

Candidate Name	Centre Number	Candidate Number
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GCSE

236/01

**SCIENCE
FOUNDATION TIER
CHEMISTRY 1**

A.M. WEDNESDAY, 17 June 2009

45 minutes

For Examiner's use only		
Question	Maximum Mark	Mark awarded
1.	5	
2.	7	
3.	7	
4.	7	
5.	4	
6.	5	
7.	7	
8.	8	
Total	50	

ADDITIONAL MATERIALS

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

INSTRUCTIONS TO CANDIDATES

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.

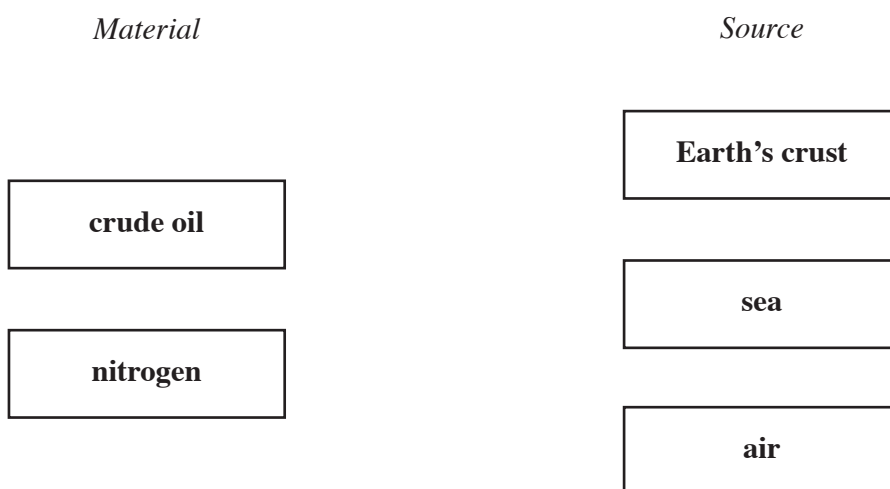
The Periodic Table is printed on the back cover of the examination paper and the formulae for some common ions on the inside of the back cover.

Answer all questions.

1. (a) The following statements refer to chemical reactions. Place a tick (✓) next to the **two correct** statements. [2]

- Atoms are rearranged during chemical reactions.
- Some atoms are destroyed in a chemical reaction.
- Reactants are made during chemical reactions.
- Reactants are used up during chemical reactions.

- (b) The materials used in chemical reactions can be obtained from the Earth's crust, sea or air. Draw a line from each material to its source. [2]



- (c) During a chemical reaction, heat may be given out. Choose from the list below the name for this type of reaction. [1]

endothermic	exothermic	neutralisation
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.....

- 2. The following box contains some information about the atmosphere. Read the information in the box and then answer the questions that follow.

Scientists believe that the Earth’s early atmosphere was formed from the gases given out by volcanoes. It consisted mainly of carbon dioxide and water vapour with some ammonia and methane. As the Earth cooled, the water vapour condensed to form the oceans. Over time, carbon dioxide dissolved in the oceans and this led to the formation of carbonate rocks. Plants evolved and produced oxygen by photosynthesis. Ammonia reacted with oxygen to produce nitrogen. Methane reacted with oxygen to produce carbon dioxide and water.

Use only the information in the box to answer the following questions.

- (i) State the source of the early atmosphere. [1]
- (ii) Name the **two main** gases present in the early atmosphere. [2]
 and
- (iii) Name the gas that was produced from ammonia. [1]

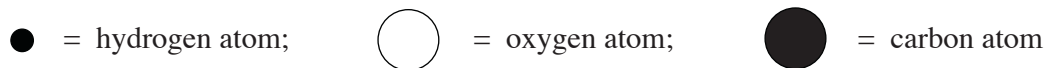
- (iv) Name the **process** that produced oxygen. [1]


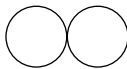

- (v) Write a **word** equation to show what happened to the methane present in the early atmosphere. [2]



3. (a) The following table shows some substances, their formulae and diagrams that represent them.

