

Chapter 17

CHAPTER TEST

● Acids, Bases, and Salts

I. Testing Concepts

In the blank at the left, write the letter of the term or phrase that best completes each statement or answers each question.

- _____ 1. In a titration, the point where the indicator changes color is the _____.
a. pH point b. endpoint c. acid point d. standard point
- _____ 2. In a titration, the solution for which the concentration is known is called the _____.
a. indicator b. hydrate c. normal solution d. standard solution
- _____ 3. H_3O^+ units are called _____.
a. hydroxide ions b. hydronium ions c. hydroxyl groups d. hydrogen ions
- _____ 4. A process that uses a solution of known concentration to find the concentration of another solution is called _____.
a. pickling b. hydration c. saponification d. titration
- _____ 5. A substance that produces H^+ ions in solution is _____.
a. an acid b. a salt c. a base d. a soap
- _____ 6. A substance that produces OH^- ions in solution is _____.
a. an acid b. a salt c. a base d. an alcohol
- _____ 7. When the acidity of a substance is determined by the hydronium ion concentration, the _____ of the substance is being calculated.
a. saponification b. ester c. pH d. oxide
- _____ 8. Organic substances that change color in the presence of an acid or a base are called _____.
a. soaps b. glycerins c. hydrates d. indicators
- _____ 9. A compound formed in solution from the negative ion of an acid and the positive ion of a base is a _____.
a. salt b. soap c. glycerin d. detergent
- _____ 10. Which of the following substances will react to form an ester?
a. ethyl alcohol and sodium hydroxide c. sodium chloride and ethyl alcohol
b. acetic acid and sodium chloride d. acetic acid and ethyl alcohol
- _____ 11. Which of the following is NOT a characteristic shared by soaps and detergents?
a. has long carbon chains
b. reacts with minerals to form insoluble substances often called scum
c. may be classified as an organic salt
d. is formed from hydroxides and fats or oils
- _____ 12. Which of the following is the best indicator of the number of hydronium ions in a solution?
a. the pH of the solution
b. the mass of the solution
c. the color of the solution in the presence of an indicator
d. the amount of water in the solution

Chapter 17 Test (continued)

- _____ 13. A substance formed when an organic acid combines with an alcohol is _____.
a. an ester b. a hydrate c. a soap d. glycerin
- _____ 14. A solution with a bitter taste and a slippery feel is most likely _____.
a. an acid b. a base c. a salt d. a hydrate
- _____ 15. HCl is the formula for _____.
a. the hydronium ion c. hydrogen peroxide
b. hydrochloric acid d. sodium hydroxide
- _____ 16. Hydrochloric acid is sometimes used to remove impurities from metals in a process called _____.
a. hydrating b. saponification c. pickling d. neutralization
- _____ 17. The terms dilute and concentrated refer to the _____ of a solution.
a. concentration b. strength c. pH d. acidity
- _____ 18. The strength of a base that only partly dissociates in solution would be described as _____.
a. dilute b. concentrated c. weak d. strong
- _____ 19. One cause of acid rain is the _____.
a. use of fertilizers
b. use of plankton as a food source
c. burning of fossil fuels
d. use of marble and limestone as building materials
- _____ 20. A reaction between an acid and a base that produces a salt and water is a _____ reaction.
a. neutralization b. synthesis c. decomposition d. saponification

II. Understanding Concepts**Skill: Concept Mapping**

1. Place the following events regarding acid rain in the order in which you would place them in an events chain concept map. Write the numbers 1 (first) through 7 (last) in the spaces provided.

- _____ a. Sulfur oxides mix with rainwater.
- _____ b. The pH of a lake decreases.
- _____ c. Fish that feed on plankton die.
- _____ d. Coal and gasoline are burned.
- _____ e. Snow or rain containing sulfuric acid falls to Earth.
- _____ f. Sulfur oxides enter the atmosphere.
- _____ g. Plankton living in the lake die.

Chapter 17

Use with Text Pages 466-473

STUDY GUIDE

● Acids and Bases

Use the words in the box to fill in the blanks in the paragraphs below.

corrosive	bitter	hydroxide ions
sour	electrolytes	metals
slippery	hydrogen ions	electricity

An acid is a substance that produces _____ in solution. Acids taste _____. Some acids can produce painful burns and damage tissues. Because acid solutions conduct _____, acids are electrolytes. Since acids seemingly "eat away" certain _____, acids are corrosive.

A base is a substance that produces _____ in solution. In solution, bases feel _____ and have a _____ taste. Like acids, strong bases are _____ and can produce painful burns. Bases are also _____.

Circle the term or phrase in parentheses that makes each statement true.

1. A substance that produces hydrogen ions in solution is (an acid, a base).
2. The familiar sour taste of citrus fruits and tomatoes is caused by the presence of (acids, bases) in these foods.
3. A substance that can remove water from materials is a (fertilizer, dehydrating agent).
4. The process by which oxides and other impurities are removed from metal surfaces by dipping the metals in hydrochloric acid is called (pickling, hydrating).
5. A substance that produces hydroxide ions in solution is (an acid, a base).
6. A hydrogen ion is indicated by (H^+ , OH^-).
7. The notation for a hydroxide ion is (OH , OH^-).
8. An organic compound that changes color in an acid or a base is an (indicator, alcohol).
9. The ion formed by the bonding of a hydrogen ion to a water molecule is called a (hydroxyl group, hydronium ion).
10. The formula for a hydronium ion is (H_3O^+ , OH^-).

