



GCSE

0236/01

SCIENCE

FOUNDATION TIER

CHEMISTRY 1

A.M. TUESDAY, 12 June 2012

45 minutes plus your additional time allowance

Surname _____

Other Names _____

Centre Number _____

Candidate Number 0 _____

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

ADDITIONAL MATERIALS

In addition to this paper you will need a calculator and a ruler.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen or your usual method.

Write your name, centre number and candidate number in the spaces provided on the front cover.

Answer ALL questions.

Write your answers in the spaces provided in this booklet.

If you run out of space, use the continuation pages at the back of the booklet, taking care to number the question(s) correctly.

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 and the formulae for some common ions are printed on a separate insert.

Chemical reactions involve converting reactants into products.

reactants \longrightarrow products

They are used in industry to produce new and useful materials from raw materials. Raw materials can be obtained from the earth, sea and air. Examples of raw materials include crude oil, nitrogen and metal ores.

Useful products include fuels, plastics, medicines, metals and fertilisers.

Answer ALL questions.

- 1(a) The box opposite contains some information about chemical reactions. Read the information carefully and answer the questions that follow.**

USE THE INFORMATION IN THE BOX OPPOSITE TO HELP YOU ANSWER PARTS (i)-(iv).

- (i) State what happens during a chemical reaction. [1]**

- (ii) State why chemical reactions are important in industry. [1]**

1(a) (iii) Name a raw material obtained from

I. the earth,

_____ **[1]**

II. the air.

_____ **[1]**

(iv) Name the raw material used to produce petrol. [1]

1(b) Sulphuric acid, H_2SO_4 , is produced during the Contact Process. One stage of the process involves burning sulphur in air to produce sulphur dioxide, SO_2 .

(i) Name the gas, found in the air, that reacts with sulphur to form sulphur dioxide. [1]

(ii) State how many atoms of sulphur are found in a molecule of sulphur dioxide, SO_2 . [1]

(iii) Give the TOTAL number of atoms found in a molecule of sulphuric acid, H_2SO_4 . [1]

2(a) The following table shows information about some ionic substances. There are **THREE** errors in the table.

CIRCLE each of the **THREE** errors. [3]

Name	Positive ion present	Negative ion present	Formula
sodium chloride	Na^+	Cl^-	NaCl
calcium chloride	Ca^{2+}	Cl^-	CaCl
magnesium oxide	Mg^{2+}	O^{2-}	MgO_2
potassium iodide	Li^+	I^-	KI

2(b) Ammonia, NH_3 , can be represented by the diagram shown below.



(i) State why ammonia is a compound. [1]

2(b) (ii)

I. Use the diagram of ammonia on page 9 to complete the key shown below. [1]



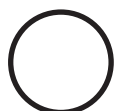
= _____



= carbon



= _____



= oxygen

II. Use the key to draw a diagram that represents a molecule of methane, CH_4 . [1]

3. Nano-silver particles have been widely used in recent years.

(a) Choose from the list below one use for nano-silver particles. [1]

AIR FRESHENER

DEODORANT

SHAMPOO

WINDOW CLEANER

Use of nano-silver _____

(b) Choose from the list below a property of nano-silver that allows it to be used in this way.

[1]

ANTI-BACTERIAL

LOW DENSITY

SHINY

WATER REPELLENT

Property of nano-silver _____

3(c) Choose from the list below the size range of nano-silver particles. [1]

