**Homework #5: Chemistry 1013 Spring 2013**

**Due Monday 3 March 20 pts**

**5.2. Draw the bond line versions of the organic compounds below (2 pts each)**



**a)CH3 -CH2 -CH2 –OH b) CH2-CH2 c)**

**| |**



**CH2-CH2**





**5.3 Given the bond line forms below, write chemical formula for the molecule drawn (2 pt each)**

**Example: = C4H10**





1. **b)**



**C5H12 C6H6**

**5.3 Draw the best structures for the molecule and ion below. Include all lone pairs !: (2 pts each)**

1. AsF5 (all 5 F are attached to As which is at the center of the molecule)





Also: could have all three O with Br=O, and Br has lone pair and (-1)

Each F has 3 pairs of lone pairs

1. BrO3- (all O are attached to a central Br. Note that the compound here is an anion with one extra electron)

**5.4. Describe the shapes of the simple molecules below (1 pt each)**

1. **:NH3 b) H2O**

**Trigonal pyramid bent**

**5.5. Draw the equivalent resonance structures for the molecules below assuming they strictly obey the**

**octet rule (2 pts each)**



All singly bonded O have 3 lone pairs

While the doubly bond O has two lone pairs

**a) O3 b) CO32-**

**.. .. .. .. ..**

**: O-O=O <🡪 :O=O-O:**

**.. ..**

**5.6.** 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 latte salt is so much more low melting than NaCl.

*The much greater size of the ions involved lowers the net electrostatic attraction between the cation and anion hence lowering the melting point of* ***[bmin]+[PF6]-.***

1. What is `peculiar’ about the anion PF6 -? 9hint: see Figure 4.2 and count the valence electrons around P.) *6 bonds to P means 12 electrons around which breaks the octet rule*
2. What is one useful, practical application of ionic liquids like **[bmin]+[PF6]-?**

*Can be used to extract heavy metals from contaminated water since it is sufficiently ionic to dissolve metals, but does not easily mix with water.(see pg 128)*