AP Chemistry Summer Assignment (2016-17)

In order to cover all of the material for this course, it is necessary for you complete a summer assignment which is basic review from first year chemistry. You will do Chapters 1-3 in your textbook independently. Make notes of the important information as you study the chapter. The following questions need to be answered completely. If it is a quantitative problem, all work must be shown. These are due the 1st day of class and will count as your first homework/packet grade.

Chapter 1: 5, 11, 13, 19, 21, 23, 25, 39, 43, 54, 60, 76, 81

Chapter 2: 3, 13, 15, 17, 19, 29, 31, 33, 37, 45, 55, 61, 65, 67, 75

Chapter 3: 1, 5, 7, 9, 13, 15, 17, 23, 33, 35, 41, 51, 53, 59, 65, 73, 79, 100, 105

You will also need to complete the last 3 pages of this packet and turn it in on the 1st day of class.

There are several areas where you will need to memorize information:

- Element names
- Common polyatomic ions and their charges
- Nomenclature Rules (ionic and covalent compounds)
- Solubility Rules
- Rules for Determining Oxidation Number

We will review oxidation numbers in class but you should make sure you are familiar with the others.

You will be tested on the 1st three chapters the 1st week of class.

You should also take a look at the college board AP website. Look up AP Chem. There are many useful tools on this site that you can access throughout the year.

Solubility Rules

1. All compounds containing alkali metal cations and the ammonium ion are soluble.
2. All compounds containing NO_3^-, ClO_4^-, ClO_3^-, and $C_2H_3O_2^-$ anions are soluble.
3. All chlorides, bromides, and iodides are soluble except those containing Ag^+, Pb^{+2}, or Hg^{+2}.
4. All sulfates are soluble except those containing Hg^{+2}, Pb^{+2}, Sr^{+2}, Ca^{+2}, Ba^{+2}.
5. All hydroxides are insoluble except compounds of the alkali metals, Ca^{+2}, Sr^{+2}, and Ba^{+2}.
6. All compounds containing PO_4^{-3}, S^{2-}, CO_3^{2-}, and SO_3^{2-} ions are insoluble except those that also contain alkali metals or NH_4^+.

Rules for Determining Oxidation Number

Oxidation Number – A number assigned to an atom in a compound that indiated the general distribution of electrons among the bonded atoms; tells the number of electrons an element in a compound has lost, gained or shared.

1. The oxidation number of any uncombined element is 0.
2. The oxidation number of a monatomic ion is equal in magnitude and sign to its' charge.
3. For a polyatomic ion, the sum of the oxidation numbers must equal the ionic charge of the ion.
4. For any neutral compound, the sum of the oxidation numbers of the atoms in the compound must equal 0.
5. The oxidation number of hydrogen in a compound is +1, **except** in metal hydrides where it is a -1.
6. The oxidation number of oxygen in a compound is -2, **exept** in peroxides where it is -1, and in compounds with the more electronegative fluorine, where it is positive.

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Name _____

1. **Name the following compounds.**

CO _____	NH_4CN _____
AlP _____	OF_2 _____
FeF_3 _____	$KC_2H_3O_2$ _____
$Pb(NO_3)_2$ _____	SO_2 _____
$LiMnO_4$ _____	$CuCr_2O_7$ _____

2. **Write formulas for the following.**

Tin (IV) phosphide _____

Magnesium hydroxide _____

Potassium nitride _____

Copper (II) cyanide _____

Cobalt (II) chromate _____

Silicon dioxide _____

Lithium acetate _____

Diphosphorous pentoxide _____

Sodium carbonate _____

Silver chloride _____

3. Review solublity rules and identify each of the following compounds as **soluble** or **insoluble** in water. State the **rule #** that applies.

Na_2CO_3 _____

$CoCO_3$ _____

K_2S _____

$BaSO_4$ _____

AgI _____

$Ni(NO_3)_2$ _____

FeS _____

$PbCl_2$ _____

Li_2O _____

$Mn(C_2H_3O_2)_2$ _____

$AgClO_3$ _____

$Sn(SO_4)_4$ _____

$Pb(NO_3)_2$ _____

$(NH_4)_2S$ _____

KI _____

$CuSO_4$ _____

FeF_2 _____

$AgCl$ _____

4. **Predict whether each of these double replacement reactions will give a precipitate or not based on the solubility of the products. If yes, identify the precipitate and write the formula.**

Silver nitrate + potassium chloride _____

Magnesium nitrate and sodium carbonate _____

Strontium bromide and potassium sulfate _____

Cobalt (III) bromide and potassium sulfide _____

Ammonium hydroxide and copper (II) acetate _____

Lithium chlorate and chromium (III) fluoride _____

5. **Balance the following equations**

$S_8 + O_2 \rightarrow SO_3$

$Fe + O_2 \rightarrow Fe_2O_3$

$C_4H_{10} + O_2 \rightarrow CO_2 + H_2O$

$KClO_3 \rightarrow KCl + O_2$

$Al + HCl \rightarrow AlCl_3 + H_2$