1-100 cm

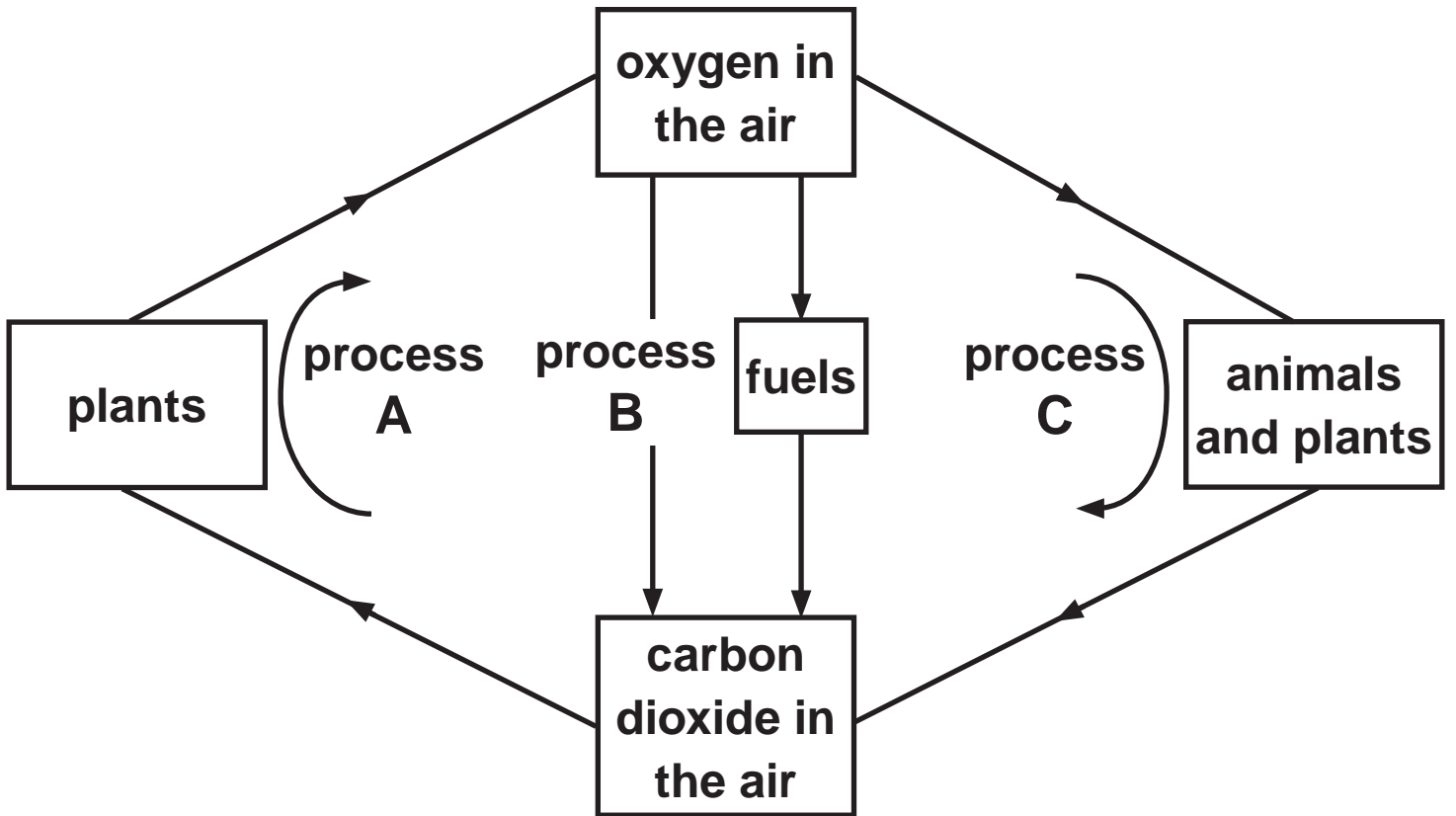
1-100 m

1-100 mm

1-100 nm

Size range of nano-silver _____

(d) Nano-silver particles could be absorbed through the skin. Suggest a reason why some people are concerned about this. [1]



