

AP CHEMISTRY SUMMER ASSIGNMENT

While you are enjoying your summer sun, you will begin your AP chemistry journey. This first assignment will give you a foundation which will be built upon as we study AP chemistry. You have 4 tasks over the summer:

I. Please visit the College Board AP Chemistry site:

<https://apstudent.collegeboard.org/apcourse/ap-chemistry>

Scroll through the site and become familiar with the format of the AP Exam and the resources available on the website.

II. Join my classroom on Google classroom. Class code is gezees5.

III. Review Assignment - FlinnPrep and Slides

Please set up a FlinnPrep account. There is a separate attachment with the instructions on how to do that. You will have to pay \$22.95 to get access. Please e-mail me to confirm you activated your account and that it's all set up. The student linking code you will need is lwbgo.

You are expected to complete units 1-9 in the FlinnPrep module over the summer. Most of the material in these units is review, some is new. In addition, slides for chapters 1 and 2 of our AP Chemistry textbook are posted on Google Classroom. These chapters include material covered in your tenth-grade chemistry class and/or the Flinn Prep review. The first test of the year (which will take place 2-3 weeks after classes have begun) will include chapters 1 and 2 but we will NOT be reviewing those chapters in class. Any other material covered in Flinn Prep will be reviewed in class, but it will be at a quick pace, so if you are not comfortable with that material, you will fall behind.

IV. First Day Quiz Material

You will have a quiz on this material on the first day of class. Please note: You will have a Periodic Table available to you for every assessment.

The first day test will cover six areas of memorization:

1. Elements 1-38, 47, 50, 78-88 (names to symbols & symbols to names)
2. Determining Oxidation Numbers
3. Ions and Polyatomic Ions (including name, symbol and charge, use the PT)
4. Nomenclature of Ionic Compounds and Molecular Compounds.
5. Rules for Naming Acids and common strong acids and bases

6. Memorization of one Solubility Rule listed at the end of this packet (If you need the other rules they will be given to you)

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.
-

Tables

COMMON ION CHART

POSITIVE IONS

+1	+2	+3	+4
H ⁺ : hydrogen	Be ⁺² : beryllium	Fe ⁺³ : iron (III)	Sn ⁺⁴ : tin (IV)
Na ⁺ : sodium	Mg ⁺² : magnesium	Au ⁺³ : gold (III)	Pb ⁺⁴ : lead (IV)
K ⁺ : potassium	Ca ⁺² : calcium	Ga ⁺³ : gallium	Mn ⁺⁴ : manganese (IV)
Li ⁺ : lithium	Sr ⁺² : strontium	In ⁺³ : indium (III)	Ti ⁺⁴ : titanium (IV)
Rb ⁺ : rubidium	Ba ⁺² : barium	Tl ⁺³ : thallium (III)	
Cs ⁺ : cesium	Ra ⁺² : radium	Al ⁺³ : aluminum	
Ag ⁺ : silver	Fe ⁺² : iron (II)	Cr ⁺³ : chromium (III)	+6
Au ⁺ : gold (I)	Cu ⁺² : copper (II)	Ti ⁺³ : titanium (III)	Cr ⁺⁶ : Chromium (VI)
Cu ⁺ : copper (I)	Zn ⁺² : zinc	Mn ⁺³ : manganese (III)	
Tl ⁺ : thallium (I)	Cd ⁺² : cadmium	Co ⁺³ : cobalt (III)	
In ⁺ : indium (I)	Hg ₂ ⁺² : mercury (I)		+7
	Hg ⁺² : mercury (II)	Bi ³⁺ Bismuth (III) As ³⁺ Arsenic (III)	Mn ⁺⁷ : manganese (VII)
NH ₄ ⁺ : ammonium	Pb ⁺² : lead (II)		
	Sn ⁺² : tin (II)		+5 Bi ⁵⁺ Bismuth (V) Arsenic ⁵⁺ (V)
	Ni ⁺² : nickel		
H ₃ O ⁺ Hydronium	Co ⁺² : cobalt (II)		
	Mn ⁺² : manganese (II)		
	Ti ⁺² : titanium (II)		
	Cr ⁺² : chromium (II)		

