A.P. Chemistry Summer Homework

Due Friday 8/23/19 (end of 2nd full week of school)
google classroom code: kgk775

The goal of the summer homework is to help you prepare by covering material that you need to know in order to understand the information that I will be presenting in class. The notes are on the basic information covered in first year chemistry and should be a review. The list of polyatomic ions are 78 formulas that we need to know by May. We will be using them all year, so they are extremely important to know. You will need to know them all by memory **by the end of the first quarter.** We will be using the scientific names of many compounds and molecules throughout the year and you must be able to name the basics. Complete the review problems provided on both worksheets.

Materials Needed

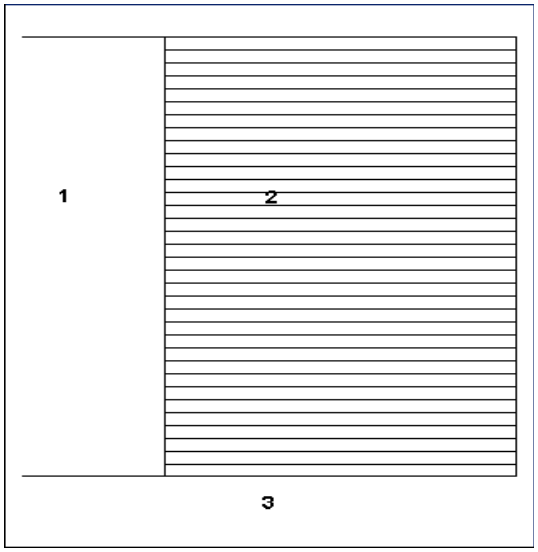
- Textbook: Zumdahl & Zumdahl, Chemistry A.P. Edition
    - Zumdahl, Steven S., and Susan A. Zumdahl. *Chemistry*. Belmont, CA: Brooks/Cole, Cengage Learning, 2014. Print.
- 3- ring binder
- Scientific calculator.
    - Recommended calculator: Texas Instruments TI-30X IIS Scientific Calculator, 10-Digit LCD

Summer Coursework Outline

- Part A: Chapter 2 notes
- Part B: Nomenclature worksheet
- Part C: 78 common ions flashcards

Part A: Chapter 2 Notes

Read chapter 2 in the textbook (pgs 43-69) and take notes on the following pages please follow the format provided below. We will be using cornell style notes to help prepare. If you are unfamiliar with cornell notes please check the format provided below.



Section 1: Include 3 questions based on the notes that you took in section 2. Write any vocabulary terms included in the notes.

Section 2: Take notes on the reading. Use section titles from the textbook and bullet points to organize your notes notes

Section 3: Summarize the information in section

Part B: Complete Nomenclature Worksheets

Using the textbook and chapter 2 notes, complete the following two attached worksheets. I will be posting tutorials on google classroom if you need additional help.

Part C: Flash Cards

Create 72 flashcards for the list of common ions. Write the name on the front and the formula on the back of the card. We will have weekly quizzes on these ions for the first 4 weeks of school.

Front	Back
Acetate	$C_2H_3O_2^-$

From the table:	
Cations	**Name**
H^+	Hydrogen
Li^+	Lithium
Na^+	Sodium
K^+	Potassium
Rb^+	Rubidium
Cs^+	Cesium
Be^{2+}	Beryllium
Mg^{2+}	Magnesium
Ca^{2+}	Calcium
Ba^{2+}	Barium
Sr^{2+}	Strontium
Al^{3+}	Aluminum
Anions	**Name**
H^-	Hydride
F^-	Fluoride
Cl^-	Chloride
Br^-	Bromide
I^-	Iodide
O^{2-}	Oxide
S^{2-}	Sulfide
Se^{2-}	Selenide
N^{3-}	Nitride
P^{3-}	Phosphide
As^{3-}	Arsenide
Type II Cations	**Name**
Fe^{3+}	Iron(III)
Fe^{2+}	Iron(II)
Cu^{2+}	Copper(II)
Cu^+	Copper(I)
Co^{3+}	Cobalt(III)
Co^{2+}	Cobalt(II)
Sn^{4+}	Tin(IV)
Sn^{2+}	Tin(II)
Pb^{4+}	Lead(IV)
Pb^{2+}	Lead(II)
Hg^{2+}	Mercury(II)

Ions to Memorize	
Cations	**Name**
Ag^+	Silver
Zn^{2+}	Zinc
Hg_2^{2+}	Mercury(I)
NH_4^+	Ammonium
Anions	**Name**
NO_2^-	Nitrite
NO_3^-	Nitrate
SO_3^{2-}	Sulfite
SO_4^{2-}	Sulfate
HSO_4^-	Hydrogen sulfate (bisulfate)
OH^-	Hydroxide
CN^-	Cyanide
PO_4^{3-}	Phosphate
HPO_4^{2-}	Hydrogen phosphate
$H_2PO_4^-$	Dihydrogen phosphate
NCS^-	Thiocyanate
CO_3^{2-}	Carbonate
HCO_3^-	Hydrogen carbonate (bicarbonate)
ClO^-	Hypochlorite
ClO_2^-	Chlorite
ClO_3^-	Chlorate
ClO_4^-	Perchlorate
BrO^-	Hypobromite
BrO_2^-	Bromite
BrO_3^-	Bromate
BrO_4^-	Perbromate
IO^-	Hypoiodite
IO_2^-	iodite
IO_3^-	iodate
IO_4^-	Periodate
$C_2H_3O_2^-$	Acetate
MnO_4^-	Permanganate
$Cr_2O_7^{2-}$	Dichromate
CrO_4^{2-}	Chromate
O_2^{2-}	Peroxide
$C_2O_4^{2-}$	Oxalate
NH_2^-	Amide
BO_3^{3-}	Borate
$S_2O_3^{2-}$	Thiosulfate