4. Levels of oxygen and carbon dioxide in the air are maintained by the processes shown in the diagram opposite.

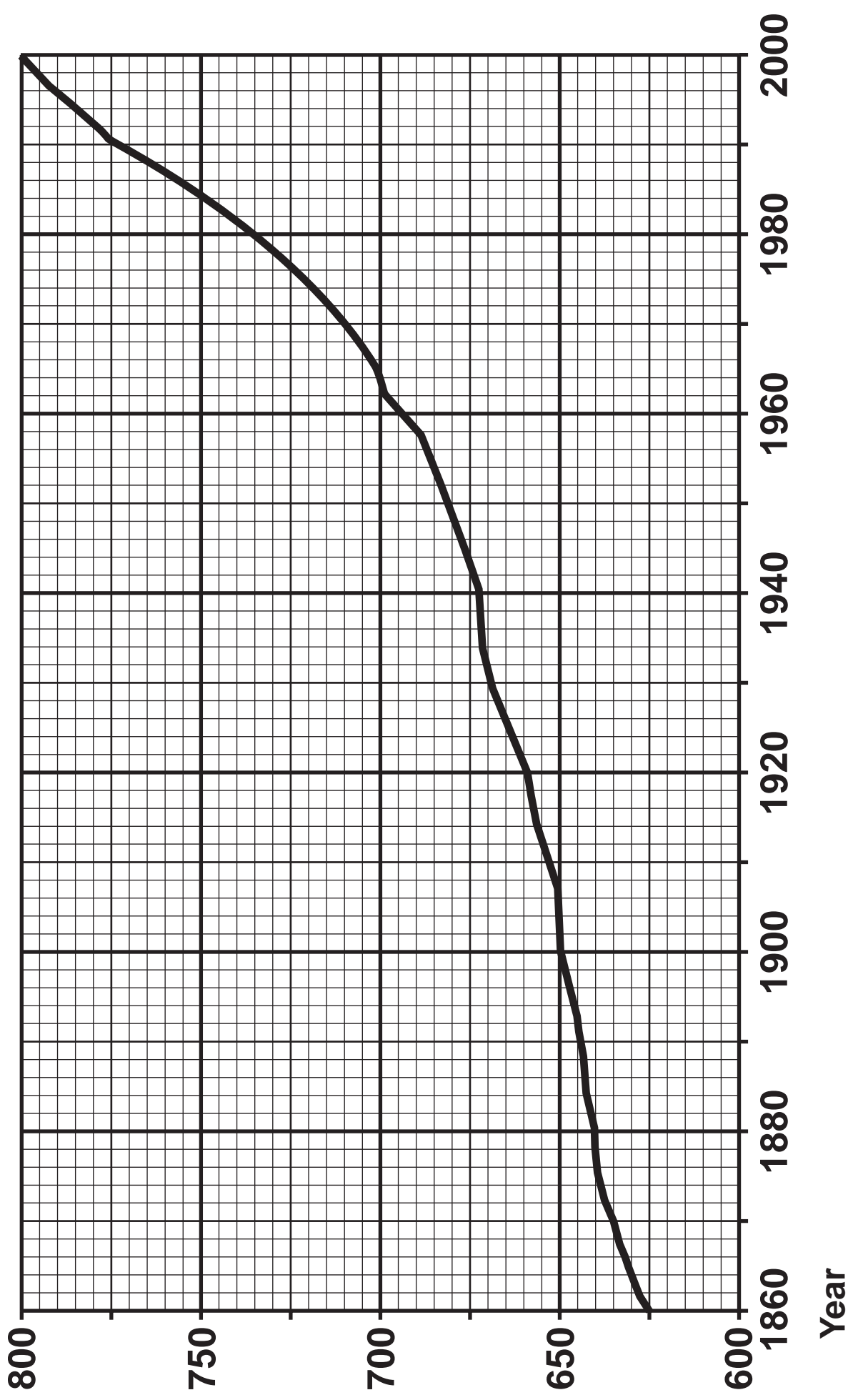
(a) Give the letter, A, B or C from the diagram, which represents the process of [2]

respiration, _____

photosynthesis, _____

combustion. _____

Mass of carbon dioxide
/ billion tonnes



4(b) The graph opposite shows how the mass of carbon dioxide in the atmosphere has changed since 1860.

(i) Give the mass of carbon dioxide in the atmosphere in 1900.

