## Experiment with states of matter and melting and freezing points

**Devices used:** Thermometer, beaker, heater, beaker with wax, ice

### Theory

It was found that when we melt ice, its temperature remains constant at zero degrees Celsius, as does the water formed in the melted ice, as long as there is a piece of unmelted ice, which we take from the temperature of the atmosphere. Several materials, including metals, can be melted. When such materials are heated, their temperature rises until melting begins. During the melting period, the temperature remains constant. When all the material melts, the temperature begins to rise. Accordingly, the melting process requires heat. When the molten material cools, the temperature initially decreases until the material begins to solidify (freeze). During the freezing process, the temperature remains constant. When the freezing process ends, the temperature begins to decrease. This means that heat is expelled during the freezing process and that the amount of heat needed to melt the material was taken from it when it froze. The processes of melting and freezing occur at the same temperature, and this temperature is often called the melting point of a pure crystalline substance similar to water. Since the temperature of the liquid does not rise during the period of boiling, this means that all the heat that the liquid takes is needed for the evaporation process.

### The practical part

1- Place a beaker of water on the heater

2-Place the small beaker containing the wax inside the beaker of water while the water is boiling

3- Attach the thermometer to the holder and place its other end in the wax and start measuring the temperature from the first melting point of the wax

4- After all the wax has melted, we remove it from the beaker of water and wait for it to cool. From the first layer of solidification, we measure the temperature every minute for 6 minutes until it is completely solidified.

5- Record the results and make a table as follows:

| Tmin | $t_\Theta$ Melting and freezing points |
|---|---|
| | |

6- A graph between the melting and freezing temperatures and the time for each case.