

CONCEPT: KINETIC MOLECULAR THEORY

- An ideal gas: is an imaginary gas that acts as though it is alone by behaving independently of other gases around it.
 - **The Kinetic Molecular Theory** uses data of real gases to predict how ideal gases would behave if they existed.

EXAMPLE: Which conditions of P and T make for the most ideal gas?

- a) High P, high T b) Low P, low T c) Low P, high T d) None of the choices

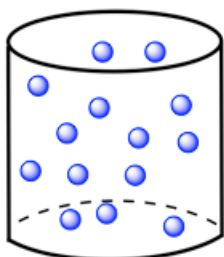
Kinetic Molecular Theory Postulates

Kinetic Molecular Theory

Postulate 1 – Volume

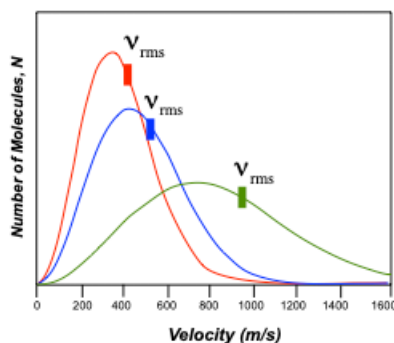
- 1** The size of the gas particle is significantly small and negligible when compared to the volume of the container.

□ The volume of a gas particle is _____ of the total volume in the container.



Postulate 2 – Temperature

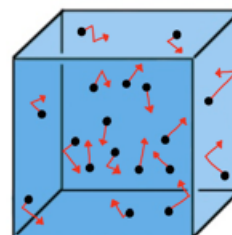
- 2** As the temperature _____ the molecules moving at higher velocities _____.



Postulate 3 – Forces

- 3** The collision between gas particles and the walls of the container are completely _____.

□ No _____ or _____ forces between gases and walls of container.



PRACTICE: Which of the following statements would correctly explain the non-ideal behavior of a gas based on the Kinetic Molecular Theory (KMT)?

- a) At high temperatures the attractive forces between molecules becomes negligible.
- b) At high pressure the volume of gas molecules become significant.
- c) An increase or decrease in the moles of gas causes the gas constant value to change.

CONCEPT: KINETIC MOLECULAR THEORY

PRACTICE: Which of the following statements is/are true for gas molecules according to the Kinetic Molecular Theory?

- I. Increasing the amount of gas molecules increases the pressure by increasing the force of the collisions.
- II. Decreasing the temperature of a gas decreases the pressure by increasing the force of the collisions.
- III. Decreasing the volume of a gas increases pressure by increasing the frequency of the collisions.

- a) I only b) II only c) III only d) I and II e) II and III

PRACTICE: Which statement is TRUE about kinetic molecular theory?

- a) A single particle does not move in a straight line.
- b) The size of the particle is large compared to the volume.
- c) The collisions of particles with one another is completely elastic.
- d) The average kinetic energy of a particle is not proportional to the temperature.

PRACTICE: Based on the kinetic-molecular theory, which of the following is/are true?

- I. At a given temperature, all gases have the same average kinetic energy.
- II. At a given temperature, different gases have the same average velocities.
- III. The average kinetic energy is proportional to the absolute temperature.

- a. I only
- b. II only
- c. I & III only
- d. I, II & III