Chemistry
Notes Ch 12

Reveiw:

*The kinetic molecular theory can be used to explain gas pressure, volume, and temperature.

*The average kinetic energy of a collection of gas particles is directly proportional to the Kelvin temperature of gas. All temperatures must be converted to Kelvin

K=273 + degrees celcius

***Pressure** is the collision of gas particles with the walls of the container.

In general:
Increasing the volume of a container decreases gas pressure; decreasing the volume of a container increases gas pressure.

Increasing the temperature of a contained gas increases its pressure; decreasing the temperature decreases its pressure.

Gas Laws:

The four variables of gases and their common units are:

Pressure (P) in kilopasclas
Volume (V) in liters
Temperature (T) in kelvins
Number of moles (n).

Boyle's law states that for a given mass of gas at constant temperature, the volume of the gas varies inversely with pressure.

$PV=constant$ $P_1V_1=P_2V_2$

Sample Problems:

Charles's law states that the volume of a fixed mass

of gas is directly proportional to its Kelvin temperature if the pressure is kept constant.

$V/T = \text{constant}$ $\quad V_1/T_1 = V_2/T_2$

Sample Problems:

Gay-Lussac's law states that pressure of a gas is directly proportional to the Kelvin temperature if the volume remains constant

$P/T = \text{constant}$ $\quad P_1/T_1 = P_2/T_2$

Sample Problems:

Combined gas law: Combines the three gas laws stated above

Sample problems:

Avogadro's hypothesis sates that equal volumes of gasses at the same temperature and pressure contain equal numbers of gases at the same temperature and pressure contain equal numbers of particles.

$V/n = \text{constant}$ $\quad V_1/n_1 = V_2/n_2$

Sample problems:

Ideal Gas Law: relates the moles of a gas to its pressure, temperature and volume.

PV/nT=R (constant)

Ideal gas constant (R) has the value 8.31 (L x kPa)/(K x mol) rearranging the equation you can obtain the usual form of the ideal gas law:

Real Vs Ideal Gas:

REAL Gases	*IDEAL Gases*
● Particles themselves occupy space ● Experience forces of attraction (or repulsion) ● Can be liquefied or solidified ● Can sublime	● Gas particles have no volume ● No forces between particles ● Experience no phase change ● Must pass through all 3 phase

Real gases differ from ideal gases because intermolecular forces tend to reduce the distance between real gas particles and because real gas particles have volume.

Partial pressure is the contribution each gas in a mixture makes to the total pressure

Dalton's law of partial pressure states that at a constant volume and temperature the total pressure exerted by a mixture of gases is equal to the sum of the partial pressures of the component gases.

Diffusion is the tendency of molecules to move toward areas of lower concentration until the concentration is uniform throughout.

Effusion is the process in which a gas escapes through a tiny hole in its container.

Ghram's law of effusion: states that the rate of effusion of a gas is inversely proportional to the square root of the gas's molar mass. **SMALL GUY WINS**