_____ [1]

(ii) Calculate the change in mass of carbon dioxide in the atmosphere between 1860 and 2000 and suggest a reason for this change. [2]

Change _____ billion tonnes

Reason _____

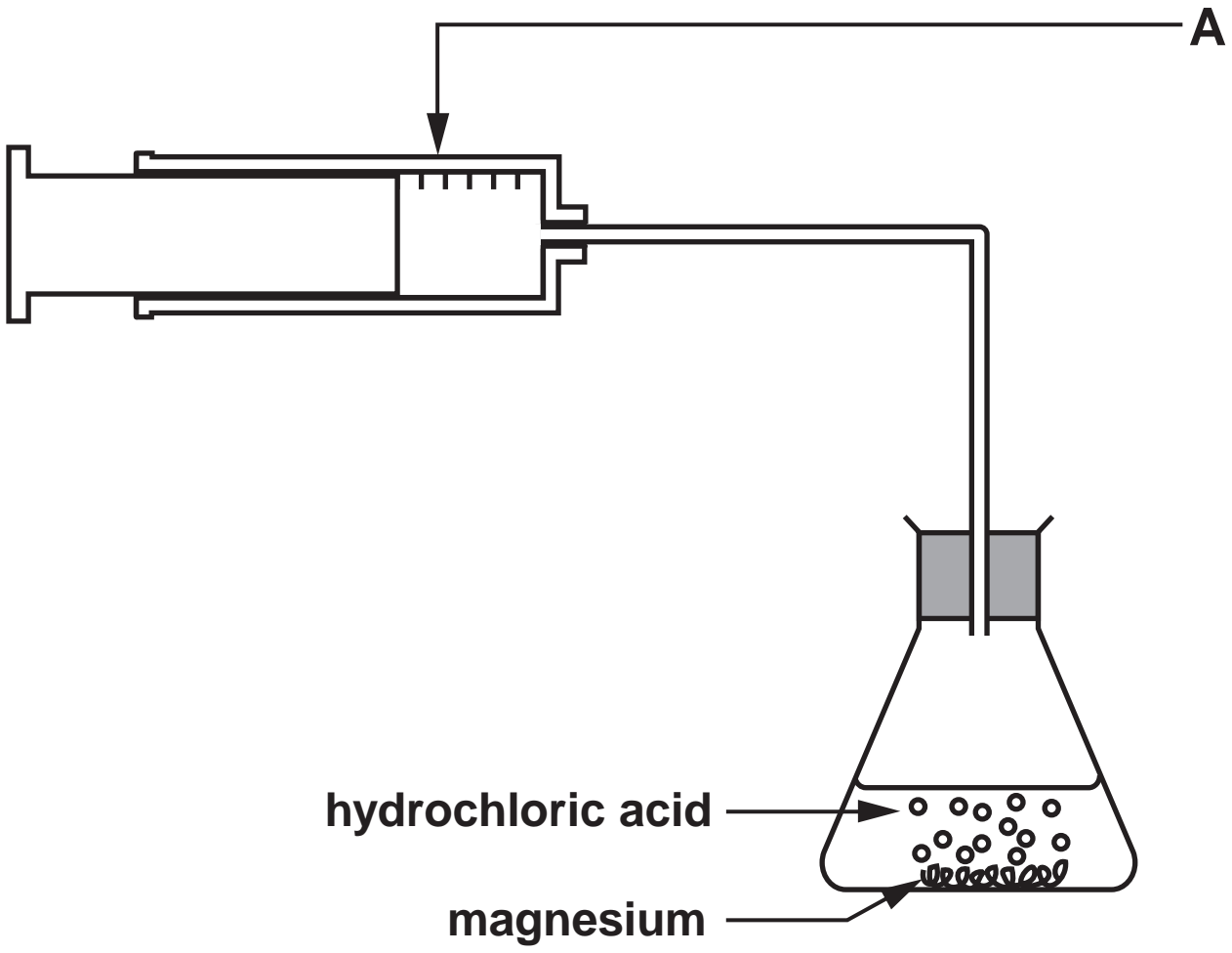
4(b) (iii) Choose from the list below the effect most scientists believe this change in carbon dioxide levels has on the temperature of the Earth's atmosphere. [1]

DECREASES

INCREASES

STAYS THE SAME

(iv) Give the term used to describe this change. [1]



