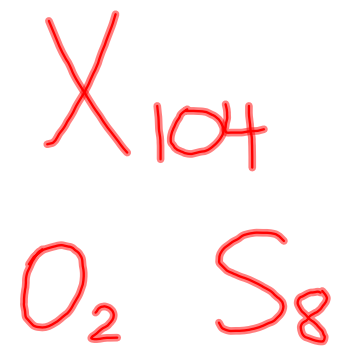
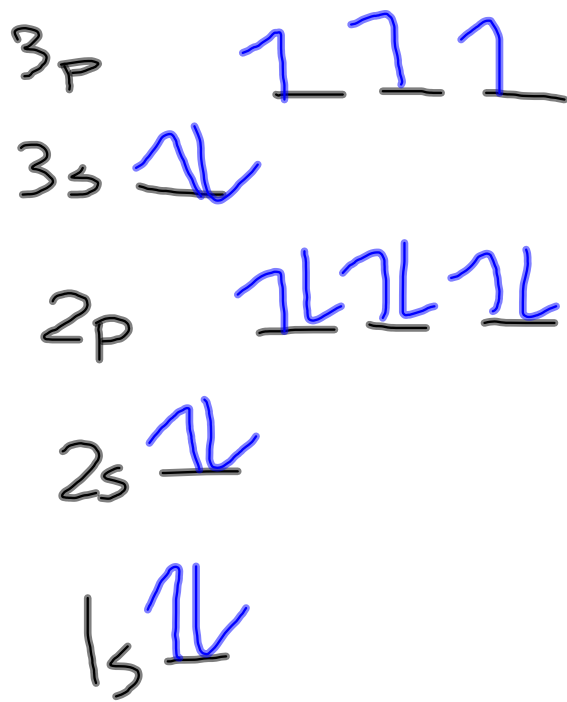


Unit 2 - Compounds

- Introduction
- Ionic Compounds
- Molecular Compounds
- Acids and Bases

**NAMES
&
FORMULAS**



Unit 2 - Compounds

COMPOUNDS are conventionally divided into three classes:

(1) **metal - nonmetal** (ionic compounds)

Ex. salt **NaCl**

(2) **nonmetal - nonmetal** (molecular compounds)

Ex. sulfur dioxide **SO₂**

(3) **metal - metal** (intermolecular compounds)

Ex. brass Cu - Zn

**we will not
be studying
metal-metal**

"tested"



Empirical Definitions

Ionic Compounds - solids at SATP

- when dissolved in water they conduct electricity

- no change in litmus paper

Periodic Table of the Elements

	I A																										0
1	1																	2									
	H																	He									
	1.00794																	4.0026									
2	3	II A															5	6	7	8	9	10					
	Li	Be															B	C	N	O	F	Ne					
	6.941	9.01219															10.811	12.011	14.0067	16.00	18.9984	20.1797					
3	11	Mg													13	14	15	16	17	18							
	Na	Mg													Al	Si	P	S	Cl	Ar							
	22.9999	24.305													27.99	28.086	30.974	32.066	35.453	39.948							
4	19	Ca	III B	IV B	VB	VB	VIB	VIB	VII	IB	1B	30	31	32	33	34	35	36									
	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr									
5	37	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe									
	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe									
6	55	Ba	* La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn									
	Cs	Ba	* La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn									
7	87	Ra	+ Ac	Rf	Ha	106	107	108	109	110																	
	Fr	Ra	+ Ac	Rf	Ha	106	107	108	109	110																	

• Lanthanide Series

+ Actinide Series

58	59	60	61	62	63	64	65	66	67	68	69	70	71
Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
90	91	92	93	94	95	96	97	98	99	100	101	102	103
Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

Ionic Compounds

Formula unit - of an ionic compound is the smallest amount of the compound that has the composition given by the chemical formula.

Ex. one Na^+ and one Cl^- form **NaCl**

one atom!

Monatomic ions - single atoms that have gained or lost electrons

Ex. Na^+ or F^-

Binary ionic compounds - are composed of monatomic ions.

Ex. $\text{Na}^+ + \text{Cl}^- \rightarrow \text{NaCl}$

many atoms!

Polyatomic ion - a cation or anion that is composed of a group of atoms with a net positive or negative charge.

Ex. NO_3^-

(back of periodic table)

Multivalent ion - some atoms (transition elements) can form more than one ion, each with its own particular charge.

Ex. Fe^{2+} and Fe^{3+}

Hydrate - compounds that decompose at relatively low temperatures to yield water and another associated compound (usually ionic)

- the water is loosely held to the ionic compound.

Ex. $\text{Cu}^{2+}\text{SO}_4^{2-} \cdot 5\text{H}_2\text{O}$

$\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$

Anhydrous - the form of a hydrate with the water removed.

Ex. $\text{CuSO}_{4(s)}$

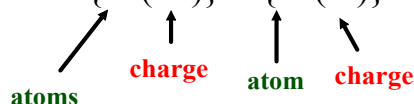
Ionic Formulas

" The net electrical charge in a theoretical chemical formula is zero (see Table 3.3)

Therefore the sum of the charges on the positive ions (cations) must equal the sum of the electrical charges on the negative ions (anions)

Ex. Na_2O

$$\{2*(+1)\} + \{1*(-2)\} = 0$$



CHEMICAL NAMES AND FORMULA'S

Type I Binary Ionic Compounds

Binary Compounds - are compounds containing only two elements. In naming binary compounds, place the name of the cation (metal) followed by the name of the anion (nonmetal) with the suffix -ide added.

Ex. AlCl_3



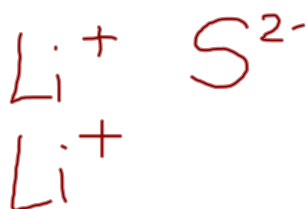
Writing the chemical symbol from the name

RULE:

[a] write the chemical symbol, with its charge, for each of the two ions in the name.

[b] predict the simplest whole number ratio of ions to obtain a net charge of zero.

Ex. lithium sulfide



Homework

Chapter 9 p. 252 - 285

p. 256 #1, 2

p. 258 #4, 5, 7-9