

Surname	Centre Number	Candidate Number
Other Names		0



**GCSE**

236/01

**SCIENCE  
FOUNDATION TIER  
CHEMISTRY 1**

A.M. WEDNESDAY, 15 June 2011

45 minutes

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	6	
2.	6	
3.	6	
4.	6	
5.	5	
6.	6	
7.	10	
8.	5	
<b>Total</b>	<b>50</b>	

**ADDITIONAL MATERIALS**

In addition to this paper you may require a calculator and a ruler.

**INSTRUCTIONS TO CANDIDATES**

Use black ink or black ball-point pen.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet.

**INFORMATION FOR CANDIDATES**

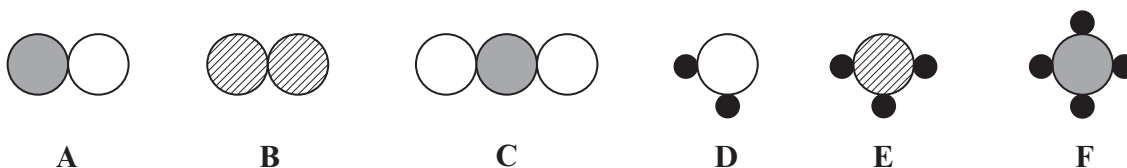
The number of marks is given in brackets at the end of each question or part-question.

You are reminded of the necessity for good English and orderly presentation in your answers.

The Periodic Table is printed on the back cover of the examination paper and the formulae for some common ions on the inside of the back cover.



2. (a) The diagrams below represent **six** different substances.



represents an atom of carbon (symbol C)

represents an atom of hydrogen (symbol H)

represents an atom of nitrogen (symbol N)

represents an atom of oxygen (symbol O)

(i) Give the letter, **A**, **B**, **C**, **D**, **E** or **F**, of the diagram which represents

I.  $\text{NH}_3$ , ..... [1]

II. an element, ..... [1]

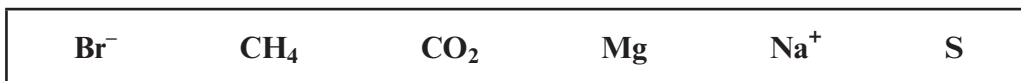
III. a compound containing **five** atoms. .... [1]

(ii) Give the chemical formula for substance **D**. ..... [1]

(b) Sulphuric acid is a strong acid and is one of the acids responsible for acid rain. Each molecule of sulphuric acid contains two atoms of hydrogen, one atom of sulphur and four atoms of oxygen. Use this information to give the chemical formula for sulphuric acid. [2]

.....

3. (a) Choose symbols/formulae from the box below to answer parts (i)-(iv).



Each symbol/formula may be used once, more than once or not at all.

Give

- (i) two atoms ..... and ..... [1]
- (ii) two molecules ..... and ..... [1]
- (iii) two ions ..... and ..... [1]
- (iv) one metal atom ..... [1]
- (b) Give the **name** and **formula** of the compound formed when  $\text{K}^+$  and  $\text{O}^{2-}$  combine.
- Name of compound* ..... [1]
- Formula of compound* ..... [1]

4. Group 1 of the Periodic Table is shown below. **M** represents a Group 1 element. **M is not the symbol of the element.** The Periodic Table of Elements shown on the **back cover of this examination paper** may be of use in answering this question.

Group 1
lithium
sodium
potassium
M
caesium
francium

- (a) Give the number of electrons in the outer orbit (shell) of an atom of potassium. [1]

.....

- (b) Name the missing element **M**. [1]

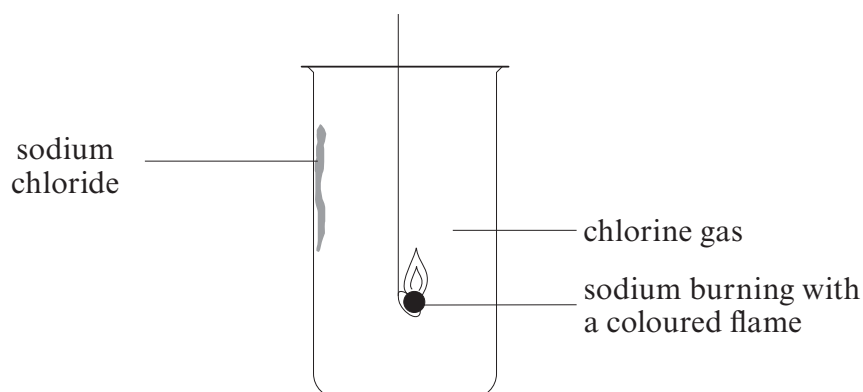
.....

