D. Stark

Chemistry

Name _____ Class _____ Date _____

Chapter 4 Atomic Structure

Section 4.2 The Structure of an Atom

(pages 108–112)

This section compares the properties of three subatomic particles. It also discusses atomic numbers, mass numbers, and isotopes.

DAY 1

Reading Strategy (page 108)

Monitoring Your Understanding Before you read, list in the table shown what you know about atoms and what you would like to learn. After you read, list what you have learned. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

What I Know About Atoms	What I Would Like to Learn	What I Have Learned

Properties of Subatomic Particles (pages 108–109)

1. What are three subatomic particles?
   a. _____ b. _____ c. _____
2. Circle the letter that identifies a subatomic particle with a positive charge.
   a. nucleus b. proton
   c. neutron d. electron
3. Why did Chadwick conclude that the particles produced by his experiment were neutral in charge? _____

Comparing Subatomic Particles (pages 109–110)

4. Circle the letters of properties that vary among subatomic particles.
   a. color b. mass
   c. charge d. location in the atom
5. Circle the letter of the expression that accurately compares the masses of neutrons and protons.
   a. mass of 1 neutron = mass of 1 proton
   b. mass of 2000 neutrons = mass of 1 proton
   c. mass of 1 electron = mass of 1 proton
   d. mass of 1 neutron = mass of 1 electron

Atomic Number and Mass Number (page 110)

6. Is the following sentence true or false? Two atoms of the same element can have different numbers of protons. _____

7. What is an atomic number? _____

_____

_____

8. Circle the letters that identify quantities that are always equal to an element's atomic number.

   a. number of nuclei

   b. number of protons

   c. number of neutrons

   d. number of electrons

9. Is the following sentence true or false? Two different elements can have the same atomic number. _____

10. What is the mass number of an atom? _____

_____

_____

11. Complete the equation in the table below.

Number of neutrons = _____ − _____

Isotopes (page 112)

12. Every atom of a given element has the same number of _____ and _____.

13. Every atom of a given element does not have the same number of _____.

14. What are isotopes? _____

_____

_____

15. All oxygen atoms have 8 protons. Circle the letter of the number of neutrons in an atom of oxygen-18.

   a. 8 b. 9

   c. 10 d. 18

16. Is the following sentence true or false? Isotopes of oxygen have different chemical properties. _____

17. Water that contains hydrogen-2 atoms instead of hydrogen-1 atoms is called _____.

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Section 5.2 The Modern Periodic Table

(pages 130–138)

This section explains the organization of the modern periodic table and discusses the general properties of metals, nonmetals, and metalloids.

DAY 2

Reading Strategy (page 130)

Previewing Before you read, complete the table by writing two questions about the periodic table on pages 132–133. As you read, write answers to your questions. For more information on this reading strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Questions About the Periodic Table	
Question	**Answer**

The Periodic Law (pages 131–133)

1. Is the following sentence true or false? In the modern periodic table, elements are arranged by increasing number of protons.

   _____

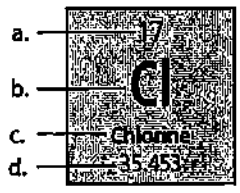
2. Explain why the number of elements per period varies. _____

   _____

3. Properties of elements repeat in a predictable way when atomic numbers are used to arrange elements into groups. This pattern of repeating properties is called the _____.

Atomic Mass (page 134)

4. Label the four types of information supplied for chlorine in the diagram.



a. _____ b. _____

c. _____ d. _____

5. Define atomic mass. _____

_____

6. Circle the letter of each sentence that is true about a carbon-12 atom.
   a. It has 6 protons and 6 neutrons.
   b. Scientists assigned a mass of 6 atomic mass units to the carbon-12 atom.
   c. It is used as a standard for comparing the masses of atoms.
   d. An atomic mass unit is defined as one twelfth the mass of a carbon-12 atom.
7. Is the following sentence true or false? Most elements exist as a mixture of two or more isotopes. _____
8. The mass of an atom of chlorine-37 is _____ than the mass of an atom of chlorine-35.
9. Is the following sentence true or false? All values are equally important in a weighted average. _____

Classes of Elements (pages 135–136)

10. Name the three categories into which elements are classified based on their general properties.
    a. _____
    b. _____
    c. _____
11. Is the following sentence true or false? All metals react with oxygen in the same way. _____
12. An important property of transition elements is their ability to form compounds _____.
13. Circle the letter of each sentence that is true about nonmetals.
    a. Nonmetals are poor conductors of heat and electric current.
    b. Many nonmetals are gases at room temperature.
    c. Some nonmetals are extremely reactive and others hardly react at all.
    d. Nonmetals that are solids tend to be malleable.

