



Determination Of Melting Point

Assistant Lecturer : Saba Abd Ul-munemHabeeb
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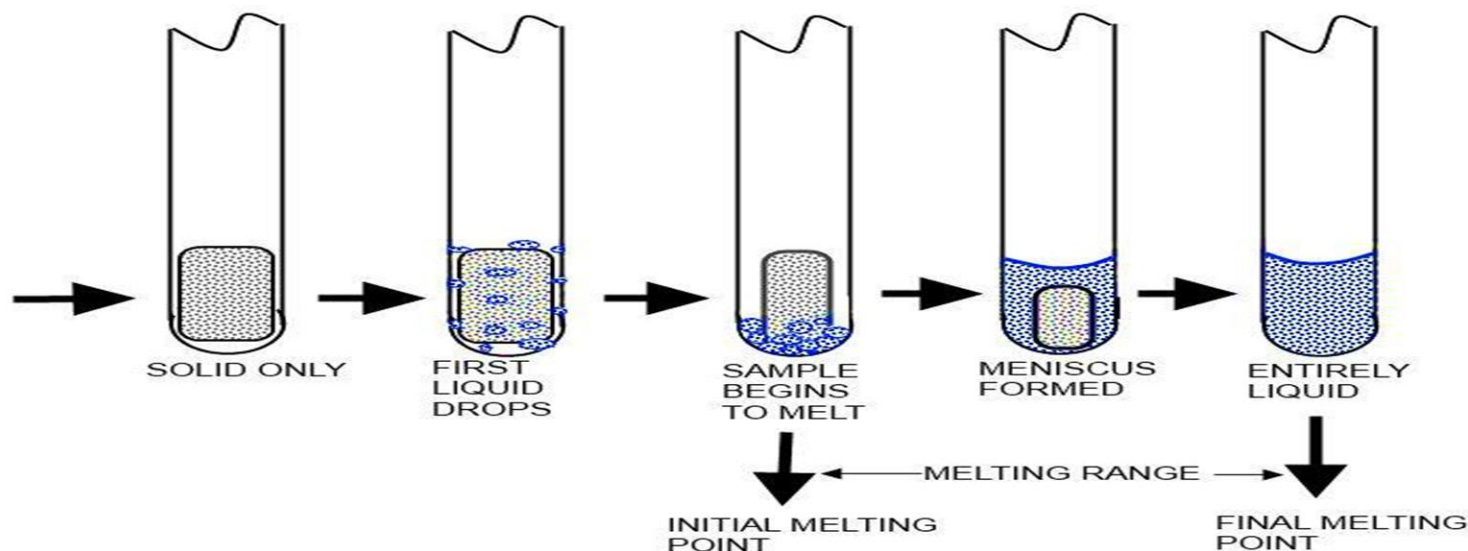
physical properties

- ❑ physical properties such as **melting point**, **color**, density, and **elemental composition** are all routinely measured
- ❑ **melting point** : The temperature at which a solid melts and becomes a liquid is the melting point
- ❑ **melting point** : can help us in the identification of a sample & to establish its purity.
- ❑ A **pure**, nonionic, **crystalline organic** compound usually has a sharp and characteristic melting point (usually 0.5-1.0 °C range).

The melting point range

- The melting point range: is the difference between the temps.
Melting point rang = $T_2 - T_1$

Pure samples usually have sharp melting points, for example 149.5-150 °C or 189-190 °C; impure samples of the same compounds melt at lower temperatures and over a wider range, for example 145-148 °C or 186-189 °C



