

CHAPTER 16 LEARNING OBJECTIVES

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

Discuss the general properties that characterize acidic and basic solutions for the Bronsted-Lowrey, and Lewis models and

- identify Bronsted-Lowry acids and bases
- identify the conjugate base associated with a given Bronsted-Lowry acid
- identify the conjugate acid associated with a given Bronsted-Lowry base

Explain what is meant by the autoionization of water and write the K_w expression for the process.

Define pH and given pH, $[H^+]$, or $[OH^-]$ be able to calculate the other two variables.

Explain the difference between weak and strong acids/bases and

- identify the common strong acids and bases
- calculate the pH of aqueous solutions of strong acids and bases given their concentrations.
- recognize how amines act as weak bases and how carboxylic acids ionize in aqueous solution
- Calculate the pH for a weak acid solution in water, given the acid concentration and K_a
- calculate K_a given the acid concentration and pH
- write stepwise ionization equations and the corresponding equilibrium-constant Expressions for polyprotic acids.
- calculate the pH for a weak base solution in water, given the base concentration and K_b
- calculate K_b given the base concentration and pH

Determine the relationship between the strength of an acid and that of its conjugate base and be able to

- Calculate K_b using a given K_a , and vice-versa.
- Predict whether a salt solution will be acidic, basic, or neutral.

Explain how acid strength relates to the polarity and strength of the H—X bond.

To learn the material in this chapter, you should:

- Review the “In Closing” and “Key Terms” sections of Chapter 16.
- Do the following:
Exercises: 16.1, 16.5, 16.7, 16.10, 16.11, 16.19
Problem Solving Practice: 16.1, 16.2, 16.3, 16.4, 16.5, 16.6, 16.7, 16.8, 16.9, 16.10
- Test your knowledge by completing the assigned OWL modules.