- (c) Choose from the list below the name by which Group 1 elements are also known. [1]

alkali metals	halogens	noble gases	transition metals
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.....

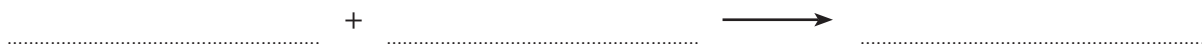
- (d) The diagram below shows sodium reacting with chlorine. [1]



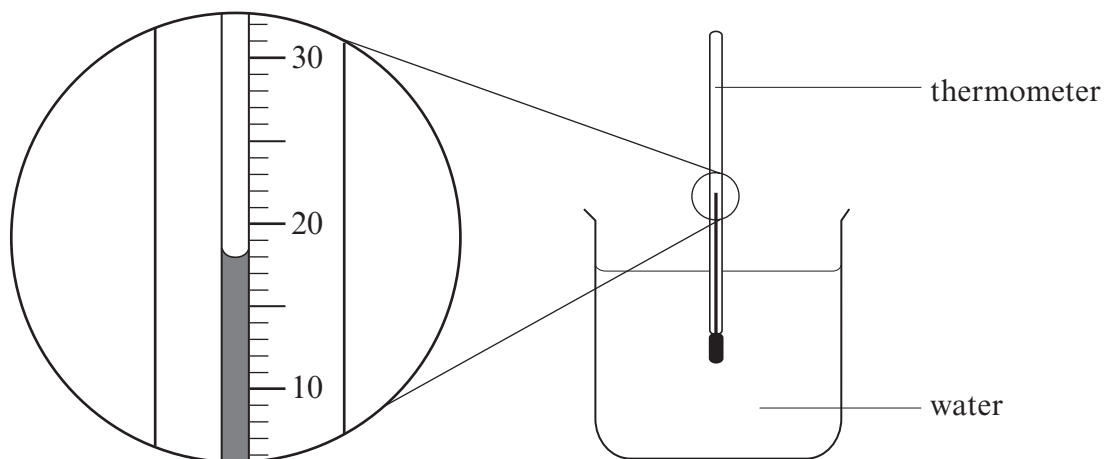
- (i) Give the colour of the flame seen during the reaction. [1]

.....

- (ii) Give the **word** equation for the reaction that takes place. [2]



5. (a) A thermometer was placed in some water. The diagram below shows part of that thermometer.



- (i) State the temperature shown on the thermometer. [1]

..... °C

- (ii) A solid was added to the water. An **endothermic** reaction took place and the temperature changed by 5.5 °C. Place a tick (✓) in the box with the correct final reading on the thermometer. [1]

12.5 °C

13 °C

13.5 °C

23 °C

23.5 °C

- (b) Natural gas is mainly methane, CH<sub>4</sub>. The symbol equation for methane burning in air is as follows.



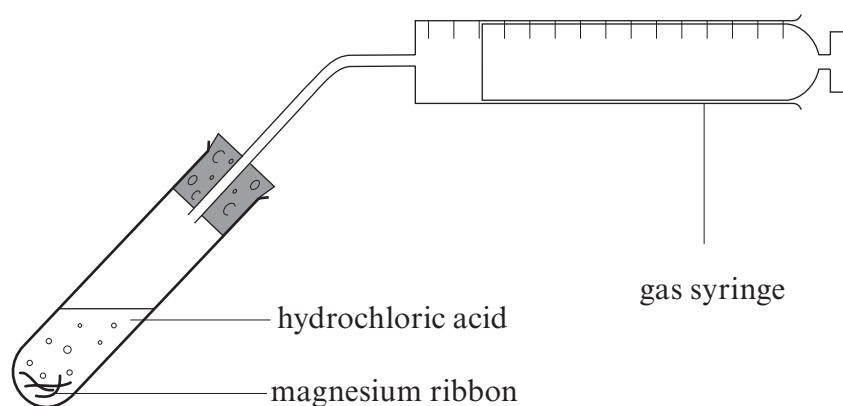
- (i) Give **one** product of this reaction. [1]

.....

- (ii) Give the **word** equation for the burning of methane. [2]

..... + .....  $\longrightarrow$  ..... + .....

