Experiment No. (3) Boiling Point

- **The boiling point of an organic liquid** *is the temperature at which vapor pressure equals the atmospheric pressure over the liquid,* ***or*** *it's the temperature at which the vapor and liquid phase are in equilibrium at a given pressure.*

درجة الغليان : هي درجة الحرارة التي يتساوى فيها الضغط البخاري للسائل مع الضغط الجوي المسلط على سطح السائل. او هي درجة الحرارة التي تكون فيها الحالة الغازية للمادة متوازنة مع الحالة السائلة تحت ضغط معين.

- The boiling point is considered as a criterion of purity of a compound and it's useful for identification or organic compound.

تعتبر درجة الغليان كمؤشر لدرجة نقاوة المادة و هي مفيدة في التعرف على نوع المواد العضوية

- Pure liquids have sharp boiling points while mixtures show boiling point range.

السوائل النقية لها درجة غليان معروفة و محددة بينما الخلائط لها مدى من درجات الغليان

- The atmospheric pressure plays an important role in the determination of point correctly. Reduction of the pressure leads to a decrease or a depression in the boiling point and vice versa.

يلعب الضغط الجوي دورا كبيرا في تحديد درجة الغليان حيث ان تقليل الضغط الجوي يؤدي الى انخفاض في درجة الغليان و العكس صحيح.

Instrument:

1. Capillary tube
2. Test tube
3. Mercury thermometer
4. Water bath
5. Burner
6. Iron stand
7. Clamp
8. Glass road.

Procedure:

1. A capillary tube closed from one end is inverted upside down and put in a test tube containing a small quantity of a liquid whose boiling point is to be measured.
2. The test tube is attached to iron stand by a clamp and placed in a water bath.
3. The thermometer is attached to iron stand by clamp and placed in water bath.
4. Start heating with continues stirring until a rapid stream of bubbles coms out of the capillary tube (inside the liquid).
5. Remove the flame and allow the oil bath to cool so that the bubble stream will become slower and slower as the temperature drops until a point is reached at which bubbling stops and the liquid starts to rise inside the capillary tube.
6. Record this temperature as the boiling point.

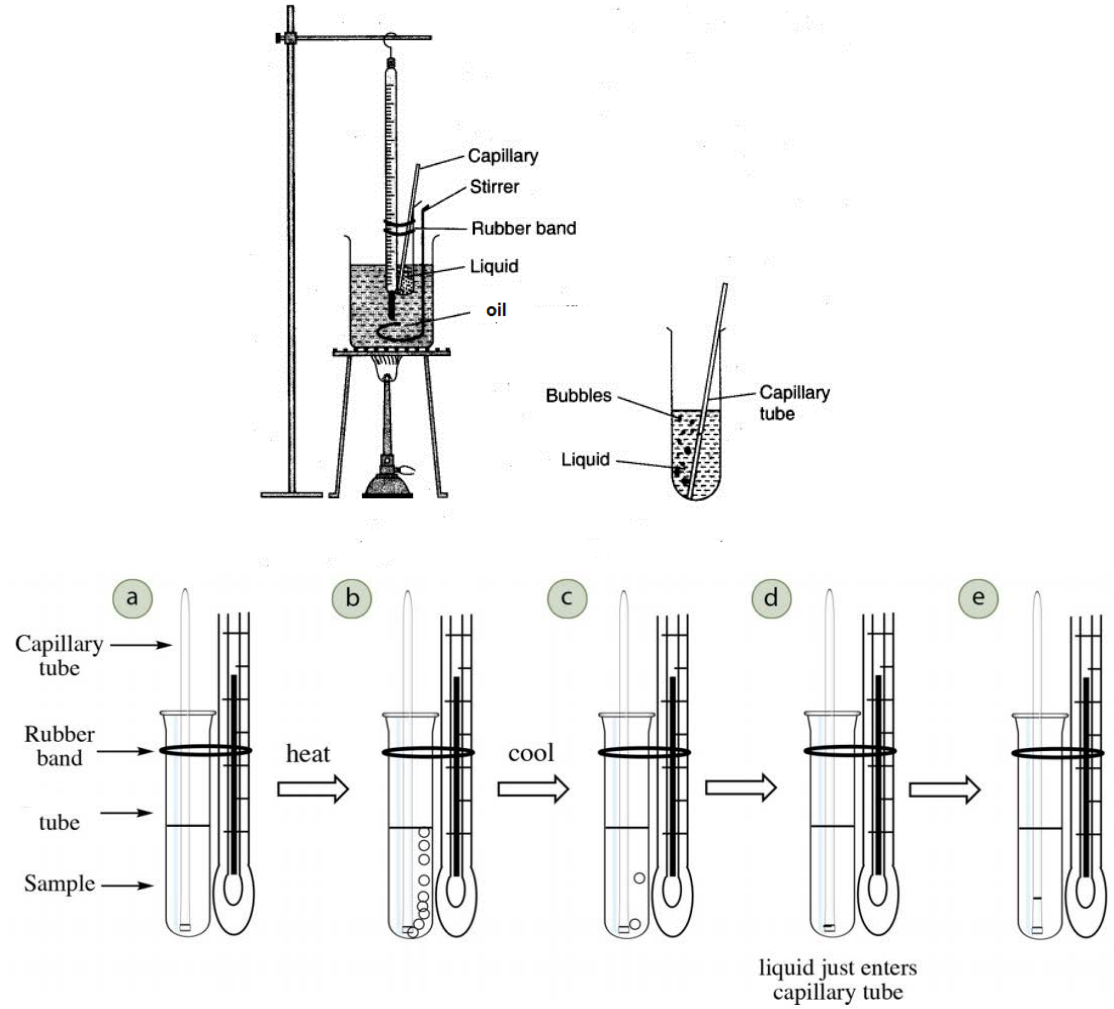

Figure1. Boiling point determination: a) Initial setup, b) After heating past the boiling point, c) Cooling, d) Liquid just enters the capillary tube (temperature is the boiling point), e) Liquid is inside the capillary tube (temperature is lower than the boiling point).