

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.

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

- _____ 15. ion
- _____ 16. ionization energy
- _____ 17. electronegativity
- _____ 18. atomic radius
- _____ 19. cation
- _____ 20. anion

Column B

- a. half the distance between the nuclei of two atoms of the same element when the atoms are joined
- b. a negatively charged ion
- c. the energy required to remove an electron from an atom in its gaseous state
- d. an atom or group of atoms that has a positive or negative charge
- e. a positively charged ion
- 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 _____