Experiment (2): Physical Properties of Organic Compounds: Determination of Boiling Point (b.p.)

Boiling point (b.p.) of a liquid represents the energy required to overcome the various intermolecular attractions binding its molecules (e.g. dipole-dipole attraction and hydrogen bonding) and therefore undergo a phase change into the gaseous phase. Therefore, the boiling point of a liquid is also an indicator of the strength of the attractive forces between its molecules.

Boiling point is a physical property used for Identification of a liquid organic compound

Procedure:

1. Attach a test tube to a thermometer by means of a rubber band see (Figure 1).
2. Place 2 mL of the unknown liquid in the test tube
3. Immerse a capillary tube (about 4 cm long) sealed at the upper end in the liquid
4. Put the thermometer with the tube in a water/oil bath
5. Start heating with a burner until a rapid stream of bubbles starts coming out of the capillary tube. At this point remove the burner. The stream of bubbles becomes slower and the temperature drops until a point is reached when bubbling stops, and the liquid starts to rise in the capillary tube. Record this temperature as the boiling point of the liquid

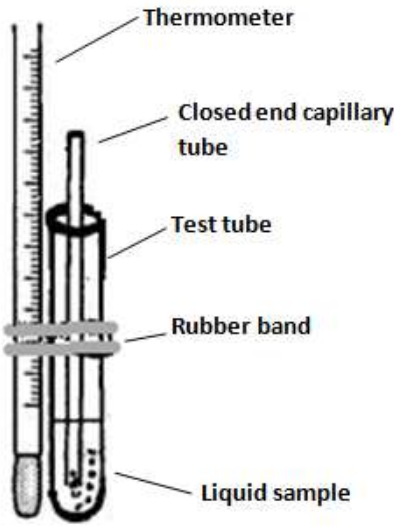

Figure 1: Sample, capillary tube and thermometer set-up for measuring boiling point