

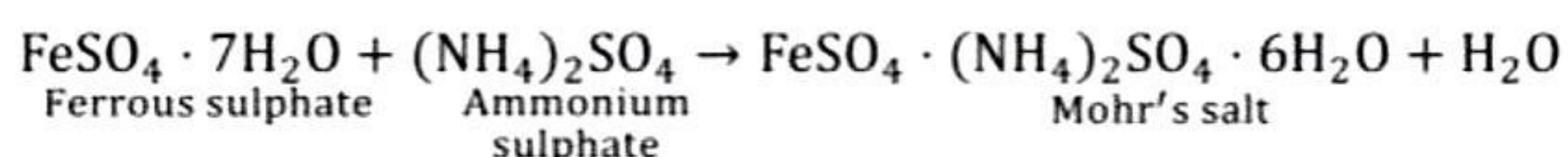
# EXPERIMENT

## Aim

To Prepare a Pure Sample of Ferrous Ammonium Sulphate (Mohr's salt),  $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$ .

## Theory

Mohr's salt is prepared by dissolving an equimolar mixture of hydrated ferrous sulphate and ammonium sulphate in water containing a little of sulphuric acid, and then subjecting the resulting solution to crystallization when light green crystals of ferrous ammonium sulphate,  $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$  separate out.



## Material Required

Two beakers (250 ml), China-dish, funnel, funnel-stand, glass-rod, wash-bottle, tripod stand and wire-gauze. Ferrous sulphate crystals, ammonium sulphate crystals, dilute sulphuric acid and ethyl alcohol.

## Procedure

1. Take a 250 ml beaker and wash it with water. Transfer 7.0 g ferrous sulphate and 3.5 g ammonium sulphate crystals to it. Add about 2-3 ml of dilute sulphuric acid to prevent the hydrolysis of ferrous sulphate.
2. In another beaker boil about 20 ml of water for about 5 minutes to expel dissolved air.
3. Add the boiling hot water to the contents in the first beaker in small instalments at a time. Stir with a glass rod until the salts have completely dissolved.
4. Filter the solution to remove undissolved impurities and transfer the filtrate to a China-dish.
5. Heat the solution in the China-dish for some time to concentrate it to the crystallization point.
6. Place the China-dish containing saturated solution over a beaker full of cold water. On cooling crystals of Mohr's salt separate out.

