Chemistry Review Sheet
Chapter 5

1. Define
   - Atomic Orbital
   - Electromagnetic Radiation
   - Energy Levels
   - Ground State
   - Photons
   - Spectrum
   - Wavelength
2. Calculate the following
   a. the wavelength of EMR with a frequency of 2.3×10^4 hz. 13000m
   b. the energy of a photon of EMR with a frequency of 2.3×10^4 hz. 1.52×10^{-29} J
   c. the frequency of EMR with a wavelength of 9.7×10^{-9}m. 3.09×10^{16} hz
   d. the energy of a photon of EMR with a wavelength of 9.7×10^{-9}m. 2.05×10^{-17} J
3. What is the speed of an electromagnetic wave in a vacuum? 3.00×10^8 m/s
4. List the types of radiation found on the electromagnetic spectrum in order of increasing wavelength.
5. Describe the three models of atoms discussed in the book. Start with the Rutherford model, then simply state the major changes for each new model.
6. What is the frequency of a photon related to?
7. What is the energy of a photon with a frequency of
   A. 6.5×10^{14} hz? 4.31×10^{-19} J
   B. 890,000,000 hz? 5.90×10^{-25} J
8. How many orbitals are found in each of the sublevels (s,p,d,f)? 1, 3, 5, 7
9. How many electrons can be held in each sublevel (s,p,d,f)? 2, 6, 10, 14
10. How many electrons can be held in each orbital? 2
11. Describe the relationship between energy levels, sublevels, and orbitals and the arrangement of the periodic table.
12. Write the Complete Electron Configuration, Noble Gas Configuration, Orbital Filling Diagrams, and Electron (Lewis) Dot Diagrams for
   A. Lithium $[He]2s^1$
   B. Vandaium $[Ar]\ 4s^2 3d^3$
   C. Polonium $[He]6s^2 5d^1 4f^{14} 5d^9 6p^4$
   D. Germanium $[Ar]4s^2 3d^{10} 4p^4$
   E. Americium $[Rn]7s^2 6d^1 5f^6$
13. What element would have the electron configuration $1s^2 2s^2 2p^6 3s^2 3p^6 3d^7 4s^2$? Co
14. What does it mean to say that atoms have discrete energy levels.