NAME KEY DATE CLASS

Chapter 15

STUDY GUIDE

Use with Text Pages 424–429

• Solubility and Concentration

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

a 1. The maximum number of grams of solute that will dissolve in 100 g of solvent at a certain temperature is the ____ of the solute.
a. solubility **b.** dilution

a 2. Different substances have ____ solubilities.
a. different **b.** the same

b 3. The concentration of a mixture of two or more liquids is expressed as a percentage by ____.
a. mass **b.** volume

b 4. A solution that has dissolved all the solute it can hold at a given temperature is ____.
a. unsaturated **b.** saturated

a 5. As the temperature of a liquid solvent increases, the amount of solid solute that can be dissolved in the solvent ____.
a. increases **b.** decreases

a 6. Any solution that can hold more solute at a given temperature is ____.
a. unsaturated **b.** saturated

a 7. Each time a saturated solution is heated to a higher temperature, it becomes ____.
a. unsaturated **b.** supersaturated

b 8. A solution that contains more solute than a saturated one at a given temperature is ____.
a. unsaturated **b.** supersaturated

b 9. Lines on a graph that show how much solute a solvent can hold at a given temperature are called ____.
a. solution graphs **b.** solubility curves

a 10. The concentration of a solid solute in a liquid solvent is expressed as a percentage by ____.
a. mass **b.** volume

a 11. A solution that has 4 g of KCl dissolved in 100 mL of water is ____ compared to a solution that has 30 g of KCl dissolved in 100 mL of water.
a. dilute **b.** concentrated

a 12. One mL of water has a mass of ____.
a. one gram **b.** one kilogram

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STUDY GUIDE

Use with Text Pages 432–437

• Particles in Solution

Match the terms in Column II with the definitions in Column I. Write the number of the correct term in the correct box in the grid. If you correctly complete the grid, the sum of the numbers in each horizontal and vertical row will be the same. The first one is done for you.

10/10

Column I

a. homogenous mixture
b. solution of metals
c. charged atom
d. can dissolve polar solutes and ionic solutes
e. substance being dissolved
f. substance that dissolves a solute
g. can dissolve only nonpolar solutes
h. number of grams of solute that will dissolve in 100 g of solvent
i. substance whose solutions do not conduct electricity
j. substance that separates into ions in a water solution
k. contains more solute than a saturated solution does at a given temperature
l. substance that allows electricity to pass through it
m. solution that has all the solute it can hold at a given temperature
n. process by which ions split apart when dissolved
o. process by which polar substances are pulled apart in water
p. any solution that can dissolve more solute at a given temperature

Column II

1. mixture
2. concentrated
3. solution
4. solvent
5. supersaturated solution
6. unsaturated solution
7. dissociation
8. nonelectrolyte
9. solubility
10. ion
11. conductor
12. ionization
13. alloy
14. solute
15. dilute
16. nonpolar solvent
17. polar solvent
18. saturated solution
19. electrolyte

Answer Box

				Totals
A3	B	C 10	D 17	43
E 14	F 4	G 16	H 9	43
I 8	J 19	K 5	L 11	43
M 18	N 7	O 12	P 6	43
Totals 43	43	43	43	

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Chapter 15

STUDY GUIDE

Use with Text Pages 416–421

How Solutions Form

In each of the following statements, a term has been scrambled. Unscramble the term and write it on the line provided.

alloys 1. Solid solutions composed of metals usually are called *loyals*.

homogeneous 2. When the particles of a mixture are evenly distributed throughout, the mixture is *housenogeom*.

solvent 3. In a solution of sugar and water, the water is the *notvels*.

solute 4. In a solution of salt and water, the salt is the *stoleu*.

surface 5. Grinding a solid solute increases its *farceus* area.

pressure 6. A gas dissolves best in a liquid solvent when the solution is under high *spursere*.

12/12

Circle the term in each set that is least related to the others. Then write a sentence explaining how the remaining terms are related. Compare your answers to those of your classmates. There may be more than one correct set of relationships.

