

Avogadro's law.

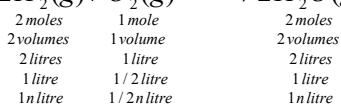
- (1) According to this law, "Equal volumes of any two gases at the same temperature and pressure contain the same number of molecules."

Thus, $V \propto n$ (at constant T and P)

or $V = Kn$ (where K is constant)

$$\text{or } \frac{V_1}{n_1} = \frac{V_2}{n_2} = \dots\dots = K$$

Example, $2H_2(g) + O_2(g) \longrightarrow 2H_2O(g)$



- (2) One mole of any gas contains the same number of molecules (Avogadro's number = 6.02×10^{23}) and by this law must occupy the same volume at a given temperature and pressure. The volume of one mole of a gas is called **molar volume, V_m** which is 22.4 L mol^{-1} at S.T.P. or N.T.P.

- (3) This law can also express as, "The molar gas volume at a given temperature and pressure is a specific constant independent of the nature of the gas".

Thus, $V_m = \text{specific constant} = 22.4 \text{ L mol}^{-1}$ at S.T.P. or N.T.P.

- (4) This law is widely applicable to solve the problems of reactive gaseous system.

Note: **Loschmidt number:** It is the number of molecules present in 1 c.c. of a gas or vapor at S.T.P. Its value is 2.687×10^{19} per c.c.