

Periodic Trends Worksheet

Directions: Use your notes to answer the following questions.

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

O, C, Al, K

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

Ne, Al, S, O

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

- smaller radius, higher Z_{eff} , greater attraction of electrons \therefore more energy to remove

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

- same # of valence electrons
- same valence shell configuration

5. Indicate whether the following properties increase or decrease from left to right across the periodic table.

- a. atomic radius (excluding noble gases) decrease
b. first ionization energy increase
c. electronegativity increase

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

- increases
- filling bigger shell, increased shielding

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

- increases
- increased Z_{eff} , more attraction between nucleus + valence e^- , more energy needed to remove e^-

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

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. Define electronegativity.

tendency of an atom to attract electron(s)

11. 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