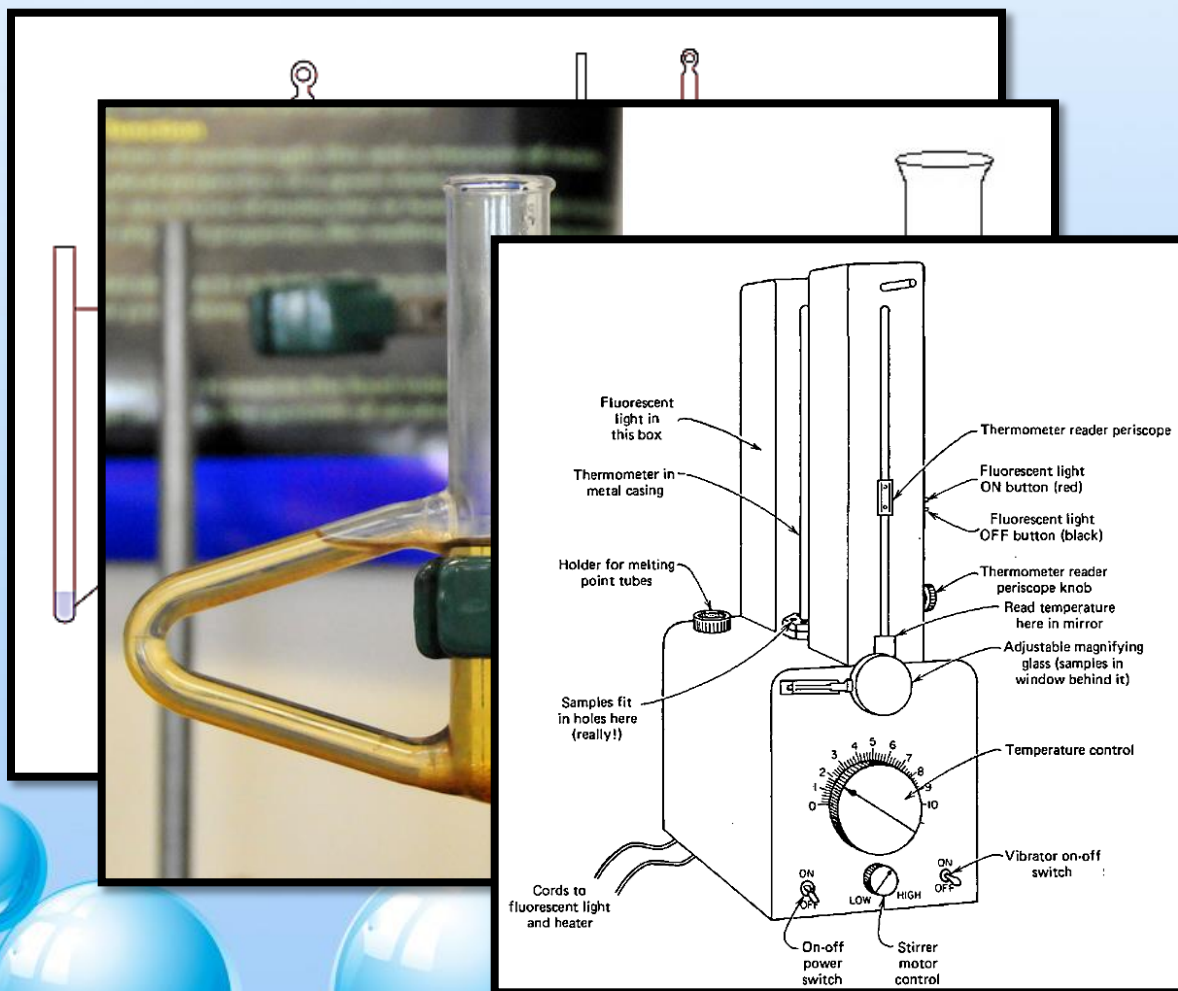
Mixed Melting Point Determination

- The phenomenon of melting point depression can be used for the determination of unknown pure substances.
- **How can you know whether the 2 samples are the same or different?**
- *We mix them and measure the m.p. for the resultant mixture, If,*
- m.p. of mixture < m.p. of original & wider m.p. range → different cpd.
- m.p. of mixture = m.p. of original & same m.p. range → same cpd.



