Name _____ Date _____ Class _____

SECTION 3-1 SECTION SUMMARY

Working With Solutions

Guide for Reading

- **What happens to the particles of a solute when a solution forms?**
- **What factors affect the solubility of a substance?**
- **How do solutes affect the freezing point and boiling point of a solvent?**

3

A **suspension** is a mixture in which particles can be seen and easily separated by settling or filtration. A **solution** is a well-mixed mixture. A solution has the same properties throughout. The particles of a solution are much smaller than those of a suspension.

All solutions have at least two parts: the solvent and the solute. The **solvent** is the part of a solution present in the largest amount. It dissolves the other substances. A substance that is present in a solution in a smaller amount and dissolved by the solvent is the **solute.**

In many common solutions, the solvent is water. Water solutions are essential in the living world. Cells are made mostly of water and dissolved chemicals. The chemicals needed for life react best in solutions.

Solutions can be made with solvents other than water. A solution may be made of any combination of gases, liquids, or solids.

Whenever a solution forms, particles of the solute leave each other and become surrounded by particles of the solvent. When an ionic solid mixes with water, water molecules surround and separate positive and negative ions as the ionic solid dissolves into the solution. A molecular solid breaks up into individual neutral molecules. Ionic compounds dissolved in water conduct electricity. Molecular compounds dissolved in water do not conduct electricity.

A **dilute solution** has only a little solute dissolved in the solvent. A **concentrated solution** has more solute dissolved in the solvent.

Solubility is a measure of how well a solute can dissolve in a solvent at a given temperature. When you've added so much solute that no more dissolves, you have a **saturated solution.** If you can continue to dissolve more solute, you still have an **unsaturated solution.**

Among the factors that affect the solubility of a substance are temperature and type of solvent. Many solids dissolve better when the temperature of the solvent increases. Unlike most solids, gases become less soluble when the temperature goes up. Ionic and polar compounds dissolve in polar solvents. Nonpolar compounds do not dissolve in polar solvents.

Solutes affect the boiling and freezing points of a solvent. **Solutes lower the freezing point of a solvent. Solutes raise the boiling point of a solvent.**