6. The following apparatus was used to investigate the effect of particle size on the speed of a chemical reaction.

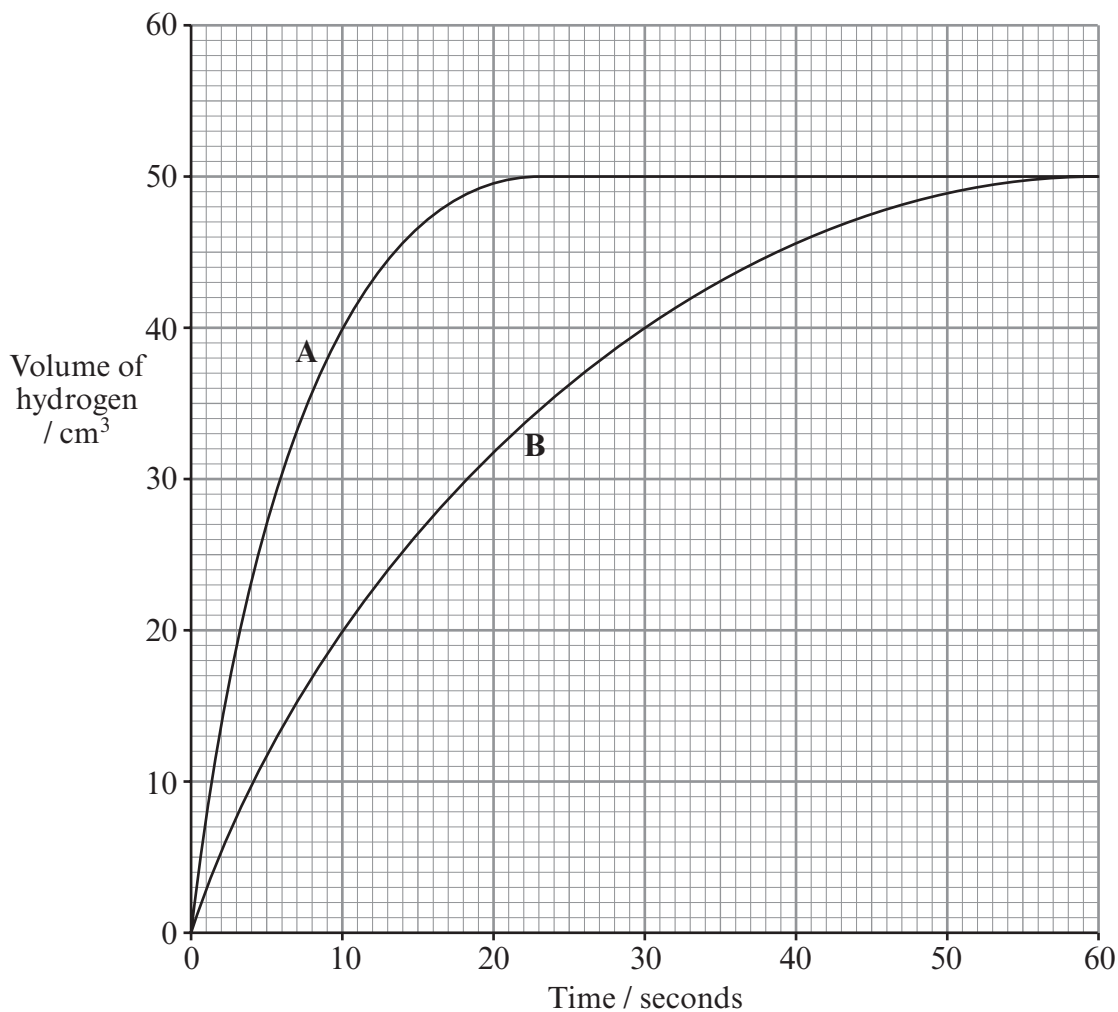


Two experiments were carried out.

In the first experiment 0.05 g of magnesium **powder** was added to 20 cm<sup>3</sup> of dilute hydrochloric acid at 20 °C. The volume of hydrogen produced was recorded at regular intervals and the results were plotted on the grid below. The line was labelled **A**.

In the second experiment 0.05 g of magnesium **ribbon** was added to 20 cm<sup>3</sup> of hydrochloric acid of the same concentration at 20 °C. The results were again plotted and this line was labelled **B**.

In both experiments the acid used was *in excess*.





(a) State the purpose of the gas syringe. [1]

(b) Use the graph to find

(i) the volume of hydrogen produced after 30 seconds when magnesium **ribbon** was used, [1]

..... cm<sup>3</sup>

(ii) the time taken for the reaction to stop when magnesium **powder** was used. [1]

..... seconds

(c) State which of the above reactions was the faster and explain how the graph shows this. [1]

*Faster reaction was experiment* .....