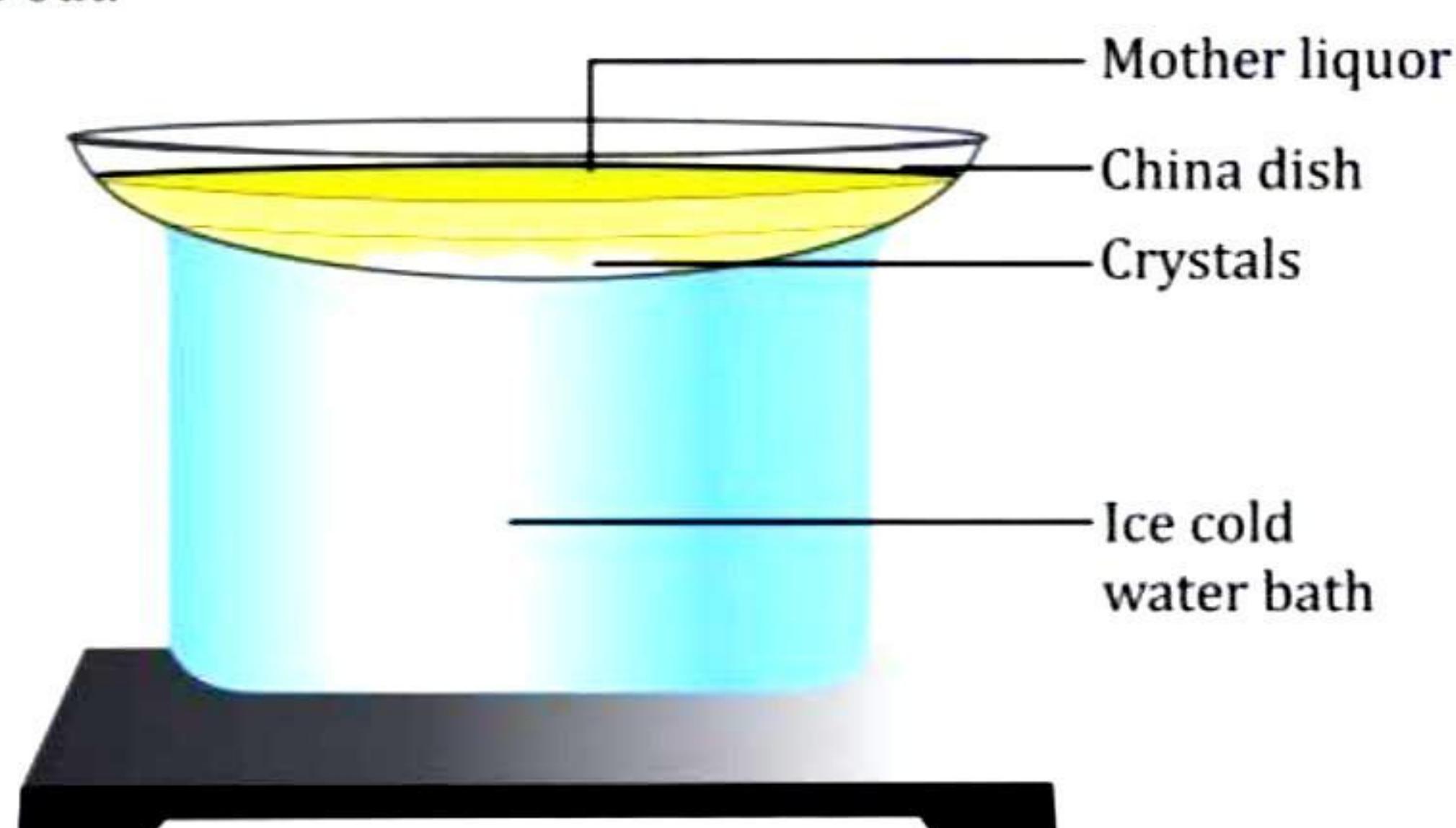


Fig.8. Preparation of Mohr's Salt

- Decant off the mother liquor quickly. Wash the crystals in the China-dish with a small quantity of alcohol to remove any sulphuric acid sticking to the crystals.
- Dry the crystals by placing them between filter paper pads.

### Observations

Weight of crystals obtained = ..... g

Expected yield = ..... g

Colour of the crystals = .....

Shape of the crystals = .....

**Note:** The crystals of Mohr's salt are monoclinic in shape.

### Result

- Colour of the crystals- \_\_\_\_\_.
- Shape of the crystals- \_\_\_\_\_.
- Cool the solution slowly to get good crystals.
- Do not disturb the solution while it is being cooled.
- Do not heat the solution for a long time as it may oxidize ferrous ions to ferric ions.

### VIVA VOCE

#### Q 1. What is the chemical formula of ferrous ammonium sulfate?

**Ans.** The chemical formula of ferrous ammonium sulfate is  $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4 \cdot 6\text{H}_2\text{O}$ .

#### Q 2. Why is ferrous ammonium sulfate often used in laboratories?

**Ans.** Ferrous ammonium sulfate is often used in laboratories because it serves as a stable and reliable reagent, particularly as a reducing agent in redox titrations and for calibrating iron solutions. Its well-known stoichiometry and ease of preparation make it suitable for various analytical and educational purposes.

#### Q 3. What is the purpose of preparing a pure sample of ferrous ammonium sulfate?

**Ans.** Ferrous ammonium sulfate is used in laboratories as a standard solution for experiments, calibrations, and educational demonstrations due to its defined stoichiometry and role in redox reactions. It ensures accurate and reliable results in various chemical analyses.

#### Q 5. Describe the procedure for preparing a pure sample of ferrous ammonium sulfate.

**Ans.** To prepare a pure sample of ferrous ammonium sulfate, weigh and dissolve crystals in distilled water, filter to remove impurities, adjust concentration if needed, and store the solution properly.

#### Q 6. Why is dilute sulfuric acid used in the preparation process?

**Ans.** Dilute sulfuric acid is used in the preparation process to maintain acidic conditions, prevent hydrolysis, and ensure the stability of ferrous ammonium sulfate during the dissolution of the crystals.

#### Q 7. Why is filtration necessary in the preparation?

**Ans.** Filtration is necessary in the preparation to separate impurities and undissolved particles, ensuring a pure sample of ferrous ammonium sulfate in the filtrate.