

# 1. Liquid Thermometer (Hg-Thermometer)

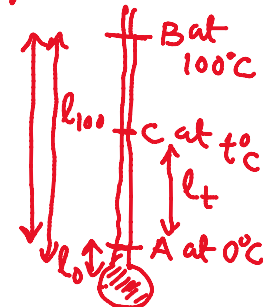
Thermometric property  $\rightarrow$  property of volume expansion of liquid

$$n = 100$$

$l_0$  = length of Hg-column at  $0^\circ\text{C}$  (ice point) 100 div

$l_{100}$  = " " " " "  $100^\circ\text{C}$  (steam point)

$l_t$  = " " " " "  $t^\circ\text{C}$  (unknown temp)



$$t^\circ\text{C} = \left( \frac{l_t - l_0}{l_{100} - l_0} \right) \times 100 \text{ --- } \textcircled{2}$$

## Note :

NOTE: In liquid thermometers mercury is preferred over other liquids. This is because of following reasons:

- Mercury freezes at  $-39^\circ\text{C}$  and boils at  $357^\circ\text{C}$ . Therefore range of temperature is quite wide. More over upper temperature limit can be increased up to  $550^\circ\text{C}$  by filling nitrogen in space over mercury, under pressure.
- Mercury has uniform coefficient of expansion over a wide range of temperature.
- Mercury is good conductor of heat and quickly acquires the required temperature.
- Mercury does not wet wall of the narrow glass tube.
- Mercury has low specific heat, so, it requires only a very small amount of heat to attain the required temperature.