**Part 2: Le Chatlier's Principle Problems**

Directions: Use the knowledge you gained form the demonstrations and class notes to predict the shifts in equilibrium for each of the following reaction systems. Remember to treat heat as a reactant if the value for ΔH is positive and as a product if ΔH is negative.

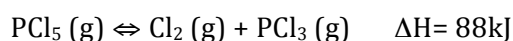Refer to the reaction below to answer questions 1-5.

$$2NO_2 (g) \Leftrightarrow N_2O_4 (g) \qquad \Delta H= -57.2kJ$$
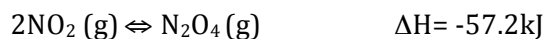
1. What direction will the equilibrium shift if NO_2 gas is added?

2. What direction will the equilibrium shift if the temperature is increased?

3. What direction will the equilibrium shift if the N_2O_4 is removed?

4. What direction will the equilibrium shift if the pressure is increase?

5. What direction will the equilibrium shift if N_2O_4 is added?

Use the reaction below to predict the effect of each of the conditions provided in numbers 6-10.

$$H_2 (g) + Cl_2 (g) \Leftrightarrow 2HCl (g) \qquad \Delta H= -184kJ$$

6. Addition of Cl_2

7. Removal of HCl

8. Increased pressure

9. Decreased pressure

10. Decreased temperature

List 5 changes in conditions would favor the production of products in the following chemical reaction.

$$PCl_5 (g) \Leftrightarrow Cl_2 (g) + PCl_3 (g) \qquad \Delta H= 88kJ$$

11.

12.

13.

14.

15.