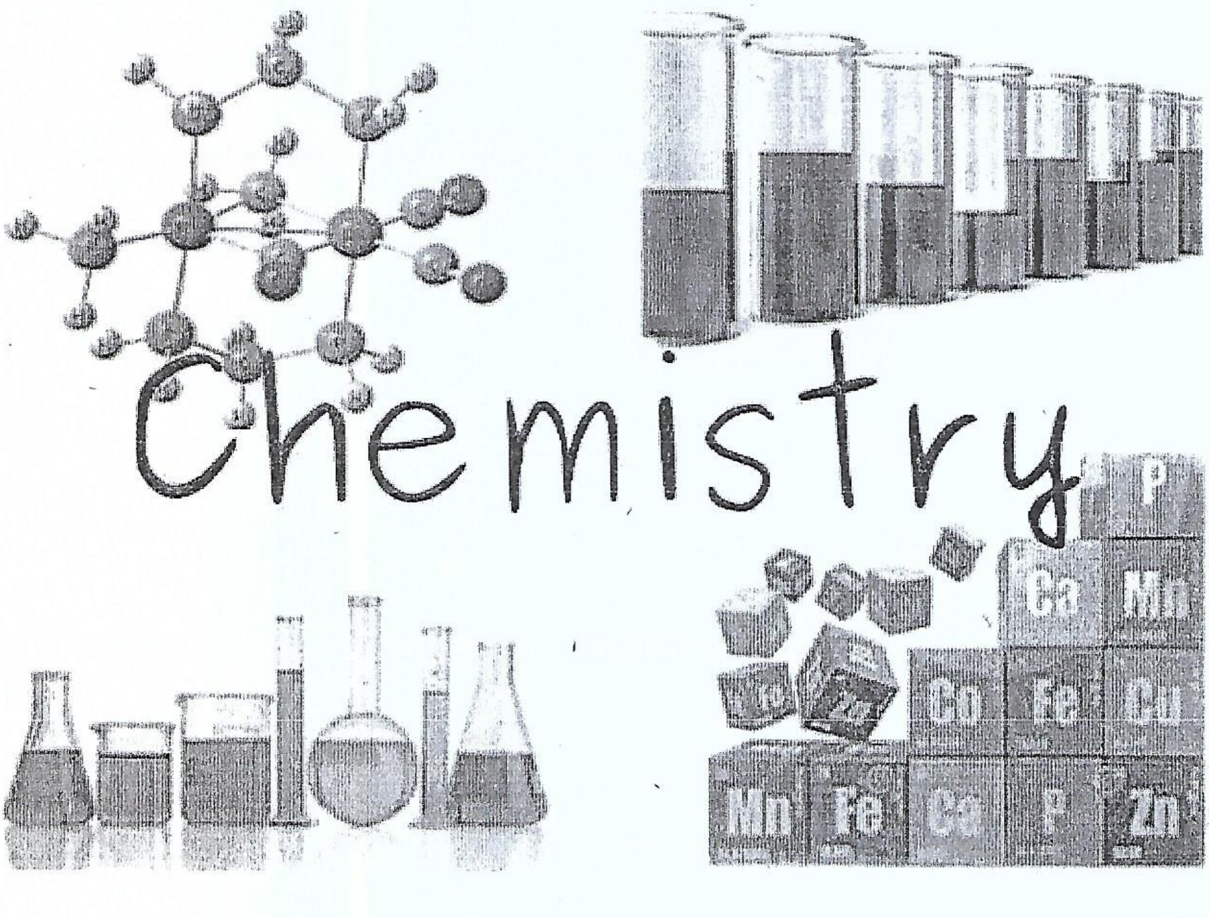
Practice Questions

Chemistry GCSE

Booklet 1

Name ....

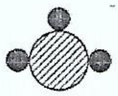


1. (a) The following table shows information about some ionic substances. There are **three** errors in the table.

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

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



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

....

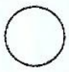
....

