* Heat of Vaporisation :-

When a liquid changes in to vapour state, the intermolecular forces have to be come. Hence, a certain amount of energy has to be supplied to the liquid in the form of heat. The quantity of heat which has to be supplied to one mole of liquid at its boiling point so as to change it into vapour state at the same temperature, is known as the molar heat of vaporisation. (ΔH_{vap}).

The molar heat of vaporisation of a liquid expressed in Joules divided by the normal boiling point of the liquid on the absolute scale is approximately equal to 88. This is known as Trouton's Rule.

This may be expressed as:

$$\frac{\Delta H_{vap}}{T_b} \simeq 88 \text{ J K}^{-1} \text{ mol}^{-1}.$$

This equation is only approximate as the values of $\Delta H_{vap}/T_b$ are seen to vary over a wide range viz. from about 60 to 110 $\text{J K}^{-1} \text{ mol}^{-1}$.

The quantity $\Delta H_{vap}/T_b$ is also called entropy of vaporisation ΔS_{vap}.

Trouton's Rule is useful for estimating the heat of vaporisation of a liquid if its boiling point is known.

* Surface Tension :-

Surface tension is defined as the force acting per unit length perpendicular to the line drawn on the surface of the liquid.

It is denoted by γ (Gamma). Its SI unit is $N\,m^{-1}$.

The energy required to increase the surface area of the liquid by one unit is called surface energy.

When the surface area is minimum, energy is lowest.

* Some facts explained by surface tension :-

1). Spherical shape of drops :-

Surface tension decreases the surface area. When the surface area is minimum, energy is lowest. Spherical shape satisfies this condition. It is the reason that mercury drops are spherical.

2). Rise of Liquid in a Capillary :-

If one end of a capillary is placed in a liquid which wets glass, it is found that liquid rises into the capillary. It is the downward attractive force acting at the surface of the liquid which pushes the liquid to rise in the capillary.

(3). Fire polishing of glass :-

Sharpe glass edges are heated to make them smooth. On heating, the glass melts and the surface of the liquid —

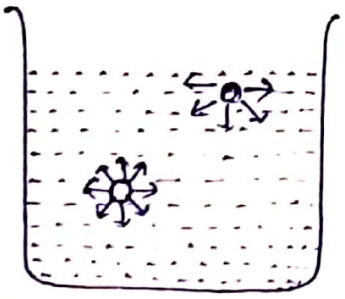
– becomes round at the edges to have minimum surface area. This is called fire polishing of glass.

(4). Effect of temperature on surface tension:–

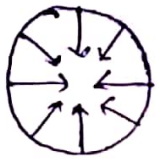
The magnitude of surface tension of a liquid depends on the attractive force between the molecules. Greater are the attractive forces, higher is the surface tension. On increasing the temperature, kinetic energy of molecules increases and intermolecular attractive force decreases. Therefore, surface tension decreases with rise in temperature.

(5) Nature of liquid and surface tension:–

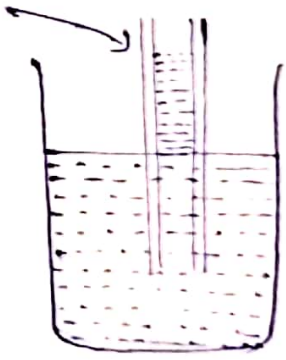
Greater are the attractive force between the molecules of the liquid, higher is the surface tension.



Surface tension of a liquid



Spherical Shape of liquid drop



Rise of the liquid in a capillary

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