

# Acids and Bases

## Section 19.1 Acids and Bases: An Introduction

In your textbook, read about the properties of acids and bases.

For each description below, write *acid* if it tells about a property of an acid or *base* if it tells about a property of a base. If the property does not apply to either an acid or a base, write *neither*. If it applies to both an acid and a base, write *both*.

- \_\_\_\_\_ 1. Can turn litmus paper a different color
- \_\_\_\_\_ 2. Reacts with certain metals
- \_\_\_\_\_ 3. Contains more hydrogen ions than hydroxide ions
- \_\_\_\_\_ 4. Feels slippery
- \_\_\_\_\_ 5. Reacts with carbonates
- \_\_\_\_\_ 6. Feels rough
- \_\_\_\_\_ 7. Contains equal numbers of hydrogen and hydroxide ions
- \_\_\_\_\_ 8. Tastes bitter
- \_\_\_\_\_ 9. Tastes sour

In your textbook, read about the different models of acids and bases.

Use the terms below to complete the passage. You may use each term more than once.

Arrhenius  
conjugate base

Brønsted-Lowry  
hydrogen

conjugate acid  
hydroxide

The (10) \_\_\_\_\_ model of acids and bases states that an acid contains the element (11) \_\_\_\_\_ and forms ions of this element when it is dissolved in water. A base contains the (12) \_\_\_\_\_ group and dissociates to produce (13) \_\_\_\_\_ ions in aqueous solution.

According to the (14) \_\_\_\_\_ model, an acid donates (15) \_\_\_\_\_ ions, and a base accepts (16) \_\_\_\_\_ ions.

According to this model, in an acid-base reaction, each acid has a (17) \_\_\_\_\_, and each base has a (18) \_\_\_\_\_.



## Section 19.2 Strengths of Acids and Bases

In your textbook, read about strengths of acids.

Circle the letter of the choice that best completes the statement or answers the question.

- Acid A and acid B are of equal concentration and are tested with a conductivity apparatus. When the electrodes are placed in acid A, the bulb glows dimly. When they are placed in acid B, the bulb glows more brightly. Which of the following is true?
  - Acid A is stronger than acid B.
  - Acid B is stronger than acid A.
  - Acid A and acid B are of equal strength.
  - No comparison of strength can be made from the results.
- A chemical equation for the ionization of an acid uses a single arrow to the right ( $\rightarrow$ ) to separate the reactant and product sides of the equation. Which of the following is true?
  - The arrow does not indicate relative strength.
  - The ionizing acid is half ionized.
  - The ionizing acid is strong.
  - The ionizing acid is weak.
- Sulfuric acid is a strong acid. What is true about its conjugate base?
  - Its conjugate base is amphoteric.
  - Its conjugate base is strong.
  - Its conjugate base is weak.
  - No conclusion can be made regarding the strength of the conjugate base.
- In solution, a weak acid produces
  - a mixture of molecules and ions.
  - all ions.
  - all molecules.
  - anions, but no hydronium ions.
- Why are  $K_a$  values all small numbers?
  - The concentration of water does not affect the ionization.
  - The equilibrium is not stable.
  - The solutions contain a high concentration of ions.
  - The solutions contain a high concentration of un-ionized acid molecules.
- Which of the following dissociates entirely into metal ions and hydroxide ions in solution?
  - a strong acid
  - a strong base
  - a weak acid
  - a weak base
- In general, compounds formed from active metals, and hydroxide ions are
  - strong acids.
  - strong bases.
  - weak acids.
  - weak bases.