1. solute, solution, ion, solvent A solute dissolves in a solvent to make a solution

2. stir, grind, heat, hydrate Stirring, grinding + heating increase the rate of solid solutes dissolving.

3. dental amalgam, soda, sterling silver, brass Dental amalgam contains a mercury, & sterling silver alloy, brass contains copper and zinc.

4. metal, air, alloy, solid Alt. metal alloys are solid

5. club soda, sugar water, vinegar, brass Vinegar, sugar water + club soda are examples of liquid solutions.

6. air, gas, nitrogen, carbon Air is a gas solution of oxygen and nitrogen.

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Chapter 15

STUDY GUIDE

Use with Text Pages 422–423

• Regulating Organic Solvents

10

Determine whether the italicized term makes each statement true or false. If the statement is true, write the word "true" in the space provided. If the statement is false, write in the blank the term that makes the statement true.

remodeling 1. Scientists warn that buildings in which people live may be hazardous to their health because of the number of potentially harmful chemicals found in materials used in construction and *appliances*.

true 2. Glues, paint remover, paint and varnish thinners, and some caulking compounds and carpeting contain *organic solvents*.

vaporize 3. Organic solvents produce fumes because they *freeze* easily.

can 4. Organic solvents *cannot* enter the body by being absorbed through the skin.

true 5. Organic solvents *can* enter the body by inhaling their fumes.

true 6. The *nervous* system is known to be affected by organic solvents.

true 7. A few organic solvents have been shown to cause *cancer*.

workers 8. The United States Occupational Safety and Health Administration (OSHA) has established regulations for *anyone* exposed to health-threatening solvents.

government 9. The Consumer Products Safety Commission, a *private* agency, requires labels on all corrosive or flammable chemicals.

true 10. Good *ventilation* is required when working with materials containing organic solvents.

