

Parachor

Macleod proposed an empirical relation between surface tension of a liquid (γ) and its density (D), in the form

$$\frac{\gamma^{\frac{1}{4}}}{(D-d)} = C \text{ (constant)} \quad \text{where } d = \text{density of vapour}$$

Multiplying both sides by M , the molar mass of the substance,

$$\frac{M \gamma^{\frac{1}{4}}}{(D-d)} = M \cdot C = P \text{ (constant)}$$

Since M is also constant for a given substance.

It is remarkable that the constant P , called the parachor is quite independent of temperature. If the vapour density d , which is quite small, be ignored, then

$$P = \frac{M}{D} \cdot \gamma^{\frac{1}{4}} = V_m \gamma^{\frac{1}{4}}$$

V_m = molar volume of the substance

If at suitable temperatures, the surface tensions of two liquids be equal then their parachors would be proportional to their molar volumes.