Experiment 6

Aim

To study the changes in state of sublimate solids on heating.

Theory

A change in state directly from solid to gas on heating without changing into liquid state, or vice-versa is called sublimation. That is,

$$\text{Solid} \underset{\text{cool}}{\overset{\text{heat}}{\rightleftharpoons}} \text{Vapour (gas)}$$

Materials Required

Ammonium chloride (or camphor or naphthalene or iodine or any other sublimable solid), china dish, funnel, cotton plug, burner, tripod stand, and a wire gauge,

Procedure

1. Take powdered sublimable solid in a china dish.
2. Put an inverted funnel over the china dish.
3. Insert a cotton plug on the stem of the funnel.
4. Put china dish over the wire gauge on the tripod stand.
5. Heat the china dish slowly with the help of a burner.

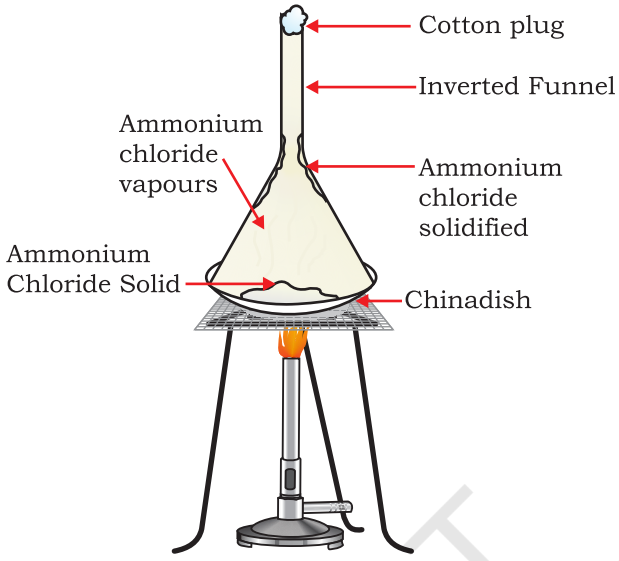

Fig. 6.1 : *Sublimation of ammonium chloride*

6. Cover the outer surface of the funnel with wet cotton to sublime the vapours quickly.

Observations

A sublimable solid on heating directly get converted into vapours, that sublimes back on cooling directly into solid again on the walls of the funnel.

Results and Discussion

A sublimable solid on heating directly converts into gaseous state. How? Is it because of the high vapour pressure of the liquid state of the solid. The liquid state is practically non-existant.

Precautions

- Heat the sample carefully.
- Take care in plugging the stem of the funnel securely with cotton.
- The size of the mouth of the funnel and china dish should be comparable.
- Do not remove the funnel when hot.

Note for the Teacher

- Moth repellent balls are easily available which can be crushed and can also be used as a sample in this experiment.

Questions

- In your view, what could be the reason for direct conversion of some solids to vapours and vice-versa?
- In the above experiment, you have observed conversion of solid to vapours. Is this a physical or a chemical change?
- Could you think of some applications of this change in daily life?