

2018 AP Chemistry Students Topic Summer Assignment:

When school opens you will be expected to demonstrate mastery of the following Chemistry I topics:

- **Numbers, Atoms, molecules, and ions (chapters 1 & 2)**
- **Nomenclature:** (naming and writing formulas for compounds) You must KNOW the formulas and names for your polyatomic ions! (**chapter 2**)
- **Equations:** Classifying, completing and writing balanced equations for 6 types of chemical rxns. You will need to know solubility rules for this. (Single Displacement; Double Displacement; Decomposition of binary compounds, hydroxides, carbonates, and chlorates; Synthesis; and Neutralization) (**CH 3**)
- **Stoichiometry** - including limiting reactant problems. (**CH 3**)

What follows is a list of helpful websites, the list of polyatomic ions and the list solubility rules you must memorize.

Common Polyatomic Ions			
$C_2H_3O_2^-$	acetate	OH^-	hydroxide
NH_4^+	ammonium	ClO^-	hypochlorite
CO_3^{2-}	carbonate	NO_3^-	nitrate
ClO_3^-	chlorate	NO_2^-	nitrite
ClO_2^-	chlorite	$C_2O_4^{2-}$	oxalate
CrO_4^{2-}	chromate	ClO_4^-	perchlorate
CN^-	cyanide	MnO_4^-	permanganate
$Cr_2O_7^{2-}$	dichromate	PO_4^{3-}	phosphate
HCO_3^-	bicarbonate	SO_4^{2-}	sulfate
		SO_3^{2-}	sulfite

SOLUBILITY RULES - KNOW THESE.

Soluble:

- All Nitrates, Acetates, Ammonium, and Group 1 (IA) salts
- All Chlorides, Bromides, and Iodides, except Silver, Lead, and Mercury(I)
- All Fluorides except Group 2 (IIA), Lead(II), and Iron(III)
- All Sulfates except Calcium, Strontium, Barium, Mercury, Lead(II), and Silver

Insoluble (0.10 M or greater):

- All Carbonates and Phosphates except Group 1 (IA) and Ammonium
- All Hydroxides except Group 1 (IA), Strontium, Barium, and Ammonium
- All Sulfides except Group 1 (IA), 2 (IIA), and Ammonium
- All Oxides except Group 1 (IA)

KNOW *Guidelines for Predicting the Products of Selected Types of Chemical Rxns**

1. SYNTHESIS:

Key: **M** = Metal **NM** = Nonmetal

- a. Formation of binary compound: **A + B → AB**
- b. Metal oxide-water reactions: **MO + H₂O → MOH**

2. DECOMPOSITION:

- a. Binary compounds: **AB → A + B**
- b. Metallic carbonates: **MCO₃ → MO + CO₂** Example: **Li₂CO₃(s) → Li₂O(s) + CO₂(g)**
- c. Metallic hydrogen carbonates: **MHCO₃ → MO + H₂O(l) + CO₂(g)**
- d. Metallic hydroxides: **MOH → MO + H₂O**
- e. Metallic chlorates: **MClO₃ → MCl + O₂(g)** Example: **2 LiClO₃(s) → 2 LiCl(s) + 3 O₂(g)**

3. SINGLE REPLACEMENT:

- a. Metal-metal replacement: **Zn(s) + CuCl₂(aq) → Cu(s) + ZnCl₂(aq)**
- b. Active metal replaces H from acid: **Zn(s) + 2 HCl(aq) → ZnCl₂(aq) + H₂(g)**
- c. Halogen-Halide replacement: **F₂(g) + 2 HBr(aq) → 2 HF(aq) + Br₂(l)**

4. DOUBLE REPLACEMENT: AB + CD → AD + CB

- a. Formation of a precipitate from solution. **(Solubility Rules)**
- b. Acid-Base **NEUTRALIZATION** reaction **Acid + base → salt + H₂O(l)**
Example **H₂SO₄(aq) + 2 NaOH(aq) → Na₂SO₄(aq) + 2 H₂O(l)**

5. COMBUSTION REACTION Know the simple alkanes → methane, ethane, propane. . . .decane
Hydrocarbon + oxygen → carbon dioxide + water

STUDY, READ, AND WORK THROUGH CHAPTER 1, 2, & 3 in the AP Textbook.

Do the **EXAMPLE PROBLEMS** in all 3 chapters. (The first 2 problems are on p 19.)

I assigned these because the solutions accompany the problems. You are not required to submit your work on these problems. Just know how to do them. ☺

Video Resources

<http://www.bozemanscience.com/ap-chemistry/> Videos #1,2,3 and #27-30

<https://cosmolearning.org/courses/ap-chemistry-with-chemguy/> Videos # 14-17

NOTE* Your job is **master** the 3 topics. (Atoms, Nomenclature, Equations, and Stoichiometry)

****There will be a quiz on day 3 of the class. ****

Marie Swann (945-1187)