

# Periodic Trends Worksheet

Use the periodic table and your knowledge of periodic trends to answer the following questions.

- Rank the following element in increasing atomic radius: carbon, aluminum, oxygen, and potassium.
- Rank the following element by increasing electronegativity: sulfur, oxygen, sodium, and aluminum
- Indicate whether the following properties increase or decrease from left to right of the periodic table.
  - Atomic radius (exclude noble gases):
  - First ionization energy:
  - Electronegativity:
- Which atom in each pair has the larger atomic radius? Circle the correct answer.
  - Li or K
  - Ca or Ni
  - Ga or B
  - Cl or Br
  - O or C
  - Be or B
  - Si or S
  - Fe or Au
- Which element in each pair has the larger ionization energy? Circle the correct answer.
  - Na or O
  - Be or B
  - Ne or F
  - Cu or Zn
  - I or Ne
  - K or V
  - Ca or Fr
  - W or Se
- Which particle has the larger radius in each atom-ion pair?
  - Na or Na<sup>+</sup>
  - S or S<sup>2-</sup>
  - I or I<sup>-</sup>
  - Al or Al<sup>3+</sup>
- For each of the following elements, circle the element with the largest atomic radius and put a square around the element with the smallest atomic radius.
  - O C Be Ne
  - Na Rb Cs He
  - Pb C Sn Si
  - Au W S Sr
- For each of the following elements, circle the element with the highest ionization energy and put a square around the element with the lowest ionization energy.
  - O C Be Ne
  - Na Rb Cs He
  - Pb C Sn Si
  - Au W S Sr

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## Answers

1. Rank the following element in increasing atomic radius: carbon, aluminum, oxygen, and potassium.

oxygen < carbon < aluminum < potassium

2. Rank the following element by increasing electronegativity: sulfur, oxygen, sodium, and aluminum

sodium < aluminum < sulfur < oxygen

3. Indicate whether the following properties increase or decrease from left to right of the periodic table.

a) Atomic radius (exclude noble gases): **decreases**

b) First ionization energy: **increases**      c) Electronegativity: **increases**

4. Which atom in each pair has the larger atomic radius? Circle the correct answer.

a) Li or **K**      b) **Ca** or Ni      c) **Ga** or B      d) Cl or **Br**

e) O or **C**      f) **Be** or B      g) **Si** or S      h) Fe or **Au**

5. Which element in each pair has the larger ionization energy? Circle the correct answer.

a) Na or **O**      b) Be or **B**      c) **Ne** or F      d) Cu or **Zn**

e) I or **Ne**      f) K or **V**      g) **Ca** or Fr      h) W or **Se**

6. Which particle has the larger radius in each atom-ion pair?.

a) **Na** or Na<sup>+</sup>      b) S or **S<sup>2-</sup>**      c) I or **I<sup>-</sup>**      d) **Al** or Al<sup>3+</sup>

7. For each of the following elements, circle the element with the largest atomic radius and put a square around the element with the smallest atomic radius.

a) O   C   **Be**   **Ne**      b) Na   Rb   **Cs**   **He**

c) **Pb**   **C**   Sn   Si      d) Au   W   **S**   **Sr**

8. For each of the following elements, circle the element with the highest ionization energy and put a square around the element with the lowest ionization energy.

a) O   C   **Be**   **Ne**      b) Na   Rb   **Cs**   **He**

c) **Pb**   C   Sn   **Si**      d) Au   W   **S**   **Sr**