Key for diagrams:



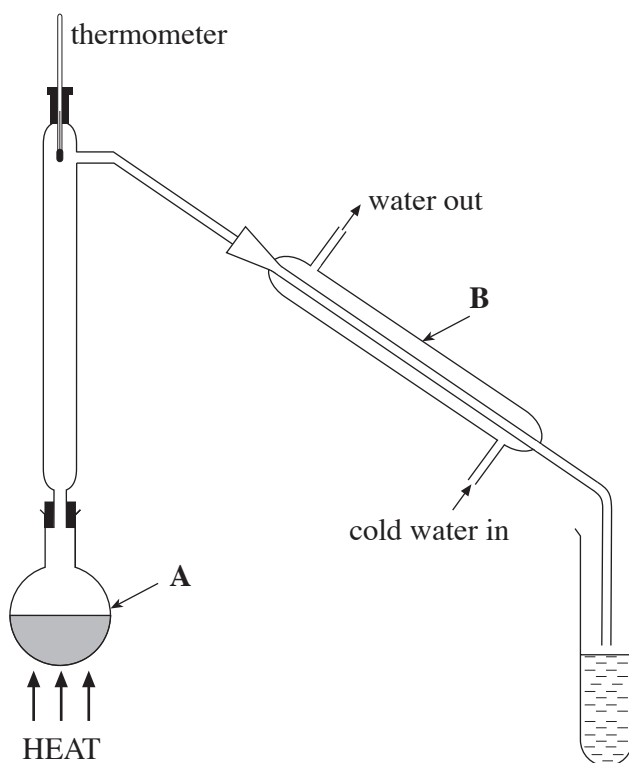
<i>Substance</i>	<i>Formula</i>	<i>Diagram</i>
hydrogen	H ₂	
oxygen	
water	H ₂ O	
carbon dioxide	

- (i) Complete the table. [3]
- (ii) I. Name the **two** substances in the table that are elements. [1]
 and
- II. Give a reason for your choices. [1]

- (b) Use the table of common ions **inside the back cover of this examination paper** to help you answer this question.
- I. Give the formulae for the following ions:
 Potassium Oxide [1]
- II. Use your answer to part (b)I. to write the chemical formula for the compound, potassium oxide. [1]

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4. (a) Crude oil can be separated into its fractions using the apparatus shown below.



- (i) Name the physical process that takes place in the part of the apparatus labelled

A

B

[2]

- (ii) State the purpose of the thermometer.

[1]

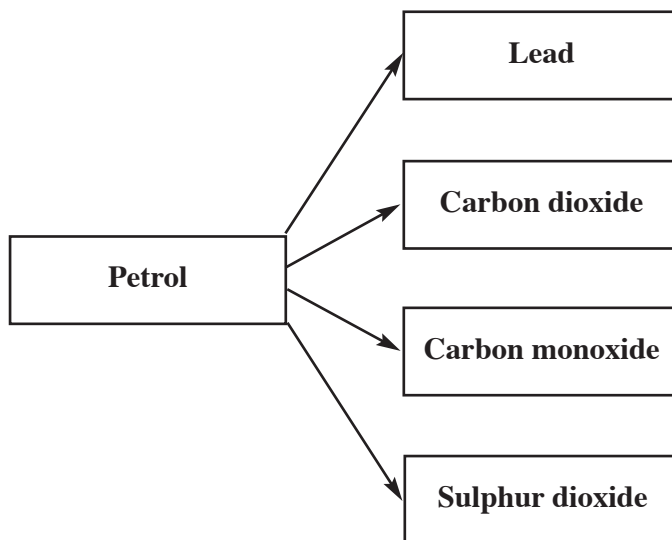
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- (iii) Give the name of the overall process taking place.

[1]

.....

- (b) Petrol is obtained from crude oil. It is used as a fuel in motor vehicles. The following diagram shows what may be released when leaded petrol burns.



Use only the information in the diagram above to answer the following questions.

- (i) Name the gas responsible for
- I. acid rain, [1]
- II. global warming. [1]
- (ii) Name the substance released that is a metal. [1]

5. (i) The Earth’s crust (lithosphere) is composed of a number of large pieces called tectonic plates. These plates are moving very slowly. The following list shows stages in the formation of new igneous rock but the stages are not in the correct order.

- A. The magma cools and solidifies.
- B. Tectonic plates move apart.
- C. Magma rises to fill the gap created.

