

③ Definition of Surface Tension: ⑥

The surface tension γ of a liquid is the force per unit length of the surface that opposes the expansion of surface area.

$$\gamma = \frac{W}{A}$$

where W work done to expansion of area A of liquid film.

unit of γ : It is $N m^{-1}$ or $J m^{-2}$

Methods of determination of surface tension:

Any phenomenon associated with surface tension affords a ready means for measuring its values. Thus the weight of a drop falling from a capillary, the pressure inside a bubble in the liquid etc. have been

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employed to calculate surface tension. But the most frequently used method is the determination of the rise of a liquid in a capillary tube, then the surface tension γ is given by the eqⁿ

$$\gamma = \frac{1}{2} r h \rho g \rightarrow \text{⑩}$$

where

ρ = density of liquid

h = height of liquid rise

r = radius of capillary tube

g = acceleration due to gravity

Factors on which surface tension depends

- ① Temp^r :- It decreases with rise of temp^r.
- ② Intermolecular force :- It decreases with decrease of the intermolecular force of liquid.

(2) Shape of molecule & Surface (3)

Surface tension of liquid decreases with increase of spherical shape of liquid molecule.

Definition of viscosity.

Viscosity of a liquid is a measure of internal friction of a liquid and it determines the rate of flow of a liquid.

Viscosity coefficient (η): The tangential

force per unit area per unit velocity gradient is called the coefficient

of viscosity of the liquid and it is denoted by η .

$$\eta = \frac{\text{Tangential force}}{\text{Area} \times \text{velocity gradient}}$$