

# GOVT. POLYTECHNIC, GAJAPATI

Experiment No. : 03

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Date :

AIM OF THE EXPERIMENT :- To Prepare the crystal of Copper sulphate from copper carbonate in the laboratory.

APPARATUS REQUIRED :-

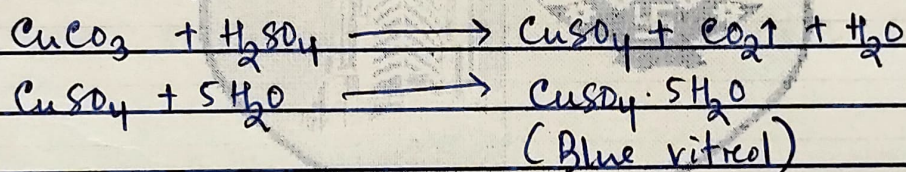
1. Beaker
2. Funnel
3. Glass rod
4. Porcelain basin
5. Tripod stand
6. Wire gauze
7. Bunsen burner
8. Filter paper
9. Filter stand.

CHEMICALS REQUIRED :-

1. Copper carbonate ( $\text{CuCO}_3$ )
2. Dilute Sulphuric acid ( $\text{H}_2\text{SO}_4$ )

THEORY :-

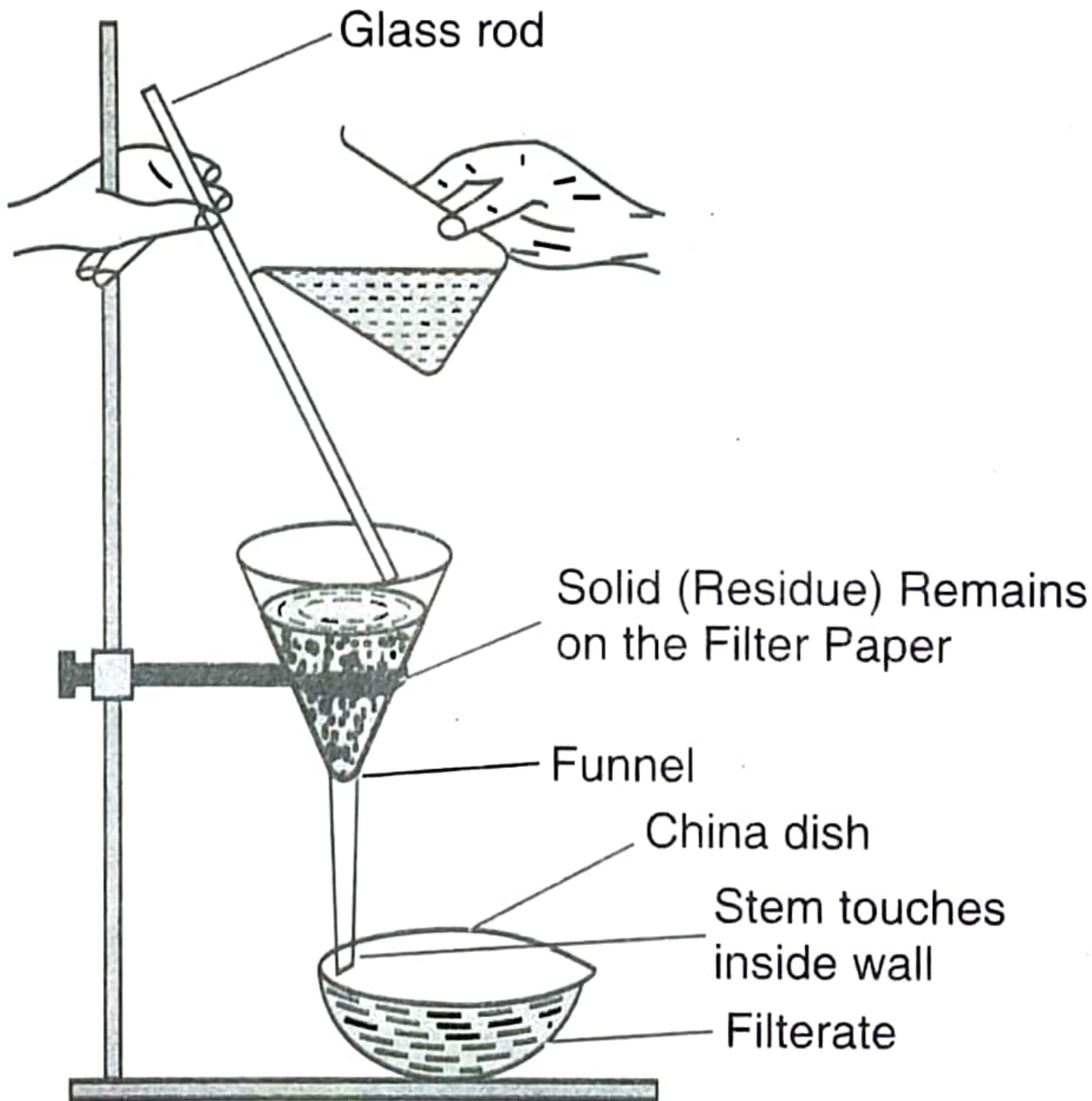
Copper carbonate reacts with dilute sulphuric acid to form soluble copper sulphate with evolution of carbon dioxide gas. The resulting solution is concentrated by evaporation till the point of crystallization is reached and then cooled to get crystals of copper sulphate pentahydrate ( $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ) called blue vitriol.

