

1. Chloride can be prepared by using the following reagents. Sodium chloride, concentrated sulphuric acid and potassium manganate (VII)

(a) What is the role of the following in the reaction

I concentrated sulphuric

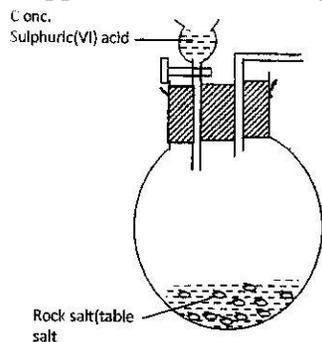
II Potassium manganate (VII)

(ii) Name the bleaching agent formed when chlorine gas is passed through cold dilute sodium hydroxide solution. (1mk)

(iii) Name one other function of the compound formed in (ii) above other than bleaching. (1mk)

(b) 3.8g of Magnesium chloride were dissolved in distilled water. Silver nitrate solution was added until in excess. Calculate the mass of silver nitrate that was used for the complete reaction. (Mg = 24, Cl=35.5, Ag = 108, N =14, O=16) (3mk)

(c) Student set up the apparatus as shown to prepare and study the properties of certain gas A.



(I) Name gas

A.....

(II) Write an equation for the reaction taking place to produce gas A

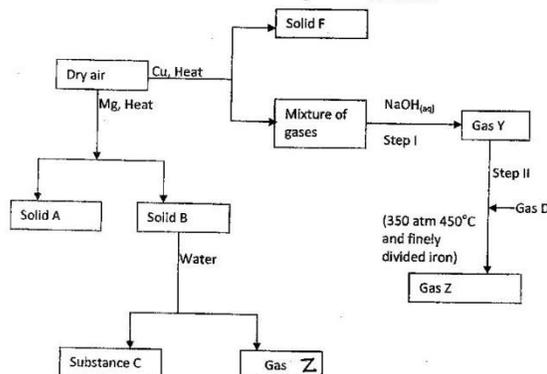
(d) Complete the diagram to show how a dry sample of the gas can be collected (2mk)

(e) Calculate the mass of the product that would be formed when 200cm<sup>3</sup> of gas A was reacted completely with excess ammonia gas at r.t.p. (3mk)

(H=1, N=14, CL=35.5)

(Molar gas Volume = 24 litres)

2. Study the flow chart below and answer the questions that follow.



- (a) Identify  
 (i) Solid A  
 (ii) Solid B  
 (iii) Gas D  
 (iv) Gas Z

(b) Explain why the amount of B obtained is much less than solid A

(c) Write an equation for the reaction between solid B and water

(d) (i) How can gas y be obtained from gas Z in the laboratory?

(ii) Write an equation for the process in d (i) above.

1mk

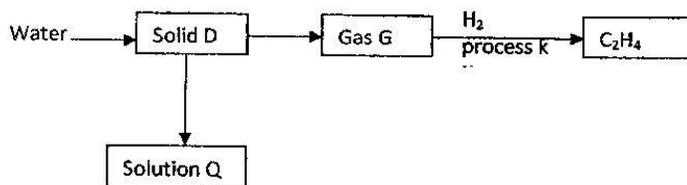
(e) Name the gas which is absorbed by sodium hydroxide in step 1

(f) Gas Y obtained in step 1 Is impure name one impurity it contains

(g) (i) What name is given to the process that occurs in step (II)?

(ii) Explain the effect of using much lower temperature than that in step (II)

3. (a) A certain hydrocarbon burns in excess oxygen to produce 4.40 g of carbon (IV) Oxide gas and 2.70g of water .Calculate the molecular formula of the hydrocarbon. If its R.M.M is 30. (CO<sub>2</sub>=44 H<sub>2</sub>O=18)



(b) (i) State one industrial use of process K

(ii) Identify

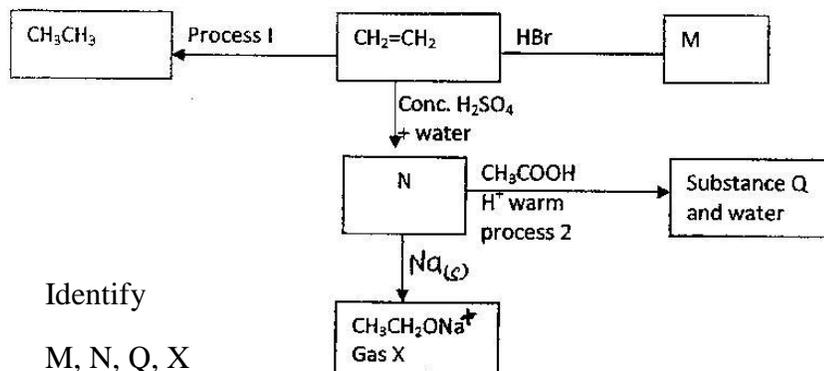
Solid D

Gas G

Solution Q

(iii) Write an equation for the reaction between solid D and water

- (c) The scheme below show reactions starting with ethane. Use it to answer the questions that follow.



