Name _____ Period _____ Date _____

Study Guide 2.1: Atoms, Ions, and Molecules

KEY CONCEPT:
All living things are based on atoms and their interactions.

VOCABULARY

atom	ion	molecule
element	ionic bond	
compound	covalent bond	

MAIN IDEA: Living things consist of atoms of different elements.

Draw lines to connect the parts of an atom with their descriptions.

1. nucleus	particle with a positive electrical charge
2. neutron	particle with a negative electrical charge
3. proton	particle with no electrical charge
4. electron	dense center of an atom

Circle the word or phrase that best completes the sentence.

5. Water (H_2O) and carbon dioxide (CO_2), are examples of ***compounds*** / ***elements***.

6. ***Elements*** / ***Compounds*** are made up of only one type of atom.

MAIN IDEA: Ions form when atoms gain or lose electrons.

Choose whether the statement is true or false.

7. ***true*** / ***false*** An atom becomes an ion when its number of protons changes.

8. ***true*** / ***false*** Some ions are positively charged, and some ions have no charge.

9. ***true*** / ***false*** The formation of an ion results in a full outermost energy level.

10. ***true*** / ***false*** Ions usually form when electrons are transferred from one atom to another.

MAIN IDEA: Atoms share pairs of electrons in covalent bonds.

Circle the word or phrase that best completes the sentence.

11. Shared pairs of electrons fill the ***innermost*** / ***outermost*** energy levels of bonded atoms.

12. Covalent bonds are generally very ***strong*** / ***weak***.

13. Two atoms may form several covalent bonds to share several pairs of ***protons*** / ***electrons***.

14. A molecule is held together by ***ionic*** / ***covalent*** bonds.

Vocabulary Check

element	compound	ion	molecule
ionic bond	covalent bond	atom	

Write each word or phrase next to its definition.

_____ 15. a substance made of atoms of different elements bonded together in a certain ratio

_____ 16. a particular type of atom

_____ 17. a bond formed by the electrical force between two ions of opposite charge

_____ 18. a bond formed when two atoms share a pair of electrons

_____ 19. the smallest basic unit of matter

_____ 20. two or more atoms held together by covalent bonds

Read chapter 2.1 of your text then answer the **formative assessment** that follows:

Reviewing Main Ideas:

1. What distinguishes one element from another?

2. Describe the formation of an ionic compound.

3. What is the difference between an ionic bond and a covalent bond?

Critical Thinking:

4. *Compare and Contrast*. How does a molecule differ from an atom?

5. *Apply*. Explain why a hydrogen atom can become either an ion or a part of a molecule.

Connect to Chemistry:

6. A sodium atom has one outer electron, and a carbon atom has four outer electrons. How might this difference be related to the types of compounds formed by atoms of these two elements?

SECTION QUIZ 2.1: Atoms, Ions, and Molecules

Choose the letter of the best answer.

_____ 1. Which phrase best describes atoms?
   a. single-celled organism
   b. smallest basic units of matter
   c. parts of a nucleus
   d. positively charged particles

_____ 2. Which of the following cannot be broken down by ordinary chemical means?
   a. element
   b. compound
   c. molecule
   d. bond

_____ 3. What is a compound?
   a. two atoms of a single element bonded together
   b. atoms of different elements bonded together in certain ratios
   c. separate atoms of multiple elements in varying ratios
   d. a molecule of two oxygen atoms

_____ 4. An ion is formed when an atom gains or loses
   a. protons.
   b. neutrons.
   c. bonds.
   d. electrons.

_____ 5. Atoms connected by covalent bonds share
   a. pairs of electrons.
   b. ionic compounds.
   c. carbon and oxygen.
   d. hydrogen ions.