Place the letters of the stages in the boxes below to show the correct order. [2]



(ii) Alfred Wegener suggested that the Earth’s continents were once joined and moved apart. Choose, from the following box, **two** pieces of evidence to support his idea. [2]

- Coastlines fitted together like the pieces of a jigsaw.**
- Similar patterns of rocks and fossils were found on different continents.**
- Continents have the same shape as each other.**
- The same animals are found on different continents.**

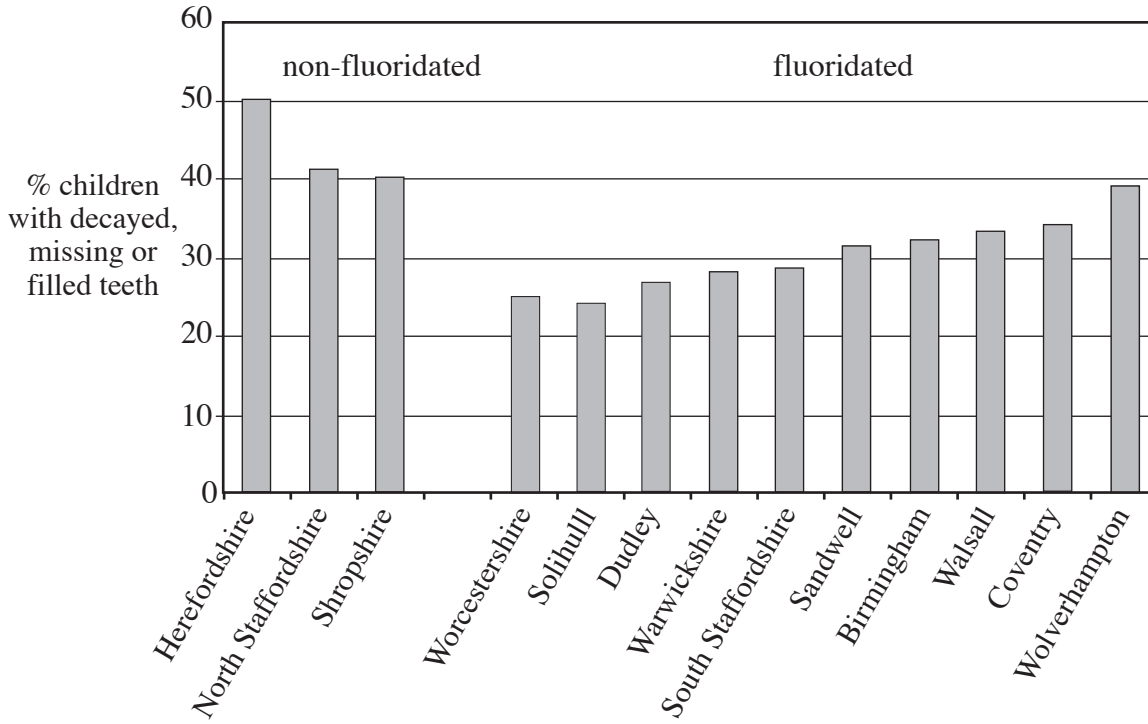
Evidence 1

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Evidence 2

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6. Fluoride is often added to drinking water to reduce dental decay. The following graph shows the percentages of children with decayed, missing or filled teeth in areas of England. It also shows whether or not the water is fluoridated.



- (i) Choose, from the box below, the way in which this data would have been collected. [1]

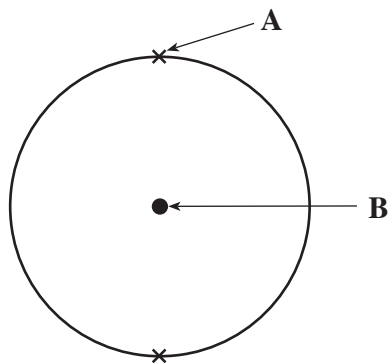
experiment	internet search	survey
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Method used

- (ii) Give the area in which there is
- I. most dental decay, [1]
- II. least dental decay. [1]
- (iii) Explain how the information in the graph can be used to show that fluoridation reduces tooth decay. [1]
-
-
- (iv) Suggest why some people may say that there is not enough evidence in the graph to prove that fluoridation reduces tooth decay. [1]
-
-

7. You may find the Periodic Table of Elements shown on the **back page of this examination paper** helpful when answering this question.

(a) The following diagram shows the structure of an atom of helium.



(i) Name the parts of the atom labelled **A** and **B**. [2]

A

B

(ii) I. Give the symbol of the element that is in the same group as helium in the Periodic Table but in period 2. [1]

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II. Give the electronic structure of this period 2 element. [1]

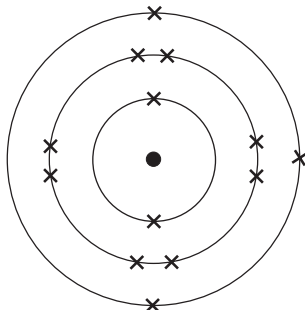
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(iii) Explain why these elements are found in the same group of the Periodic Table. [1]

.....