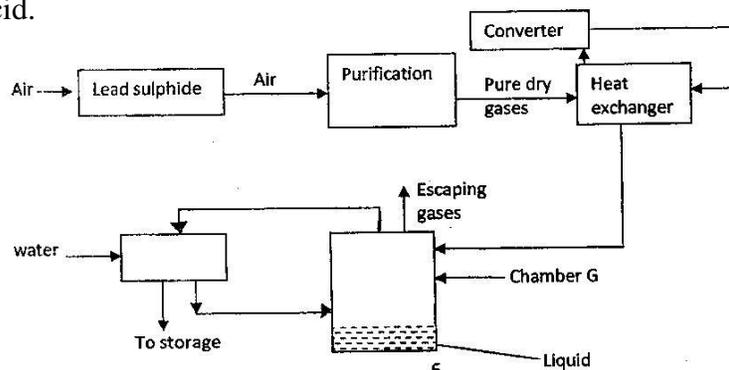
- (i) Identify M, N, Q, X
- (ii) To what class of organic compound does Q belong?
- (iii) State the conditions necessary for process 1 to take place
4. (a) Describe how solid ammonium chloride can be separated from a solid mixture of ammonium chloride and anhydrous chloride.
- (b) The table below shows liquids that are miscible and those that are immiscible.

Liquid	L3	L4
L1	Miscible	Miscible
L2	Miscible	Immiscible

Use the information given to answer the questions that follows.

- (i) Name the method that can be used to separate L1 and L3 from a mixture of the two.
- (ii) Describe how a mixture of L2 and L4 can be separated.
- (c) Sodium hydroxide pellets were accidentally mixed with sodium chloride. 17.6 of the mixture were dissolved in water to make one litre of solution. 100cm<sup>3</sup> of the solution was neutralized by 40cm<sup>3</sup> of 0.5m sulphuric acid.
- (i) Write an equation for the reaction that took place.
- (ii) Calculate the:-
- Number of moles of the substance that reacted with sulphuric acid.
  - Number of moles of the substance that would react with sulphuric acid in the one litre of solution
  - Mass of the unreacted substance in the one litre of solutions  
(H=1.0, Na=23.0, Cl=35.5, O=16.0)

5. The diagram below shows some process that takes place during the industrial manufacture of sulphuric (VI) acid.



- Write the equations for the reaction in which sulphuric (IV) oxide gas produced.
- Why it is necessary to keep the gases pure and dry?
- Describe the process that takes place in chamber G
- Name the gas that escape into the environment.
- Explain the harmful effect on the environment one of the gases named in (IV) above
- Give one reason why it is necessary to use a pressure of 2-3 atmospheres and hot more.

(b) Copper metal reacts with concentrated sulphuric (VI) acid but not with acid in dilute form. Explain.

(c) Suggests a reason why  $\text{BaSO}_4$  (A pigment made from sulphuric acid) would be suitable in making paint for cars.

(d) Name one fertilizer made form sulphuric acid

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

Particle	Protons	Electrons	Neutrons
V	18	18	22
W	17	18	18
X	19	19	20
Y	9	8	10
Z	19	19	22

(a) From the above choose: -

- A cation. Explain
- An anion. Explain
- A pair of isotopes

(b) Study the grid below and use the information to answer the question that follows. The letters are not actual symbols of elements.

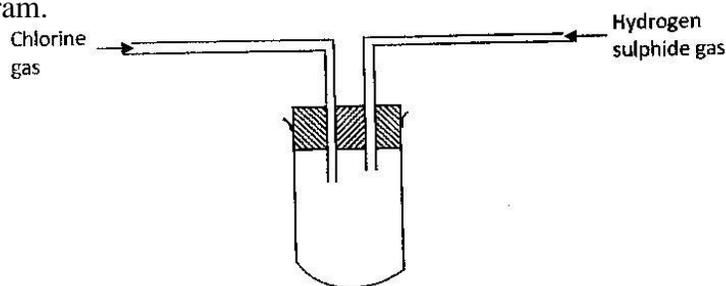
			C					
P				Q		R	D	T
U					W		X	E
Y				Z				

- (a) How many protons are in an atom of element W
- (b) Which element forms a:-
- Divalent anion
  - Trivalent cation
- (c) Which two elements react most vigorously with one another? Give a reason for your choice
- (d) In what form will the compound formed between U and X conduct an electric current?

Explain

- (d) What name is given to elements in the part labeled with letter C?

7. (a) In an element chlorine gas was mixed with moist hydrogen sulphide in a boiling tube as shown in the diagram.

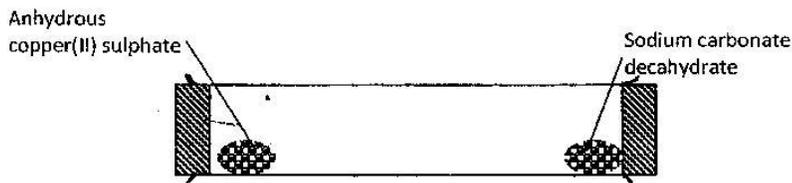


- State the observation made in the boiling tube
- Write an equation for the reaction that took place in the boiling tube.

- (b) Complete the table below by filling in the missing tests and observations.

No	Gas	Test	Observation
I	Chloride	Put a moist red litmus paper into the gas	
II	Sulphur (IV)Oxide		Paper turns to green
III	Butene	Add a drop of bromine water	

- (c) A student set up an experiment as shown below



- State two observations made in the combustion tube after sometime
- Explain the observations made in (i) above
- Write the formula of Copper (II) sulphate crystals