Chemistry I Name _____

Date _____ Per _____

Worksheet #C53: Dalton's Law of Partial Pressures

Dalton's Law says that the sum of the individual pressures of all the gases that make up a mixture is equal to the total pressure, or $P_T = P_1 + P_2 + P_3 + ...$ The partial pressure of eac gas is equal to the mole fraction of each gas times the total pressure.

$P_T = P_1 + P_2 + P_3 + ...$

Mole fraction = $\frac{\text{moles gas}}{\text{total moles}}$

Partial pressure of one gas in a mixture of gases

$P_x = \frac{\text{moles gas}}{\text{total moles}} \times P_T$

1. What is the total pressure of a container that has $NH_3(g)$ exerting a pressure of 346 torr $N_2(g)$ exerting a pressure of 225 torr, and H_2O (g) exerting a pressure of 55 torr?

2. What would be the total pressure of a container that is holding $SO_2(g)$ with a pressure o .385 atm, $SO_3(g)$ with a pressure of 125 mm Hg, and N_2O (g) with a pressure of 5.67 psi? (Answer in atm.)

3. A 250. mL sample of oxygen is collected over water at 25ºC and 760.0 torr. What is the pressure of the dry gas alone? (Vapor pressure of water at 25ºC = 23.8 torr.)

4. If a balloon contains 3.00 moles of $O_2(g)$, 6.00 moles of $N_2(g)$ and 8.00 moles of $H_2(g)$, what is the mole fraction of each of the gasses?

$O_2(g)$ = _____

$N_2(g)$ = _____

$H_2(g)$ = _____

What would happen if you lit this balloon with a match? _____

5. The total pressure of the balloon in problem # 4 is 950. torr. What is the partial pressure of each of the gases?

$O_2(g)$ = _____

$N_2(g)$ = _____

$H_2(g)$ = _____

6. A mixture of 2.00 moles of H_2, 3.00 moles of NH_3, 4.00 moles of CO_2 and 5.00 moles of N_2 exerts a total pressure of 800.0 torr. What is the partial pressure of each gas?

$H_2(g)$ = _____

$NH_3(g)$ = _____

$CO_2(g)$ = _____

$N_2(g)$ = _____

7. The partial pressure of F_2 in a mixture of gases where the total pressure is 1.00 atm is 300.0 torr. What is the mole fraction of F_2?