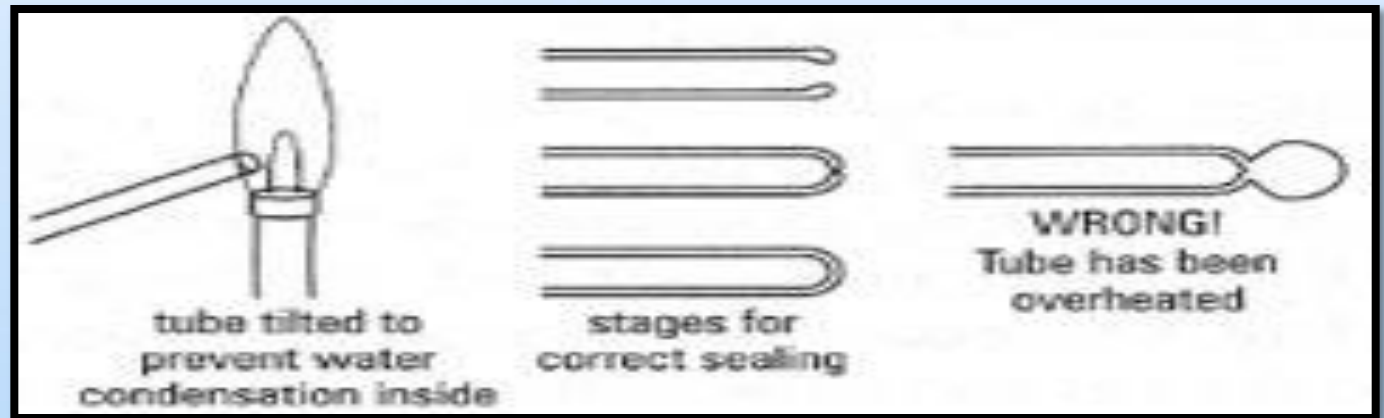
Melting Point Apparatus:

- Hot - oil m.p. bath.
- Thiele apparatus
- Mel-temp

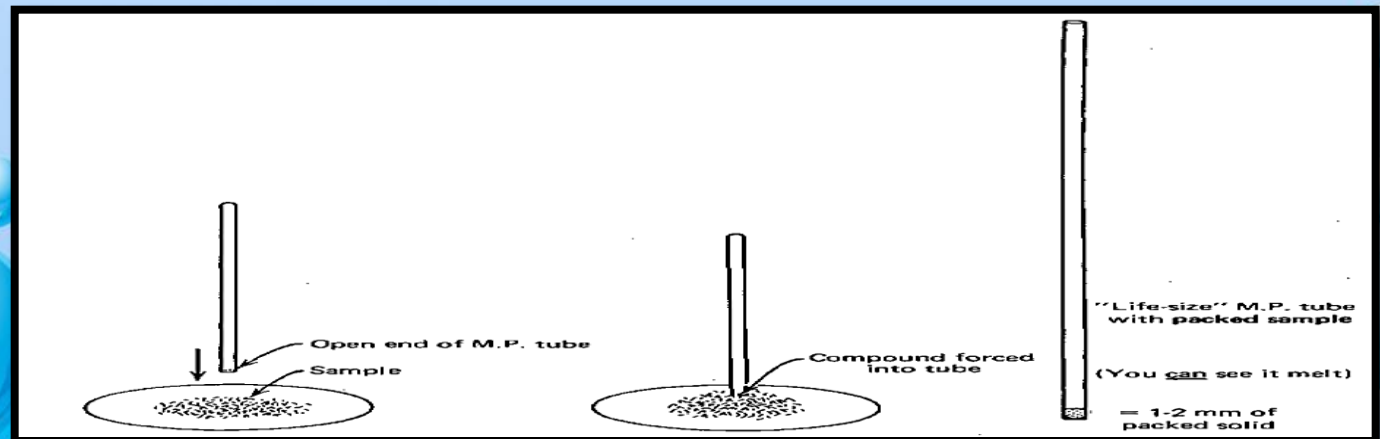


Sample preparation

- capillary tube method



Filling a capillary tube:



Procedure:

- ❖ Obtain a capillary melting point tube and a known compound.
- ❖ Place a small amount of the compound on a clean surface. Push the open end of the tube into the compound. Some of the sample will now be in the top of the tube.
- ❖ Hold the closed end of the capillary tube over a dropping tube; the dropping tube should be held perpendicular to the table and a couple of inches above the table surface. Drop the capillary tube into the dropping tube; the capillary tube will bounce on the table packing the powder into the bottom.



- ❖ Place the capillary melting point tube in the Mel-temp apparatus chamber. Start with a setting of two to two and a half; the temperature should slowly rise. The sample should be observed continuously, so that the melting point of the sample is not missed. Heat slowly to acquire the most accurate results. Record the melting range, which begins when the sample first starts to melt and ends when the sample is completely melted.
- ❖ Allow the Mel-Temp to cool. Obtain an unknown sample and determine its melting range. Identify the unknown by comparing the data of the known the class has obtained.



Data and Report Sheet

- *Name:*
- *Group:*
- *Date:*
- *Title of experiment:*
- *aim of experiment:*

- *devices and tools:*

Table:

Organic Compound	Correct M.P.	Measured M.P.	Range