

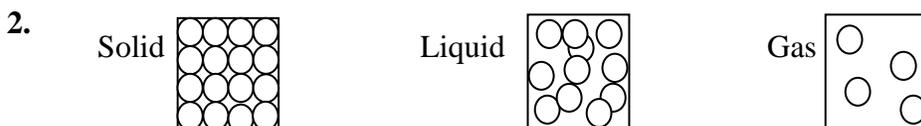
- (a) Air has mass.

(b) Air has volume and occupies space.

(c) Air has pressure.

(d) Gas volume is dependent upon temperature.

(e) Gas pressure increases with temperature.

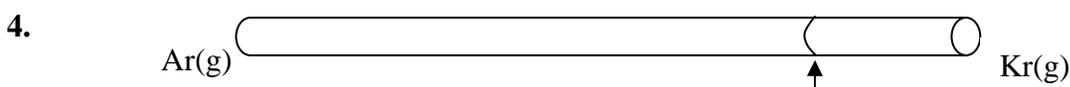


The molecules in the solid are closely packed, held in a rigid pattern, and have restricted movement.

In the liquid, the molecules are still close together, but can move or flow past one another.

The gas molecules are far apart, and move at a very fast speed.

- If T remains constant, P and V remain constant. Collisions are elastic, which means no energy is lost as the molecules collide with the walls of the tire.



Argon is lighter and will travel faster than krypton, so the gases will meet toward the krypton end of the glass tube.

- (a) The kinetic energy is the same in both balloons since they are at the same temperature.

(b) The hydrogen molecules have greater speed than the nitrogen molecules because the hydrogen molecules are smaller.

(c) The mass of the nitrogen-filled balloon is greater than that of the hydrogen-filled balloon because nitrogen has a higher molar mass.
- On a cold day, the temperature of the air in the tire decreases, which lowers the average kinetic energy of the gas molecules. This decreases the number of the collisions with the walls of the tire, which decreases the pressure and volume.
- As the diaphragm pushes down, the volume in the lung cavity increases, causing the pressure to decrease. The pressure of air outside is greater than that in the lungs. This helps to force air into our lungs to aid in breathing.
- As the temperature dropped and approached the condensing point, the molecules moved more slowly. The attractive forces between the ammonia molecules pulled the molecules closer together and decreased the volume from the expected volume of an ideal gas.
- The density of helium is less than that of air, so the helium-filled balloon will rise quickly.