

Homework

Honors Chem 1

Hill-Petrucci

Page 333 & 334 # 49,51,53,57,

49. a. Al is to the left of S and is larger because the positive pull of the nucleus holds the electrons closer.  
b.  $\text{Cl}^-$  is larger than  $\text{Ca}^{2+}$ . Calcium has 20 protons and 18 electrons while chlorine has 17 protons and 18 electrons. The nucleus of calcium is much more effective at pulling those electrons in closer.  
c. Sn is smaller than Ba. Barium has one more energy level.  
d.  $\text{Na}^+$  is smaller than K.  $\text{Na}^+$  has lost its valence electron so the outermost electrons are in the 2<sup>nd</sup> energy level. Potassium's valence electron is in the 4<sup>th</sup> energy level.
51. a.  $\text{B} < \text{Al} < \text{Mg} < \text{K}$   
B has one less energy level than Al or Mg and K has one more energy level than Al or Mg. Al and Mg have their valence electrons in the same energy level, however the 13 protons of Al are more effective at pulling the electrons a little closer than the 12 protons of Mg.  
b.  $\text{Cl} < \text{P} < \text{Br} < \text{Br}^-$   
P's nucleus is less effective than Cl, with both having valence electrons in the 3<sup>rd</sup> energy level. The valence electrons for Br are in the 4<sup>th</sup> energy level making it larger.  $\text{Br}^-$  has one more electron compared to Br so the nucleus is less effective at pulling in the electrons in  $\text{Br}^-$  so it will be the largest.
53. The lower left-hand corner of the periodic table will have the largest atoms. We will find the highest energy level at the bottom and the least effective nuclear pull on the left.
57. a.  $\text{Ba} < \text{Ca} < \text{Mg}$   
The number of energy levels increases as you go down a family. The more energy levels, the larger the atom will be.  
b.  $\text{Al} < \text{P} < \text{Cl}$   
The valence electrons for all three atoms are in the third energy level. The effectiveness of the nucleus is greatest in Cl.  
c.  $\text{Na} < \text{Fe} < \text{Cl} < \text{F} < \text{Ne}$