids

[1]

- 5 Oxygen gas is obtained from air by a number of steps.

Examiner Only	
Marks	Remark

Step 1: Carbon dioxide is removed from the air.

Step 2: The remaining air is cooled to form a liquid.

Step 3: The liquid is carefully heated.

Step 4: The different gases in air boil at different temperatures and are collected separately. Oxygen is separated from the other gases.

- (a) In which step, 1, 2, 3, or 4, does **condensation** take place?

_____ [1]

- (b) In the box below draw the arrangement of the particles of oxygen in oxygen gas.



○ = one oxygen particle

[1]

- (c) If carbon dioxide is cooled it forms a solid, known as “dry ice”.

When “dry ice” is heated it turns into a gas.

What word describes the change of state from solid to gas?

_____ [1]

- (d) Explain why carbon dioxide is a **compound**.

[2]

- 6 This question is all about hard water. Place a tick (**✓**) in the box beside each correct answer.

Examiner Only	
Marks	Remark

- (a) Hard water is water which will not easily form a lather with:

detergent

soap

bleach

[1]

- (b) Hard water causes hot water pipes:

to burst

to fur up

to rust

[1]

- (c) Hard water may be softened by using:

an acid

an alkali

washing soda

[1]

- (d) Which one of the following is **not** an advantage of hard water?

Good for bones and teeth

May prevent heart disease

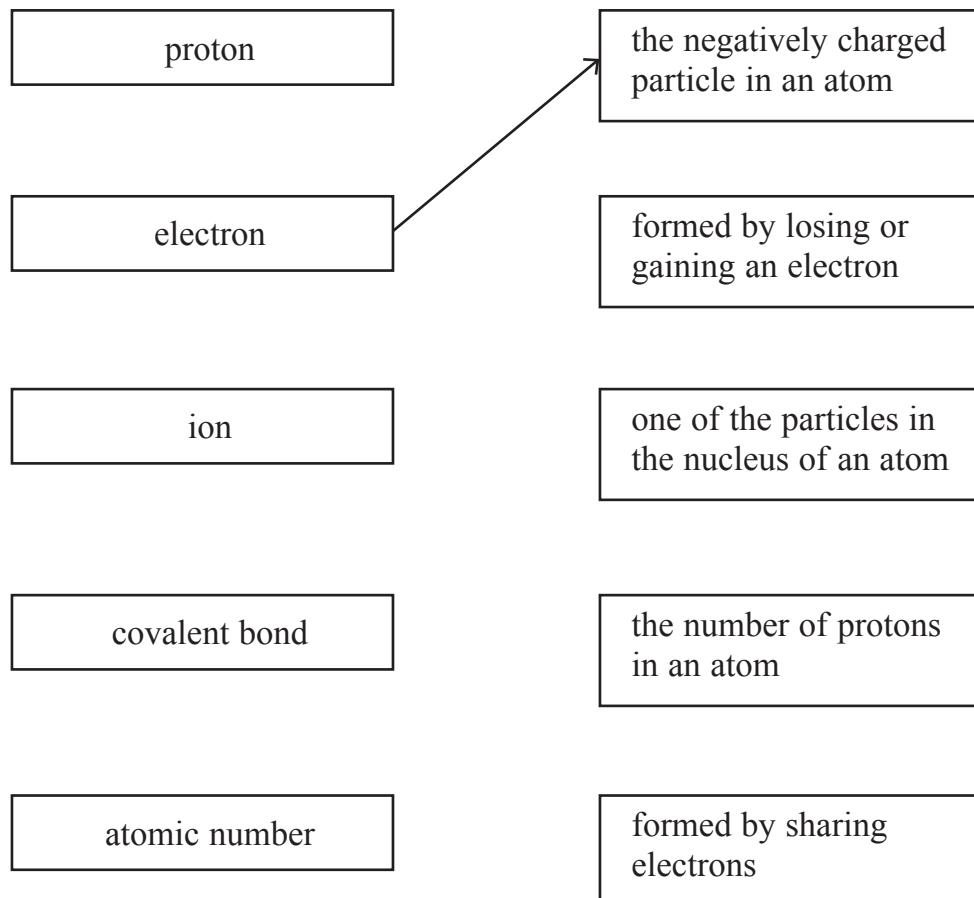
May prevent kidney failure

[1]

- 7 Each of the terms in the first list below can be matched with one of the descriptions in the second list.

Draw lines to match each term to the correct description. One has been done for you.

Examiner Only	
Marks	Remark

Term**Description**

[4]

8 This question is about aluminium.

- (a) Complete the table below which gives the number of protons, neutrons and electrons present in an aluminium atom, $^{27}_{13}\text{Al}$.

