

Naming Ionic Compounds HW #1

name: _____

1. Isoelectric means having the same electron configuration as a noble gas. Metals must _____ electrons to get that configuration while non metals must _____ electrons to do so.
2. List the symbols of ALL the noble gases in group 18

In high school we won't see these nonmetal atoms make anions: H, B, C, Si, Te, At

3. List the symbols of ALL of the other non metals that WILL gain electrons to form anions

atom	# protons (atomic number)	ground state e ⁻ configuration	ion e ⁻ configuration (isoelectric to?)	#electrons in ion	ionic symbol
Li		2-1			Li ⁺¹
Be			2		
Na					
Mg	12	2-8-2	2-8 (Ne)	10	Mg ⁺²
K					
Ca		2-8-8-2			
N	7	2-5	2-8	10	N ⁻³
O					
F					
P		2-8-5			
S			2-8-8		
Cl					
Br	35	2-8-18-7	2-8-18-8	36	Br ⁻¹

Compounds HW #2 Naming simple ionic compounds

name: _____

1st name rule: name the metal cation, it is always the same name as the metal atom

2nd name rule: name the non-metal anion, but change the ending to be -ide.

Examples: Oxygen becomes oxide, sulfur becomes sulfide, bromine becomes bromide (etc.).

No matter what the ratio of cations to anions is, we use the single metal name and the single anion name.

For each pair of metals and non metals, write the ions symbols with charges, write the neutral formula for the ionic compound that they form, then, name the compound.

Metal	Non-metal	Cation that forms	Anion that forms	Compound that forms	Compound name
Ba	S	Ba^{+2}	S^{-2}	BaS	Barium sulfide
Rb	N	Rb^{+1}	N^{-3}	Rb_3N	Rubidium nitride
Li	O				
Al	F				
Sr	S				Strontium sulfide
Na	Br				
Ca	O				
Cs	P				Cesium phosphide
Be	O				
Mg	N	Mg^{+2}	N^{-3}		
K	O				
Na	P				Sodium phosphide

Molecular compounds are made when 2 or more non metals bond together by sharing electrons to form a new compound. Metal atoms or cations do not make molecular compounds, only non-metals do this. To name these compounds we use the prefix method, in our class we need to name and recognize up to 10 atoms of any one kind, which means we need to know how to “count” to ten in “prefixes”. Mono is first, write the prefixes for 2-10:

The rules to naming molecular compounds are summed up using 3 common substances. Their formulas are:

Name these, or write their formulas:

N_2O_5		Hydrogen mono iodide	
SO_3		silicon difluoride	
PCl_3		dinitrogen monoxide	
NF_4		fluorine monobromide	
PBr_3		arsenic trichloride	
CCl_4		sulfur dioxide	
H_2S		phosphorous pentabromide	
I_4F_7		diarsenic decabromide	
$SeCl_4$		tritellurium dichloride	

Compound HW #4 Naming Transitional Metal compounds

name: _____

Transitional metals make cations like other metals. Many of these can make more than one kind of stable cation, which is very different from metals in groups 1 and 2 and Al. If there is more than one + numbered ion in the atom's box on the periodic table, then each of these is a possible cation charge.

Atom 26, iron has a +2 and +3 ion charge listed. That means that iron can make Fe^{+2} or Fe^{+3} cations. We call these, Iron (II) cation, and the Iron (III) cation. The ROMAN NUMERAL matches to the charge of the ion. Atom 30 is Zinc, but it has just a +2 charge, it can only make the Zn^{+2} cation.

When these different iron ions, and zinc combine with the anion for oxygen (oxide, or O^{-2}) they do so this way: Fe^{+2} and O^{-2} forms FeO or Iron (II) oxide. Fe^{+3} and O^{-2} forms Fe_2O_3 or Iron (III) oxide. Zn^{+2} and O^{-2} forms ZnO or zinc oxide, without any roman numeral. Since it only makes one kind of ion, it makes only one kind of zinc oxide. There is nothing to differentiate, no need to clarify "which" zinc ion is being used.

Name these compounds or write their formulas

CuS		tin (IV) fluoride	
Ni_2O_3		niobium (V) phosphide	
PbO_2		bismuth (III) chloride	
PbO		iron (III) oxide	
TiCl_4		iron (II) oxide	
CrO_3		gold (I) sulfide	
MnS_2		gold (III) selenide	
Mn_2S_7		yttrium oxide	
TaI_5		silver sulfide	

Naming Compounds Homework #5

name: _____

Write in the formulas, or names, or ions with charges, as requested. This is BIG, it counts for 25 HW points, because it's long (no complaints) and you must know this in order to find future success in this course. Good luck. Use your reference tables, put fingers in the right boxes!

cations	anions	formulas
		$\text{Fe}(\text{NO}_3)_2$
		$\text{Fe}(\text{OH})_3$
		AuOH
		$\text{Ir}(\text{NO}_3)_4$
		Li_3P
		$\text{Al}_2(\text{SO}_4)_3$
		$(\text{NH}_4)_2\text{O}$
		$(\text{NH}_4)_3\text{N}$
formulas	STOCK NAMES	
	dinitrogen trisulfide	
	carbon tetrabromide	
	hydrogen monoiodide	
	silicon tetrafluoride	
	boron mononitride	
	carbon diselenide	

cations	anions	formulas
Tin II	chlorate	
Tin IV	chlorite	
palladium IV	sulfite	
tungsten	oxide	
Lead II	permanganate	
Lead IV	carbonate	
Osmium III	carbonate	
Osmium IV	permanganate	
formulas	STOCK NAMES	
AsCl_3		
SF_4		
PI_5		
B_2O_3		
SiO_2		
SeBr_6		

	atom	ground state electron configuration	possible excited state electron configuration	electron configuration as an ION	This is isoelectric to which noble gas?
1	Mg				
2	S				
3	F				
4	K				
5	N				

	Make up an example for each Combine a...	cation	anion	formula	name
6	monoatomic cation + monoatomic anion				
7	monoatomic cation + polyatomic anion				
8	polyatomic cation + monoatomic anion				
9	polyatomic cation + polyatomic anion				
10	transitional metal cation + monoatomic anion (with Roman Numeral)				
11	transitional metal cation + polyatomic anion (without a Roman Numeral!)				
12	Si + F into a molecular compound (your choice which one)				