

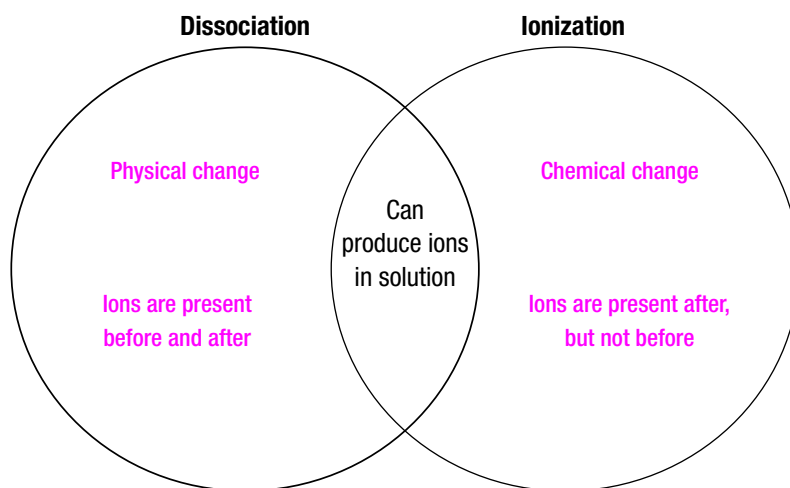
Chapter 8 Solutions, Acids, and Bases

Section 8.1 Formation of Solutions**(pages 228–234)**

This section explains the parts of a solution, the processes that occur when compounds dissolve, and how the properties of a solution compare with those of its solvent and solute.

Reading Strategy (page 228)

Comparing and Contrasting Contrast dissociation and ionization by listing the ways they differ in the Venn diagram below. For more information on this reading strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

**Dissolving (page 229)**

- Define a solution. A solution is a homogenous mixture of two or more substances.
- Circle the letter that identifies a substance whose particles are dissolved in a solution.
 - solvent
 - b.** solute
 - solid
 - ion
- Circle the letter that identifies the solvent in air.
 - oxygen
 - carbon dioxide
 - c.** nitrogen
 - argon
- The process in which an ionic compound separates into ions as it dissolves is called dissociation.
- The process in which particles dissolve by breaking apart and scattering is called dispersion.
- A(n) proton is transferred from each HCl molecule to a water molecule when hydrogen chloride gas dissolves in water.
- Is the following sentence true or false? Dissolving by ionization is a physical change. false

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Properties of Liquid Solutions (page 231)

8. What physical properties of a solution can differ from those of its solute and solvent?
- Conductivity
 - Freezing point
 - Boiling point
9. Compare the conductivities of solid sodium chloride and saltwater. Solid sodium chloride is a poor conductor of electric current. However, when you dissolve sodium chloride in water, it becomes a good conductor of electric current.
10. Circle the letters that identify what happens to water as it freezes.
- The water molecules become more organized.
 - The water molecules become more disorganized.
 - The water molecules ionize.
 - The water molecules arrange themselves in a hexagonal pattern.

Heat of Solution (page 232)

11. Dissolving sodium hydroxide in water is a(n) exothermic process, as it releases heat.
12. Dissolving ammonium nitrate in water is a(n) endothermic process, as it absorbs heat.
13. Is the following sentence true or false? Breaking the attractions among solute particles and the attractions among solvent particles releases energy. false
14. Describe heat of solution. The heat of solution is the difference between the energy required to break the attractions among solute particles and the attractions among solvent particles, and the energy released as attractions form between solute and solvent particles.

Factors Affecting Rates of Dissolving (page 234)

15. How are rates of dissolving similar to rates of chemical reactions? Like reaction rates, dissolving rates vary with the conditions under which the change occurs.
16. Why does powdered sugar dissolve in water faster than granulated sugar? Powdered sugar has more surface area per unit mass than granulated sugar, so collisions between solute and solvent particles can occur at a greater rate.
17. Heating a solvent increases the energy of its particles, making them move faster on average, and increases the rate at which a solid solute can dissolve in the solvent.
18. Explain how stirring or shaking a mixture of powdered detergent and water can affect the rate of dissolving. Stirring or shaking a solution that contains a solid solute moves dissolved particles away from the surface of the solid. It also causes more frequent collisions between the solute and solvent particles.