**Chemical Equilibrium Applied Practice Section 2**

1. At a particular temperature, K = 3.75 for the reaction

If all four gases had initial concentrations of 0.800 M, calculate the equilibrium concentrations of the gases.

1. At -50, K = 2.3 x 10-5 for the reaction

Calculate the concentrations of all species at equilibrium for each of the following cases

1. 1.0 g and 2.0 g are mixed in a 1.0-L flask
2. 1.0 mol of pure HOCl is placed in a 2.0-L flask
3. At 1100 K, Kp = 0.30 for the reaction

Calculate the equilibrium partial pressures of , , and produced from an initial mixture in which = = 0.5 atm and = 0.

1. For the reaction

Kp = 2.00 at some temperature. If this reaction at equilibrium has a total pressure of 6.00 atm, determine the partial pressures of and in the reaction container.

1. The reaction

Has Kp = 0.15 at 30. What is the minimum amount of NH4SH that must be present for this reaction to be at equilibrium in a 10.0-L container?

1. Suppose the reaction system

has already reached equilibrium. Predict the effect that each of the following changes will have on the equilibrium position. Tell whether the equilibrium will shift to the right, will shift to the left, or will not be affected.

1. Additional is added to the system
2. The reaction is performed in a glass reaction vessel; HF(g) attacks and reacts with glass
3. Water vapor is removed.
4. In which direction will the position of the equilibrium

Be shifted for each of the following changes?

1. is added
2. is removed
3. is removed
4. In a rigid reaction container, Ar(g) is added
5. The volume of the container is doubled
6. The temperature is decreased (the reaction is exothermic)
7. Old-fashioned “smelling salts” consist of ammonium carbonate, (NH4)2CO3. The reaction for the decomposition of ammonium carbonate

Is endothermic. Would the smell of ammonia increase or decrease as the temperature is increased? Explain.

1. At 25 , gaseous SO2Cl2 decomposes to SO2(g) and Cl2(g) to the extent that 12.5% of the original SO2Cl2 (by moles) has decomposed to reach equilibrium. The total pressure (at equilibrium) is 0.900 atm. Calculate the value of Kp for this system.
2. Novelty devices for predicting rain contain cobalt(II) chloride and are based on the following equilibrium.

**Pink**

**Purple**

What color will such an indicator be if rain is imminent?