Chemical Equilibrium

Section 18.1 Equilibrium: A State of Dynamic Balance

In your textbook, read about chemical equilibrium.

Complete each statement.

1. When a reaction results in almost complete conversion of reactants to products, chemists say the reaction goes to ________________.

2. A reaction that can occur in both the forward and the reverse directions is called a(n) ________________.

3. ________________ is a state in which the forward and reverse reactions balance each other because they take place at equal rates.

4. At equilibrium, the concentrations of reactants and products are ________________, but that does not mean that the amounts or concentrations are ________________.

5. Equilibrium is a state of ________________, not one of ________________.

In your textbook, read about equilibrium expressions and constants.

For each statement below, write true or false.

6. The law of chemical equilibrium states that at a given pressure, a chemical system may reach a state in which a particular ratio of reactant to product concentrations has a constant value.

7. The equation $\text{H}_2(g) + \text{I}_2(g) \rightleftharpoons 2\text{HI}(g)$ is an example of a homogeneous equilibrium.

8. If an equilibrium constant has a value less than one, the reactants are favored at equilibrium.

9. The value for $K_{eq}$ is constant only at a specific volume.

10. If the equilibrium constant for a reaction at 300 K is 49.7, the concentration of the reactants will be greater than the concentration of the products.

11. A heterogeneous equilibrium means that reactants and products are present in more than one state.

12. The product of the forward chemical reaction is HI, for the equilibrium expression:

$$K_{eq} = \frac{[\text{HI}]^2}{[\text{H}_2][\text{I}_2]}$$