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(b) Element **X** is found in period 3 of the Periodic Table. An atom of **X** is shown below.



I. Use the diagram above to explain why this element is to be found in period 3. [1]

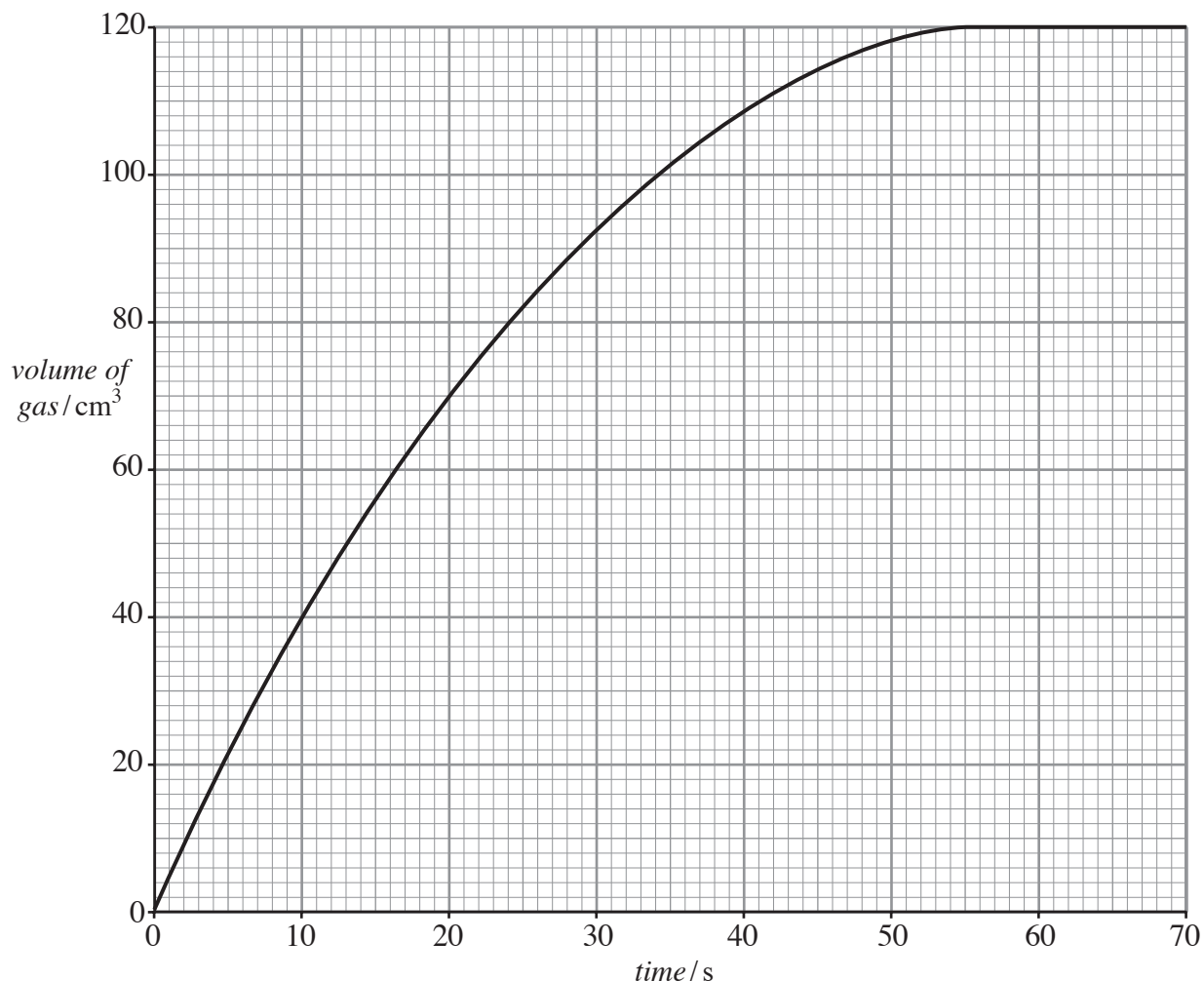
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II. Name this element. [1]