(ii) I. Use the diagram of ammonia to complete the key shown below. [1]

 = ...

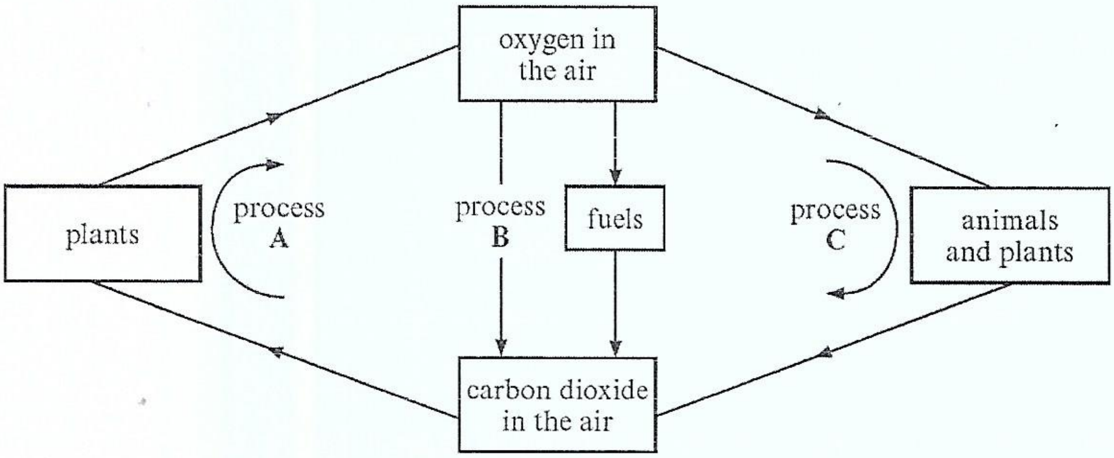
 = carbon

 = ...

 = oxygen

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

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



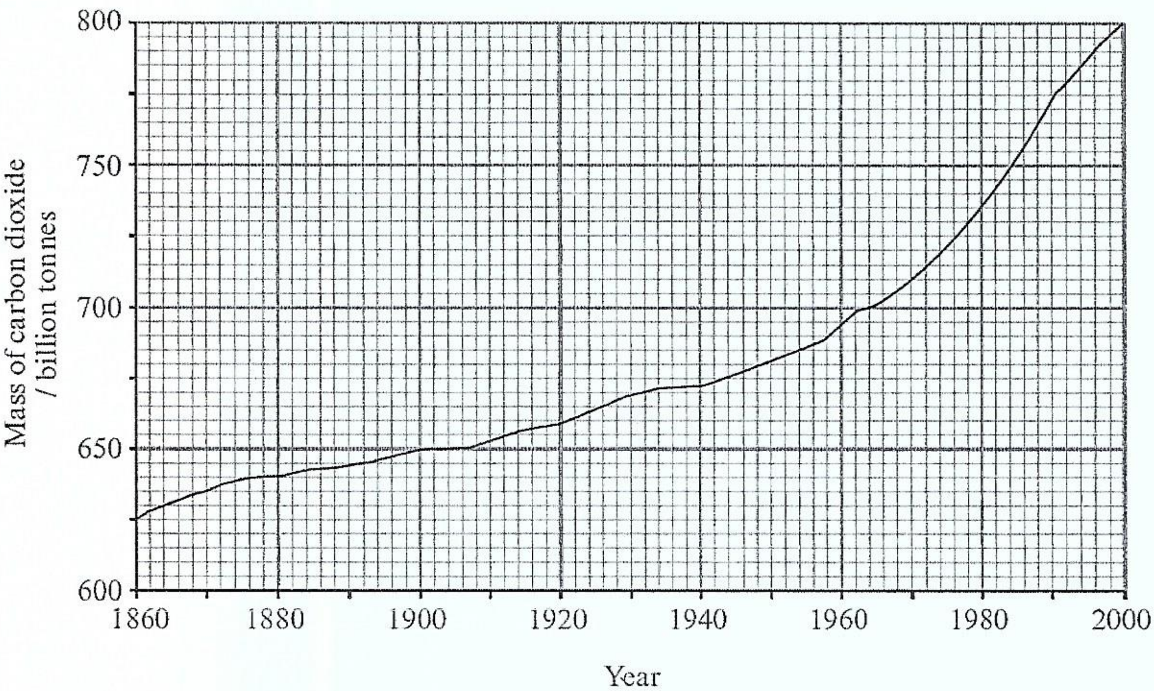
(a) Give the letter, A, B or C from the diagram, which represents the process of [2]

