

## Exam 3 Objectives

### Chapter 19 Solubility and Simultaneous Equilibria

1. Be able to write equilibrium expressions for saturated solutions and calculate  $K_{sp}$
2. Be able to calculate molar solubility
3. Be able to calculate molar solubilities taking into account the common ion effect and the formation of complex ions.
4. Be able to determine whether a precipitate will form when combining solutions.
5. Be able to determine whether salts can be separated by selective precipitation and the conditions needed.
6. To learn the vocabulary of complex ions and how to represent the equilibria involving metal ion complexes in solution.
7. To learn how to write appropriate chemical equations and equilibrium laws that correspond to formation constants and instability constants for complexes.
8. To be able to apply Le Châtelier's principle to explain how complex ion formation affects the solubility of a sparingly soluble salt.

**HW:** Review Problems: 14-24 (even), 30, 32, 34, 36, 44, 46, 48, 52-60 (even), 61,65-70, 79, 87  
Test of Facts and Concepts: 37-42

### Chapter 14

1. Explain the rule of thumb: "like dissolves like" by analyzing the solution process in terms of forces overcome in the solute and solvent and forces formed between solute and solvent particles.
2. Define solution density, molarity, mole fraction, weight percent, and molality, and perform calculations using these quantities.
3. Perform calculations using Henry's law.
4. Use Raoult's law to calculate the vapor pressure over a solution containing a nonvolatile solute and a solution containing two volatile liquids.
5. Perform calculations involving freezing point depression and boiling point and determine the molar mass of the solute.
6. Perform calculations involving the osmotic pressure equation, and determine the molar mass of the solute.

**Homework:** 4,9,10,18,19,22,27,29,44,45,50,51,58,67,71,75,77,79-103 (odd)

### Review! Chapter 18 Acid-Base Applications

1. Be able to write net ionic equations for neutralization reactions and calculate the  $K_n$ .
2. Be able to predict shifts based on the Common-Ion Effect.
3. Be able to label equivalence points on titration curves of strong and weak acids and bases.
4. Be able to calculate the pH at different points in a titration.
5. Be able to do calculations involving a buffered solution.
6. Be able to state le Chatelier's Principle.

**HW:** Review Problems: 116-121, 136  
Test of Facts and Concepts: 13,14, 27, 30,31