Chemistry 11 Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ms. Drescher Block 3

**REVIEW for Test 2 - Atoms, Electrons, and Trends, Oh My!**

Topics include: atomic structure and bonding, lewis and bohr models, early models of the atom, periodic trends, electron configuration and rules.

1. What type of charge do each of the following particles have
   1. Protons \_\_\_\_\_\_\_\_\_\_\_
   2. Neutrons \_\_\_\_\_\_\_\_\_\_
   3. Electrons \_\_\_\_\_\_\_\_\_\_
2. What is the definition of an isotope? Give an example.
3. Match the scientist with the discovery:

\_\_ Gold foil experiment A. Rutherford

\_\_ Universe made of tiny particles called atoms B. Thompson

\_\_ Isolated electron with cathode ray tube C. Democritus

\_\_ Plum Pudding Model D. Milikan

\_\_ Oil Drop Experiment E. Bohr

\_\_ 2 dimensional model of atom

1. Draw a filled diagram of an s, p, d and f orbital (showing how many electrons fit in each)
2. Write out the full electron configuration for the following:
   1. Ca \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. N-3\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Write out the shorthand electron configuration for the following:
   1. Fe \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Na+ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Columns on the periodic table are called: \_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_
5. Rows on the periodic table are called \_\_\_\_\_\_\_\_\_\_\_\_
6. When an atom loses electrons it becomes more \_\_\_\_\_\_\_\_\_\_
7. When an atom gains electrons it becomes more \_\_\_\_\_\_\_\_\_\_\_
8. An atom is “happy” when it has how many electrons? \_\_\_\_
9. If an atom is “happy” does it want to react with others? Yes or No?
10. What are the differences between covalent and ionic bonds?
11. How do I calculate the atomic mass of an atom if I am given the number of protons and neutrons?
12. You will need to know the trends of atomic radius, ionization energy and electronegativity.
    1. Which atom has a bigger radius? Oxygen or Sulphur?
    2. Which atom has a higher ionization energy? Sodium or Magnesium?
    3. Which atom has a lower electronegativity? Aluminum or Potassium?
13. Draw Lewis Structures for the following atoms
    1. S
    2. Ca
14. Draw Lewis Structures for the following molecules:
    1. NaCl

* 1. NH3

1. Draw a Bohr model for Helium
2. By using orbital filling diagrams, give an example of each rule being broken:
   1. Pauli

* 1. Hund
  2. Aufbau

ANSWERS

1. 1. Positive
   2. Neutral
   3. Negative
2. An isotope is another form of the same element with a different number of neutrons, therefore a different atomic mass. Example: O-16 O-17
3. Letters in order of discovery list: A, C, B, B, D, E
4. \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_ \_\_
5. 1. 1s22s22p63s23p64s2
   2. 1s22s22p6
6. 1. [Ar] 4s23d6
   2. [He] 2s22p6
7. Groups or Families
8. Periods
9. positive
10. negative
11. 8
12. No, it is not reactive - like the noble gases
13. Covalent bonds involve the sharing of electrons. Ionic bonds involve donating and receiving or giving and taking electrons. Covalent is two non metals, ionic is a metal and nonmetal.
14. Add protons and neutrons together.
15. 1. Sulphur has a bigger atomic radius. As you go down a group, the radius increases because more electron shells are added.
    2. Magnesium has a higher ionization energy. As you go across a period, the ionization energy increases due to more electrons within that shell, and more protons so more attraction to the nucleus therefore holding onto the electrons tighter.
    3. Potassium has a lower electronegativity. As you go from right to left across a period, the electronegativity decreases, as well as down a group. Due to the fact that the electrons are less tightly held and therefore less of a charge, so less likely to attract electrons.