AP CHEMISTRY CHAPTER 8/9 SAMPLE PROBLEMS

Sample problem 1

Order the following bonds according to polarity: H-H, O-H, Cl-H, S-H, F-H

Sample problem 2

For each of the following molecules, show the direction of the bond polarities and indicate which ones have a dipole moment: HCl, Cl2, SO3 (a planar molecule with the oxygen atoms spaced evenly around the central atom), CH4 (a tetrahedral molecule with the carbon atom at the center), and H2S (V-shaped with the sulfur atom at the point)

Sample problem 3

Arrange the ions Se2-, Br-, Rb+ and Sr2+ in order of decreasing size

Sample problem 4

Choose the largest ion in each of the following groups.

Li+, Na+, K+, Rb+, Cs+

Ba2+, Cs+, I-, Te2-

Sample problem 5

Using the bond energies listed in Table 8.4, calculate ΔH for the reaction of methane with chlorine and fluorine to give Freon-12 (CF2Cl2)

CH4(g) + 2Cl2(g) + 2F2(g) → CF2Cl2(g) + 2HF(g) + 2HCl(g)

Sample problem 6

Draw Lewis Structures for each of the following

a. HF b. N2 c. NH3 d. CH4 e. CF4 f. NO+

Sample problem 7

Write the Lewis Structure for

PCl5

I3-

Sample problem 8

Write the Lewis structure for each molecule or ion.

a. ClF3 b. XeO3 c. RnCl2 d. BeCl2 e. ICl4-

Sample problem 9

Describe the electron arrangement in the nitrite anion (NO2-)

Sample problem 10

Give possible Lewis structures for XeO3, an explosive compound of xenon. Which Lewis structure or structures are most appropriate according to the formal charge?

EXAMPLES: Draw a Lewis Structure and give the shape of each, determine if the molecule possesses a dipole, and give the hybridization of the central atom.

F2O, NF3, CH4, BeH2, XeI4, PI5, SbCl5, BrF5, SCl4, ClI3, H2S