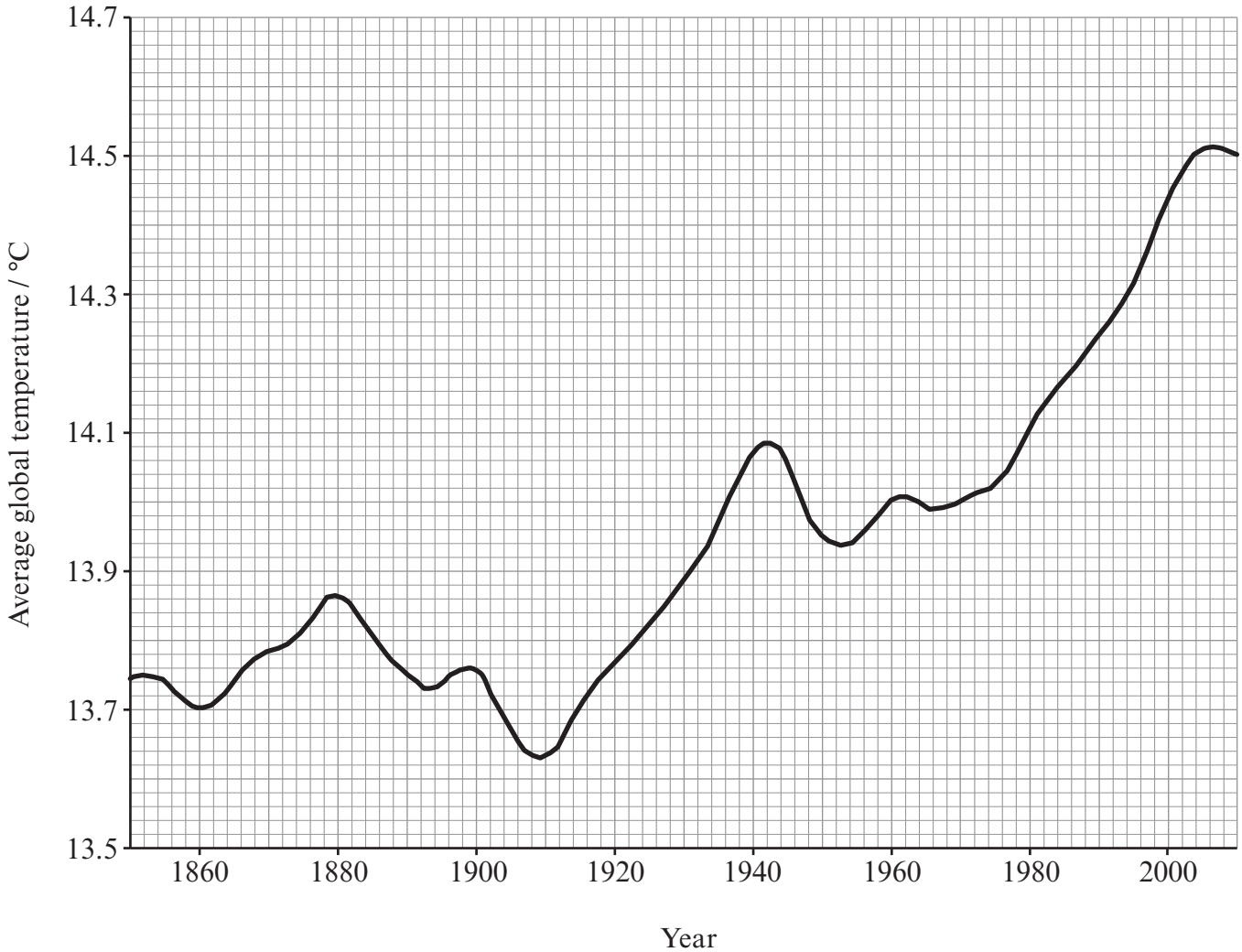
*Explanation* .....

(d) Give **two** ways in which this experiment was made a fair test. [2]

1. ....

2. ....

7. (a) Global temperature records go back about 160 years, which allows us to draw conclusions about how our climate has changed over this period of time. The graph below shows the average global temperature during the last 160 years.



Use the graph to answer parts (i)-(iii).

- (i) State the average global temperature in 1990. [1]

..... °C

- (ii) Describe the general trend in global temperature since 1910. [1]

.....

- (iii) Describe the general trend in global temperature between 1850 and 1910. [1]

.....

(b) When fossil fuels such as petrol are burned, a gas is released. This is the main gas responsible for the change in global temperature since 1910.

(i) Name this gas. [1]

.....

(ii) Apart from the increase in the amount of fossil fuels burned each year since 1910, give **one** reason for the increased amount of this gas in the atmosphere. [1]

.....

