PHASE CHANGES LAB

The phase in which matter exists depends upon the speed of and distance between the particles. As a result, when the particles absorb energy, there is an increase in the motion of or space between the particles. In this lab, you will observe the change in temperature of a substance as it is heated.

MATERIALS

- hot plate
- 600-mL beaker
- thermometer
- beaker tongs
- ring stand
- utility clamp
- stirring rod
- crushed ice

PROCEDURE

1. See figure 1 for equipment setup.

2. Fill a 600-mL beaker about halfway with crushed ice and place it on the hot plate.

3. Position the thermometer on the ring stand so that the end of the thermometer is just above the bottom of the beaker. Wait for the temperature reading to stabilize.

4. Turn on the hot plate. Record the initial temperature then record temperature every 30 seconds. Watch the water level and make sure the thermometer is always submerged. Stir the ice/water mixture gently with a stirring rod as it heats up. Be careful not to hit the thermometer.

5. Make sure to record at what time all the ice melted and when the water began to boil.

6. After the water has been boiling at a constant temperature for about 5 minutes, turn off the hot plate, and allow the beaker to cool before removing it from the hot plate with beaker tongs. Pour the water down the drain.

7. Plot points on graph with temperature on the y-axis and time on the x-axis. Note on the graph the points where the ice melted and the water started to boiled. We are going to record 4 stages of heat:

- The heating of the ice (Slope 1)
- The melting of the ice (Slope 2; no temperature change)
- The heating of the water (Slope 3)
- The vaporization of the water (Slope 4; no temperature change)

8. Draw a best fit line on the graph for each stage
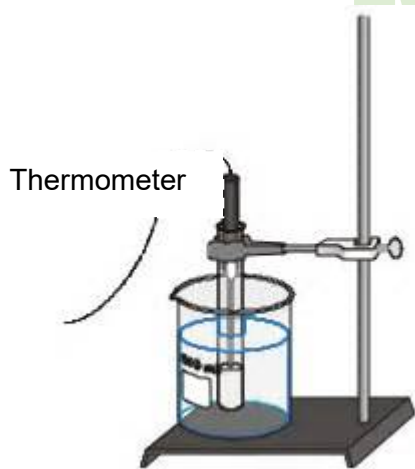9. Calculate slope for each stage

CONCLUSION

1. At any time did the temperature seem to rise at or near a constant rate?

2. When did the temperature change the slowest?

3. When did the temperature change the fastest?

Thermometer

(Figu:e 1) Setup Bunsen burner under beaker