Class ⇒ B.Sc. (Hons.) Part I
Subject ⇒ Chemistry
Paper ⇒ 1A (Physical chemistry)
Chapter ⇒ Gaseous state (Group - A)
Topic ⇒ Kinetic theory of gases.

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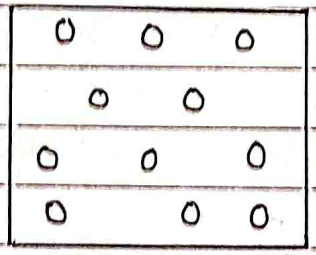
Kinetic theory of gases

Assumptions

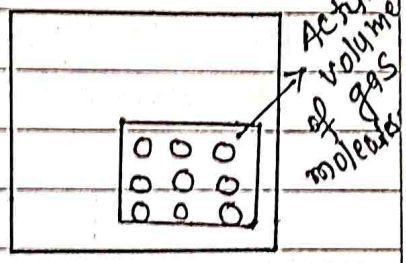
1. A gas consists of extremely small discrete particles called molecules dispersed throughout the container.

Fig. (A)



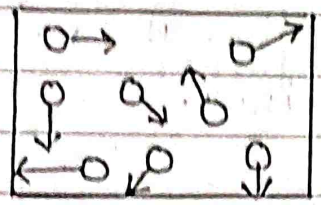
A gas is made of molecules dispersed in space in the container.

(B)



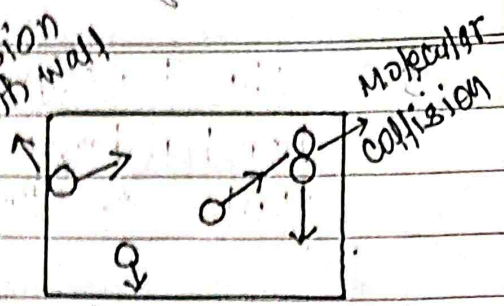
Actual volume of gas molecules is negligible.

(c)



Gas molecules are in constant motion in all possible directions.

(d)



Molecules move in straight line and change direction on collision with another molecule or wall of container.

2. Gas molecules are in constant random motion with high velocities.

They move in straight lines with uniform velocity and change direction on collision with other molecules or the walls of the container.

3. The distance between the molecules are very large and it is assumed that vanderwaals attractive forces between them do not exist.

Thus the gas molecules can move freely independent of each other.

4. All collisions are perfectly elastic. Hence there is no loss of the kinetic energy of a molecule during a collision.

5. The pressure of the gas is due to the bombardment or hit of the molecules on the walls of the container.

6. The average kinetic energy ($\frac{1}{2}mv^2$) of the gas molecules is directly proportional to absolute temperature (Kelvin temperature).
This implies that the average kinetic energy of molecules is same at a given temperature.

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