CHAPTER EIGHT
Acid and Base Ionizations (3)

8.116 Use Le Châtelier's principle to explain how the common ion effect affects the pH of a solution.

8.117 Describe the effect on pH (increase, decrease, or no change) that results from each of the following additions: (a) potassium acetate to an acetic acid solution; (b) ammonium nitrate to an ammonia solution; (c) sodium formate (HCOONa) to a formic acid (HCOOH) solution; (d) potassium chloride to a hydrochloric acid solution; (e) barium iodide to a hydroiodic acid solution.

8.118 Determine the pH of (a) a 0.40 *M* CH_3COOH solution, (b) a solution that is 0.40 *M* CH_3COOH and 0.20 *M* CH_3COONa.

8.119 Determine the pH of (a) a 0.20 *M* NH_3 solution, (b) a solution that is 0.20 *M* in NH_3 and 0.30 *M* NH_4Cl.

8.120 Which of the following ionic compounds will be more soluble in acid solution than in water? (a) $BaSO_4$, (b) $PbCl_2$, (c) $Fe(OH)_3$, (d) $CaCO_3$

8.121 Which of the following will be more soluble in acid solution than in pure water? (a) CuI, (b) Ag_2SO_4, (c) $Zn(OH)_2$, (d) BaC_2O_4, (e) $Ca_3(PO_4)_2$

8.122 Compare the molar solubility of $Mg(OH)_2$ in water and in a solution buffered at a pH of 9.0.

8.123 Calculate the molar solubility of $Fe(OH)_2$ at (a) pH 8.00, (b) pH 10.00.

8.124 The solubility product of $Mg(OH)_2$ is 1.2×10^{-11}. What minimum OH^- concentration must be attained (for example, by adding NaOH) to decrease the Mg^{2+} concentration in a solution of $Mg(NO_3)_2$ to less than 1.0×10^{-10} *M*?

8.125 Calculate whether or not a precipitate will form if 2.00 mL of 0.60 *M* NH_3 are added to 1.0 L of 1.0×10^{-3} *M* $FeSO_4$.

8.126 Calculate *x*, the number of molecules of water in oxalic acid hydrate, $H_2C_2O_4 \cdot xH_2O$, from the following data: 5.00 g of the compound is made up to exactly 250 mL solution, and 25.0 mL of this solution requires 15.9 mL of 0.500 *M* NaOH solution for neutralization.

8.127 Which of the following solutions has the highest $[H^+]$? (a) 0.10 *M* HF, (b) 0.10 *M* HF in 0.10 *M* NaF, (c) 0.10 *M* HF in 0.10 *M* SbF_5. (*Hint:* SbF_5 reacts with F^- to form the complex ion SbF^-_6.)