

AP Chemistry Summer Assignment.

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

Welcome to Advanced Placement Chemistry. The summer assignments are designed to prepare you for a rigorous course equivalent to a first year college chemistry class.

Review the following information. There will be a test on the first day of school.

- 1. Names and symbols of common ions: Make flashcards (or other memorization learning devices). Memorize the names, symbols and charges of the common ions listed on the back of this page. Two tables are provided, both tables must be memorized.**
- 2. Memorize the prefix names and symbols for the metric system. See back of sheet.**
- 3. Know how to name and write ionic compounds.**
- 4. Memorize the solubility rules.**
- 5. Know the following equipment and their function: Erlenmeyer flask, test tube, beaker, graduated cylinder, volumetric flask, watch glass, funnel, thermometer, Bunsen burner, beaker tongs, test tube holder, ring stand and ring, wash bottle, crucible and cover, evaporating dish, mortar/pestle, forceps, test tube rack, and wire gauze**
- 6. Be able to solve density problems. Try “ChemTeam” website for practice work.**

Ex. In the opening scenes of the movie Raiders of the Lost Ark, Indianan Jones tries to remove a gold idol from a booby-trapped pedestal. He replaces the idol with a bag of sand of approximately equal volume. (Density of gold = 19.32g/cm³; density of sand ≈ 3g/cm³.)

 - a. Did he have a reasonable chance of not activating the mass-sensitive booby-trap?**
 - b. In a later scene he and an unscrupulous guide play catch with the idol. Assume that the volume of the idol is about 1L. If it were gold, what mass would the idol have? Is playing catch with it plausible?**
- 7. Research and be able to explain the following laws: Law of conservation of mass, Law of definite proportions, Law of multiple proportions**

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

Solubility Rules

1. All compounds containing alkali metal cations and the ammonium ion are soluble.
2. All compounds containing NO₃⁻, ClO₄⁻, ClO₃⁻, and C₂H₃O₂⁻ anions are soluble.
3. All chlorides, bromides, and iodides are soluble except those containing Ag⁺, Pb²⁺, or Hg²⁺.
4. All sulfates are soluble except those containing Hg²⁺, Pb²⁺, Sr²⁺, Ca²⁺, or Ba²⁺.
5. All hydroxides are insoluble except compounds of the alkali metals, Ca²⁺, Sr²⁺, and Ba²⁺.
6. All compounds containing PO₄³⁻, S²⁻, CO₃²⁻, and SO₃²⁻ ions are insoluble except those that also contain alkali metals or NH₄⁺.

Names, Formulas, and Charges of Some Common Polyatomic Ions					
NH_4^+	Ammonium	SO_4^{2-}	Sulfate	FO^-	Hypofluorite
$\text{C}_2\text{H}_3\text{O}_2^-$	Acetate	HSO_4^-	Hydrogen sulfate	ClO^-	Hypochlorite
CO_3^{2-}	Carbonate	SO_3^{2-}	Sulfite	ClO_2^-	Chlorite
HCO_3^-	Hydrogen carbonate	HSO_3^-	Hydrogen sulfite	ClO_3^-	Chlorate
$\text{C}_2\text{O}_4^{2-}$	Oxalate	$\text{S}_2\text{O}_3^{2-}$	Thiosulfate	ClO_4^-	Perchlorate
CN^-	Cyanide	HS^-	Hydrogen sulfide	BrO^-	Hypobromite
OCN^-	Cyanate	OH^-	Hydroxide	BrO_3^-	Bromate
SCN^-	Thiocyanate	O_2^{2-}	Peroxide	BrO_4^-	Perbromate
NO_2^-	Nitrite	CrO_4^{2-}	Chromate	IO^-	Hypoiodite
NO_3^-	Nitrate	$\text{Cr}_2\text{O}_7^{2-}$	Dichromate	IO_3^-	Iodate
PO_4^{3-}	Phosphate	MnO_4^-	Permanganate	IO_4^-	Periodate
HPO_4^{2-}	Hydrogen phosphate	MnO_4^{2-}	Manganate		
H_2PO_4^-	Dihydrogen phosphate				

Names, Formulas, and Charges of Some Common Ions					
Al^{3+}	Aluminum	Au^{3+}	Gold (III) or auric	Fe^{3+}	Iron (III) or ferric
H^-	Hydride	Sn^{2+}	Tin (II) or stannous	Co^{2+}	Cobalt (II) or cobaltous
Mn^{2+}	Manganese (II)	Sn^{4+}	Tin (IV) or stannic	Co^{3+}	Cobalt (III) or cobaltic
Ni^{2+}	Nickel (II)	Pb^{2+}	Lead (II) or plumbous	Cu^+	Copper (I) or cuprous
Zn^{2+}	Zinc	Pb^{4+}	Lead (IV) or plumbic	Cu^{2+}	Copper (II) or cupric
Cd^{2+}	Cadmium	Cr^{2+}	Chromium (II) or chromous	Hg_2^{2+}	Mercury (I) or mercurous
Ag^+	Silver	Cr^{3+}	Chromium (III) or chromic	Hg^{2+}	Mercury (II) or mercuric
Au^+	Gold (I) or aurous	Fe^{2+}	Iron (II) or ferrous	Bi^{3+}	Bismuth (III)

Mega	(M)	10^6	or	1,000,000	One million of
Kilo	(k)	10^3	or	1000	One thousand of
Deci	(d)	10^{-1}	or	1/10	One tenth of
Centi	(c)	10^{-2}	or	1/100	One hundredth of
Milli	(m)	10^{-3}	or	1/1000	One thousandth of
Micro	(μ)	10^{-6}	or	1/1,000,000	One millionth of
Nano	(n)	10^{-9}	or	1/1,000,000,000	One billionth of