Name STURMAN key Date _____ Class _____

29 poss
≥ 20 (+3)

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.

1. decrease
2. increases
3. orbitals or energy levels (subshells)
4. attraction or charge or force
5. ionization
6. increases
7. electrons
7. _____
8. smaller
9. electronegativity
10. increases

Part B True-False

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

ST 11. Compounds are composed of particles called ions.

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AT 12. Removing one electron from an atom results in the formation of a positive ion with a 1+ charge.

AT 13. An anion has more electrons than protons.

ST / NT 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
D 15. ion	a. half the distance between the nuclei of two atoms of the same element when the atoms are joined
C 16. ionization energy	b. a negatively charged ion
F 17. electronegativity	c. the energy required to remove an electron from an atom in its gaseous state
A 18. atomic radius	d. an atom or group of atoms that has a positive or negative charge
E 19. cation	e. a positively charged ion
B 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 Al
    b. S, O S
    c. Br, Cl Br
    d. Na, Al Na
    e. O, F O

22. Indicate which element of the following pairs is the most electronegative.
    a. calcium, gallium (31) gallium
    b. lithium, oxygen oxygen
    c. chlorine, sulfur chlorine
    d. bromine, arsenic (33) bromine

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