

Determining K_{eq} and K_{sp} for Reactions at Chemical Equilibrium

Determining K_{eq} for Reactions at Chemical Equilibrium

1. Write a balanced chemical equation.

- Make sure that the reaction is at equilibrium before you write a chemical equation.

2. Write an equilibrium expression.

- To write the expression, place the product concentrations in the numerator and the reactant concentrations in the denominator.
- The concentration of any solid or a pure liquid that takes part in the reaction is left out because these concentrations never change.
- For a reaction occurring in aqueous solution, water is omitted because the concentration of water is almost constant during the reaction.

3. Complete the equilibrium expression.

- To complete the expression, raise each substance's concentration to the power equal to the substance's coefficient in the balanced chemical equation.

Determining K_{sp} for Reactions at Chemical Equilibrium

1. Write a balanced chemical equation.

- Remember that the solubility product is only for those salts that have low solubility. Soluble salts such as sodium chloride and ammonium nitrate do not have K_{sp} values.
- Make sure that the reaction is at equilibrium.
- Chemical equations should always be written so that the solid salt is the reactant and the ions are products.

2. Write a solubility product expression.

- To write the expression, write the product of the ion concentrations.
- Concentrations of any solid or pure liquid that take part in the reaction are left out because they never change.

3. Complete the solubility product expression.

- To complete the expression, raise each concentration to a power equal to the substance's coefficient in the balanced chemical equation.
- Remember that K_{sp} values depend on temperature.