Temperature and Phase Changes

Introduction

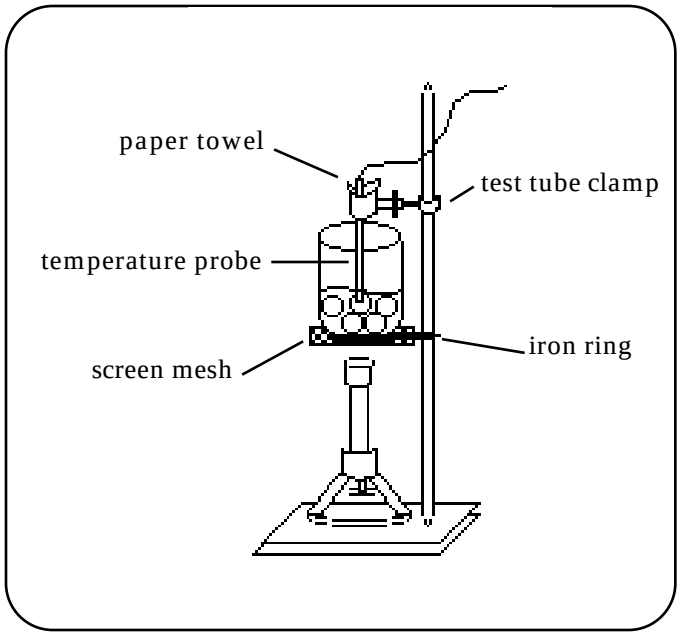
The purpose of this lab is to observe temperature changes as water changes from solid (ice), to liquid, to steam.

Materials needed for this lab:

- 400 ml beaker
- an iron ring
- screen mesh
- paper towel
- glass stirring rod
- ring stand
- test tube clamp
- Bunsen burner
- ice

<u>Construct the following apparatus</u>:

1) Attach a ring to the ring stand so that it will hold a beaker a few inches above a Bunsen burner.
2) Place the wire mesh on top of the ring.
3) Put enough ice in the beaker to fill it 1/4 full.
4) Add enough water to just cover the ice.
5) Using a test tube clamp, and a paper towel, secure the temperature probe so that the tip is about 1.5 centimeters below the surface of the ice.



6) Make sure that the wire extending from the probe is not allowed to hang down so that it may be damaged by the heat of the Bunsen burner. Let the setup stand for 3 minutes.

<u>Procedure</u>:

1)Using a glass stirring rod, continuously stir the ice / water mixture throughout the entire experiment. Start stirring for one minute before collecting data.
2) After one minute has past, use the mouse to select the "start" button on the lower left corner of the screen and light the Bunsen burner. Keep stirring.
3) Adjust the burner to a medium flame.
4) As changes in phase start to occur, note the times when one state of matter has completely changed to another state. In other words, record the time at which the ice has completely changed to water, and the time when the water starts to boil.

5) Continue stirring until the water has been boiling for two minutes. Then increase the flame to the hottest flame you can muster and boil for another minute.

Questions:

1) On a piece of graph paper make a sketch of the graph and mark the times when the ice completely changed to water and when the water began to boil.

2) What explanations do you have for the plateaus in your graph? Why is the graph nearly flat while the ice is melting?

3) Why is the graph flat while the water is boiling?

4) You should have found that the temperature did not change when you turned up the Bunsen Burner in the end. Why is this true?