$^{27}_{13}\text{Al}$	
Number of protons	
Number of neutrons	
Number of electrons	

[3]

- (b) What is the electronic structure of the aluminium atom?

_____ [1]

- 9 Oxygen reacts with both metals and non-metals to form oxides. These oxides can be classified as acidic, basic or neutral because of the way they react.

- (a) Use the words **acidic**, **basic** or **neutral** to complete the table below. One has been done for you.

Compound	acidic, basic or neutral
Sodium oxide	basic
Hydrogen oxide (water)	
Carbon dioxide	
Magnesium oxide	

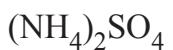
[3]

- (b) What name is given to basic oxides which can dissolve in water?

_____ [1]

Examiner Only	
Marks	Remark

10 Ammonium sulphate has the chemical formula



Examiner Only	
Marks	Remark

Use this information to answer the following questions.
You may find your Data Leaflet helpful.

- (a)** How many different elements are present in a molecule of ammonium sulphate?

_____ [1]

- (b)** How many hydrogen atoms are present in a molecule of ammonium sulphate?

_____ [1]

- (c)** What is the charge on the ammonium ion?

_____ [1]

- (d)** Write the formula for ammonium carbonate.

_____ [1]

- 11** Calcium is a metallic element which combines with oxygen to form the compound calcium oxide. You may find your Data Leaflet helpful in this question.

Examiner Only	
Marks	Remark

- (a) Draw a diagram to show **all** the electrons in a calcium atom.

[1]

- (b)** Draw a diagram to show all the electrons in an oxygen atom.

[1]

- (c) Explain how calcium and oxygen atoms join together to form calcium oxide.

[2]

[2]

- (d) What kind of force holds the particles together in calcium oxide?

[1]

- 12 The table below shows the solubility of different gases in water at different temperatures.

			Examiner Only		
			Marks	Remark	
Gas	Solubility/100 g water at		0 °C	20 °C	40 °C

Oxygen	0.07	0.04	0.03
Nitrogen	0.03	0.02	0.01
Carbon dioxide	0.34	0.17	0.10

- (a) Which of the three gases is the **least** soluble in water at 20 °C?

_____ [1]

- (b) Complete the sentence below.

The solubility of gases _____ as the temperature increases. [1]

- (c) Fizzy drinks contain dissolved carbon dioxide.

If you want the drink to stay fizzy you should keep it?

Tick (✓) the correct box.

in the fridge

at room temperature

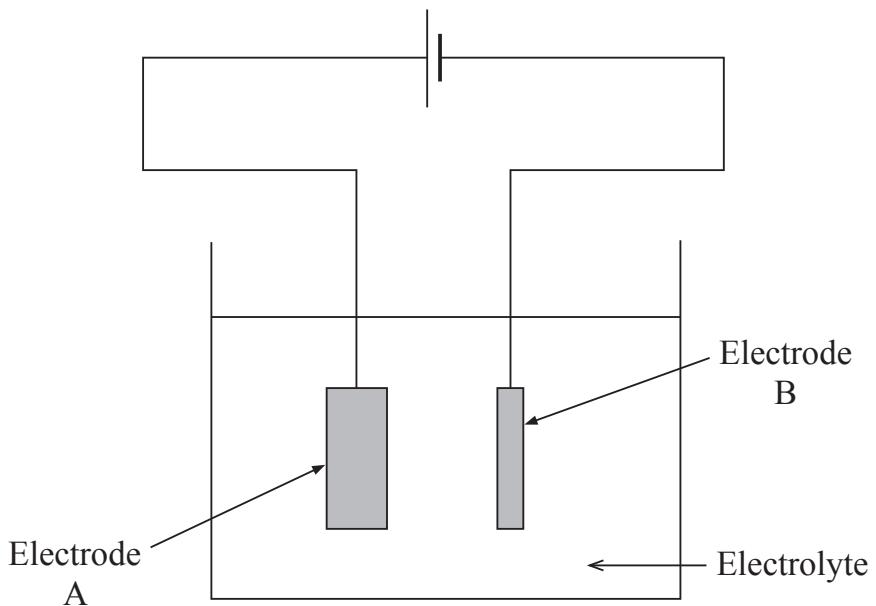
in a warmer room

it doesn't matter where it is kept

[1]

13 Copper can be purified by the process of electrolysis.

Examiner Only	
Marks	Remark



Circle the correct answer in each part below.

(a) Electrode B is made from:

pure copper

impure copper

platinum

[1]

(b) A suitable substance for the electrolyte would be:

sulphuric acid

copper sulphate

water

[1]

(c) Pure copper is formed:

at the anode

at the cathode

in solution

[1]

THIS IS THE END OF THE QUESTION PAPER

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