

## 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 1<sup>st</sup> 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 1<sup>st</sup> 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 1<sup>st</sup> three chapters the 1<sup>st</sup> 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  $\text{NO}_3^-$ ,  $\text{ClO}_4^-$ ,  $\text{ClO}_3^-$ , and  $\text{C}_2\text{H}_3\text{O}_2^-$  anions are soluble.
3. All chlorides, bromides, and iodides are soluble except those containing  $\text{Ag}^+$ ,  $\text{Pb}^{+2}$ , or  $\text{Hg}^{+2}$ .
4. All sulfates are soluble except those containing  $\text{Hg}^{+2}$ ,  $\text{Pb}^{+2}$ ,  $\text{Sr}^{+2}$ ,  $\text{Ca}^{+2}$ ,  $\text{Ba}^{+2}$ .
5. All hydroxides are insoluble except compounds of the alkali metals,  $\text{Ca}^{+2}$ ,  $\text{Sr}^{+2}$ , and  $\text{Ba}^{+2}$ .
6. All compounds containing  $\text{PO}_4^{-3}$ ,  $\text{S}^{2-}$ ,  $\text{CO}_3^{2-}$ , and  $\text{SO}_3^{2-}$  ions are insoluble except those that also contain alkali metals or  $\text{NH}_4^+$ .

## Rules for Determining Oxidation Number

Oxidation Number – A number assigned to an atom in a compound that indicated 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, **except** 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 \_\_\_\_\_  $\text{NH}_4\text{CN}$  \_\_\_\_\_

AlP \_\_\_\_\_  $\text{OF}_2$  \_\_\_\_\_

$\text{FeF}_3$  \_\_\_\_\_  $\text{KC}_2\text{H}_3\text{O}_2$  \_\_\_\_\_

$\text{Pb}(\text{NO}_3)_2$  \_\_\_\_\_  $\text{SO}_2$  \_\_\_\_\_

$\text{LiMnO}_4$  \_\_\_\_\_  $\text{CuCr}_2\text{O}_7$  \_\_\_\_\_

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

$\text{Na}_2\text{CO}_3$  \_\_\_\_\_

$\text{CoCO}_3$  \_\_\_\_\_

$\text{K}_2\text{S}$  \_\_\_\_\_

$\text{BaSO}_4$  \_\_\_\_\_

$\text{AgI}$  \_\_\_\_\_

$\text{Ni}(\text{NO}_3)_2$  \_\_\_\_\_

$\text{FeS}$  \_\_\_\_\_

$\text{PbCl}_2$  \_\_\_\_\_

$\text{Li}_2\text{O}$  \_\_\_\_\_

$\text{Mn}(\text{C}_2\text{H}_3\text{O}_2)_2$  \_\_\_\_\_

$\text{AgClO}_3$  \_\_\_\_\_

$\text{Sn}(\text{SO}_4)_4$  \_\_\_\_\_

$\text{Pb}(\text{NO}_3)_2$  \_\_\_\_\_

$(\text{NH}_4)_2\text{S}$  \_\_\_\_\_

$\text{KI}$  \_\_\_\_\_

$\text{CuSO}_4$  \_\_\_\_\_

$\text{FeF}_2$  \_\_\_\_\_

$\text{AgCl}$  \_\_\_\_\_

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