5. When magnesium ribbon is added to hydrochloric acid, magnesium chloride and hydrogen gas are produced.

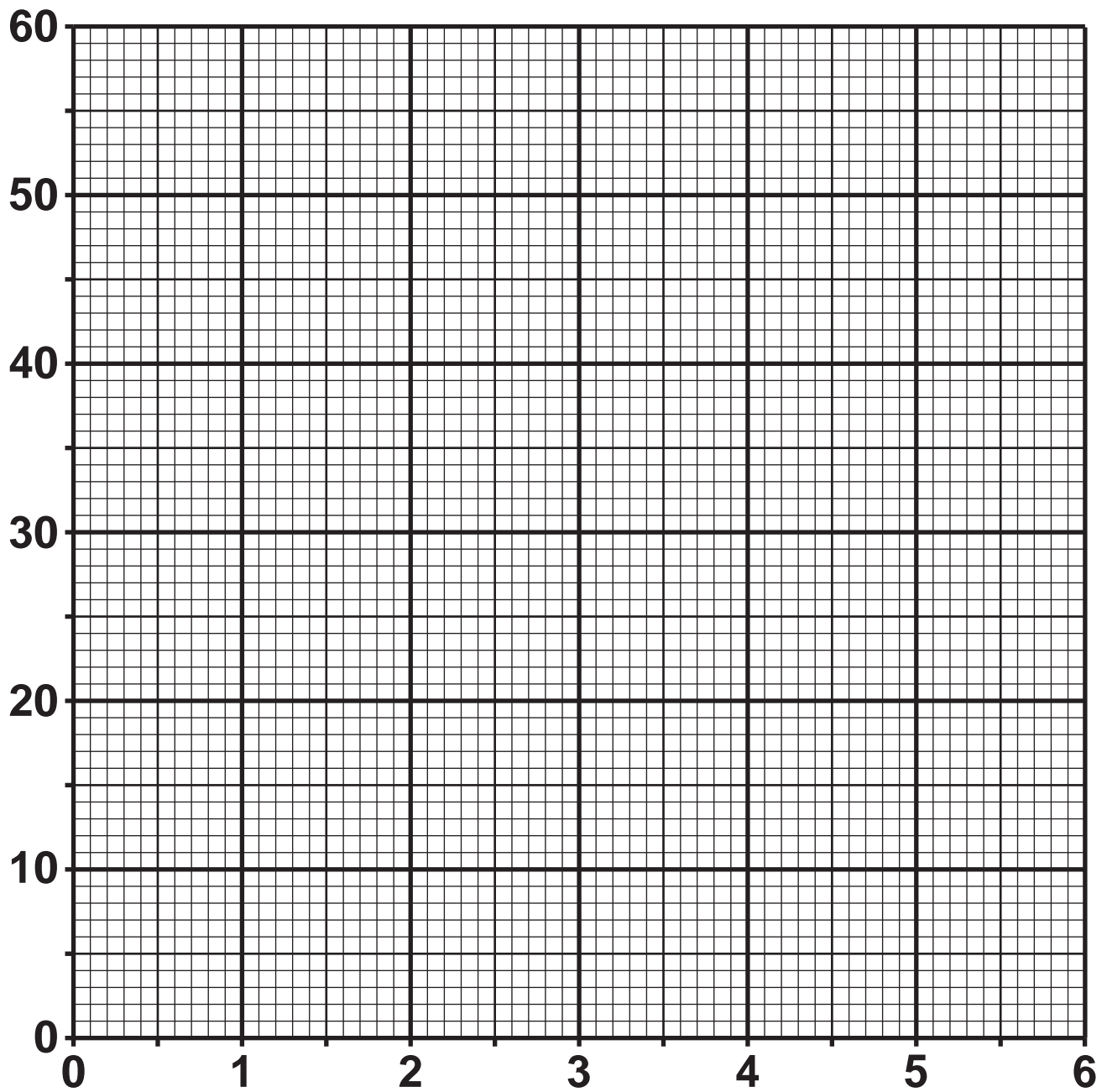
(a) Write a WORD equation for the reaction taking place. [2]

_____ + _____ → _____ + _____

(b) The rate of this reaction can be investigated using the apparatus shown opposite.

(i) Name the apparatus A, shown in the diagram. [1]

Volume of hydrogen produced / cm³



Time / minutes

- 5(b) (ii) John carried out an experiment using the apparatus shown opposite page 16. He measured the volume of hydrogen every minute for 6 minutes. His results are shown in the table below.