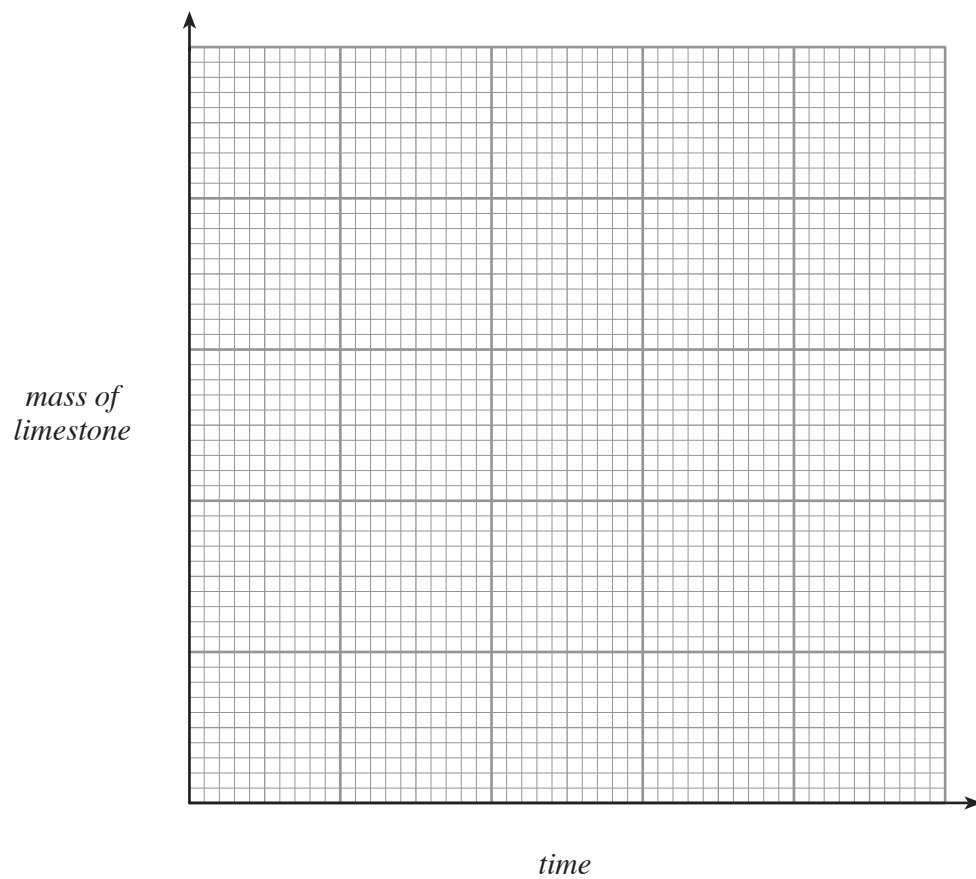
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8. The following graph shows the volume of carbon dioxide produced when excess limestone is added to 100 cm^3 of hydrochloric acid at room temperature.



- (i) Use the graph to find
- I. the volume of carbon dioxide produced after 20 seconds, [1]
 cm^3
 - II. the time taken for the reaction to stop. [1]
 seconds
- (ii) I. On the grid above, draw the curve you would expect if the reaction were repeated using exactly the same volume and concentration of acid at a **higher temperature** with the limestone still in excess. Label the graph **A**. [2]
- II. Give a reason, in terms of particles, for the difference in the rate of reaction. [2]
-
-

- (iii) On the grid below, draw a curve to show how the mass of limestone would change during the reaction. [2]



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FORMULAE FOR SOME COMMON IONS

POSITIVE IONS		NEGATIVE IONS	
Name	Formula	Name	Formula
Aluminium	Al³⁺	Bromide	Br⁻
Ammonium	NH₄⁺	Carbonate	CO₃²⁻
Barium	Ba²⁺	Chloride	Cl⁻
Calcium	Ca²⁺	Fluoride	F⁻
Copper(II)	Cu²⁺	Hydroxide	OH⁻
Hydrogen	H⁺	Iodide	I⁻
Iron(II)	Fe²⁺	Nitrate	NO₃⁻
Iron(III)	Fe³⁺	Oxide	O²⁻
Lithium	Li⁺	Sulphate	SO₄²⁻
Magnesium	Mg²⁺		
Nickel	Ni²⁺		
Potassium	K⁺		
Silver	Ag⁺		
Sodium	Na⁺		

