Name _____ **Block** ____

Test Review for Unit 4 Periodic Trends

Part A: Multiple Choice

1. As one moves from down (↓) a group on the periodic table, the electronegativity of the elements encountered tends to:

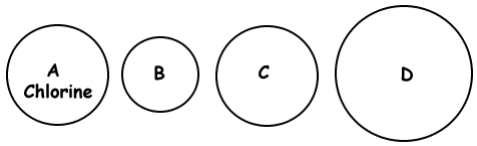
   A. decrease
   B. stay the same
   C. increase

2. **Multiple Response**: A vertical column (↓) of elements on the periodic table may also be referred to as a:

   A. period
   B. family
   C. group
   D. series

3. Given the size of a chlorine atom, which circle might represent an atom of fluorine?

   A. Circle D
   B. Circle B
   C. None of these
   D. Circle C



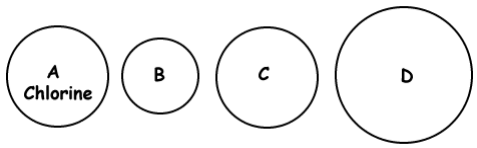
4. The least electronegative elements are the:
   A. Noble gases
   B. Metalloids
   C. Halogens
   D. Alkali metals

5. The energy required to remove an electron from an atom is known as:

   A. electron affinity
   B. ionization energy
   C. radioactivity
   D. Electronegativity

6. Given the size of a chlorine atom, which circle might a chloride ion, Cl^-?

   A. Circle C
   B. Circle B
   C. Circle D
   D. None of these

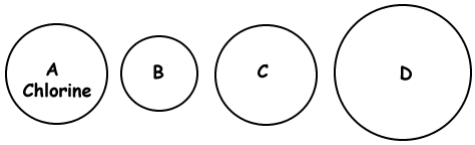


7. As one moves from left to right (→) within a period across the periodic table, the electronegativity of the elements encountered tends to:

   A. decrease
   B. stay the same
   C. Increase

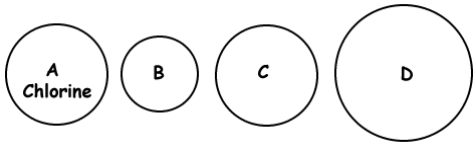
8. Given the representation of a chlorine atom, which circle might represent an atom of argon?

   A. Circle B
   B. Circle C
   C. Circle D
   D. None of these



9. Given the representation of a chlorine atom, which circle might represent an atom of bromine?

   A. None of these
   B. Circle D
   C. Circle C
   D. Circle B



10. Of the following elements, which one would have the smallest radius?

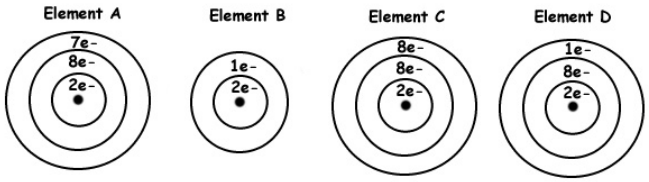
    A. Bromine (Br, atomic #35)
    B. Chlorine (Cl, atomic #17)
    C. Fluorine (F, atomic #9)
    D. Iodine (I, atomic #53)

11. As one moves from down (↓) a group on the periodic table, the atomic radius of the elements encountered tends to:

    A. decrease
    B. increase
    C. stay the same

12. Which of these elements would have the lowest first ionization energy?

    A. Element D
    B. Element A
    C. Element B
    D. Element C



13. **Multiple Response**: A horizontal row (→) of elements on the periodic table may also be referred to as a:

    A. period
    B. family
    C. group
    D. series

14. The elements with the smallest atomic radii are found in the:

    A. lower right-hand corner of the periodic table
    B. upper left-hand corner of the periodic table
    C. lower left-hand corner of the periodic table
    D. upper right-hand corner of the periodic table

15. Of the following elements, which one would have the largest electronegativity energy?

    A. Iodine (I, atomic #53)
    B. Chlorine (Cl, atomic #17)
    C. Fluorine (F, atomic #9)
    D. Bromine (Br, atomic #35)

Name _____ Date _____

Part B: Short Answer

1. Rank the following elements by increasing atomic radius: carbon, aluminum, oxygen, potassium.

2. Rank the following elements by increasing electronegativity: sulfur, oxygen, neon, aluminum.

3. Why does fluorine have a higher ionization energy than iodine?

4. Why do elements in the same family generally have similar properties?

5. Indicate whether the following properties increase or decrease from left to right across the periodic table.
   a. atomic radius (excluding noble gases)
   b. first ionization energy
   c. electronegativity

6. What trend in atomic radius occurs down a group on the periodic table? What causes this trend?

7. What trend in ionization energy occurs across a period on the periodic table? What causes this trend?

8. Circle the atom in each pair that has the largest atomic radius.
   a. Al or B
   b. Na or Al
   c. S or O
   d. O or F
   e. Br or Cl
   f. Mg or Ca

Name _____ Date _____

9. Circle the atom in each pair that has the greater ionization energy.
   a. Li or Be
   b. Ca or Ba
   c. Na or K
   d. P or Ar
   e. Cl or Si
   f. Li or K

10. Circle the atom in each pair that has the greater electronegativity.
   a. Ca or Ga
   b. Br or As
   c. Li or O
   d. Ba or Sr
   e. Cl or S
   f. O or S

Part C: Fill-in-the-blank and Critical Thinking

1. Sulfur has _____ valence electrons when it is in the ground state.

2. Calcium and strontium have similar chemical properties because they both have the same number of _____ _____.

3. The strength of an atom's attraction for the electrons in a chemical bond is called _____.

4. The element in Group 1 that is most likely to lose an electron is _____.

5. The element in Group 17 that has the least attraction for gaining electrons is _____.

6. The element with the highest ionization energy is _____, and the element with the lowest ionization energy is _____.

Part D: Critical Thinking

1. Name an element from Period 5 on the periodic table that is a transition element.

2. List the elements from Group 2 in order of increasing atomic radius.

3. List the elements from Group 1 in order of increasing ionization energy.

4. Explain the difference between ionization energy and electronegativity.

5. If ionization energy and electronegativity are different, then why do their trends increase in the same direction?

6. Name the elements that belong to the Halogen group.

7. Which group on the periodic table has no electronegativity value? Why?

8. What happens to the atomic radius as shielding increases? Why?

9. What happens to the electronegativity as shielding decreases? Why?

10. What happens to ionization energy as you move from left to right across the table?

11. What happens to ionization energy as shielding increases? Why?