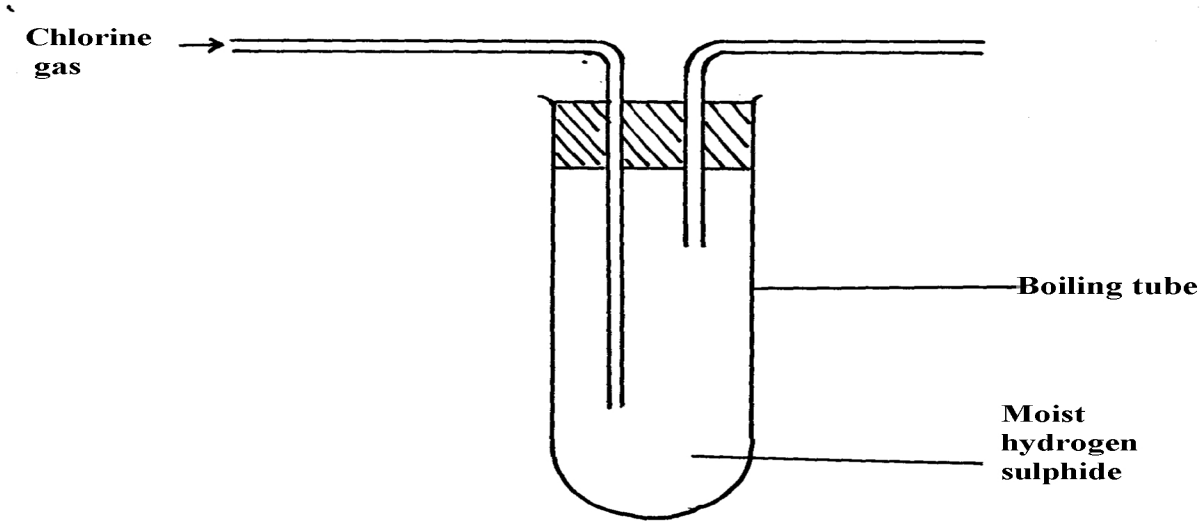
Chlorine and its compounds

1. (i) State **one** observation made in this experiment
   (ii) Identify the substances formed in the above reaction
2. Hydrogen chloride gas was passed into water as shown below:

   (a) When a blue litmus paper was dropped into the resulting solution, it turned red. Give a reason for this observation
   (b) What is the function of the funnel?
3. A group of compounds called chlorofluoro-carbons have a wide range of uses but they also have harmful effects on the environment. State one:-
   a) Use of chlorofluoro carbons
   b) Harmful effect of chlorofluoro carbons on the environment.
4. a) Water from a town in Kenya is suspected to contain chloride ions but not sulphate ions. Describe how the presence of the chloride ions in the water can be shown.
5. In an experiment, chlorine was passed into moist hydrogen sulphide in a boiling tube as shown below:



   (a) What observation was made in the boiling tube?
   (b) Write an equation of the reaction that took place in the boiling tube
   (c) What precaution should be taken in carrying out this experiment? Give a reason
6. Heated iron can react with both chlorine gas and hydrogen chloride gas
   i) Write equations for the reactions
   ii) Chlorine gas has no effect on dry blue litmus paper. Explain
7. The following diagram represents a set-up that can be used in the laboratory to prepare and collect a sample of chlorine gas:

   Manganese
   (IV) oxide

(a) No gas bubbles were produced in the above experiment. Explain the observation

(b) Complete the following equation

$Cl_2O_{(g)} + H_2O_{(l)}$

(c) Describe the bleaching property of chlorine water

8. Study the flow diagram below and answer the questions that follow:

(a) Name gas **L** ……

(b) Write a balanced equation for the reaction between hydrochloric acid and manganese (IV) oxide

(c) Explain what happens to coloured petals when dropped into a solution of **M**

9. Carbon (IV) Oxide, methane, nitrogen (I) Oxide and trichloromethane are green house gases

(i) State **one** effect of an increased level of these gases to the environment

(ii) Give **one** source from which each of the following gases is released to the environment;

(i) Nitrogen (I) Oxide

(ii) Tricholomethane

10. (a) Two reagents that can be used to prepare chlorine gas are manganese (IV) oxide and concentrated hydrochloric acid.

(i) Write an equation for the reaction

(ii) Give the formula of another reagent that can be reacted with concentrated hydrochloric acid to produce chlorine gas

(iii) Describe how the chlorine gas could be dried and collected in the laboratory

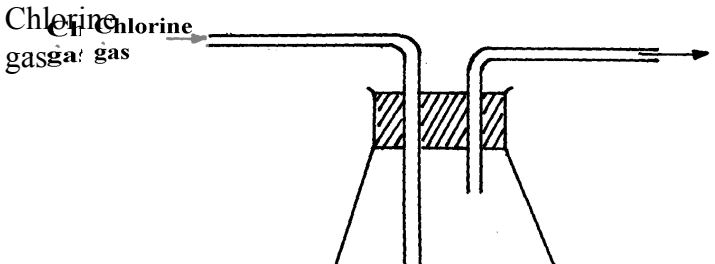
(b) In an experiment, dry chlorine gas was reacted with aluminium as shown in the diagram below

(i) Name substance **A**

(ii) Write an equation for the reaction that took place in the combustion tube

(iii) State the function of the calcium chloride in the set-up above

11. The figure below was set by a student to investigate the reaction between chlorine gas and hydrogen gas:



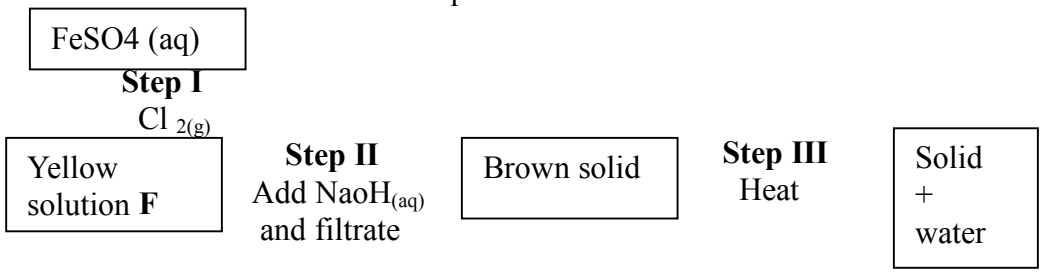
Flask

Hydrogen
sulphide gas

(a) Write an equation for the reaction that took place in the flask
(b) What observation was made in the flask?
(c) What precaution should be taken in carrying out the experiment?

12. In an attempt to prepare a gas, Sabulei added concentrated hydrochloric acid to Potassium manganate. The products were then passed through two wash bottles containing water and concentrated sulphuric acid
(a) Name the gas prepared……
(b) Name the purpose of wash bottle:
(i) Containing water?
(ii) Containing concentrated sulphuric acid?

13. Study the scheme below and answer the questions that follow.



(a) Write the formula of the cation present in the yellow solution **F**
(b) What property of chlorine is shown in Step **II**?
(c) Write an equation for the reaction in step **III**

14. (i) Name **one** drying agent for hydrogen Chloride
(ii) State and explain the observation that would be made when hydrogen Chloride gas is bubbled into a solution of Silver nitrate