(c) Petrol is a mixture of different hydrocarbon compounds. State what is meant by a *hydrocarbon*. [1]

.....

.....

(d) Some fossil fuels contain sulphur.

(i) Give the **word** equation for the reaction that takes place when sulphur is burnt in air. [2]

..... + .....  $\longrightarrow$  .....

(ii) State which environmental problem is caused by the product of this reaction. [1]

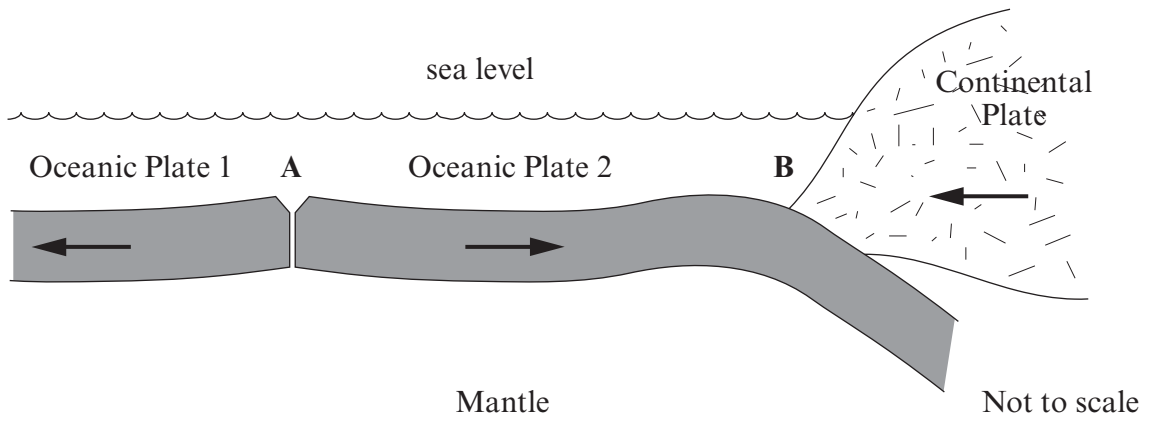
.....

(iii) Give **one** effect of this environmental problem. [1]

.....

.....

8. The Earth's crust (lithosphere) is broken up into huge plates.  
The diagram below shows two plate boundaries **A** and **B**.



- (a) Describe what occurs at plate boundary A.

[2]

.....

.....

.....

(b) The two types of plate have different densities as shown in the following table.

Type of plate	Density / g cm <sup>-3</sup>
continental	2.7
oceanic	3.0

Describe and explain what occurs at plate boundary **B**.

[3]

.....

.....

.....

.....

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**FORMULAE FOR SOME COMMON IONS**

<b>POSITIVE IONS</b>		<b>NEGATIVE IONS</b>	
<b>Name</b>	<b>Formula</b>	<b>Name</b>	<b>Formula</b>
<b>Aluminium</b>	<b>Al<sup>3+</sup></b>	<b>Bromide</b>	<b>Br<sup>-</sup></b>
<b>Ammonium</b>	<b>NH<sub>4</sub><sup>+</sup></b>	<b>Carbonate</b>	<b>CO<sub>3</sub><sup>2-</sup></b>
<b>Barium</b>	<b>Ba<sup>2+</sup></b>	<b>Chloride</b>	<b>Cl<sup>-</sup></b>
<b>Calcium</b>	<b>Ca<sup>2+</sup></b>	<b>Fluoride</b>	<b>F<sup>-</sup></b>
<b>Copper(II)</b>	<b>Cu<sup>2+</sup></b>	<b>Hydroxide</b>	<b>OH<sup>-</sup></b>
<b>Hydrogen</b>	<b>H<sup>+</sup></b>	<b>Iodide</b>	<b>I<sup>-</sup></b>
<b>Iron(II)</b>	<b>Fe<sup>2+</sup></b>	<b>Nitrate</b>	<b>NO<sub>3</sub><sup>-</sup></b>
<b>Iron(III)</b>	<b>Fe<sup>3+</sup></b>	<b>Oxide</b>	<b>O<sup>2-</sup></b>
<b>Lithium</b>	<b>Li<sup>+</sup></b>	<b>Sulphate</b>	<b>SO<sub>4</sub><sup>2-</sup></b>
<b>Magnesium</b>	<b>Mg<sup>2+</sup></b>		
<b>Nickel</b>	<b>Ni<sup>2+</sup></b>		
<b>Potassium</b>	<b>K<sup>+</sup></b>		
<b>Silver</b>	<b>Ag<sup>+</sup></b>		
<b>Sodium</b>	<b>Na<sup>+</sup></b>		