respiration, ...

photosynthesis, ...

combustion. ....

(b) The following graph 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 ....

....

(iii) Choose from the box 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]

....

3. 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 box 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.

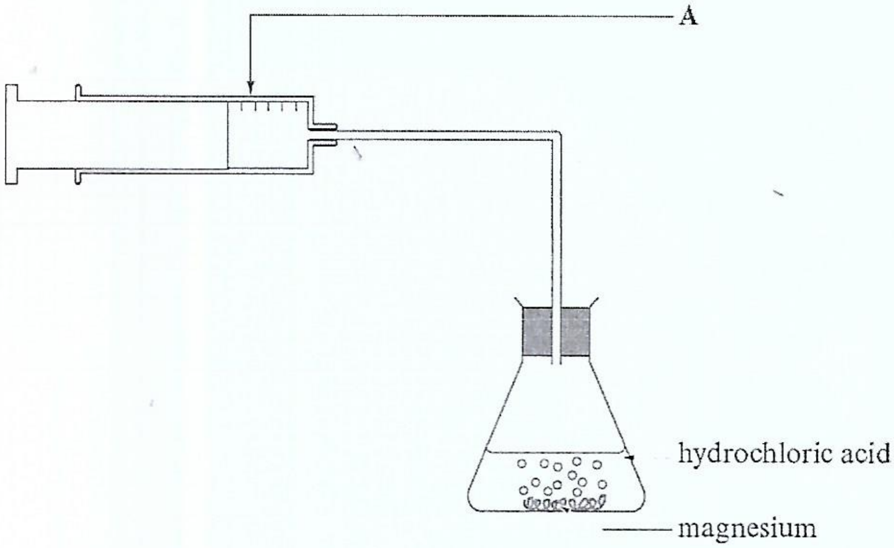
He also found that similar patterns of .... of the same age and similar .... exist on different continents, separated by huge oceans.

6i. 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 below.