Table 6.8 Anions

Ionic Charge: 1-		Ionic Charge: 2-		Ionic Charge: 3-	
Halogens: Group 7A/17		Oxyanions		Group 6A/16	
F ⁻	Fluoride	ClO ₄ ⁻	Perchlorate	O ²⁻	Oxide
Cl ⁻	Chloride	ClO ₃ ⁻	Chlorate	S ²⁻	Sulfide
Br ⁻	Bromide	ClO ₂ ⁻	Chlorite	Oxyanions	
I ⁻	Iodide	ClO ⁻	Hypochlorite	CO ₃ ²⁻	Carbonate
Acid Anions		BrO ₃ ⁻	Bromate	SO ₄ ²⁻	Sulfate
HCO ₃ ⁻	Hydrogen carbonate	BrO ₂ ⁻	Bromite	SO ₃ ²⁻	Sulfite
HS ⁻	Hydrogen sulfide	BrO ⁻	Hypobromite	C ₂ O ₄ ²⁻	Oxalate
HSO ₄ ⁻	Hydrogen sulfate	IO ₄ ⁻	Periodate	CrO ₄ ²⁻	Chromate
HSO ₃ ⁻	Hydrogen sulfite	IO ₃ ⁻	Iodate	Cr ₂ O ₇ ²⁻	Dichromate
H ₂ PO ₄ ⁻	Dihydrogen phosphate	NO ₃ ⁻	Nitrate	Acid Anions	
Other Anions		NO ₂ ⁻	Nitrite	HPO ₄ ²⁻	Hydrogen phosphate
SCN ⁻	Thiocyanate	OH ⁻	Hydroxide	Diatomic Elemental	
CN ⁻	Cyanide	C ₂ H ₃ O ₂ ⁻	Acetate	O ₂ ²⁻	Peroxide
H ⁻	Hydride	MnO ₄ ⁻	Permanganate		

© 2004 Thomson/Brooks Cole

Less Common but still know:
S₂O₃²⁻ Thiosulfate

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

-If necessary, use the stock system

- review the criss cross method

FOR NAMING MOLECULAR (COVALENT) COMPOUNDS--GREEK PREFIXES

mono-	hexa-
di-	hepta-
tri-	octa-
tetra-	nona-
penta-	deca-

ELEMENTS THAT EXIST AS DIATOMIC MOLECULES

Br I N C H O F or H O N C I B r I F or H N O
Halogens

Br₂ I₂ N₂ Cl₂ H₂ O₂ F₂

You should know how to go from a name to a formula and a formula to a name. Look in your book if you need extra help or go to

<http://www.chemteam.info/Nomenclature/Nomenclature.html>

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 $\text{HCl} = \text{hydrochloric acid}$
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 $\text{HClO}_2 = \text{Chlorous acid}$.
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 $\text{HClO}_3 = \text{Chloric acid}$.

TABLE OF STRONG ACIDS

Completely Ionized in Water to Give One (*or more*) Protons per Acid Molecule

HI	$\text{H}^+(\text{aq}) + \text{I}^-(\text{aq})$
HBr	$\text{H}^+(\text{aq}) + \text{Br}^-(\text{aq})$
HClO_4	$\text{H}^+(\text{aq}) + \text{ClO}_4^-(\text{aq})$
HCl	$\text{H}^+(\text{aq}) + \text{Cl}^-(\text{aq})$
HClO_3	$\text{H}^+(\text{aq}) + \text{ClO}_3^-(\text{aq})$
H_2SO_4	$\text{H}^+(\text{aq}) + \text{HSO}_4^-(\text{aq})$ (<i>HSO_4^- is a weak acid that contributes additional protons</i>)
HNO_3	$\text{H}^+(\text{aq}) + \text{NO}_3^-(\text{aq})$

TABLE OF STRONG BASES

Completely Ionized in Water to Give One (*or more*) Hydroxides per Base Molecule

NaOH	$\text{Na}^+(\text{aq}) + \text{OH}^-(\text{aq})$
KOH	$\text{K}^+(\text{aq}) + \text{OH}^-(\text{aq})$
LiOH	$\text{Li}^+(\text{aq}) + \text{OH}^-(\text{aq})$
RbOH	$\text{Rb}^+(\text{aq}) + \text{OH}^-(\text{aq})$
CsOH	$\text{Cs}^+(\text{aq}) + \text{OH}^-(\text{aq})$
$\text{Ca}(\text{OH})_2$	$\text{Ca}^{2+}(\text{aq}) + 2\text{OH}^-(\text{aq})$ (<i>but not very soluble</i>)
$\text{Ba}(\text{OH})_2$	$\text{Ba}^{2+}(\text{aq}) + 2\text{OH}^-(\text{aq})$ (<i>but not very soluble</i>)
$\text{Sr}(\text{OH})_2$	$\text{Sr}^{2+}(\text{aq}) + 2\text{OH}^-(\text{aq})$ (<i>but not very soluble</i>)

**Memorize the following Solubility Rule:
All sodium, potassium, ammonium, and nitrate salts are
soluble in water.**

ENJOY YOUR SUMMER! LOOKING FORWARD TO A CHALLENGING
BUT GREAT YEAR OF AP CHEMISTRY!