

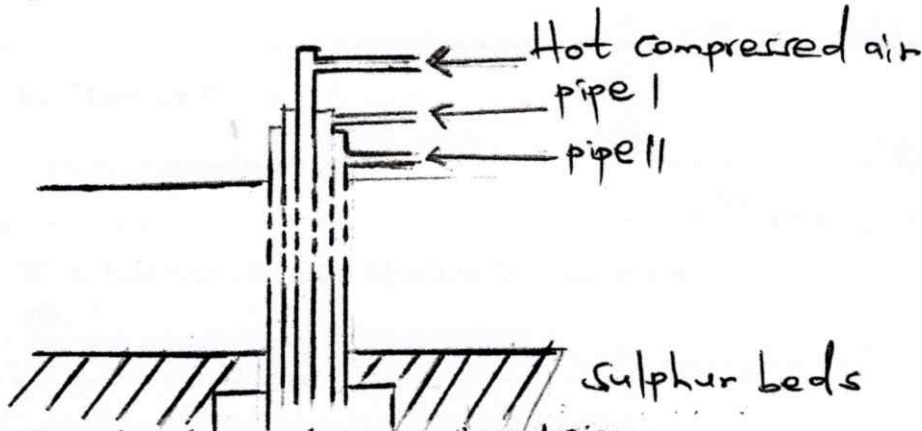


1. The grid below is part of a periodic table. Study it and answer the questions that follow. The letters are not the actual symbols of the elements.

P					N			U
	L						Q	
M		T					F	

- a) Give
- (i) The electron arrangement of an ion
- P ..... (1 mark)
- N ..... (1 mark)
- (ii) The formula of the compound formed between elements L and Q (1 mark)
- .....
- .....
- b) Which is the most reactive metallic element shown in the table? Explain (2 marks)
- .....
- .....
- c) What is the name given to the group of elements to which Q and F belong? (1 mark)
- .....
- .....
- d) Compare the atomic radius of P and N (2 marks)
- .....
- .....
- e) How do the ionization of P and M compare? Explain (2 marks)
- .....
- .....
- f) What name is given to the elements to which element T belong. (1 mark)
- .....
- .....

2. The diagram below represents the extraction of Sulphur by Frasch process.



a)(I) Name the substance that passes through pipe (2 marks)

(i) .....

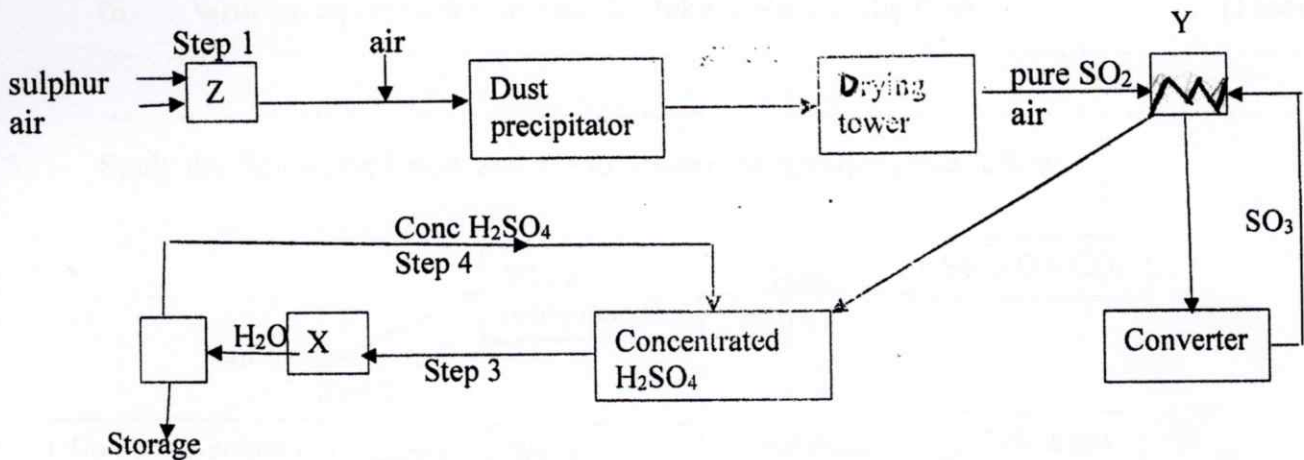
(ii) .....

