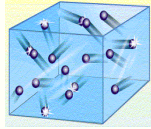


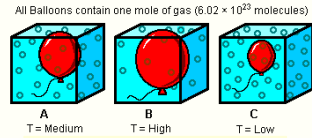
Kinetic Theory

- The theory states that the tiny particles in are in _____
- This theory is used to explain the behaviors common among gases



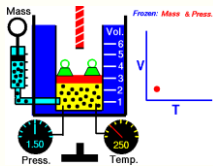
Charles' Law

Figure 2. Volume of One Mole of Gas Under Different Conditions



The _____ of a given amount of dry ideal gas is _____ to the _____ provided when the amount of gas and the pressure remain fixed.

Charles' Law



Increases in the temperature of a gas will cause the _____

Temperature Volume

Charles' Mathematical Law

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}$$

or

$$V_1 T_2 = V_2 T_1$$

Charles' Law Example

A gas has a volume of 3.0 L at 400 K. What is its volume at 500 K?

Identify the variables that you know...

(Temp needs to be in Kelvin)

$T_1 =$

$T_2 =$

$V_1 =$

$V_2 =$

Substitute the values in for the variables...

$$V_1 T_2 = V_2 T_1$$

Solve for the unknown variable...

Charles' Law Practice

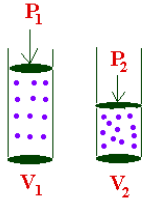
A gas sample at 313 K occupies a volume of 2.32 L. If the temperature is raised to 348 K, what will the volume be, assuming the pressure remains constant?

Identify the variables that you know...

Substitute the values in for the variables...

Solve for the unknown variable...

Boyle's Law



Under conditions of constant temperature, there is an _____ between the _____ and _____ for an ideal gas.

Boyle's Law



Increase in pressure will cause the _____

pressure volume

Boyle's Mathematical Law

$$P_1 V_1 =$$

or

$$\frac{P_1}{P_2} = \text{---}$$

Boyle's Law Example

A gas has a volume of 3.0 L at 2 atm. What is its volume at 4 atm?

Identify the variables that you know...

$$P_1 =$$

$$V_1 =$$

$$P_2 =$$

$$V_2 =$$

Substitute the values in for the variables...

$$P_1 V_1 = P_2 V_2$$

Solve for the unknown variable...

Boyle's Law Example

A sample of helium gas in a balloon is compressed from 4.0 L to 2.5 L at a constant temperature. If the pressure of the gas in the 4.0L volume is 210 kPa, what will the pressure be at 2.5 L??

Identify the variables that you know...

Substitute the values in for the variables...

Solve for the unknown variable...

Combined Gas Law

$$\frac{P_1 V_1}{T_1} =$$

or

$$P_1 V_1 T_2 =$$