Chapter 13 Review Rebecca Groner
Gases

Equations:
PV=nRT
P: pressure
V: volume
n: number of moles
T: temperature
R: universal gas constant, .080206 L atm/K *mol
This is equation that demonstrates the "ideal gas law"

$P_1V_1 / T_1 = P_2V_2 / T_2$
The "combined gas law" states that the initial measures of pressure times volume divided by the initial temperature will equal the pressure times the volume after the reaction over the new temperature. A gas that follows this equation will follow the **kinetic molecular theory of gases** in that it has a small volume relative to its container, the gas molecules move in random motion, elastic collisions do **not** occur (this is when molecules bounce off each other). These collisions occur in real gases because the molecules attract each other.

1 atm=760 mm Hg=760 torr=101,325 Pa

Laws:
Charles Law- for a given amount of gas at constant pressure, the volume is directly proportional to the temperature. V/T= k

Boyle's Law-the volume of gas is inversely proportional to the pressure of the gas at constant temperature. PV=k

Guy Lussac- for a given amount of gas at constant volume, the pressure is directly proportional to the temperature. P/T= k

Pressure Laws
Partial Pressure- the total pressure of a gas mixture is the sum of each "partial pressure" of the gases that make it up. $P_T=P_1 + P_2 + P_3$

When part of a gas is removed, the total pressure decreases.

If the pressure and number particles of a gas are constant then the ratio of the volume and temperature is constant also.

As the volume of a container gets smaller, the pressure increases, which mean the particles will be close together and more likely to attract each other. Under

conditions like this of high pressure, the gas may not be able to follow ideal gas behavior and fully obey the equation PV=nRT.

Definitions:
STP: standard temperature and pressure. For a gas the STP is 1 atm and 0°
Pascal: SI unit for pressure
Avogadro's law: same as Guy-Lussac's law

Measurements:
Gas temperature is measured as Kelvin (K) because gasses don't have a "negative" temperature.
Pressure is measured using a manometer and can be measured in atm, in Hg, bar, mm Hg, torr, or lbs/in. A type of manometer, called a barometer, looks like the following: