

Name: _____ Per _____

The Equilibrium Constant
Practice Sheet #55

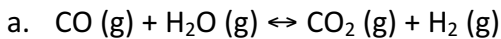
1. Complete the following statements with the word “denominator” or “numerator”.
 - a. In an equilibrium constant expression, the products are written in the _____ and the reactants are written in the _____
 - b. The coefficients in the balanced equilibrium reaction become _____ in the equilibrium constant expression.
 - c. An equilibrium constant expression includes the phases of matter _____, symbol () and _____, symbol () but does not include the phases of matter _____, symbol () and _____, symbol ().
 - d. The value of an equilibrium constant is calculated from the _____ of each substance at equilibrium.

2. Write a K_{eq} expression for each of the following equilibria
 - a. $\text{COCl}_2(\text{g}) \leftrightarrow \text{CO}(\text{g}) + \text{Cl}_2(\text{g})$
 - b. $\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \leftrightarrow 2\text{HCl}(\text{g})$
 - c. $\text{C}(\text{s}) + \text{H}_2\text{O}(\text{g}) \leftrightarrow \text{CO}(\text{g}) + \text{H}_2(\text{g})$
 - d. $\text{SnO}_2(\text{s}) + 2\text{CO}(\text{g}) \leftrightarrow \text{Sn}(\text{s}) + 2\text{CO}_2(\text{g})$
 - e. $3\text{H}_2(\text{g}) + \text{N}_2(\text{g}) \leftrightarrow 2\text{NH}_3(\text{g})$
 - f. $4\text{HBr}(\text{aq}) + \text{O}_2(\text{g}) \leftrightarrow 2\text{H}_2\text{O}(\text{g}) + 2\text{Br}_2(\text{l})$
 - g. $\text{Fe}(\text{s}) + 2\text{HCl}(\text{aq}) \leftrightarrow \text{H}_2(\text{g}) + \text{FeCl}_2(\text{aq})$
 - h. $\text{C}_6\text{H}_{12}\text{O}_6(\text{s}) + 6\text{O}_2(\text{g}) \leftrightarrow 6\text{CO}_2 + 6\text{H}_2\text{O}(\text{l})$

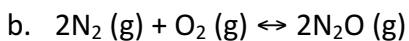
3. Complete the states with the word “reactants” or “products”
 - a. A K_{eq} value GREATER than ONE indicates that equilibrium favors the _____ and a K_{eq} LESS than ONE indicates that the equilibrium favors the _____

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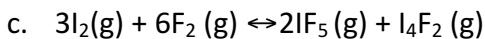
4. Write a K_{eq} expression for each of the following equilibrium. Determine the value of K_{eq} . Does the equilibrium favor the products or the reactants?



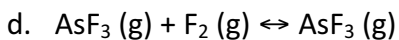
At equilibrium, $[\text{CO}] = 0.50 \text{ M}$, $[\text{H}_2\text{O}] = 0.025 \text{ M}$, $[\text{CO}_2] = 0.25 \text{ M}$, and $[\text{H}_2] = 0.25 \text{ M}$



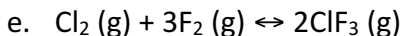
At equilibrium $[\text{N}_2] = 2.5 \text{ M}$, $[\text{O}_2] = 0.080 \text{ M}$, and $[\text{N}_2\text{O}] = 0.10 \text{ M}$



At equilibrium, $[\text{I}_2] = 0.500 \text{ M}$, $[\text{F}_2] = 0.200 \text{ M}$, $[\text{IF}_5] = 0.100 \text{ M}$, and $[\text{I}_4\text{F}_2] = 0.240 \text{ M}$

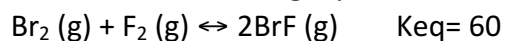


At equilibrium, a 2.0 L container holds 1.5 mol AsF_3 , 1.2 mol F_2 and 0.36 mol AsF_5



At equilibrium, a 5.0 L container holds 1.0 mol Cl_2 , 2.0 mol F_2 and 4.0 mol ClF_3 .

5. Consider the following equilibrium:



Write an equilibrium expression for the reaction.

At equilibrium, $[\text{Br}_2] = 0.50 \text{ M}$, and $[\text{F}_2] = 0.30 \text{ M}$. Calculate $[\text{BrF}]$ at equilibrium.