

SC151 - CHAPTER 7 LEARNING OBJECTIVES

To satisfy the minimum requirements for this course, you should master the following learning objectives.

Discuss the general properties of Bronsted acids and bases by

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

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

Define pH and pOH; given pH, pOH, $[H_3O^+]$, or $[OH^-]$ be able to calculate the other quantities.

Explain the difference between weak and strong acids/bases and

- be able to give the names and chemical formulas of common strong acids and bases. (see Pro-Knowledge)
- calculate the pH of aqueous solutions of strong acids and bases given their concentrations.
- identify amines as weak bases and carboxylic acids as weak acids, write their ionization reactions in water, and write their corresponding equilibrium-constant expressions.
- rank a series of weak acids or bases by acid or base strength given their K_a or K_b values.
- calculate the pH for a weak acid solution in water (under conditions where the dissociation of water itself does not significantly contribute H_3O^+), 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.
- calculate percent ionization for an acidic or basic solution.

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 and be able to calculate the pH.