**Name: Period: Seat#:**

**Worksheet #3**

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| 1. Which change would cause the equilibrium to shift to the **righ**t in this endothermic rxn?  *Circle an answer choice!*   **CH4 (g) + 2H2S (g) ↔ CS2 (g) + 4H2 (g)**   * 1. *Decrease the concentration of dihydrogen sulfide.*   2. *Increase the pressure on the system.*   3. *Increase the temperature of the system.*   4. *Increase the concentration of carbon disulfide.* | 1. What happens to equilibrium position in each situation  **2SO3 (g) ↔ 2SO2 (g) + O2 (g)**  * Sulfur dioxide is added to the system.      * Sulfur trioxide is removed from the system.      * Oxygen is added to the system. |
| 1. What would happen to the position of the equilibrium   **2HgO (s) ↔Hg (l) + O2 (g)**   * HgO is added to the system. * The pressure on the system increases. | 1. When the volume of the following mixture of gases is increased, what will be the effect on equilibrium position? **4HCl (g) + O2 (g) ↔ 2H2O (g) + 2Cl2 (g)** |
| 1. Predict the effect of decreasing the volume of the container for each equilibrium.  * **2H2O (g) + N2 (g) ↔ 2H2 (g) + 2NO (g)** * **SiO2 (s) + 4HF (g) ↔ SiF4 (g) + 2H2O (g)** * **CO (g) + H2 (g) ↔ C (s) + H2O (g)** | 1. Predict the effect of decreasing the temperature on the position of the following equilibria.  * **H2 (g) + Cl2 (g) ↔ 2HCl (g) + 49.7 kJ** * **2NH3 (g) ↔ N2 (g) + 3H2 (g) ΔH = +37.2 kJ** * **CO (g) + H2O (g) ↔ CO2 (g) + H2 (g) ΔH = -27.6 kJ** |
| 1. In the following reaction, will the [H2] increase or decrease when equilibrium is reestablished after these stresses are applied?   **N2 (g) + 3 H2 (g) ↔ 2 NH3 (g) + 22 kJ**   * NH3 (g) is added * N2 (g) is removed * Pressure is increased * Temperature is increased | 1. How would an increase in pressure affect the [H2] in the following reactions?  * **2 H2 (g) + O2 (g)** ↔ **2 H2O (g)** * **4 H2 (g) + Fe3O4 (s) ↔ 3 Fe (s) + 4 H2O (l)** * **H2 (g) + Cl2 (g) ↔ 2 HCl (g)** |
| 1. State Le Chatelier’s Principle in your own words. |
| 1. In which direction, left or right, will the equilibrium shift if the following changes are made?   **2 NO (g) + H2(g) ↔ N2O (g) + H2O (g) + 36 kJ**   * NO is added * The system is cooled * H2 is removed * Pressure is increased * N2O is added * H2 is added | 1. In the reaction: **CO2(g) + H2(g) + heat ↔ CO(g) + H2O(g)**  * Is heat absorbed or released by the forward reaction? * In which direction will the equilibrium shift if these changes are made? * CO is added * Temperature is increased * CO2 is added * System is cooled * H2 is removed * Pressure is increased * Catalyst is added |
| 1. **2NO(g) + H2(g) ↔N2O (g) + H2O(g) + heat** What will happen to the [H2O] when equilibrium is reestablished after these stresses are applied?  * Temperature is increased * A catalyst is added * Pressure is decreased * NO is added * N2O is removed | 1. The reaction of iron(III) oxide with carbon monoxide occurs in a blast furnace when iron ore it reduced to iron metal: **Fe2O3 (s) + 3CO (g) ↔ 2Fe (l) + 3CO2 (g)**   Use Le Chatelier’s Principle to predict the direction of reaction when an equilibrium mixture is disturbed by:  * Adding CO (g) * Removing CO2 (g) * Removing Fe (l) * Decrease the volume |
| 1. For the reaction, **PCl5(g)↔PCl3(g) + Cl2(g) ΔHrxn= 111 kJ**  Which way does the reaction shift when you:  * Remove Cl2 * Add Ne * Decrease volume * Increase pressure * Increase temperature * Add a catalyst | 1. For the reaction: **2HI(g)**↔**H2(g) + I2(g)** Δ**Hrxn = -51.8kJ**   Which way does the reaction shift when you:   * Add H2 * Remove HI * Add Kr * Increase volume * Decrease pressure * Decrease temperature |