Unit 8 – Chapter 14: Acids & Bases **Name _____**

Assignment #1: Strong to Weak Acid/Bases, pH Calculations, % Dissociations **Period _____**

1) Use Table 14.2 to order the following from the strongest to the weakest base:
   ClO_2^-, H_2O, NH_3, ClO_4^-

2) At 40^0C the value of K_w is 2.92×10^{-14}.
   a. Calculate the $[H^+]$ and $[OH^-]$ in pure water at 40^0C.
   b. What is the pH of pure water at 40^0C?
   c. If the hydroxide ion concentration in a solution is 0.10 *M*, what is the pH at 40^0C?

3) The pOH of a sample of baking soda dissolved in water is 5.74 at 25^0C. Calculate the pH, $[H^+]$, and $[OH^-]$ for this sample. Is the solution acidic or basic?

4) A solution is prepared by mixing 90.0 mL of 5.00 *M* HCl and 30.0 mL of 8.00 *M* HNO_3. Water is then added until the final volume is 1.00 L. Calculate $[H^+]$, $[OH^-]$, and the pH for this solution.

5) For propanoic acid ($HC_3H_5O_2$, $K_a = 1.3 \times 10^{-5}$), determine
   a. the concentration of all species present
   b. the pH
   c. the percent dissociation of a 0.100 *M* solution.

6) A typical aspirin tablet contains 325 mg of acetylsalicylic acid, $HC_9H_7O_4$. Calculate the pH of a solution that is prepared by dissolving two aspirin tablets in one cup (237 mL) of solution. Assume the aspirin tablets are pure acetylsalicylic acid, $K_a = 3.3 \times 10^{-4}$.

7) Using the K_a values in Table 14.2, calculate the percent dissociation in a 0.20 *M* solution of each of the following acids.
   a. Nitric acid (HNO_3)
   b. Nitrous acid (HNO_2)
   c. phenol (HOC_6N_5)