Time / minutes	0	1	2	3	4	5	6
Volume of hydrogen produced / cm³	0	20	34	42	48	50	50

Plot the results from the table on the grid opposite and draw a line of best fit. **YOUR LINE SHOULD GO THROUGH THE ORIGIN (0,0).** [3]

- (iii) John used an **EXCESS** of hydrochloric acid during the experiment. Give the reason why the reaction came to an end after 5 minutes. [1]
-
-

6. In 1915 Alfred Wegener suggested that the Earth's continents were once joined and that they had drifted apart to their present positions.

Choose words from the list below to complete the following sentences, describing the evidence Wegener used to support his idea. [3]

ANIMALS

COASTLINES

COUNTRIES

EARTHQUAKES

FOSSILS

MOUNTAINS

PLANTS

ROCKS

VOLCANOES

Wegener noticed that the _____ of different continents appear to have shapes that would fit together like a jigsaw.

He also found that similar patterns of

_____ of the same age and similar

_____ exist on different

continents, separated by huge oceans.

7. The diagram opposite shows an outline of the Periodic Table of Elements.

YOU MAY FIND THE PERIODIC TABLE SHOWN ON THE SEPARATE INSERT USEFUL IN ANSWERING THIS QUESTION.

- (a) Using the letters A-E, show the position of the following elements on the diagram opposite. [5]