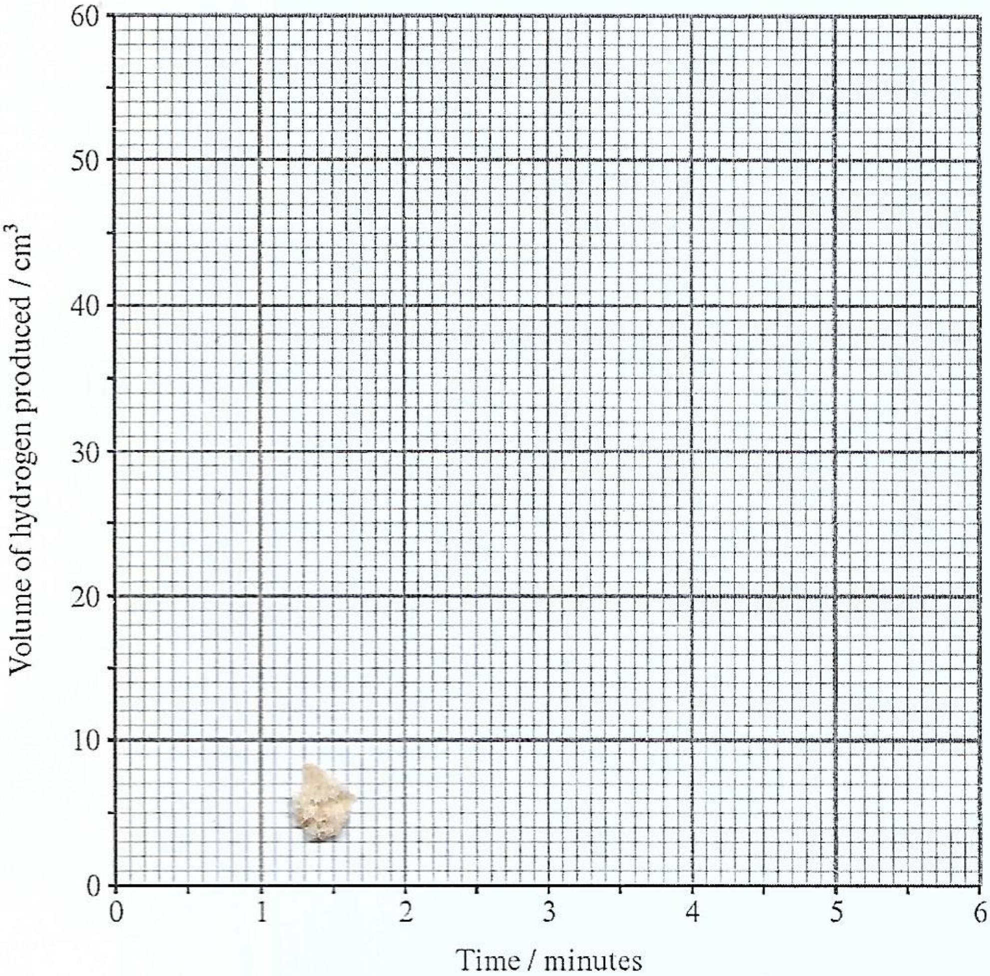
(i) Name the apparatus **A**, shown in the diagram. [1]

....

(ii) John carried out an experiment using the apparatus shown opposite. 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 / cm^3	0	20	34	42	48	50	50

Plot the results from the table on the grid below and draw a line of best fit.
Your line should go through the origin (0,0). [3]

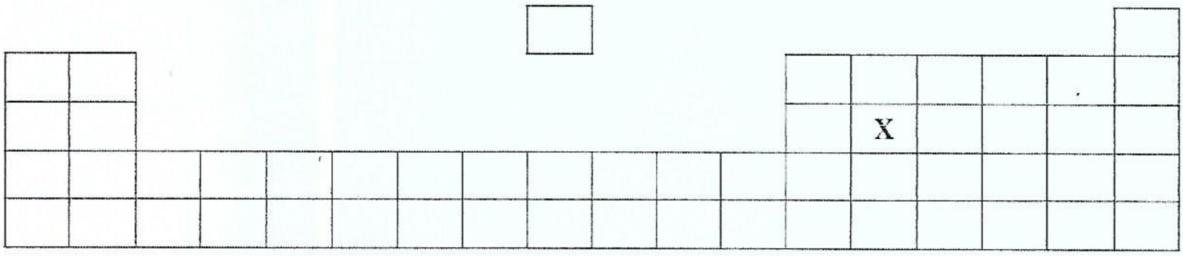


(iii) John used an *excess* of hydrochloric acid during the experiment. Give the reason why the reaction came to an end after 5 minutes. [1]

....

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

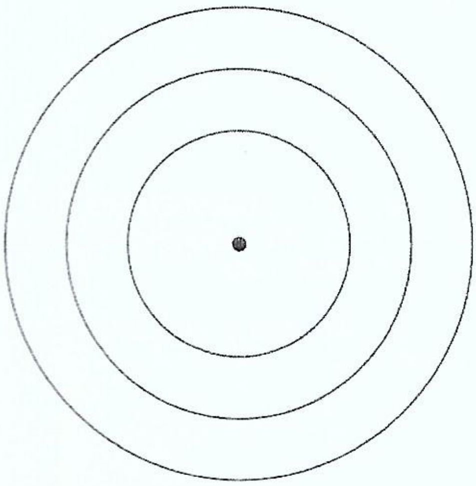
You may find the Periodic Table shown on the back page of this examination paper useful in answering this question.



