



**AL-Mustaqbal University College**

**Medical laboratory Techniques  
Department**

**Practical General Chemistry**

**Lecture (11)  
(Melting point measurement)**



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## Melting Points:-

The temperature at which a solid melts is known as the melting point (MP) of that substance. The melting point is a physical property of a solid and can be used to help identify a substance. In practice, a solid usually melts over a range of temperatures rather than at one specific temperature. For this reason it is more useful to speak of a melting point range. Although the term "melting point" is usually used, what is meant is "melting point range". If the compound melts over a very narrow range, it can usually be assumed that the compound is relatively pure. Conversely, compounds that melt over a wide range are assumed to be relatively impure.

## Notes

- When a contaminant (**impurity**) is present, the melting point of the impure sample is always **lower** than that of the pure (colligative property: melting point depression), and the range is always **broader** (for the substances that have an melting point range instead of a sharp point).
- Most of the organic compounds have a melting range, rather than a point. A sharp melting point is generally accepted to have a range of **1 to 2 °C**.

- To determine a melting point range, a small sample of the solid in close contact with a thermometer is heated in a metal heating block so that the temperature rises at a slow, controlled rate. The rate of heating would be controlled so that the melting range is as narrow as possible.



### The Determination of Melting Points :-

Melting points will be determined by using one of the DigiMelt units (Figure 1.1). The DigiMelt units must always be kept upright. Place a small quantity (1/16 inch in tube) of the solid to be melted in a capillary tube (labeled melting point tubes). Tap the closed end of the tube on the desk, clean the outside, and use the tamper of the right side of the DigiMelt to compact the solid down to the closed end of the melting point capillary tube. Drop the tube (closed end down) down a section of glass tubing (see TA) to compact the solid in the bottom or closed end of the tube even more. Place the tube loaded with the sample into the

sample holder of the DigiMelt with the closed end down. The crystals can be ground up in a clean and dry mortar and pestle if they are too big to fit into the capillary tube.



Figure 1.1: The DigiMelt apparatus. Melting point capillary tubes are placed (**closed end down**) in the slots directly in front of the magnifying lens where they are viewed during melting. Up to three samples can be viewed at once. The heating rate of the DigiMelt is adjusted by setting a temperature ramp along with a start and end temperature following the "Quick Start Instructions" on the front of the DigiMelt. A ramp of 20 °C per minute will result in a rapid temperature rise while a ramp of say 2 °C per minute will give a slower rise that will more accurately measure the melting range of a solid.