Chapter 9 – Monoprotic Acid-Base Equilibria

Objectives and Problems

At the end of this chapter you should:

- Be able to calculate the pH of a solution containing a strong acid or a strong base (with and without using activities)
  Exercise: 9-A, 9-B, 9-C, 9-D, 9-G
  Problems: 9-1, 9-2, 9-3, 9-4,

- Know when and how to use the systematic treatment of equilibrium to determine the pH of a solution
- Know when you can or can not make assumptions in acid-base equilibrium calculations
- Understand how to perform weak acid and weak base equilibria calculations
  Problems: 9-5, 9-6, 9-7, 9-8, 9-9, 9-10, 9-11, 9-12, 9-13, 9-14, 9-15, 9-16
  9-18, 9-19, 9-20, 9-21, 9-22, 9-23 9-24, 9-25, 9-44

- Be able to calculate the fraction of dissociation of an acid or base
  Problems: 9-6, 9-9, 9-13, 9-15, 9-16, 9-19, 9-22,

- Understand the basic behavior of a buffer
- Be able to perform the necessary calculations to prepare a buffer solution and be able to realistically prepare a buffer
  Exercise: 9-F, 9-H
  Problems: 9-26, 9-27, 9-28, 9-29, 9-30, 9-31, 9-32, 9-33, 9-34, 9-35, 9-36, 9-37, 9-38,
  9-39, 9-40, 9-41

Problem Set #6 (due Monday October 29th

For problems involving the calculation of activity coefficients you may use either the Debye-Huckel equation or the Davies equation. Please make sure you state which equation you use.

Exercise: 9-F, 9-H
Problems: 9-1, 9.4, 9-6, 9-12, 9-22, 9-26, 9-30, 9-34

Extra Credit

Problem: 9-44