Worksheet 9: Acids and Bases

Objectives

1. Identify acid/base conjugate pairs based on the Bronsted-Lowry definition
2. Write an appropriate acid-dissociation equilibrium constant K_a expression for any acid
3. Describe what is meant in terms of strong and weak in reference to an acid or base
4. Given the value of K_a, assess the relative strength of an acid

Key Questions

1. What is the Bronsted-Lowry definition of acids and bases?

2. For the reaction $HCl + H_2O \rightleftharpoons H_3O^+ + Cl^-$, which substance serves as the acid in the forward reaction? Which substance serves as the base? What about in the reverse reaction?

3. What do we call pairs of acids and bases like those in the reaction above? Name the members of each pair from the reaction above.

4. What does it mean for a substance to be amphoteric or amphiprotic? Write an example you saw in class.

5. Write the equilibrium constant, K_c, expression for the dissociation of the acid HA in water. How is this different from the associated K_a expression?

6. What does it mean in terms of the forward and reverse reactions for K_a to be large? What does K_a say about acid strength?

7. Given the following K_a values, order the acids in terms of acidity.

Acid	K_a
HNO_3	28
H_2S	1.0×10^{-7}
HF	7.2×10^{-4}

8. Write down the mnemonic for the strong acids below.