**Homework #6: Chemistry 1013 Spring 2012**

**Due Friday 9 March in class 15 pts**

**6.1.** We have previously associated salts with the property of melting only at high temperatures. Sodium chloride, for example, melts at ~800 C and boils at a still higher temperature of ~1475 oC. However, in chapter 4.1, Waldron begins with a discussion about `ionic liquids’ which are salts that are liquid at room temperature and which boil at temperatures as alow as 200 oC. One example she uses is **[bmin]+[PF6]-.**

1. Briefly describe why the latter salt is so much more low melting than NaCl.
2. What is `peculiar’ about the anion PF6 -? hint: see Figure 4.2 and count the valence electrons around P.
3. What is one useful, practical application of ionic liquids like **[bmin]+[PF6]-?**

**6.2.** Sketch the interaction between (hint: this is similar to problem 3 on page 160)

1. Mg2+ and water
2. PO43- (phosphate anion) and water

**6.3.** Briefly explain the physiological benefits of drinking Gatorade after extreme physical exertion.

**6.4** My Big Boy tomatoes reside in upstate soil with ~0.1 grams NaCl/liter soil.

The average salt concentration inside my tomatoes is 0.3 grams NaCl/liter tomato. Give n that the tomato cells are semi-permeable to just water, predict whether my tomatoes will shrivel or expand and why (2 pts)

**6.5** Draw the best structures for the molecules and ions below:

1. H3PO3 (all O attached to P, each H is attached to one O)
2. AsF5 (all 5 F are attached to As which is at the center of the molecule)
3. BrO3- (all O are attached to a central Br. Note that the compound here is an anion with one extra electron)

**6.6.** pH and pOH problems (see pp 149-153 of text also)

a) What is the pH of an acid solution containing 0.003 M H+?

b) What is the pOH of the above solution?

c) The pH of blood is ~7.25. What is the concentration of H+ implied by this?

d) The pOH of liquid Drano is 0.1. What is the concentration of OH- implied by this?