

Key

Name _____

Date _____

Periodic Trends Worksheet

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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?

Fluorine's valence electrons are closer to the nucleus - more nuclear pull.

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

Same number v.e.

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

- a. atomic radius (excluding noble gases) **D**
- b. first ionization energy **I**
- c. electronegativity **I**

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

increase - more energy shells

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

increase - more v.e.

8. Circle the atom in each pair that has the largest atomic radius

- a. Al or B
- b. Ne or Al
- c. S or O
- d. O or F
- e. Br or Cl
- f. Mg or Ca

b) O²⁻
 1s²
 2s² 2p⁴
 1s² 2s² 2p⁴
 [Ne]

c) K
 1s²
 2s² 2p⁶ 3s² 3p⁴
 3s² 3p⁶ 4s¹

d) W
 1s²
 2s²
 3s²
 4s²
 5s²
 6s²
 7s²
 1s² 2s² 2p⁶ 3s² 3p⁴
 [Xe] 4f¹⁴ 5d⁴ 6s²

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.

Ability to attract a bonding e⁻

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

12. Which rule does this violate and why?

1s² 1s²
 2s² 2p⁴ 1s²
 Pauli's exclusion - must spin opp. ways.

13. Which rule does this violate and why?

1s²
 2s² 2p¹ 1s²
 Aufbau - must fill lower energy first

14. Which rule does this violate and why?

1s²
 2s² 2p¹ 1s²
 Hund's - no empty orbitals!

15. Draw orbital notation for the following elements & ions.

a) Fe²⁺ b) O²⁻ c) K d) W

Write long and short hand electron configuration of the elements

and ions in #15.
 1s² 2s² 2p⁶ 3s² 3p⁴
 [Ar] 4s² 3d⁴
 1s² 2s² 2p⁶ 3s² 3p⁴
 [Ar] 3d⁴ 4s²