II) What is the purpose of hot compressed air in this process (1 mark)

.....

.....

b) Below is a flow diagram for an industrial process. Study it and answer the questions below.



(i) Identify the name of the chambers labelled (2 marks)

X .....

Y .....

(ii) State any two conditions in the converter (1 mark)

.....

.....

(iii) Explain why the gases are passed through; (1 mark)

a) Dust precipitator and drying tower

b) Chamber Y

(1 mark)

(iv) Write balanced chemical equation for reactions in;  
Step 1

(1 mark)

Step 3

(1 mark)

c) In an experiment, hydrogen sulphide gas was mixed with moist  $\text{SO}_2$  gas.

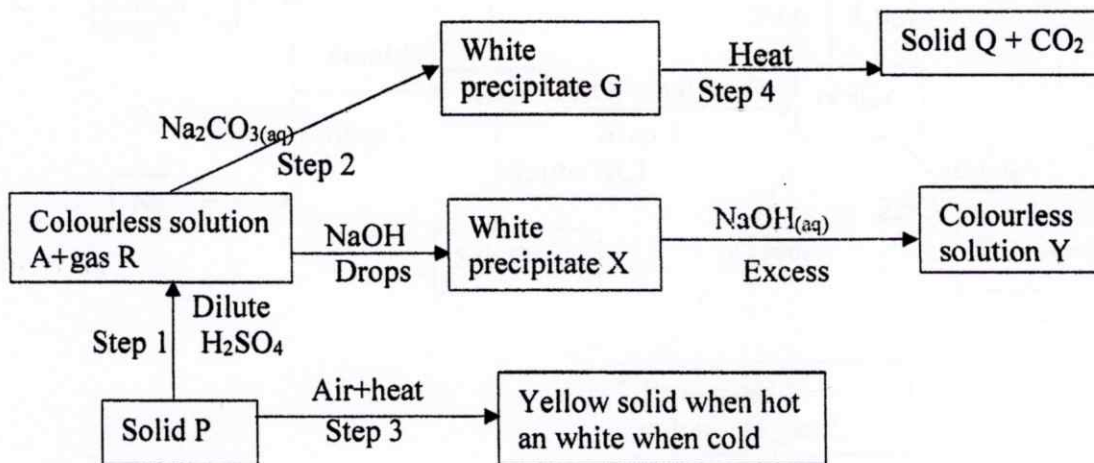
(i) What two observations are made in the boiling tube.

(2 marks)

(ii) Write an equation for the reaction taking place in the flask

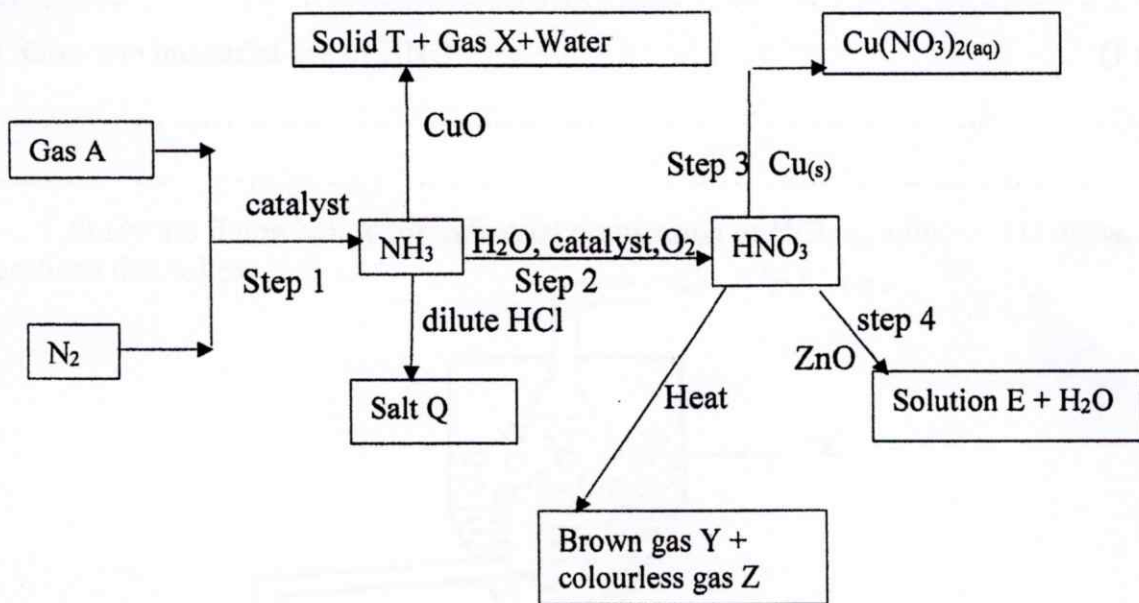
(1 mark)

