

**Intro to Acid/Base**

**Reaction 1:** Consider a 0.342 M HF solution, the  $K_a$  of HF is  $6.6 \times 10^{-4}$ .

- (a) What is the chemical reaction?
- (b) What is the equilibrium expression?
- (c) What is the concentration of  $F^-$ ,  $H_3O^+$ ,  $OH^-$ , and HF at equilibrium?
- (d) What is the pH and pOH of the solution?

**Reaction 2:** Consider a 0.342 M  $\text{HClO}_2$  solution, the  $K_a$  of  $\text{HClO}_2 = 1.1 \times 10^{-2}$

- (a) What is the chemical reaction?
- (b) What is the equilibrium expression?
- (c) What is the concentration of  $\text{ClO}_2^-$ ,  $\text{H}_3\text{O}^+$ ,  $\text{OH}^-$ , and  $\text{HClO}_2$  at equilibrium?
- (d) What is the pH and pOH of the solution?

**Reaction 3:** Consider a 0.342 M  $\text{CH}_3\text{NH}_2$  solution, the  $K_b$  of  $\text{CH}_3\text{NH}_2$  is  $5.25 \times 10^{-4}$

- (a) What is the chemical reaction?
- (b) What is the equilibrium expression?
- (c) What is the concentration of  $\text{CH}_3\text{NH}_2$ ,  $\text{H}_3\text{O}^+$ ,  $\text{OH}^-$ , and  $\text{CH}_3\text{NH}_3^+$  at equilibrium?
- (d) What is the pH and pOH of the solution?

**Now compare Reaction 1, 2, and 3.** Which has the highest pH? Which has the lowest pH? Which is the strongest acid? Which is the strongest base?