(a) Using the letters **A-E**, show the position of the following elements on the diagram above. [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

(b) Complete the diagram below to show the electronic structure of the element shown in position **X** in the table above. [1]

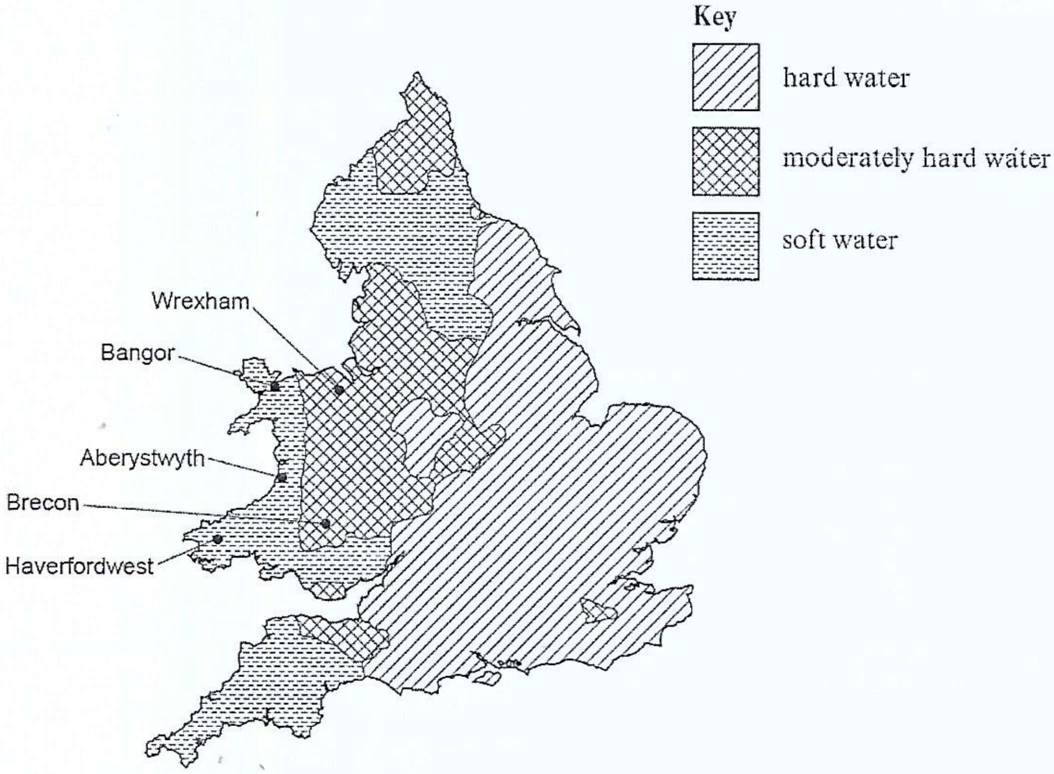


(c) State how the electronic structure can be used to determine an element's atomic number. [1]

....

....

8. The map below shows the hardness of water across the different regions of Wales and England.



(a) Water samples were collected at Bangor, Brecon and Wrexham.
1 cm^3 of soap solution was added to 10 cm^3 of each sample in separate test tubes.
Each tube was shaken for 10 seconds.

State, and explain, the difference you would expect in the appearance of the shaken solutions in each tube. [3]

....

....

....

....

