**Test Review – Naming Compounds, Writing Formulas, Chemical Bonds, Shapes of Molecules, and Polarity**

***You will have a test over this material on Thursday, November 12.***

Students should be able to:

1. Write formulas for compounds if given the name of the compound (ionic, molecular and acids).
2. Write the name of a compound if given the formula of the compound (ionic, molecular and acids).
3. Compare and contrast ionic and covalent bonds.
4. Define molecule and formula unit. How are they alike? Different?
5. Draw Lewis structures for polyatomic ions, molecules (covalent compounds) and ionic compounds.
6. Explain the role of VSEPR theory in determining shape (tetrahedral, trigonal pyramid, bent, linear and trigonal planar).
7. Name the different types of repulsive forces found in molecules. Which type of repulsive force is the greatest? Which type of repulsive force displays the least repulsion?
8. Identify lone pairs (unshared pairs), shared pairs, single, double, or triple covalent bonds (areas of electron density).
9. Give the bond angles for methane (CH4), ammonia (NH3), and water (H2O). Also give the approximate bond angles in other similar shaped molecules.
10. Draw structural formulas for molecular (covalent) compounds. The structural formulas should represent the molecular geometries of tetrahedral, trigonal bipyramidal, bent (from a tetrahedral electronic geometry), trigonal planar, and bent (from a trigonal planar electronic geometry).
11. Draw Lewis structures for particles that exhibit resonance.
12. Describe the effect that resonance has on bond energy and bond length.
13. Be able to determine whether or not a molecule is polar (using dipoles) and indicate the polarity of the molecule using an arrow to represent the dipole moment.

***\*\*\*\* STUDY ALL NOTES , HANDOUTS, HOMEWORK, ACTIVITIES FOR THIS UNIT!!!!\*\*\*\****

1. In what two ways do atoms of different elements combine to form compounds? (In other words, what are the two types of bonds and how do they form?)
2. What types of atoms tend to form the following types of bonding?

a.) ionic b.) covalent

1. Why do atoms form bonds?
2. Draw the Lewis structure for the following **ionic compounds**:

a.) MgCl2 b.) Al2O3 c.) BaS

1. Draw the following Lewis Structures, and then using the VSEPR theory, predict the shape of the following molecules: (do NASU if you need to!). Indicate if resonance occurs!
   1. CI4 b.) BF3 c.) H2S d.) CO e.) OF2  f.) HCN g.) BeCl2 h.) SO32- i.) NO3-
2. What is a polar bond?
3. Draw the Lewis and Structural formulas for the particles below. Determine if the particles are polar or nonpolar and indicate the polarity appropriately.
   1. BF3 b.) PH3 c.) SO3 d.) HF e.) SiF3Cl f.) Cu g.) SF2 h.) NBr3 ­ i.) HOCl (O is the center atom)
4. How many electrons are in a single covalent bond? Double covalent bond? Triple covalent bond? Give an example of a molecule with each.
5. Not every molecule with polar bonds is polar. Explain this statement. Use CCl4 as an example.

10. What is electronegativity? What are the eight most electronegative elements – in order from most to least

electronegative.

11. Rank the following bonds from most polar to least polar:

* 1. Li and F b.) C and F c.) F and Cl d.) F and F e.) O and F

12. Name the following:

a. HI

b. CuCl

c. N3O­7

d. MgSO4 5H2O

e. HNO3

13. Write formulas for the following:

a. acetic acid

b. potassium oxide

c. hydrobromic acid

d. barium chloride dihydrate

e. diphosphorus tetrachloride

14. Definitions to know:

valence electrons octet rule resonance

Lewis structure dipole nonpolar bond

polar bond VSEPR theory nonpolar molecule

polar molecule formula unit resonance

structural formula electronegativity binary acid

molecule electron density oxyacid

molecular structure acid molecule polyatomic ion

formula unit molecule

***This study guide is intended to be a review of some of the major topics covered during the unit. You should also study all of your notes packets, worksheets, and the molecular models activity.***