CHM 1045 Ch 8 HW

1. Review Example 8.02, 8.03, and 8.04. Also, review this Orbital Diagrams chart.
   a. Describe Hund's rule. Define valence e^{-1}. (1 pt)
   b. Draw the orbital diagrams for the valence e^{-1} **only** of P (Z=15) and S (Z=16). (1 pt)

2. Review the Pauli Exclusion Principle section of the class notes and Example 8.01.
   Describe the principle, and what values are possible for m_s.
   Explain how these describe the limit on the number of electrons per orbital. (1 pt)

3. Review the Pauli Exclusion Principle section of the class notes. For two spin-paired electrons that are in the same orbital, describe how the values for the first three quantum numbers (n, L, and m_L) are related for the two electrons. (1 pt)

4. Review this table of electron configurations, as well as Figures 6.24, 6.26, and 6.27. Describe the Aufbau principle for subshells and how the order corresponds to e^{-1} configuration. Show the order up through 6p. (0.5 pt)

5. Review this table of electron configurations. Write the complete electronic configuration for yttrium (Z=39), and write the abbreviated form using the correct VIIIA element plus yttrium's valence electrons. (1 pt)

6. Review Examples 8.05 and 8.06, as well as this atomic radius chart and this IE chart. See how Br atoms are larger than Cl atoms, which are larger than F atoms. Also, see how F has a larger ionization energy than Cl, which has larger ionization energy than Br. Explain why the two trends are inversely related. (0.5 pt)

7. Review the Atomic Radii section of the class notes. Write the effective nuclear charge equation. Explain how effective nuclear charge, along with the principle quantum number (shell #), controls the row trends and column trends for atomic radii in the periodic table.
   Explain why Na is a larger atom than Cl in terms of the effective nuclear charge equation.
   (2 pts)

8. Review the Ionization Energy (IE) section of the class notes, as well as this IE chart and this IE table. Define (first) IE. Write the first IE reactions for both Na and Cl, along with their IE values. Which product is a stable ion and which is not? Which reaction requires less energy input? Why? (1 pt)

9. Review the Electron Affinity section of the class notes, as well as this EA chart and this EA Periodic Table. Define EA. Write the first EA reactions for Na and Cl, along with their EA values. Explain which product ion is very stable and why. Explain which product ion is moderately stable and why. Which reaction has a more exothermic value? Why? (1 pt)