Name _____ Date _____ Class _____

Section 6.3 Periodic Trends

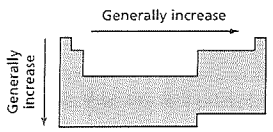
In your textbook, read about atomic radius and ionic radius.

Circle the letter of the choice that best completes the statement or answers the question.

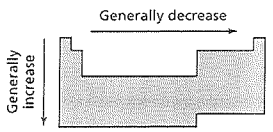
1. Atomic radii cannot be measured directly because the electron cloud surrounding the nucleus does not have a clearly defined
   a. charge. **b.** mass. **c.** outer edge. **d.** probability.

2. Which diagram best represents the group and period trends in atomic radii in the periodic table?

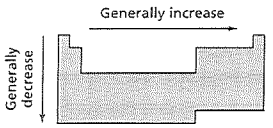
a.



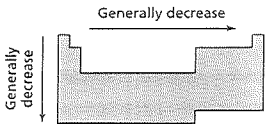
c.



b.



d.



3. The general trend in the radius of an atom moving down a group is partially accounted for by the
   a. decrease in the mass of the nucleus. **c.** increase in the charge of the nucleus.
   b. fewer number of filled orbitals. **d.** shielding of the outer electrons by inner electrons.

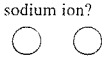
4. A(n) _____ is an atom, or bonded group of atoms, that has a positive or negative charge.
   a. halogen **b.** ion **c.** isotope **d.** molecule

5. An atom becomes negatively charged by
   a. gaining an electron. **b.** gaining a proton. **c.** losing an electron. **d.** losing a neutron.

6. Which diagram best represents the relationship between the diameter of a sodium atom and the diameter of a positive sodium ion?

a.

b.



c.

Name _____ Date _____ Class _____

Section 6.3 *continued*

In your textbook, read about ionization energy and electronegativity.

Answer the following questions.

7. What is ionization energy?
   Ionization energy is the energy required to remove an electron from a gaseous atom.

8. Explain why an atom with a high ionization-energy value is not likely to form a positive ion.
   A high ionization-energy value indicates that the atom has a strong hold on its electrons and is not likely to lose an outer electron and form a positive ion.

9. What is the period trend in the first ionization energies? Why?
   The first ionization energies generally increase as you move left-to-right across a period. The increased nuclear charge of each successive element produces an increased hold on the valence electrons.

10. What is the group trend in the first ionization energies? Why?
    The first ionization energies generally decrease as you move down a group. Because atomic size increases down a group, the valence electrons are farther from the nucleus and, therefore, less strongly attracted to the nucleus. As a result, less energy is required to remove the valence electrons.

11. State the octet rule.
    Atoms tend to gain, lose, or share electrons to acquire a full set of eight valence electrons.

12. What does the electronegativity of an element indicate?
    The electronegativity of an element indicates its atom's ability to attract electrons in a chemical bond.

13. What are the period and group trends in electronegativities?
    Electronegativities generally increase as you move left-to-right across a period and decrease as you move down a group.