3. Study the flow-chart below and use to answer the questions that follow.



- a) Identify the  
 (i) White precipitate X (1 mark)
- .....
- (ii) Substance P (1 mark)
- .....
- b) Write an ionic equation for the formation of white precipitate G (1 mark)
- .....
- c) Write an ionic equation for the reaction in step 3 (1 mark)
- .....
- d) Name the ions present in colourless solution Y (1 mark)
- .....
- e) Give two uses of gas R (2 marks)
- .....

4. I. Study the flow chart below and answer the questions that follow.



- a) Identify the following substances;  
 (i) Gas X (1 mark)

.....  
(ii) Solution E (1 mark)

.....  
(iii) Salt Q (1 mark)

.....  
b) Give the 3 equations for the reactions that take place in step 2. (3 marks)

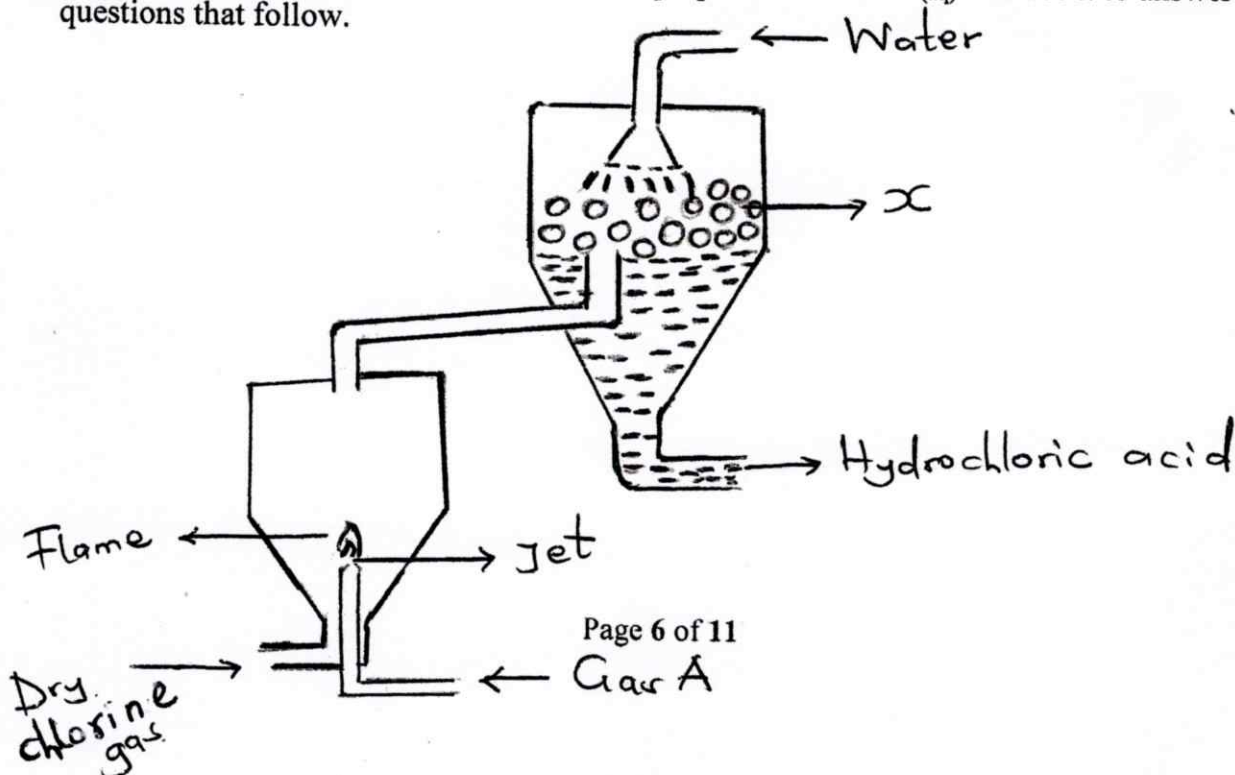
.....  
c) Name the catalyst used in; (2 marks)  
Step 1