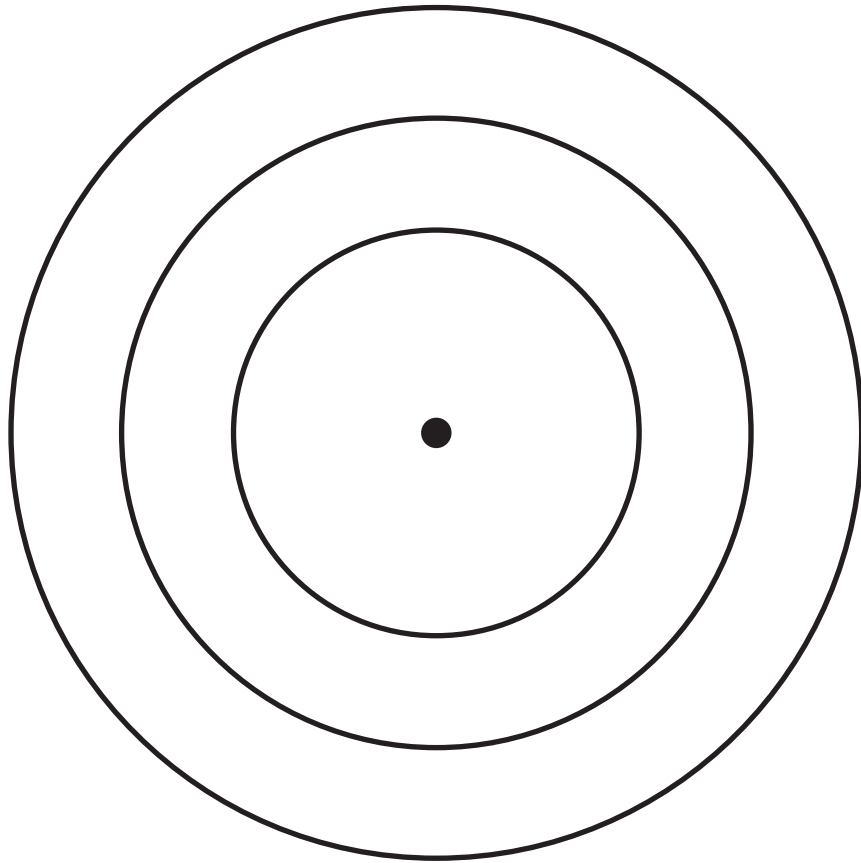
A – the most reactive alkali metal

B – the least reactive halogen

C – the gas used to fill weather balloons

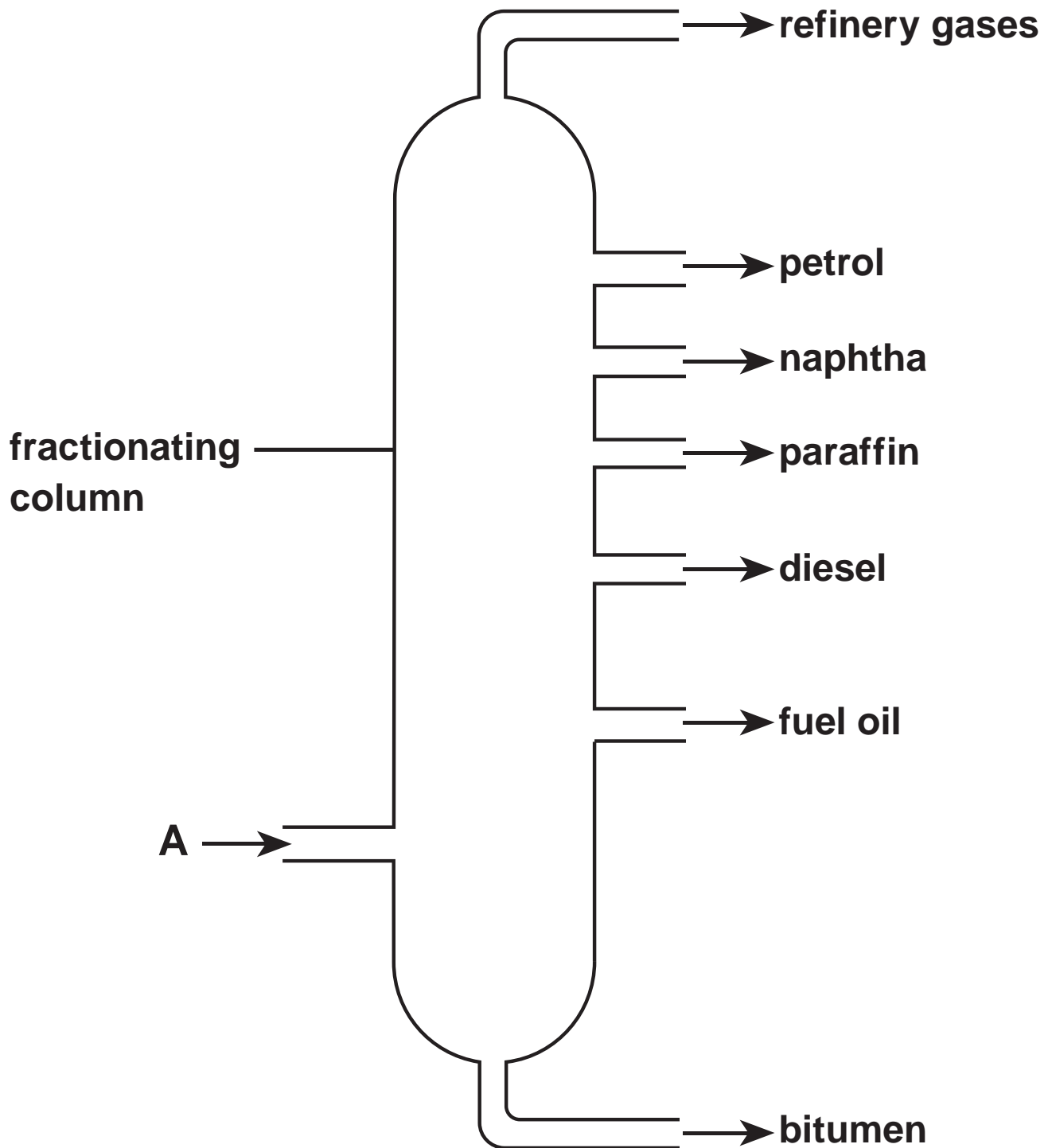
D – the element that reacts with sodium to produce sodium chloride

E – the element with electronic structure 2,8,2



7(b) Complete the diagram opposite to show the electronic structure of the element shown in position X in the table opposite page 19. [1]

(c) State how the electronic structure can be used to determine an element's atomic number. [1]



8(a) Crude oil is a mixture of compounds called hydrocarbons which can be separated into fractions in a fractionating column as shown opposite.

