CHAPTER 15 LEARNING OBJECTIVES

To satisfy the minimum requirements for this course, you should be able to:

Use the molecular-kinetic to describe a solution and be able to

- describe the energy changes that occur in the solution process in terms of the solute-solute, solvent-solvent, and solute-solvent attractive forces
- describe the role of entropy in the solution process.
- describe the effects of solute-solvent interactions and pressure and temperature on solubilities.

Define weight percent, mass fraction, parts per million, mole fraction, molarity, molality, and

- calculate concentrations in any of these concentration units.
- convert concentration in one concentration unit into any other unit.

Discuss the concept of colligative properties and be able to

- describe the effects of solute concentration on the vapor pressure, boiling point, freezing point, and osmotic pressure of a solution
- calculate the vapor pressure, boiling point, freezing point, and osmotic pressure of a solution given appropriate concentration data.
- determine the concentration and molar mass of a nonvolatile nonelectrolyte from its effect on the colligative properties of a solution.
- explain the difference between the magnitude of changes in colligative properties caused by electrolytes compared to those caused by nonelectrolytes.

Describe the distribution of water (fresh and salt) on earth and discuss

- processes to purify drinking water
- the difference between hard and. soft water.

To learn the material in this chapter, you should:

- Review the “In Closing” and “Key Terms” sections of Chapter 15.

- Do the following:
  Exercises: 15.2, 15.4, 15.8, 15.9, 15.11, 15.15, 15.16, 15.17
  Problem Solving Practice: 15.2, 15.3, 15.4, 15.6, 15.9, 15.10, 15.13

- Test your knowledge by completing the assigned OWL modules.