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Chapter 15

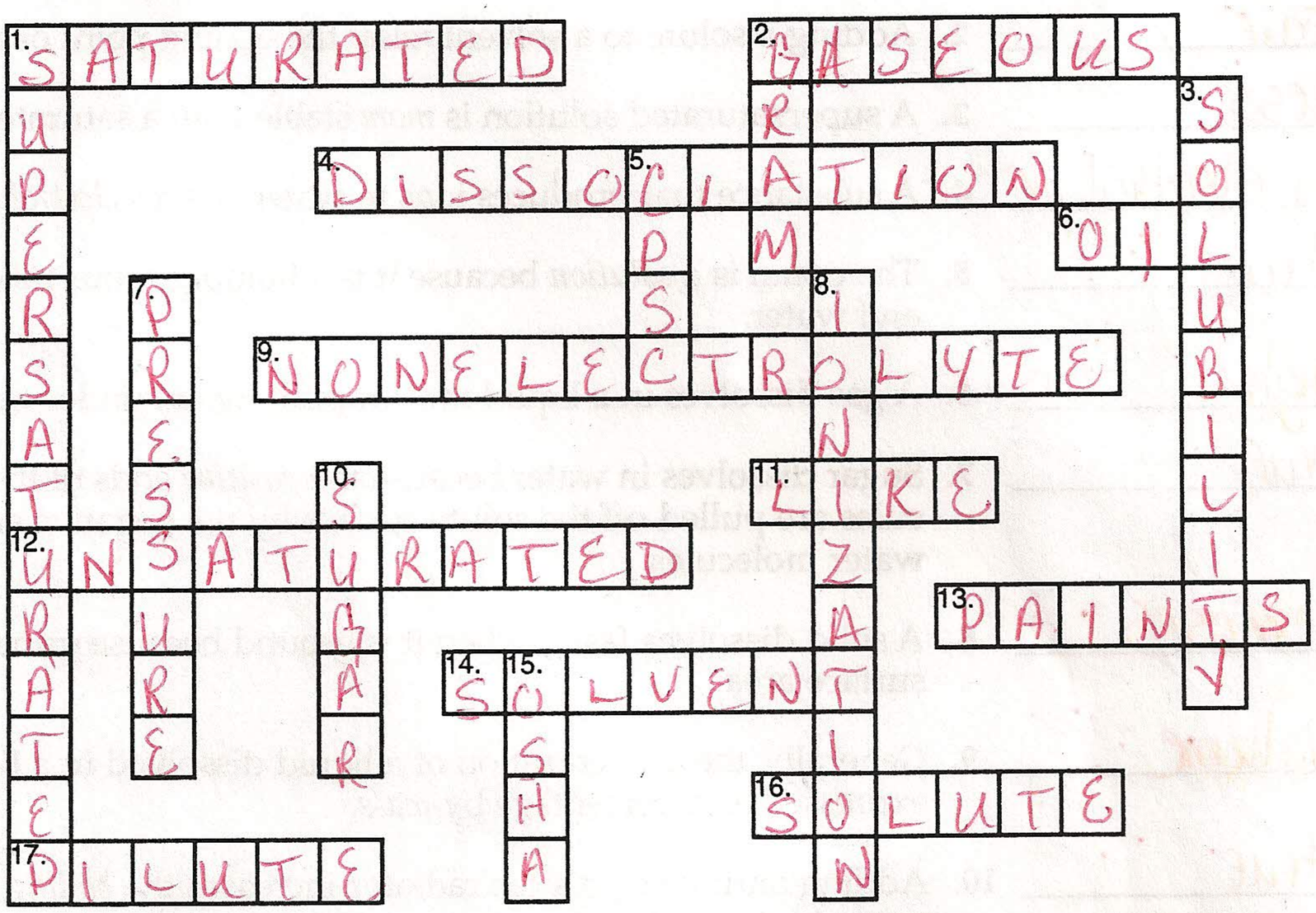
CHAPTER REVIEW

• Solutions

10/10

Part A. Vocabulary Review

Use the clues given below to complete the crossword puzzle.



Across

1. A solution that contains all the solute it can hold at a given temperature is ____.
2. Air is an example of a(n) ____ solution.
4. process by which ions of opposite charges separate when dissolved
6. ____ and vinegar do NOT form a solution.
9. substance that forms nonconducting solutions with water
11. "Like dissolves ____."
12. solution that can dissolve more solute at a given temperature
13. may give off fumes that cause health problems
14. substance that dissolves another substance
16. substance that is dissolved
17. a small amount of solute in the solvent

Down

1. A solution that contains more solute than does a saturated solution at a given temperature is a ____ solution.
2. unit of mass measurement used to measure a solid solute
3. maximum number of grams of solute that will dissolve in 100 g of solvent at a given temperature
5. agency that requires labels on corrosive or flammable liquids
7. Gases dissolve in liquid when this is high.
8. process by which polar substances dissolved in water are pulled apart
10. the solute in a sugar and water solution
15. agency that sets limits to time workers can be exposed to organic solvents

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Chapter 15 Review (continued)

12

Part B. Concept Review

Determine whether the italicized term makes each statement true or false. If the statement is true, write the word "true" in the blank. If the statement is false, write in the blank the term that makes the statement true.

lowers 1. Adding a solute to a solvent *raises* the freezing point of the solvent.

True 2. Adding a solute to a solvent *raises* the boiling point of a solvent.

less 3. A supersaturated solution is *more* stable than a saturated solution.

an electrolyte 4. A substance that produces ions in water is *a nonelectrolyte.*

true 5. The ocean is a *solution* because it is a homogeneous mixture of salts and water.

high 6. A gas dissolves in a liquid most rapidly when under *low* pressure.

true 7. Sugar dissolves in water because the *positive* ends of the sugar molecules are pulled off the solute surface by the negative ends of the water molecules.

increases 8. A solid dissolves faster when it is ground because grinding *decreases* surface area.

volume 9. Generally, the concentration of a liquid dissolved in a liquid can be expressed as a percentage by *mass.*

true 10. Adding antifreeze to a car radiator increases the *boiling point* of the water in the radiator.

does not 11. Pure water *does* conduct an electric current.

cannot 12. Because grease is nonpolar, it *can* be dissolved in water.