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CHAPTER

7

## Chapter 7 Quiz

### Part A: Modified True/False

Indicate whether each statement is true or false. If false, change the underlined word or phrase to make the statement true.

- \_\_\_\_ 1. The atomic theory of Niels Bohr states that the atom is like a raisin bun, with small negative particles randomly distributed throughout a positive mass.
- \_\_\_\_ 2. J.J. Thompson's major contribution to the atomic theory is the discovery of the nucleus.
- \_\_\_\_ 3. For an element in the second row of the Periodic Table, a maximum of 10 electrons can occupy the second shell.
- \_\_\_\_ 4. Positive ions are atoms that have lost electrons to empty their outer electron shell.

### Part B: Completion

Complete the sentence.

5. The charge of an ion is determined by comparing the number of electrons in the ion to \_\_\_\_\_.
6. Starting from carbon, as you move to the right across the Periodic Table, the ion charge of the elements \_\_\_\_\_.
7. According to the Bohr theory, metals and non-metals form \_\_\_\_\_ by the process of electron transfer.
8. The elements in the \_\_\_\_\_ column of the Periodic Table do not generally form ions.

### Part C: Multiple Choice

Circle the letter beside the answer that best completes the statement or answers the question.

9. In terms of the structure of the atom, the number of neutrons
- (a) determines the ion charge                      (c) determines the atomic number  
(b) contributes to the mass                      (d) contributes to the proton number
10. According to the Bohr theory, the size of the atom is determined by
- (a) the number of protons, neutrons, and electrons in the nucleus  
(b) the size of the outer electron shell  
(c) the size of the nucleus  
(d) the number of protons compared to the number of electrons

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**Chapter 7 Quiz (continued)**

11. An ion of a certain element has 12 protons, 15 neutrons, and 10 electrons. The ion charge of the element is therefore  
 (a) 2+                      (b) 3+                      (c) 2-                      (d) 3-
12. Elements in the last column of the Periodic Table do not readily react because  
 (a) They do not have enough electrons to react.  
 (b) Only elements with a negative ion charge are beside them.  
 (c) They have a full outer electron shell as ions.  
 (d) They have a full outer electron shell as atoms.
13. Which of the following rows represents a correct number of protons, electrons, and neutrons for an ion?

	Number of protons	Number of neutrons	Number of electrons
(a)	14	28	18
(b)	28	14	32
(c)	14	14	18
(d)	14	14	14

14. The theory that the atom has a nucleus containing most of the mass and all of the positive charge was first proposed by  
 (a) Rutherford            (b) Bohr                    (c) Thomson            (d) Dalton
15. It is correct to say that ionic compounds do not have molecules because  
 (a) There are no bonds formed between the atoms of an ionic compound.  
 (b) When liquid, gaseous, or in solution, the positive and negative ions can move independently of one another.  
 (c) Ionic compounds are elements. Elements are found as atoms, not molecules.  
 (d) Molecules are only formed from the combination of metals and non-metals.

**Part D: Short Answer**

Use complete sentences or diagrams to answer each question.

16. Describe what happens to the electrons when a non-metal forms an ion.

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**Chapter 7 Quiz (continued)**

17. Magnesium has an ion charge of  $2+$ , and nitrogen has an ion charge of  $3-$ .

(a) Determine the minimum number of electrons that must be transferred when these two elements combine to form a compound.

\_\_\_\_\_

(b) Determine the minimum number of ions of each element that are required.

\_\_\_\_\_

18. In terms of the Bohr atomic theory, explain why sodium is more reactive than magnesium.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

19. Draw the Bohr diagram for

(a) aluminum

(b) an oxygen ion

20. Describe how the Bohr atomic theory differs from the Rutherford atomic theory.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_