Variation Across a Period (page 138)

14. Across a period from left to right, the elements become _____ metallic and _____ nonmetallic in their properties.
15. Circle the letter of each Period 3 element that is highly reactive.
    a. sodium b. silicon
    c. chlorine d. argon

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Chapter 7 Chemical Reactions

Section 7.3 Energy Changes in Reactions

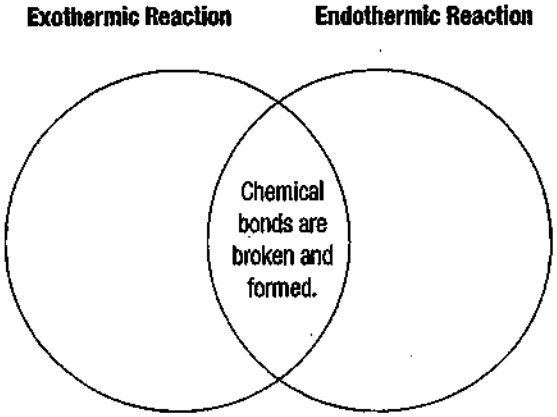
(pages 206–209)

This section discusses how chemical bonds and energy relate to chemical reactions.

DAY 3

Reading Strategy (page 206)

Comparing and Contrasting As you read, complete the Venn diagram below to show the differences between exothermic and endothermic reactions. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.



Chemical Bonds and Energy (pages 206–207)

1. What is chemical energy? _____

_____

2. Chemical reactions involve the breaking of chemical bonds in the reactants and the formation of chemical bonds in the _____.
3. Is the following sentence true or false? The formation of chemical bonds absorbs energy. _____
4. What role does the spark from the igniter play in the reaction that takes place when propane is burned in a gas grill? _____

_____

5. Is the following sentence true or false? The heat and light given off by a propane stove result from the formation of new chemical bonds. _____
6. The combustion of one molecule of propane (C_3H_8) results in the formation of _____ C=O double bonds and _____ O–H single bonds.

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Exothermic and Endothermic Reactions (pages 208–209)

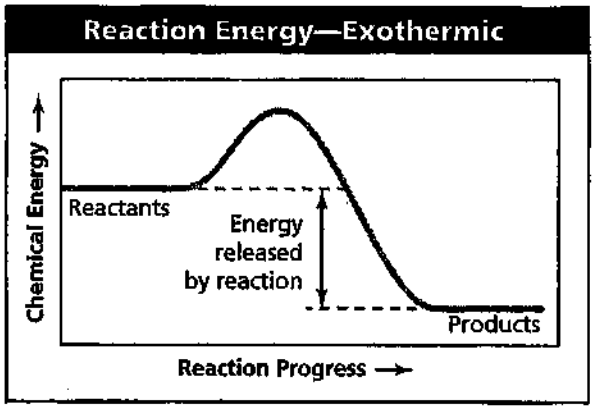
7. During a chemical reaction, energy is either released or _____.

8. Is the following sentence true or false? Physical and chemical changes can be either exothermic or endothermic changes. _____

9. What is an exothermic reaction? _____

_____

10. Is the following sentence true or false? In exothermic reactions, the energy required to break the bonds in the reactants is greater than the energy released as the products form. _____



11. Circle the letter of each sentence that is correct for the graph above.
    a. The energy required to break the bonds in the reactants is greater than the energy released as the products form.
    b. The energy released as the products form is greater than the energy required to break the bonds in the reactants.
    c. The chemical energy of the reactants is greater than the chemical energy of the products.
    d. The chemical energy of the products is greater than the chemical energy of the reactants.

12. In an exothermic reaction, the difference between the chemical energy of the reactants and the chemical energy of the products equals _____.

13. Where does the energy term appear in the equation for an endothermic reaction? _____

Conservation of Energy (page 209)

14. In an endothermic reaction, heat from the surroundings plus the chemical energy of the reactants is converted into the _____.