Miscellaneous concepts used in Gaseous State:

(I) **Analysis of a reaction involving gaseous**

$A(g) + B(g) \longrightarrow C(g)$

What happens to pressure as reaction proceeds (in a closed container)

(II) **Vapour density and degree of dissociation** $\alpha = \frac{D - d}{(n-1)d}$

(III) **Payload / lifting power** [based on Buoyancy]

Payload = wt of air displaced (M_{air} g) – wt. of balloon (m_b g) – wt. of gas (m_{gas} g)

V = Volume of balloon

d = density of outside gas

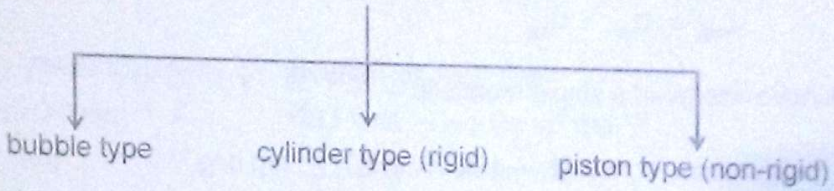
d = density of gas in the balloon

M = Mass of balloon

(IV) **Types of vessels**

(A) Open vessel

(B) closed vessel



(a) **Bursting of containers** : two concepts used depending upon type of container.

(i) **Bubble type** (very thin skin) cannot tolerate difference in pressure on the skin

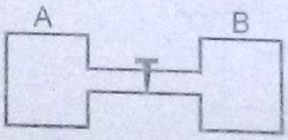
outside pressure = inside pressure

Any change in these cause change in volume & the container bursts due to maximum stretching.

(ii) **Cylinder type** (thick skin) can withstand pressure difference till a limit but cannot have volume change.

Any change cause change in pressure & when it exceeds the limits the container burst.

(b) **Connecting containers having gases**



On removal of nozzel the gas from higher pressure will travel so as to have equal pressure at both the containers.... from idea of total moles & final temperature each parameter can be calculated.

(c) **Changes in Open vessel :** Pressure of gas remains constant & so is the volume.

$$\therefore \; n_1 T_1 = n_2 T_2$$

(e) **Changes in closed vessel :** $\frac{P_1}{n_1 T_1} = \frac{P_2}{n_2 T_2}$

Kinetic theory of gases :

$$PV = \frac{1}{3} m N u^2 = \frac{1}{3} M u^2 \text{ (For 1 mole)}$$

Types of speeds :

$$u^2 = \frac{u_1^2 + u_2^2 + ... + u_N^2}{N} \quad ; \quad u = \text{root mean square speed}$$