

## 6.3

## PERIODIC TRENDS

## Section Review

## Objectives

- Describe trends among elements for atomic size
- Explain how ions form
- Describe and explain periodic trends for first ionization energy, ionic size, and electronegativity

## Vocabulary

- atomic radius
- ion
- cation
- anion
- ionization energy
- electronegativity

## Part A Completion

Use this completion exercise to check your understanding of the concepts and terms that are introduced in this section. Each blank can be completed with a term, short phrase, or number.

Atomic radii generally 1 as you move from left to right in a period. Atomic size 2 with atomic number within a group because there are more occupied 3 and an increased shielding effect, despite an increase in nuclear 4.

The energy required to remove an electron from an atom is known as 5 energy. This quantity generally 6 as you move left to right across a period. Ions form when 7 are transferred between atoms. Cations are always 8 than the atoms from which they form. The ability of an atom to attract electrons when it is in a compound is called 9, and this value 10 as you move from left to right across a period.

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## Part B True-False

Classify each of these statements as always true, AT; sometimes true, ST; or never true, NT.

\_\_\_\_\_ 11. Compounds are composed of particles called ions.

- \_\_\_\_\_ 12. Removing one electron from an atom results in the formation of a positive ion with a 1+ charge.
- \_\_\_\_\_ 13. An anion has more electrons than protons.
- \_\_\_\_\_ 14. Elements with a high electronegativity value tend to form positive ions.

### Part C Matching

Match each description in Column B to the correct term in Column A.

- | Column A                    | Column B   |
|-----------------------------|--|
| _____ 15. ion               | a. half the distance between the nuclei of two atoms of the same element when the atoms are joined |
| _____ 16. ionization energy | b. a negatively charged ion  |
| _____ 17. electronegativity | c. the energy required to remove an electron from an atom in its gaseous state                     |
| _____ 18. atomic radius     | d. an atom or group of atoms that has a positive or negative charge                                |
| _____ 19. cation            | e. a positively charged ion  |
| _____ 20. anion             | f. the ability of an atom of an element to attract electrons when the atom is in a compound        |

### Part D Questions and Problems

Answer the following in the space provided.

21. For the following pairs of atoms, tell which one of each pair has the largest ionic radius.
- a. Al, B \_\_\_\_\_
- b. S, O \_\_\_\_\_
- c. Br, Cl \_\_\_\_\_
- d. Na, Al \_\_\_\_\_
- e. O, F \_\_\_\_\_
22. Indicate which element of the following pairs is the most electronegative.
- a. calcium, gallium \_\_\_\_\_
- b. lithium, oxygen \_\_\_\_\_
- c. chlorine, sulfur \_\_\_\_\_
- d. bromine, arsenic \_\_\_\_\_