**CH 112 Problem Set 5**

**Due Wednesday April 3 at the beginning of class**

1. a) What is the pH of 6.14 x 10-3 M HI? Is the solution neutral, acidic, or basic?

b) What is the pOH of 2.55 M Ba(OH)2? Is the solution neutral, acidic, or basic?

2. In each equation, label the acids, bases, and conjugate pairs:

a) NH4+ + CN- ↔ NH3 + HCN

b) H2O + HS- ↔ OH- + H2S

c) HSO3- + CH3NH2 ↔ SO32- + CH3NH3+

3. What is the molarity of OH- ions that remain in solution when 25.10 ml of 0.2455 M NaOH and 35.05 ml of 0.1524 M HNO3 react?

4. HY (MW = 60 g/mol) and HZ (MW = 180 g/mol) are weak acids. A solution of 5.0 g/L of HY has the same pH as one containing 10.0 g/L of HZ. Which is the stronger acid. Explain your answer

5. Solutions created to etch glass can be made by dissolving HF into water. Calculate the initial molarity of HF in an aqueous etching solution with a pH of 3.0 Ka for HF = 6.8 x 10-4.

6. Formic acid, HCHO2, sometimes written as HCOOH, is used in the textile and rubber industries. It is best known as the irritant associated with ant bites, especially fire ants (family *Formicidae*). Calculate the percent dissociation of 0.75 M HCHO2 if the Ka for formic acid is 1.8 x 10-4.

7. A 0.250 mole sample of HX is dissolved in enough H2O to form 655 mL of solution. If the pH of the solution is 3.54, what is the Ka of HX?

8. Acetic acid, CH3COOH, has a Ka of 1.8 x 10-5 and ammonia, NH3, has a Kb of 1.8 x 10-5.

Find the [H3O+], [OH-], pH, and pOH for a) 0.240 M CH3COOH and b) 0.240 M NH3.