Week 5 review Gen Chem

1)Rank the following the sets of elements by increasing effective nuclear charge:

Mg, Al, Cl, Na Mg2+, Al, Cl, Na K, Na, Cs, Mg

2)Give 2 examples of cations that will have the ground state electron of each:

$[Kr]4d^6$ $[Ar]4s^23d^7$ $[Ar]3d^{10}$ Vanadium(III) Cobalt(II)

3)Explain why

a) The radius of the chlorine atom is smaller than the radius of the chloride ion, Cl^-

b) The first ionization energy of aluminum is lower than the first ionization energy of magnesium.

c) The difference between the atomic radii of Na and K is relatively large compared to the difference between the atomic radii of Rb and Cs.

4)Rank the following the sets of elements by increasing atomic radii:

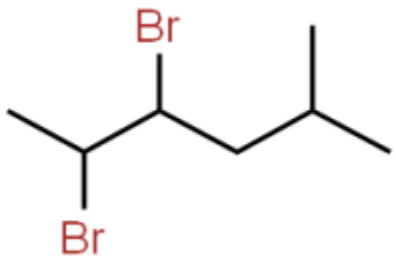
Ca^{2+} Ga N K^+ Li Be O^{2-} Cr

5)What are some differences between the bonding between atoms in those that are ionic vs those that are covalent?

6)Calculate the percent mass of carbon in each of the following organic compounds

2-chloro-2-methylbutane: $CH_3CH_2C(CH_3)_2Cl$

2,3 dibromo-5-methylhexane:



7) James finds that in a new organic compound he synthesizes, it contains 76.54% carbon and balance element Z, which has a molar mass of 0.02207kg/kmol. What is the empirical formula of ZC?