.....  
Step 2

.....  
d) State the process taking place in step I (1 mark)

.....  
e) Give one industrial use of  $\text{HNO}_3$  (1 mark)

.....  
II Study the figure below for industrial preparation of  $\text{HCl}_{(aq)}$  and use it to answer the questions that follow.



(i) State two sources of Gas A (1 mark)

.....  
.....

(ii) A small amount of gas A is allowed to burn in excess chlorine through a jet. Give a reason (1 mark)

.....  
.....

(iii)a) Name part X and give a reason for its presence (2 marks)

.....  
.....

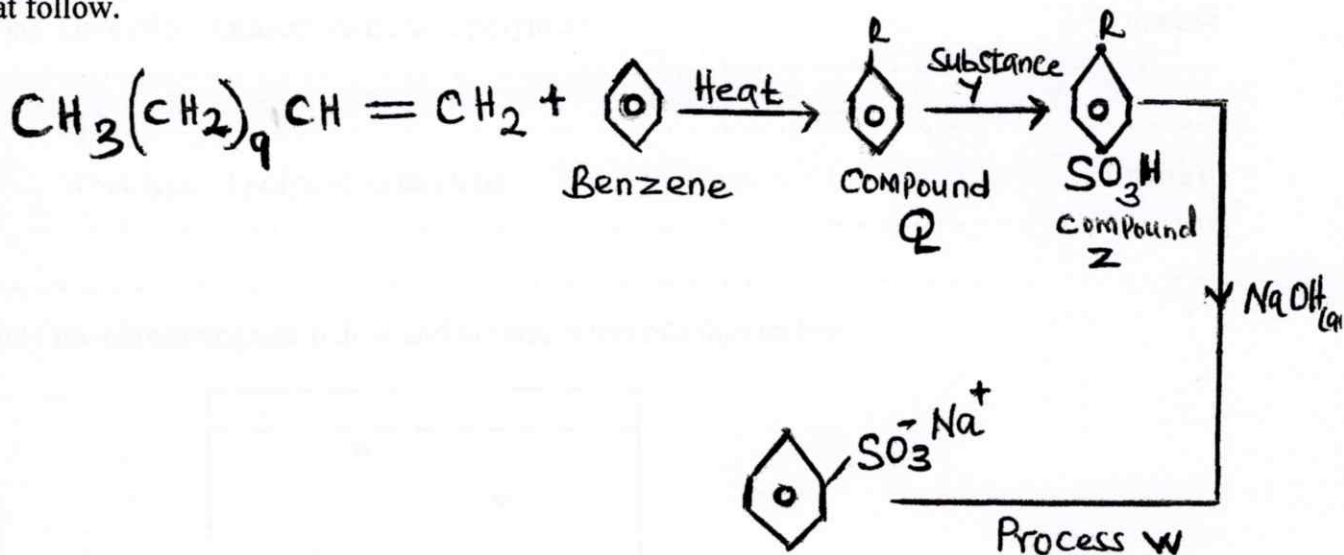
b) Write a balanced chemical equation for the reaction taking place over part A. (1 mark)

.....  
.....

