Chem 2 AP Homework #5-3: Dalton's Law of Partial Pressures
Problems pg. 206 #63, 64, 68, 70, 102

63. A mixture of gases contains 0.31 mole CH_4, 0.25 mole C_2H_6, and 0.29 mole C_3H_8. The total pressure is 1.50 atm. Calculate the partial pressures of the gases.

64. A 2.5-L flask at 15°C contains a mixture of N_2, He, and Ne at partial pressures of 0.32 atm for N_2, 0.15 atm for He, and 0.42 atm for Ne.

(a) Calculate the total pressure of the mixture.

(b) Calculate the volume in liters at STP occupied by He and Ne <u>if the N_2 is removed selectively.</u>

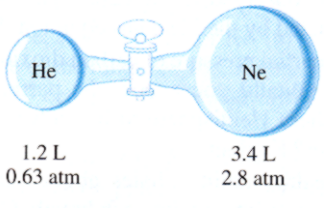
68. A sample of zinc metal reacts completely with excess hydrochloric acid:

$$Zn\ (s) + 2\ HCl\ (aq) \rightarrow ZnCl_2\ (aq) + H_2\ (g)$$

The hydrogen gas produced is collected over water at 25.0°C using an arrangement similar to that shown in Figure 5.15. The volume of the gas is 7.80 L, and the pressure is 0.980 atm. Calculate the mass of zinc consumed in the reaction (P_{vap} of H_2O at 25.0°C is 23.8 mmHg).

70. A sample of NH_3 gas is completely decomposed to N_2 and H_2 gases over heated iron wool. If the total pressure is 866mmHg, calculate the partial pressures of N_2 and H_2.

102. Consider the following apparatus. Calculate the partial pressures of He and Ne after the stopcock is open. The temperature remains constant at 16°C



Answers: 63) $P_{CH_4} = 0.54$ atm $P_{C_3H_6} = 0.44$ atm $P_{C_3H_8} = 0.51$ atm; 64a) 0.89 atm; 64b) 1.4 L ; 68) 19.8 g Zn; 70) $P_{H_2} = 650$ mmHg $P_{N_2} = 217$ mmHg. 102) $P_{He} = 0.16$ atm $P_{Ne} = 2.0$ atm