WOC Chemistry I Chapter 3 Objective Review

1. Define these terms: atom alpha particles ion isotope radioactivity
   anion cation

2. Describe how atomic structure is related to electricity.

3. Describe three characteristics of atoms that were suggested by cathode ray experiments. Describe how atomic structure is related to electricity.

4. What did Rutherford's experiments suggest about the location of mass in an atom?

5. List the names, locations, charge, and mass (in amu) of three fundamental subatomic particles.

6. Choose four elements and construct a table which shows number of protons, neutrons, and electrons in each type of atom.

7. Describe how to use the periodic table to predict what ions will be formed by elements.

8. Describe how to use the criss-cross method to write a formula for a neutral ionic binary comound.
   Write formulas for compounds made up of: magnesium and chlorine
   aluminum and oxygen
   lithium and phosphorous

9. Write the complete chemical symbol and charge for each of these atoms:
   an atom with 8 protons which gained two electrons
   an atom with 11 protons which lost one electron
   an atom of gold with a mass of 185 amu
   an atom of iodine with a mass of 131 which gained one electron.

10. State the periodic law.

11. Why do elements in a group or family have similar properties? Relate your answer to their valence electrons.

12. Draw an outline of the periodic table and identify each of the following:
    s block p block d block f block noble (inert) gases
    metals semi-metals (metalloids) non-metals alkali metals
    halogens alkaline earth metals transition metals

13. Define each periodic trend listed below and explain how it is reflected in the periodic table.
    Atomic Radius Ionic Size Ionization energy
    Electron Affinity Electronegativity

14. Explain why...

    a. the diameter of a fluorine^{-} ion is greater than that of a fluorine atom.

    b. the diameter of an oxygen^{2-} ion is less than that of a nitrogen^{3-} ion.

    c. the diameter of a lithium^{+} ion is greater than the diameter of a beryllium^{2+} ion.

    d. a magnesium ion has a smaller diameter than a sodium ion.

    e. ionization energies decrease as you move down a group but increase as you move across a period.