(b) Give one way the procedure was made a fair test. [1]

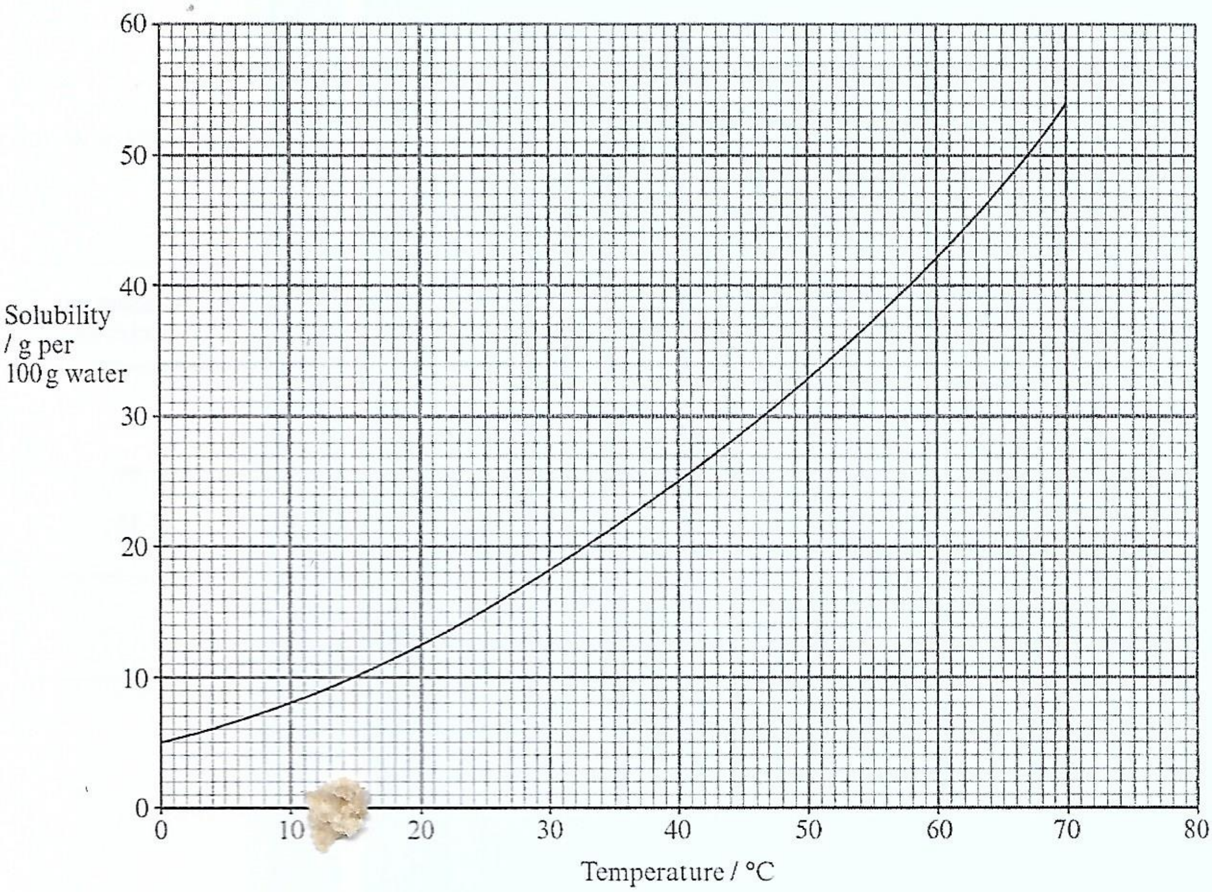
....

(b) Use the relative atomic masses given below to calculate the relative molecular mass (M_r) of butane, C_4H_{10}. [2]

$A_r(H) = 1$ $A_r(C) = 12$

$M_r(C_4H_{10}) =$ ....

9. The graph below shows the solubility of potassium dichromate in water at different temperatures.



The table below shows the solubility of potassium chloride in water at different temperatures.

