

Class XI, Thermal Expansion

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Thermal Expansion of Liquid :

$$T > T_0$$

$$\Delta T = T - T_0$$

Increase in volume of liquid (real exp)

$$\Delta V_L = (AB) \cdot a \quad \text{--- (1)}$$

Increase in volume of solid (vessel)

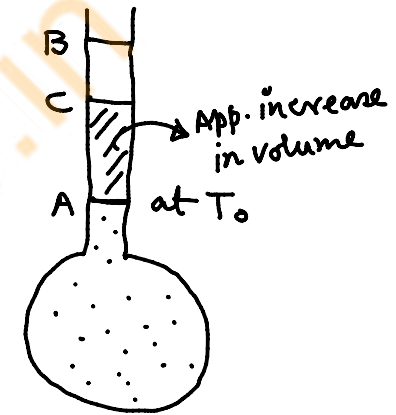
$$\Delta V_S = (BC) \cdot a \quad \text{--- (2)}$$

App. increase in volume $\Delta V_a = (AC) \cdot a \quad \text{--- (3)}$

$$AC = AB - BC$$

$$(AC) \cdot a = (AB) \cdot a - (BC) \cdot a$$

$$\Delta V_a = \Delta V_L - \Delta V_S \quad \text{--- (4)}$$



$\Delta V_L \Rightarrow \Delta V_r$
$\Delta V_S \Rightarrow \Delta V_g$

App. increase in volume of liquid is equal to the difference between the real increase in volume of liquid (ΔV_L) and increase in volume of vessel.

$$\gamma = \frac{\Delta V}{V_0 \cdot \Delta T}$$