AP CHEMISTRY SUMMER ASSIGNMENT (2014-2015)

and First Day Test Material

Please Note: This assignment is a requirement, and is NOT for extra credit!

1. Purchase your own copy of 5 Steps to a 5 AP Chemistry 2014-2015, Langley and Moore, McGraw Hill, 2013. This edition has been written to prepare for the changes to AP Chemistry. Also, you are highly encouraged to purchase the companion book, 5 Steps to a 5 500 AP Chemistry Questions to know by test day, Mina Lebitz, McGraw Hill, 2012. This book will be very helpful when you are reviewing for the exam. This book will probably be difficult to find in the stores later in the school year.
2. Buy a few color highlighters.
3. Read and study Chapter 1, 2, and 4. Highlight material that applies to you.
4. Take the diagnostic test in chapter 3.
5. Take a look at the AP College Board and other websites. List the three most useful in the front cover of your book
6. Read and study (highlight, take notes in the margin, etc) and do all the review questions at the end of the chapter for Chapter 5 Basics and Chapter 7 Stoichiometry.
7. Bring your highlighted book, notes and diagnostic test to school the first day of class. It should evident that you spent several hours studying and reviewing.

NO LATE ASSIGNMENTS WILL BE ACCEPTED!!!

AP CHEMISTRY FIRST DAY TEST

AP Chemistry is a difficult course. It is not all about memorization; however, having the following items memorized is essential for success in learning the concepts covered in the course. Make flashcards, have your friends and family quiz you, take the lists with you on vacation, or do whatever it takes to get this information firmly planted in your head. Do not wait until the night before school begins.

The first day test will cover six areas of memorization:

1. Polyatomic Ions (including name, symbol and charge)
2. Variable Valences for Transition Metals
3. Rules for Naming Acids
4. Rules for Naming Ionic Compounds
5. The Solubility Rules
6. Determining Oxidation Numbers

Advanced Placement Chemistry is a college level course. You will need to be dedicated and work very hard if you are to be successful.

Polyatomic Ions

Name	Symbol	Charge
ammonium	NH_4	+1
acetate	$C_2H_3O_2$	-1
bromate	BrO_3	-1
chlorate	ClO_3	-1
chlorite	ClO_2	-1
cyanide	CN	-1
dihydrogen phosphate	H_2PO_4	-1
hypochlorite	ClO	-1
hydrogen carbonate (bicarbonate)	HCO_3	-1
hydrogen sulfate (bisulfate)	HSO_4	-1
hydrogen sulfite (bisulfite)	HSO_3	-1
hydroxide	OH	-1
iodate	IO_3	-1
nitrate	NO_3	-1
nitrite	NO_2	-1
perchlorate	ClO_4	-1
permanganate	MnO_4	-1
thiocyanate	SCN	-1
carbonate	CO_3	-2
chromate	CrO_4	-2
dichromate	Cr_2O_7	-2
oxalate	C_2O_4	-2
selenate	SeO_4	-2
silicate	SiO_3	-2
sulfate	SO_4	-2
sulfite	SO_3	-2
phosphate	PO_4	-3
phosphite	PO_3	-3

Rules for Naming Ionic Compounds

1. Balance charges (charges should equal zero)
2. Cation is always written first (in name and in formula)
3. Change the ending to –ide for binary formulas

Variable Valences for Transition Metals

Name	Symbol	Charge	Stock Name
chromium	Cr	+2 +3	chromium (II) chromium (III)
manganese	Mn	+2 +3	manganese (II) manganese (III)
iron	Fe	+2 +3	iron (II) iron (III)
cobalt	Co	+2 +3	cobalt (II) cobalt (III)
copper	Cu	+1 +2	copper (I) copper (II)
lead	Pb	+2 +4	lead (II) lead (IV)
mercury	Hg	+1 +2	mercury (I) mercury (II)
tin	Sn	+2 +4	tin (II) tin (IV)
gold	Au	+1 +3	gold (I) gold (III)
silver	Ag	+1 +2 (rarely)	silver silver (II)
bismuth	Bi	+3 +5	bismuth (III) bismuth (V)
antimony	Sb	+3 +5	antimony (III) antimony (V)
cadmium	Cd	+2	cadmium
zinc	Zn	+2	zinc

Rules for Naming an Acid

1. When the name of the anion ends in –ide, the acid name begins with the prefix hydro-, the stem of the anion has the suffix –ic and is followed by the word acid.

-ide becomes hydro_____ic acid

Cl^- is the chloride ion, so… HCl = hydrochloric acid

2. When the anion name ends in –ite, the acid name is the stem of the anion with the suffix –ous, followed by the word acid.

-ite becomes _____ous acid

ClO_2^- is the chlorite ion so … $HClO_2$ = chlorous acid

3. When the anion name ends in –ate, the acid name is the stem of the anion with the suffix –ic, followed by the word acid.

-ate becomes _____ic acid

ClO_3^- is the chlorate ion so… $HClO_3$ = chloric acid

Rules for Determining Oxidation Number

Oxidation Number: A number assigned to an atom in a molecular compound or molecular ion that indicates the general distribution of electrons among the bonded atoms.

1. The oxidation number of any uncombined element is 0.
2. The oxidation number of a monatomic ion is equal to the charge of the ion.
3. The more electronegative element in a binary compound is assigned the number equal to the charge it would have if it were an ion.
4. The oxidation of fluorine in a compound is always -1.
5. Oxygen has an oxidation number of -2 unless it is combined with F, when it is +2, or it is in peroxide, when it is -1.
6. The oxidation number of hydrogen in most of its compounds is +1 unless it is combined with a metal, in which case it is -1.
7. In compounds, the elements of groups 1 and 2 as well as aluminum have oxidation numbers of +1, +2, and +3, respectively.
8. The sum of the oxidation numbers of all atoms in a neutral compound is 0.
9. The sum of the oxidation numbers of all atoms in a polyatomic ion equals the charge of the ion.

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}, and Hg^{+2}.
4. All sulfates are soluble except those containing Hg^{+2}, Pb^{+2}, Sr^{+2}, Ca^{+2}, or 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 contain alkali metals or NH_4^+.