Temperature / °C	0	20	40	60	80
Solubility / g per 100 g water	28	34	40	46	52

(a) Plot the graph of the solubility of potassium chloride on the grid on the opposite page. [3]

(b) Using the graphs give

(i) the temperature at which the solubility is the **same** for both potassium chloride and potassium dichromate, [1]

Temperature = ... °C

(ii) the **difference** between the solubilities of potassium chloride and potassium dichromate at 30 °C. [1]

Difference = ... g per 100 g of water

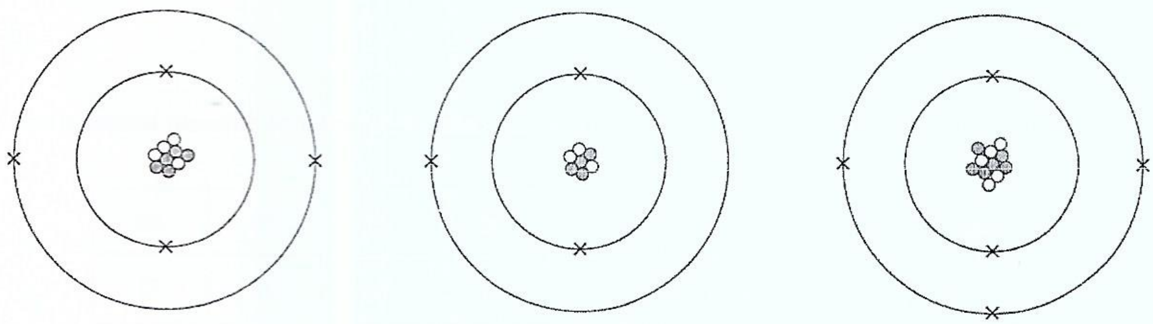
10. The table below shows information about the atoms of three elements.

Use the data and key on the Periodic Table of Elements shown on the **back page of this examination paper** to complete the table. [4]

Element	Symbol	Number of protons	Number of neutrons	Number of electrons
beryllium	$^{9}_{4}Be$	4		4
phosphorus		15	16	15
argon	$^{40}_{18}Ar$		22	

11. (a) Atoms are made up of protons, neutrons and electrons.

A, **B** and **C** represent atoms of three different elements.



A **B** **C**

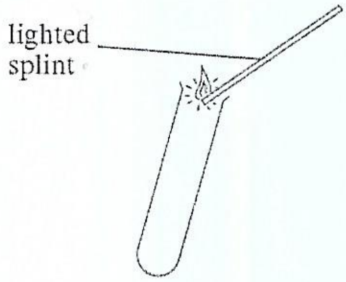
Give the letter of the atom which contains

(i) four protons, ... [1]

(ii) five electrons. .... [1]

12. (a) Choose a gas from the box below to answer this part-question.

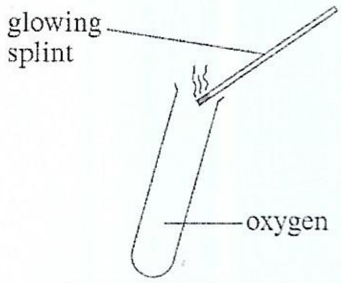
ammonia	chlorine	hydrogen	sulphur dioxide



When a lighted splint was introduced into a gas a 'pop' was heard.

Name the gas. .... [1]

(b) A glowing splint was introduced into a test tube of oxygen.
State what you would expect to happen. [1]



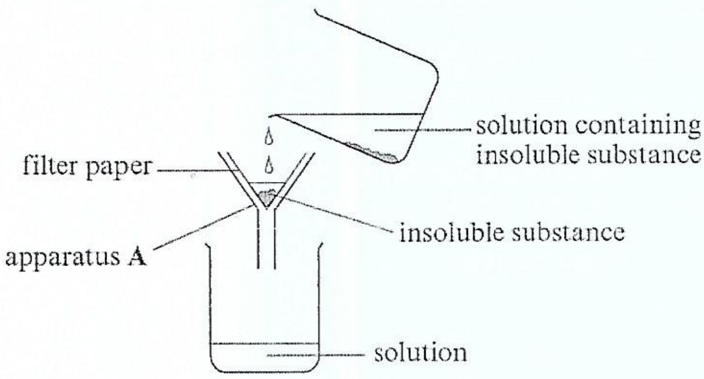
....

