

## Worksheet 10: 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  $\text{HCl} + \text{H}_2\text{O} \rightleftharpoons \text{H}_3\text{O}^+ + \text{Cl}^-$ , 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	$K_a$
$\text{HNO}_3$	28
$\text{H}_2\text{S}$	$1.0 \times 10^{-7}$
HF	$7.2 \times 10^{-4}$

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