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Use with Text Pages 466-473

REINFORCEMENT

● Acids and Bases

Identify each item listed below as to whether it refers to an acid, a base, or both an acid and a base. Use the letters in the key.

KEY: A = acid

B = base

AB = acid and base

- | | |
|--|---|
| _____ 1. sour taste | _____ 12. is used in pickling |
| _____ 2. bitter taste | _____ 13. forms through ionization |
| _____ 3. produces hydrogen ions in solution | _____ 14. forms through dissociation |
| _____ 4. is an electrolyte | _____ 15. Compounds that produce this in solution are made up of polar molecules. |
| _____ 5. is slippery | _____ 16. produces hydronium ions |
| _____ 6. is often corrosive | _____ 17. Most compounds that produce this in aqueous solution are ionic. |
| _____ 7. exists as a crystalline solid in an undissolved state | _____ 18. exists in aqueous solution |
| _____ 8. produces hydroxide ions in solution | _____ 19. HCl is an example. |
| _____ 9. can be detected with an indicator | _____ 20. Ammonia is a common example. |
| _____ 10. Soaps are an example. | _____ 21. conducts electricity |
| _____ 11. may be used to make fertilizer | |

Complete the following. Write your answers on the lines provided.

22. Use the information above to identify four properties that acids and bases have in common.

23. Identify three characteristics of acids that are NOT true of bases. _____

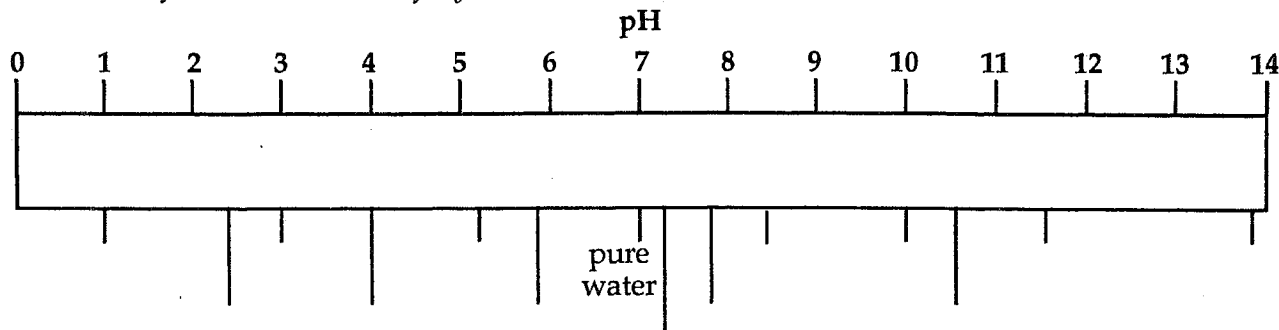
24. Identify three characteristics of bases that acids do NOT have. _____

Chapter 17**REINFORCEMENT**

Use with Text Pages 474-477.

● Strength of Acids and Bases

The pH values of several common substances are listed below. Place each item from the list on the pH scale in its proper location. The first one has been done for you.



pure water 7.0

ocean water 8.5

tomatoes 4.0

lye 13.8

stomach acid 1.0

lemons 2.5

shampoo 5.8

bananas 5.2

blood 7.2

milk of magnesia 10.5

ammonia 11.5

eggs 7.8

soap 10.0

vinegar 3.0

Complete the table below by writing the name of each of the substances above under the proper heading. Place substances with a pH lower than 3.0 in the strong acids column. Place substances with a pH higher than 10.0 in the strong bases column.

Strong acids	Weak acids	Weak bases	Strong bases

Answer the following questions on the lines provided.

1. Is pure water an acidic, basic, or neutral substance? _____

2. How does the pH of a strong acid compare with the pH of a weak acid? _____

3. How does the pH of a strong base compare with the pH of a weak base? _____

4. How does the pH of an acid compare to the pH of a base? _____

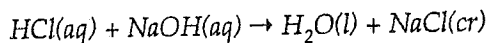
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Use with Text Pages 480–485

REINFORCEMENT

● Acid, Bases, and Salts

Use the equation below to answer questions 1–6.



1. What type of reaction is shown? _____
2. What are the products in this reaction? _____
3. What are the reactants? _____
4. a. Which of the reactants shown is a base? _____
 b. How do you know? _____
5. a. Which of the reactants is an acid? _____
 b. What is the name of the acid? _____
 c. Is the acid a strong acid or a weak acid? _____
6. What kind of compound is NaCl? _____

Identify the type of substance that is most likely to be formed by each reaction described below. Use the terms *soap*, *salt*, and *ester*.

- _____ 7. hydrochloric acid and a base
- _____ 8. an organic acid and an alcohol
- _____ 9. sodium hydroxide and a fat
- _____ 10. acetic acid and methyl alcohol
- _____ 11. potassium hydroxide and oil
- _____ 12. an acid and ammonia

Answer the following questions on the lines provided.

13. How does a soap made from sodium hydroxide differ from a soap made from potassium hydroxide? _____

14. Why are most laundry products detergents instead of soaps? _____

15. What is an observable characteristic of an ester? _____
