

## Problem Set # 8

## pH Calculations for Weak Acids

1. Calculate the  $[\text{H}_3\text{O}^+]$ ,  $[\text{OH}^-]$ , pH, and pOH for 0.20 M HCN.

$$[\text{H}_3\text{O}^+] = \underline{\hspace{2cm}} \quad [\text{OH}^-] = \underline{\hspace{2cm}} \quad \text{pH} = \underline{\hspace{2cm}} \quad \text{pOH} = \underline{\hspace{2cm}}$$

2. Calculate the  $[\text{H}_3\text{O}^+]$ ,  $[\text{OH}^-]$ , pH, and pOH for 2.20 M HF.

$$[\text{H}_3\text{O}^+] = \underline{\hspace{2cm}} \quad [\text{OH}^-] = \underline{\hspace{2cm}} \quad \text{pH} = \underline{\hspace{2cm}} \quad \text{pOH} = \underline{\hspace{2cm}}$$

3. Calculate the  $[\text{H}_3\text{O}^+]$ ,  $[\text{OH}^-]$ , pH, and pOH for 0.805 M  $\text{CH}_3\text{COOH}$ .

$$[\text{H}_3\text{O}^+] = \underline{\hspace{2cm}} \quad [\text{OH}^-] = \underline{\hspace{2cm}} \quad \text{pH} = \underline{\hspace{2cm}} \quad \text{pOH} = \underline{\hspace{2cm}}$$

4. Calculate the  $[\text{H}_3\text{O}^+]$ ,  $[\text{OH}^-]$ , pH, and pOH for 1.65 M  $\text{H}_3\text{BO}_3$ .

pH = \_\_\_\_\_      pOH = \_\_\_\_\_       $[\text{H}_3\text{O}^+] =$  \_\_\_\_\_       $[\text{OH}^-] =$  \_\_\_\_\_

5. The pH of 0.20 M HCN is 5.00. Calculate the  $K_a$  for HCN. Compare your calculated value with that in the table.

6. The pH of 2.20 M HF is 1.56. Calculate the  $K_a$  for HF. Compare your calculated value with that in the table.