

The Islamic
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Practical Organic Chemistry

By

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Experimental 1: Determination of melting point

The melting point of a solid is the temperature at which transition from solid to liquid occurs at atmospheric pressure. A pure solid within a narrow range of .has a sharp melting point and will melt (1-2) C .

Solid state \longleftrightarrow Liquid state

The purpose of the experime

1. Discovery of unknown compound .
2. Know the purity of the compound.

Chemical properties

1. Dry
2. Fine powder
3. Appropriate Quantity

Apparatus:

Stand , beaker , rubber , clamp , thermometer , Bunsen burner , capillary tube , paraffin , unknown substances , spatula , watch glasses and unknow substances .

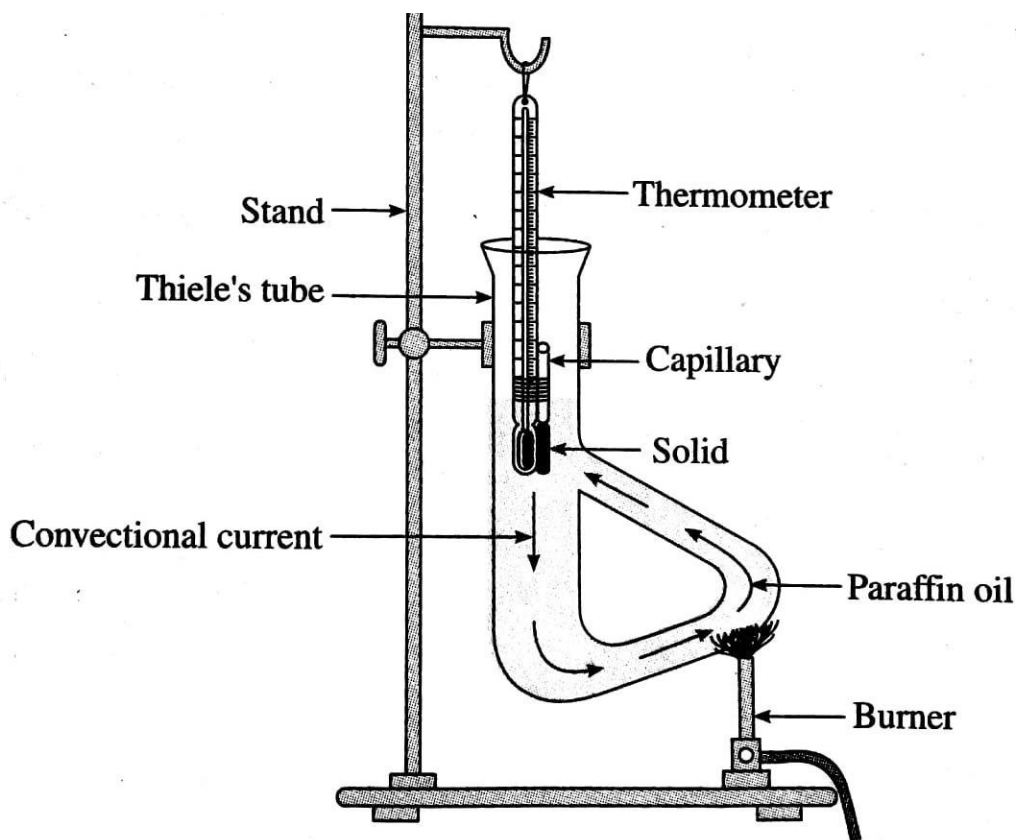


Figure (1) : melting point device

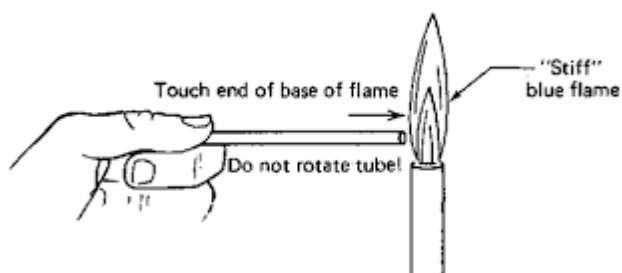


Figure (2): Sealing the end of the capillary tube

Capillary melting point tubes are about (6-7) cm in length and (1) mm in diameter. They are sealed by rotating one end of the capillary tube in the edge of a small hot flame **Figure (2)**.The dry solid is ground to a fine powder on a piece of paper with a

spatula. The open end of the capillary is then pushed into the powder which is forced down the capillary tube by gently tapping the closed end on the bench top **Figure (3)**. This is repeated several times until the solid is densely packed at the bottom of the tube to a height of 2-3 mm.

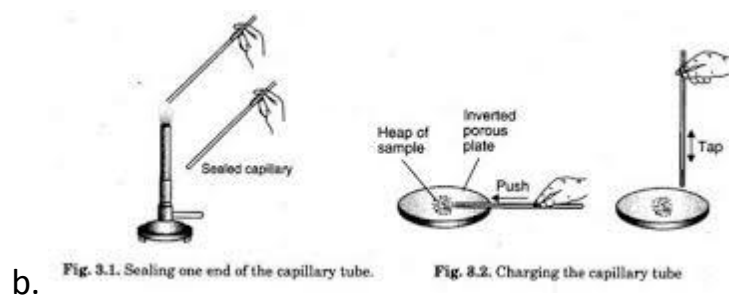
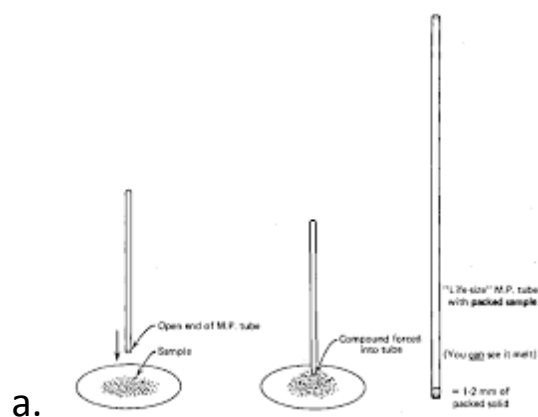


Figure (3): Filling the capillary tube with the powder of the unknown.



COSLAB M.B Apparatus

Procedure:

To determine the melting point of a solid, a small amount of the powdered substance is introduced into a capillary tube which is then attached to a thermometer and placed in the **oil bath** (Paraffin oil). The bath is heated rapidly to within (20) C° of the expected melting point then slowly, and at a constant rate of (2-3) degrees per minute, close to the melting point. The temperature at which the solid begins to melt, and that at which it is completely liquid, is recorded as the melting point range of that substance.

Characteristics of the used Oil bath:

- 1-Has a high boiling point reaches 300 C.
- 2-Does not liberate toxic fumes.
- 3- It has a higher density than the density of water which helps to deliver heat to the material in a calm

and harmonious.

4- Does not come apart

Calculations

The Melting point (M.t)

$$\Delta T = T_2 - T_1$$