Naming Molecular Compounds

Chem Worksheet 9-2

Name _____

A **molecular compound** is a group of atoms held together by a covalent bond. Compounds made entirely of non-metals are generally molecular compounds. Carbon tetrachloride, CCl_4, is an example of a molecular compound. When naming these compounds prefixes are used to denote how many of each atom is bonded in the compound. However, the prefix *mono-* is not used with the first element in the compound, even if there is only one element. The ending of the second element in the compound is always changed to *–ide*, in the same way the ending is changed for monatomic anions.

Rules for naming Molecular Compounds

1. Name the first element using the element's full name.
2. Name the second element using the *–ide* ending.
3. Use prefixes to tell how many of each element is present. (do not use the prefix *mono-* on the first element).

Naming Prefixes	
1	mono-
2	di-
3	tri-
4	tetra-
5	penta-
6	hexa-
7	hepta-
8	octa-
9	nona-
10	deca-

Examples

#1. Write the chemical formula for diphosphorus pentoxide

- this compound contains two phosphorus atoms and five oxygen atoms: **P_2O_5**

#2. Name the following compound: IF_7.

- there is <u>one</u> iodine and there are <u>seven</u> fluorine atoms: **iodine heptafluoride**

(the prefix *mono-* is not used on the first element and that the ending of fluorine is changed to *–ide*.)

Fill in the following table with the missing information.

	Formula	Name
1.	SO_2	
2.		Sulfur trioxide
3.	N_2O_4	
4.		Chlorine dioxide
5.	P_4O_{10}	
6.		Carbon disulfide
7.	NO_2	
8.	N_2Cl_4	
9.		Xenon difluoride
10.	S_2Cl_2	
11.		Iodine trichloride
12.	P_2S_5	

	Formula	Name
13.	SF_6	
14.		Tetraphosphorus hexasulfide
15.	SeO_2	
16.		Ammonia
17.		Boron trichloride
18.	N_2O	
19.	BrF_5	
20.		Carbon dioxide
21.		Carbon monoxide
22.	ClF_3	
23.		Iodine monochloride
24.	CH_4	

Naming Ionic Compounds

Chem Worksheet 8-2

Name _____

An **ionic compound** is a combination of oppositely charged ions. Ionic compounds generally contain a metal bonded to a non-metal (or non-metals). When naming ionic compounds we simply name the cation (the positive ion) then the anion (the negative ion). The cations generally retain the name of the element, so Na^+ is named sodium. The **monatomic anions** are formed when a non-metal gains an electron and these ions have an –ide ending, so S^{2-} is named sulfide. There are a group of **polyatomic ions** as well that have their own unique names. A list of these appears below.

Some metals can form more than one positive ion. Copper for example forms Cu^{1+} and Cu^{2+} ion. These ions are named using Roman numerals: copper (I) and copper (II) respectively. Most metals that form more than one type of cation are found in the transition metal family or below the non-metals in the *p*-block.

Rules for naming Molecular Compounds

1. Name the positive ion. Most cations have the same name as their elements.
2. Name the negative ion. Monatomic anions have an –ide ending. Polyatomic anions names' must be memorized.
3. If the positive ion is a transition metal or located on the right side of the table it may have more than one charge. In this case use Roman numerals to designate the charge.

Common Polyatomic Ions	
NH_4^+	Ammonium
OH^{1-}	Hydroxide
CN^{1-}	Cyanide
NO_3^{1-}	Nitrate
ClO_3^{1-}	Chlorate
$C_2H_3O_2^{1-}$	Acetate
SO_4^{2-}	Sulfate
CO_3^{2-}	Carbonate
PO_4^{3-}	Phosphate
HCO_3^{1-}	Bicarbonate
HSO_4^{1-}	Bisulfate

Examples

Name the following compounds:

Formula	Name
NaCl	Sodium chloride
K_2S	Potassium sulfide
$MgSO_4$	Magnesium sulfate
$Mn(OH)_2$	Manganese (II) hydroxide

Write the names for the following ionic compounds.

	Formula	Name
1.	Li_2S	
2.	KF	
3.	Mg_3N_2	
4.	$Ca(OH)_2$	
5.	$Ba(NO_3)_2$	
6.	$CuCl_2$	
7.	PbO	
8.	ZnF_2	
9.	$NaC_2H_3O_2$	
10.	$SrCO_3$	
11.	$CrSO_4$	
12.	Na_3PO_4	

	Formula	Name
13.	$CaBr_2$	
14.	$Ni(CN)_2$	
15.	$Al(NO_3)_3$	
16.	$Sn(OH)_2$	
17.	HgI_2	
18.	$Fe_2(SO_4)_3$	
19.	$Ca(C_2H_3O_2)_2$	
20.	$TiCl_3$	
21.	$KClO_3$	
22.	$ZnCO_3$	
23.	$NaHCO_3$	
24.	$Co(HSO_4)_2$	