

## **KINETIC THEORY OF GASES**

The theory is based on following assumptions as regards to the motion of molecules and the nature of the gases.

- (1) All the molecules of a gas are identical . The molecules of different gases are different.
- (2) The molecules are rigid and perfectly elastic spheres of very small diameter.
- (3) Gas molecules occupy very small space. The actual volume occupied by the molecule is very small compared to the total volume of the gas. Therefore volume of the gas is equal to volume of the vessel.
- (4) The molecules of gases are in a state of random motion, i.e., they are constantly moving with all possible velocities lying between zero and infinity in all possible directions.
- (5) Normally no force acts between the molecules. Hence they move in straight line with constant speeds.
- (6) The molecules collide with one another and also with the walls of the container and change there direction and speed due to collision. These collisions are perfectly elastic i.e., there is no loss of kinetic energy in these collisions.
- (7) The molecules do not exert any force of attraction or repulsion on each other except during collision. So, the molecules do not posses any potential energy. Their energy is wholly kinetic.
- (8) The collisions are instantaneous i.e., the time spent by a molecule in a collision is very small as compared to the time elapsed between two consecutive collisions.
- (9) Though the molecules are constantly moving from one place to another, the average number of molecules per unit volume of the gas remains constant.
- (10) The molecules inside the vessel keep on moving continuously in all possible directions, the distribution of molecules in the whole vessel remains uniform.
- (11) The mass of a molecule is negligibly small and the speed is very large, there is no effect of gravity on the motion of the molecules. If this effect were there, the density of the gas would have been greater at the bottom of the vessel.