

AP CHEMISTRY SUMMER ASSIGNMENT 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 on the AP: Chemistry, John T Moore, McGraw Hill, 2003.
2. Purchase your own Student Laboratory Notebook. (Chemistry Top Bound Notebook 50 pages for \$8.95 at www.labnotebooks.net or 1-734-455-7900)
3. Buy a few color highlighters.
4. Buy a TI-83 calculator.
5. Read and study Chapter 1 and 2. Highlight material that applies to you.
6. Take the diagnostic test on Page 23. (Go ahead and write in the book, I will make an additional copy of this test for you to take before the AP Exam.)
7. Take a look at the AP and other websites. List the three most useful in the front cover of your book
8. Read and study (highlight, take notes in the margin, etc) and do all the review questions at the end of the chapter for Chapter 3 and 5
 - Chapter 3: Basics
 - Chapter 5: Stoichiometry
9. Bring your highlighted book, notes and diagnostic test to school the first day of class in August. Points will be assigned to you and then the book will be returned to you for your further enjoyment.

NO LATE ASSIGNMENTS WILL BE ACCEPTED!!!

AP CHEMISTRY SECOND DAY TEST

AP Chemistry is a difficult course. It is not all about memorization; however, having these 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

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 equal the charge on 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 number 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 a peroxide, when it is -1.
6. The oxidation state of hydrogen in most of its compounds is +1 unless it 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 number 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 number 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 $\text{C}_2\text{H}_3\text{O}_2^-$ anions are soluble.
3. All chlorides, bromides, and iodides are soluble except those containing Ag^+ , Pb^{2+} , or Hg_2^{2+}
4. All sulfates are soluble except those containing Hg_2^{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 also contain alkali metals or NH_4^+ .

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 it 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.

Variable Valences for Transition Metals

Name	Symbol	Charge	Stock Number
Chromium	Cr	+2	Chromium (II)
		+3	Chromium (III)
Manganese	Mn	+2	Manganese (II)
		+3	Manganese (III)
Iron	Fe	+2	Iron (II)
		+3	Iron (III)
Cobalt	Co	+2	Cobalt (II)
		+3	Cobalt (III)
Copper	Cu	+1	Copper (I)
		+2	Copper (II)
Lead	Pb	+2	Lead (II)
		+4	Lead (IV)
Mercury	Hg	+1	Mercury (I)
		+2	Mercury (II)
Tin	Sn	+2	Tin (II)
		+4	Tin (IV)
Gold	Au	+1	Gold (I)
		+3	Gold (III)
Silver	Ag	+1	Silver
		+2(rarely)	Silver(II)
Bismuth	Bi	+3	Bismuth (III)
		+5	Bismuth (V)
Antimony	Sb	+3	Antimony (III)
		+5	Antimony (V)
Cadmium	Cd	+2	Cadmium
Zinc	Zn	+2	Zinc

Polyatomic Ions

Name	Symbol	Charge
Ammonium	NH ₄	+1
Acetate	C ₂ H ₃ O ₂	-1
Bromate	BrO ₃	-1
Chlorate	ClO ₃	-1
Chlorite	ClO ₂	-1
Cyanide	CN	-1
Dihydrogen phosphate	H ₂ PO 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 ₂ O ₇	-2
Oxalate	C ₂ O 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 of the anion to -ide