**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
 |