Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class period: \_\_\_\_

****Unit 4: Electron Configurations  
Test Review

**What to study?**

* Quizzes
* Homework
* Notes
* Bell Ringers

**What will the questions be like? What can I expect?**

This test will be just like the previous quizzes you have taken.

* Matching
* Multiple choice
* Short answer

**Sample questions/Important Topics**

1. Write the **complete** (long form) electron configuration AND include how many **valence electrons** there are for each of the following:
   1. Ga
   2. Ir
2. Write the **orbital notation** for each of the following: (Be sure to label your sublevels)
   1. O
   2. Sc
3. Use **noble gas abbreviations** to write the electron configuration for each of the following:
4. Ra
5. Sm
6. Write the long form **electron configuration** for each of the following ions AND tell which noble gas each is isoelectronic with:
7. I-1 is isoelectronic with \_\_\_\_\_\_\_\_\_\_\_\_\_
8. Ca+2 is isoelectronic with \_\_\_\_\_\_\_\_\_\_\_\_\_
9. Te-2 is isoelectronic with \_\_\_\_\_\_\_\_\_\_\_\_\_
10. Identify the following elements/ions based on their electron configuration or orbital notation and their overall charge:

\_\_\_\_\_\_\_\_\_\_ 1s2 2s2 2p6 3s2 3p5 (neutral)

\_\_\_\_\_\_\_\_\_\_ 1s2 2s2 2p6 3s2 3p6 (-1 charge)

\_\_\_\_\_\_\_\_\_\_ 1s2 2s2 2p6 3s2 3p6 (-3 charge)

\_\_\_\_\_\_\_\_\_\_ 1s2 2s2 2p6 3s2 3p6 3d10 4s2 4p6 (+1 charge)

\_\_\_\_\_\_\_\_\_\_ O (+3 charge)  
 1s

1. Identify the element described:
   1. 5p4
2. Fill in the best answer for each of the following:
3. A vertical column on the periodic table is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. The periodic table was first arranged by the scientist \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. The elements in the periodic table are presently arranged in order of increasing \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ says that when the elements of the periodic table are arranged in order or increasing atomic number there are periodic patterns in their physical and chemical properties.
7. All the elements in group 17 will have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ configuration in their outermost energy level.
8. Group 1 is also known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ metals.
9. The 2 rows on the bottom of the periodic table are also known as the \_\_\_\_\_ block.
10. All the elements in group \_\_\_\_\_ have an electron configuration that ends in p2.
11. The d block elements are also known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
12. The elements in group 12 have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ electron configuration.
13. An atom with a positive or negative charge is called an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. It becomes charged when it loses or gains \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
14. The size of an atom is due mainly to the number of occupied \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that the atom has.
15. 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.
16. As you move down a group, the size of the atoms will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ due to a greater number of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as you move down the group.
17. The amount of energy required to remove the most loosely held electron from an atom is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
18. 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.
19. For Potassium (K), we would expect a large increase in ionization energy to occur when the \_\_\_\_\_ electron is removed. This is because potassium will have the same electron configuration as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ before that electron is removed.
20. Ionization energy will increase as you move \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and decrease as you move \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
21. The size of a positive ion is always \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than the size of the neutral atom from which it was made.
22. The size of a negative ion is always \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than the size of the neutral atom from which it was made.
23. Fluorine has the highest Electronegativity with a value of \_\_\_\_\_.
24. Electronegativity is the ability of an atom to attract electrons to itself when the atom is in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
25. Electronegativity will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as you move down a group.
26. The elements in group \_\_\_\_\_ do not have defined values for electronegativity.
27. Electronegativity will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as you move across a period.
    1. Circle that atom with the larger atomic radius:
28. Mg or Ca
29. N or As
30. Ga or Br
31. Rb or Sr
    1. Circle that atom with the smaller atomic radius:
32. V or Mn
33. N or F
34. Sn or Si
35. Rb or Sr
    1. Circle the atom with the larger first ionization energy:
36. P or S
37. K or Li
38. Al or Cl
39. O or Te
    1. Circle the atom or ion that is larger:
40. F-1 or F
41. Mg+2 or Mg
42. Cr+2 or Cr+3
43. P-1 or P-3
    1. Circle the atom with the larger electronegativity:
44. B or In
45. C or F
46. Rb or Cs
47. Sn or Sb
    1. Does Li or F have the larger atomic radius? *Explain your choice using atomic structure.* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. Arrange the following elements as described below:

**Same period:** C, F, O **Same group:** K, Li, Cs

* 1. In order of *decreasing* atomic size (largest to smallest)

Period:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Group:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. In order of *increasing* ionization energy (smallest to largest)

Period:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Group:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. In order of *decreasing* electronegativity (largest to smallest)

Period:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Group:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. Among the following pairs of atoms, *identify the larger of the two*, *the one that requires the most ionization energy*, and *the one with the lower electronegativity*.

|  |  |  |  |
| --- | --- | --- | --- |
| *Atom* | *Larger* | *Greater IE* | *Lower EN* |
| Li or K |  |  |  |
| C or N |  |  |  |
| Mg or Ca |  |  |  |
| O or S |  |  |  |