(HT1-3) Melting Point of Wax

Aim of experiment

Determination of melting/freezing point of wax.

Apparatus

Insulated Water Jacket Heater- Wax- Beaker- Thermometer.

Theory of experiment

Suppose that a wax at 20oC is placed in a container, and a thermometer inserted in it. Imagine the container to be surrounded by a heating coil which supplies heat to the wax at a uniform rate. The temperature of the wax would be observed to increase until reaches to 60oC, the normal melting point of wax. It is the temperature at which solid melts when heat supplied to it at atmospheric pressure. As soon as this temperature is reached, the wax begins to melt. The melting process is a change of phase, from the solid phase to a liquid phase. The thermometer, however, will show no increase in temperature, and even though heat is being supplied by the same rate as before, the temperature will remain at 60oC until all the wax is melted. The quantity of heat per unit mass that must be supplied to a material at its melting point to convert it completely to a liquid at the same temperature is called Latent heat of fusion. As soon as the last of the wax has melted, the temperature begins to rise again at a uniform rate. When a temperature of 120oC is reached, bubbles of steam start to escape from the liquid surface, or the wax begins to boil. This is the Normal boiling point; the temperature at which liquid boils when heat is supplied to it at atmospheric pressure.

The temperature remains constant at 120oC until all the wax has boiled away. Another change in phase has therefore take place, from the liquid phase to the gaseous phase. The quantity of heat per unit mass that must be supplied to a material at its boiling point to convert it completely to a vapor at the same temperature is known as Latent heat of evaporation

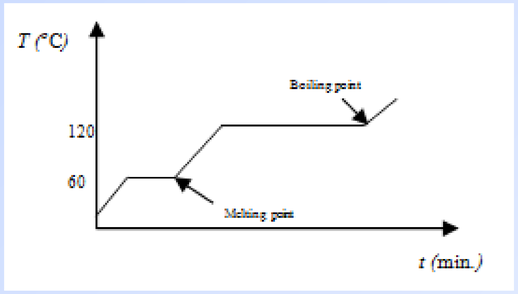

Figure 1. Variation of temperature as a function of time of heating.

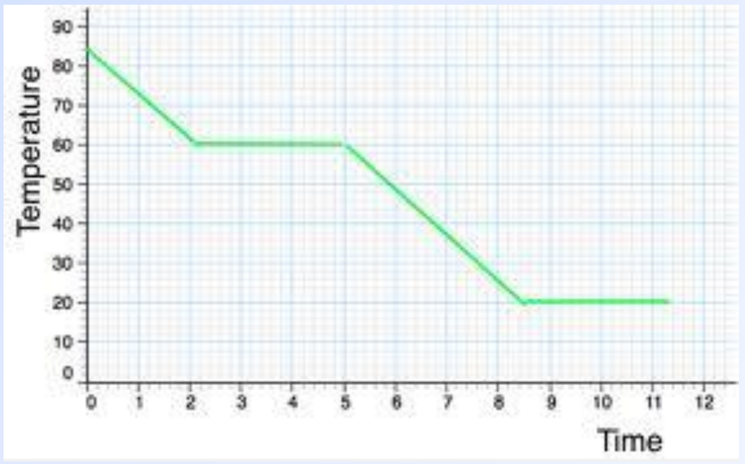

Figure 2. Variation of temperature as a function of time of cooling.

Procedure

1. Put the wax in a glass beaker.
2. Put the wax beaker in a water jacket on the heater until its temperature rises to ~ 85 oC, figure 2.
3. Switch off the heater and record the cooling temperature each one minute.
4. Tabulate the results and draw a graph between the time on x-axis and temperature on y-axis, figure 2.
5 From the graph find the melting point of wax.

Results

t (min.)	*T (°c)*	*t (min.)*	*T (°c)*	*t (min.)*	*T (°c)*

Melting point of wax = Freezing point of wax

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