(i) Name the elements present in all hydrocarbons. [1]

and _____

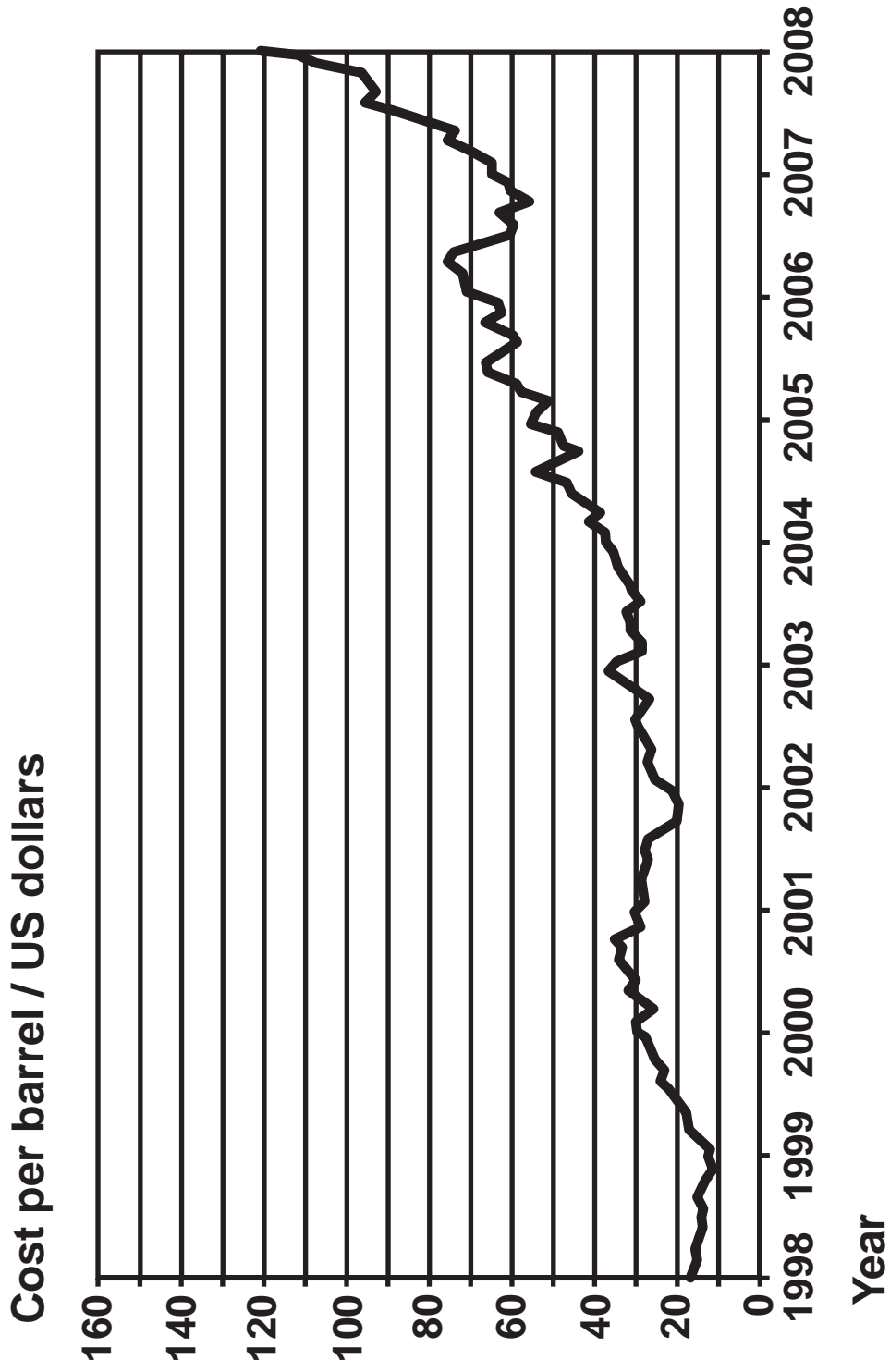
(ii) State what must happen

I. to the crude oil before it enters the column at point A, [1]

II. in order to collect the fractions as liquids. [1]

(iii) Give the name of this process. [1]

8(a) (iv) Explain why petrol is collected above diesel in the fractionating column. [2]



8(b) The graph opposite shows how the average price of crude oil changed between 1998 and 2008.

(i) State the trend in oil price over this period.

[1]

(ii) Suggest a reason for this trend. [1]