....

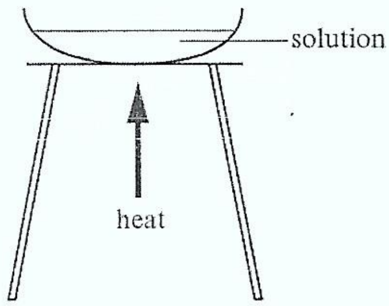
(c) A flame test was carried out on a sample of sodium chloride.
Place a tick (✓) in the box which gives the colour seen during the flame test. [1]

lilac	☐
green	☐
red	☐
yellow	☐

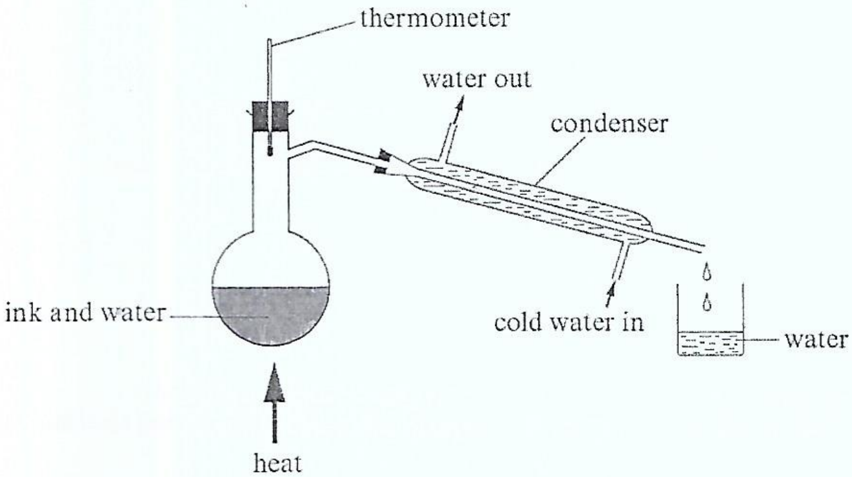
13. The diagrams below show three methods used to separate mixtures.



filtration



method B



distillation

(a) Name apparatus A. [1]

....

(b) Give the name of method B. [1]

....

(c) You have been given a mixture of sand, salt and water.

(i) Name the method used to remove sand from the mixture. [1]

....

(ii) Name the method used to obtain water from the mixture. [1]

....

14. The three tables below show how some ions can be identified.

Positive ion	Action with sodium hydroxide solution
magnesium, Mg^{2+}	white precipitate
iron(II), Fe^{2+}	green precipitate
copper, Cu^{2+}	blue precipitate
sodium, Na^{+}	no visible change

Negative ion	Action with silver nitrate solution
chloride, Cl^{-}	white precipitate
bromide, Br^{-}	cream precipitate
iodide, I^{-}	yellow precipitate
carbonate, CO_3^{2-}	white precipitate

Negative ion	Action with dilute hydrochloric acid
chloride, Cl^{-}	no visible change
bromide, Br^{-}	no visible change
iodide, I^{-}	no visible change
carbonate, CO_3^{2-}	bubbles

Use only the information in the tables to answer parts *(a)* and *(b)*.

(a) A substance is suspected to be iron(II) iodide. State the **two** ions present, the tests you would carry out to identify these ions and the results of each test. [4]

Ion 1 ....

Test ....

Result ....

Ion 2 ....

Test ....

Result ....

(b) An unknown solution, X, gave a white precipitate with silver nitrate solution and no precipitate with sodium hydroxide solution. When dilute hydrochloric acid was added bubbles were seen.

(i) Give the **formulae** of the two ions present in X. [1]

.... and ....

(ii) Give the **formula** of substance X. [1]

....