**Honors Chemistry**

**Periodic Trends Worksheet 1**

1. Calculate the effective nuclear charge experienced by the outmost electrons of sulfur. Detailed calculations show that the nuclear charge for sulfur is actually 10.52. Explain the difference.
2. Which will experience the greater effective nuclear charge, the electrons in the n=3 shell in Ar or the n=3 shell of Kr? Which will be closer to the nucleus?
3. Arrange in order of increasing radius:
   1. Ca, Mg, Be
   2. Ga, Br, Ge
   3. Al, Tl, Si
4. Arrange in order of increasing radius:
   1. Cs, K, Rb
   2. In, Te, Sn
   3. P, Cl, Sr
5. (a) Why are cations smaller than their corresponding neutral atoms?

(b) Why are anions larger than their corresponding neutral atoms?

(c) Why does the size of ions increase as one proceeds down a column in the periodic table?

1. Explain the following trends in ionic radii:
2. I- > I > I+
3. Ca2+ > Mg2+ > Be2+
4. Fe > Fe2+ > Fe3+
5. Consider the following spheres

Which one represents Ca, Ca2+, and Mg2+?

1. Which neutral atom is isoelectronic with each of the following?
2. N3- (b) Ba2+ (c) Se2- (d) Bi3+
3. Select the ions or atoms from the following sets that are isoelectronic with each other.
4. Na+, Sr2+, Br-
5. Y3+, Br-, Kr
6. N3-, P3-, Ti4+
7. Fe3+, Co3+, Mn2+
8. Arrange in order of increasing size:
9. Se2-, Te2-, Se
10. Co3+, Fe2+, Fe3+
11. Ca, Ti4+, Sc3+