* Kinetic Interpretation of temperature:—

The pressure of a gas, according to kinetic theory is,

$$P = \frac{1}{3}\rho C^2$$

$$P = \frac{1}{3}\cdot\frac{MC^2}{V}$$

$$PV = \frac{1}{3}MC^2$$

Let us consider 1 gm molecule of the gas at a tempr T K. $PV = RT$

$$\therefore \frac{1}{3}MC^2 = RT$$

$$\frac{1}{2}MC^2 = \frac{3}{2}RT \quad \text{—(i)}$$

Let the mass of each molecule be m and Avogadro's number be N.

$$M = m \times N$$

$$\frac{1}{2}mNC^2 = \frac{3}{2}RT$$

$$\frac{1}{2}mC^2 = \frac{3}{2}\cdot\frac{R}{N}\cdot T$$

$$= \frac{3}{2}KT \quad \text{— (ii)}$$

Here K is called Boltzmann's constant.

Thus from eqn (ii), the mean kinetic energy of a molecule is directly porportional to the absolute temperature of a gas. When the temperature of the gas increased, the mean kinetic energy of the molecules increased. When heat is withdrawn from a gas, the mean kinetic energy of the molecules decreases. Thus at absolute zero temperature the molecules are in a perfect state at rest and have no kinetic energy. But before the absolute zero temperature is reached, all gases change their state to liquids and solids.

Also from eqn (ii)

$$c^2 \propto T$$

It means that the root mean square velocity of the molecules is also directly proportional to the square root of the ~~molecules~~ absolute temperature.