CHEM 1212 Chapter 17 Homework

1. Calculate the pH at the equivalence point when 40.0 mL of 0.025 *M* benzoic acid (C6H5COOH, *Ka* = 6.3 × 10−5) is titrated with 0.050 *M* NaOH
2. Does a precipitate form when 0.050 L of 2.0 × 10−2 *M* NaF is mixed with 0.010 L of 1.0 × 10−2 *M* Ca(NO3)2? Ksp for CaF2 = 3.9 × 10 −11
3. The Ka of acetic acid is 1.76 × 10-5. Calculate the pH of a buffer prepared by combining 45.0 mL of 1.00 M potassium acetate and 50.0 mL of 1.00 M acetic acid.
4. Calculate the pH of a solution prepared by dissolving 0.850 mol of NH3 and 0.350 mol of NH4Cl in water sufficient to yield 1.00 L of solution. The Kb of ammonia is 1.77 × 10-5.
5. Calculate the pH of a solution prepared by dissolving 0.350 mol of benzoic acid (C7H5O2H) and 0.250 mol of sodium benzoate (NaC7H5O2) in water sufficient to yield 1.00 L of solution. The Ka of benzoic acid is 6.50 × 10-5.
6. A 25.0-mL sample of 0.150 M hydrazoic acid is titrated with a 0.150 M NaOH solution. What is the pH after 13.3 mL of base is added? The Ka of hydrazoic acid is 1.9 × 10-5.
7. A 25.0 mL sample of an HCl solution is titrated with a 0.139 M NaOH solution. The equivalence point is reached with 25.3 mL of base. Calculate the concentration of HCl .
8. Calculate the pH of a solution prepared by mixing 55.0 mL of 0.183 M KOH and 30.0 mL of 0.145 M HC2H3O2 .
9. What is the molar solubility of silver sulfate (Ag2SO4) in water? The solubility-product constant for Ag2SO4 is 1.5 × 10-5 at 25°C.
10. A solution of NaF is added drop wise to a solution that is 0.0144 M in Ba2+. When the concentration of F- exceeds \_\_\_\_\_\_\_\_\_\_ M, BaF2 will precipitate. Neglect volume changes. For BaF2, Ksp = 1.7 × 10-6.