# Acids and Bases

**Directions:** Identify the conjugate acid-base pairs in each reaction. Then use a table of $K_a$ values and determine which direction the reaction will favor.

| Reaction | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $CH_3COOH(aq)$ | + | $H_2O(l)$ | ⇌ | $H_3O^{+1}(aq)$ | + | $CH_3COO^{-1}(aq)$ | | | | |
| 2 | $HCl(aq)$ | + | $H_2O(l)$ | → | $H_3O^{+1}(aq)$ | + | $Cl^{-1}(aq)$ | | | | |
| 3 | $NH_3(aq)$ | + | $H_2O(l)$ | ⇌ | $OH^{-1}(aq)$ | + | $NH_4^{+1}(aq)$ | | | | |
| 4 | $HClO_3(aq)$ | + | $H_2O(l)$ | → | $ClO_3^{-1}(aq)$ | + | $H_3O^{+1}(aq)$ | | | | |
| 5 | $NH_4^{+1}(aq)$ | + | $CO_3^{-2}(aq)$ | ⇌ | $HCO_3^{-1}(aq)$ | + | $NH_3(aq)$ | | | | |
| 6 | $HSO_4^{-1}(aq)$ | + | $OH^{-1}(aq)$ | ⇌ | $H_2O(l)$ | + | $SO_4^{-2}(aq)$ | | | | |

**1.** Which direction is favored in reaction 1?

A To the left (reactant favored)

B To the right (product favored)

**2.** Which direction is favored in reaction 2?

A To the left (reactant favored)

B To the right (product favored)

**3.** Which direction is favored in reaction 3?

A To the left (reactant favored)

B To the right (product favored)

**4.** Which direction is favored in reaction 4?

A To the left (reactant favored)

B To the right (product favored)

**5.** Which direction is favored in reaction 5?

A To the left (reactant favored)

B To the right (product favored)

**6.** Which direction is favored in reaction 6?

A To the left (reactant favored)

B To the right (product favored)

Tro, Nivaldo. *Chemistry: A Molecular Approach*. 3rd ed. New York City: Pearson, 2014. Print.