



Kinetic Theory Of Gas

Postulates of Kinetic Theory: The molecules of a gas are assumed to obey the following properties.

Axioms (assumptions):

- (1) The molecules of a gas are perfectly elastic, hard, solid sphere identical in all respect such as mass, size form etc. The molecules of different gases are different.
- (2) The molecules of a gas are in a state of incessant random motion, moving in all directions with all possible velocities. In course of their motion the molecules collide with one another and with the wall of the containing vessel. But in the steady state the collisions do not affect the molecular density of the gas.
- (3) There is no intermolecular force of attraction between the molecules of the gas hence the gas molecules do not possess any potential energy. All the energy possessed by the gas molecules is kinetic energy.
- (4) The time for which two molecules remain in contact with each other is known as time of collision. The time of collision is negligible compared to the time during which the molecules are moving freely.
- (5) The distance covered by the molecule between any two collisions is known as free path.
- (6) All the free paths traversed by a molecule are not same, some are long and some are short. The average of all the free paths traversed by a molecule is known as mean free path λ
- (7) The mean free paths of all the molecules of a gas are same. The gas whose molecules obey the postulates is said to be a perfect gas or an ideal gas. Under normal temperature and pressure no gas obeys these postulates and hence all gases are known as real gas. However under extremely low pressure and very high temperature molecules of all gases obey the above postulates and behave as ideal or perfect gas.