Name _____ Date _____ Class _____

CHAPTER 16 STUDY GUIDE FOR CONTENT MASTERY

Energy and Chemical Change

Section 16.1 Energy

In your textbook, read about the nature of energy.

In the space at the left, write true if the statement is true. If the statement is false, change the italicized word or phrase to make it true.

true 1. *Energy* is the ability to do work or produce heat.

cannot be 2. The law of conservation of energy states that energy can be created and destroyed.

true 3. Chemical potential energy is energy stored in a substance because of its composition.

true 4. *Heat* is a form of energy that flows from a warmer object to a cooler object.

true 5. A calorie is the amount of energy required to raise the temperature of one gram of pure water by one degree Celsius.

joule 6. A calorie is the SI unit of heat and energy.

true 7. The *specific heat* of a substance is the amount of heat required to raise the temperature of one gram of that substance by one degree Celsius.

true 8. *Kinetic energy* is energy of motion.

both potential and kinetic energy 9. Chemicals participating in a chemical reaction contain only *potential energy*.

1000 calories 10. One nutritional Calorie is equal to 100 calories.

true 11. One calorie equals 4.184 joules.

true 12. When a fuel is burned, some of its *chemical potential energy* is lost as heat.

multiply 13. To convert kilojoules to joules, divide the number of kilojoules by 1000 joules/1 kilojoule.

Answer the following question. Show all your work.

14. If the temperature of a 500.0 g sample of liquid water is raised 2.00°C, how much heat is absorbed by the water? The specific heat of liquid water is 4.184 J/(g·°C).

$q = c \times m \times \Delta T$

$q = 4.184\ J/(g \cdot °C) \times (5 \times 10^2\ g) \times 2.00°C$

$q = 4.184 \times 10^3\ J = 4.18\ kJ$

Name _____ Date _____ Class _____

CHAPTER 16 STUDY GUIDE FOR CONTENT MASTERY

Section 16.2 Heat in Chemical Reactions and Processes

In your textbook, read about measuring heat and about chemical energy and the universe.

For each item in Column A, write the letter of the matching item in Column B.

Column A		Column B
b	1. An insulated device used to measure the amount of heat absorbed or released during a chemical or physical process	a. system
c	2. The study of heat changes that accompany chemical reactions and phase changes	b. calorimeter
a	3. The specific part of the universe that contains the reaction or process you wish to study	c. thermochemistry
f	4. The change in enthalpy in a chemical reaction	d. universe
d	5. A system plus its surroundings	e. enthalpy
e	6. The heat content of a system at constant pressure	f. enthalpy (heat) of reaction
g	7. Everything in the universe except the system being studied	g. surroundings

Use the illustration to answer the following questions.

8. A scientist is studying this solution in the flask. What is the system?

The system is the solution of $Ba(OH)_2$ and NH_4NO_3.

9. What are the surroundings?

The surroundings include everything except the solution.

10. What is the universe?

The universe is the solution plus the surroundings.

Chapter 16 Study Guide Answers Energy Chemical Change

Silberberg

Chapter 16 Study Guide Answers Energy Chemical Change:

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