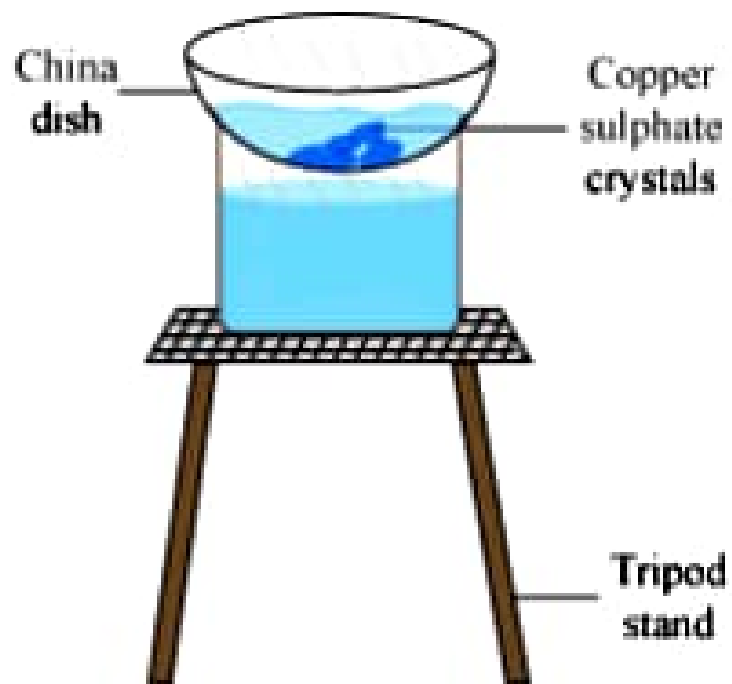
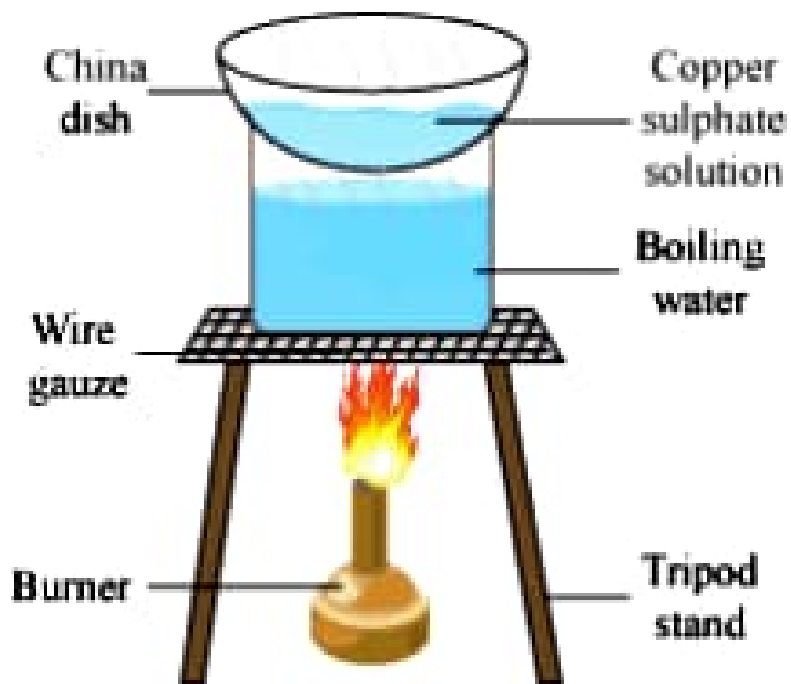


WORKING PROCEDURE :- The preparation of Copper sulphate crystals from Copper carbonate involves following steps.

(A) Preparation of Saturated solution :-

- (i) About 20ml of dilute sulphuric acid was taken in a beaker.
- (ii) Supplied Copper carbonate ( $\text{CuCO}_3$ ) powder was added gradually to this acid in small quantities with constant stirring.
- (iii) Addition of the powder was continued till a small quantity of Copper carbonate ( $\text{CuCO}_3$ ) is left behind.
- (iv) The resulting solution was heated slightly to expel the dissolved  $\text{CO}_2$  gas.
- (v) The filter paper was taken and it was folded into four.
- (vi) A cone of filter paper was prepared by taking three folds





- in one side and one fold in the other side.
- (vii) A funnel was taken and the cone was inserted which was made by the filter paper into it.
- (viii) The solution was filtered from beaker to the porcelain basin.
- (ix) The solution was transferred from the beaker to the filter paper cone slowly with the help of a glass rod.
- (x) The insoluble component present in the cone was washed with the distilled water so as to make it free from soluble component.

## (B) Concentrating the Filtrate :-

- (i) The filtrate was evaporated in the porcelain basin with constant stirring.
- (ii) The process of evaporation was continued till a drop of the liquid solution formed crystals on the tip of glass rod when blown on it. This state is termed as Crystallisation point.

## (C) Crystallisation :-

- (i) The hot solution was cooled (after reaching crystallisation point) slowly in air to start the process of crystallisation.
- (ii) The hot porcelain basin containing the solution was kept over a beaker full of water for quicker cooling.

## (D) Drying and Crystals :-

- (i) The saturated mother liquor present over the crystals was decanted off after the crystallisation is over.
- (ii) The deep blue crystals present in the porcelain basin was transferred to a filter paper and spreaded to dry.

RESULT : Colour - Blue

Shape - Crystalline, Octahedral.

Yield -