

Name : _____ Date : _____

Periodic Trends Worksheet

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

- 1 Each of the following is a multiple-choice question. Circle the correct answer.
- a) Which statements best describes Group 2 element as they are considered in order from top to bottom of the periodic table?
- i) The number of principal energy levels increases, and the number of valence electrons increases.
 - ii) The number of principal energy levels increases, and the number of valence electrons remains the same
 - iii) The number of principal energy levels remains the same, and the number of valence electrons increases.
 - iv) The number of principal energy levels remains the same, and the number of valence electrons
- b) What is the total number of valence electrons in a boron atom in the ground state?
- i) 1 ii) 3 iii) 5 iv) 7
- c) The elements strontium and calcium have similar chemical properties because they both have the same
- i) Atomic number ii) Mass number
 - iii) Number of valence electrons iv) Number of completely filled subshell
- 2 Fill in the best answer for each of the following:
- a) As you move across a period from left to right, the size of an atom will _____. This is due to the increased number of _____ that the atoms have as you move to the right.
- b) As you move down a group, the size of the atoms will _____ due to a greater number of _____ as you move down the group.
- c) The amount of energy required to remove the most loosely held electron from an atom is called the _____.
- d) The amount of energy required to remove a second or third electron from an atom is always _____ than the amount of energy required to remove the first electron.
- 3 Circle that atom with the larger atomic size:
- a) Mg or Ca b) N or As c) Ga or Br d) Rb or Sr
- 4 Keeping in mind the trend in atomic radius as you move from left to right across a period, suggest a reason for this trend in ionization energies. (Hint: What happens to the distance and the force of attraction between the nucleus and the outer electron as atoms get smaller?)

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Answers

- 1 Each of the following is a multiple-choice question. Circle the correct answer.
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- b) What is the total number of valence electrons in a boron atom in the ground state?
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- c) The elements strontium and calcium have similar chemical properties because they both have the same
- i) Atomic number
 - ii) Mass number
 - iii) Number of valence electrons
 - iv) Number of completely filled subshell
- 2 Fill in the best answer for each of the following:
- a) As you move across a period from left to right, the size of an atom will decrease . This is due to the increased number of protons that the atoms have as you move to the right.
- b) As you move down a group, the size of the atoms will increase due to a greater number of energy levels as you move down the group.
- c) The amount of energy required to remove the most loosely held electron from an atom is called the first ionization energy .
- d) The amount of energy required to remove a second or third electron from an atom is always more than the amount of energy required to remove the first electron.
- 3 Circle that atom with the larger atomic size:
- a) Mg or Ca b) N or As c) Ga or Br d) Rb or Sr
- 4 Keeping in mind the trend in atomic radius as you move from left to right across a period, suggest a reason for this trend in ionization energies. (Hint: What happens to the distance and the force of attraction between the nucleus and the outer electron as atoms get smaller?)
- Atoms get small, and electrons are held tightly by the nucleus. As a result, more energy is required to remove the electron.