(iv) State one use of HCL (1 mark)

.....  
.....

5. The flow chart below is used to manufacture a detergent. Study and use to answer the questions that follow.



a(i) Name components (i) Q (1 mark)

.....

(ii) Z (1 mark)

.....

b(i) Identify reagent Y (1 mark)

.....

(ii) Process W (1 mark)

.....

c(i) name the type of detergent above (1 marks)

.....

(ii) state the disadvantage of the detergent above (1 mark)

.....

.....

(iii) Give a reason for adding tetraoxophosphate (v) to the detergents. (1 mark)

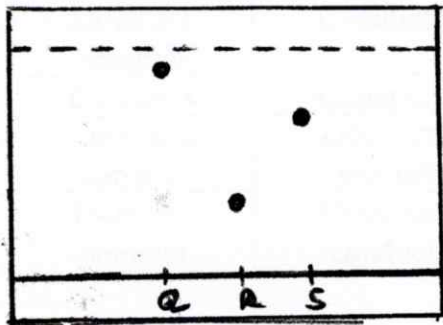
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.....  
(iv)a) Give two examples of natural polymers. (2 marks)

.....  
b) What type of polymer is terylene (1 mark)

6. Study the chromatogram below and answer questions that follow.



a) Which is the  
I Most soluble dye (1 mark)

.....  
II Most absorbed dye (1 mark)

.....  
III Possible solvent that can be used in the process above. (1 mark)

.....  
b) On the diagram, show the chromatogram of T which is a mixture of R and S. (1 mark)

c) State two applications of chromatography (2 marks)

.....  
.....  
d) I In a different experiment, Fatuma a student in your school wanted to extract oil from simsim seeds in the laboratory.

(i) Which method of mixture separation would she use? (1 mark)

.....  
.....  
(ii) Describe the method stated above as used in the experiment (3 marks)

.....  
 .....  
 .....  
 .....

7. a) The table below gives some properties of substances A, B, C and D. Study it and answer the questions that follow.

Substance	Electrical conductivity		Melting point (°C)	Boiling point (°C)
	Solid	Molten		
A	Does not conduct	Conducts	800	1420
B	Conducts	Conducts	650	1108
C	Does not conduct	Does not conduct	1701	2200
D	Does not conduct	Does not conduct	113	441

(i) What type of bonding exists in substances A and B? (2 marks)

A .....

B .....

ii) Which substance is likely to be Sulphur? Explain (2 marks)

.....  
 .....

b)i) Distinguish between covalent bond and ionic bond (2 marks)

.....  
 .....

ii) Using dots (•) and crosses (x) to represent electrons, show bonding in the following compounds.

I  $H_3O^+$  (1 mark)

.....  
 .....

II CO (1 mark)

.....  
.....  
c) In terms of structure and bonding, explain the following observations.

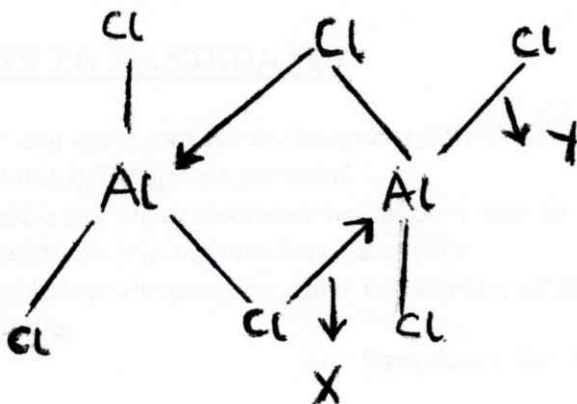
I The melting point of aluminium is higher than that of sodium (2 marks)

.....  
.....  
.....

II Graphite conducts electricity but diamond does not conduct electricity (2 marks)

.....  
.....  
.....

d) Below is a structure of aluminium chloride.



Name the bonds labelled x and y

X ..... (½ mark)

Y ..... (½ mark)