IUPAC Nomenclature or Name That Compound (cpd)

Question 1

- Is the compound **Ionic** or **Covalent**?

transfere⁻ M → NM

Ionic metal to nonmetal

Covalent nonmetal to nonmetal NM–NM share e⁻

Therefore **you must identify** the first element.

Identify the following as Ionic (I) or Covalent (C):

$MgCl_2$ I

N_2O_4 C

H_2SO_4 C

$AuPO_4$ I

H_2S C

SiO_2 C

Question 2

- Is the compound **Binary**?

Binary Cpd 2 elements

Ending "IDE"

Binary Covalent AKA Molecular Cpd then say "Thank you Chemistry Gods!!"

= molecules

- Non-metal to non-metal
- **Prefices**!!!!!
- Memorize them!

Mono—Di—Tri—Tetra—Penta—Hexa—Heptha—Octa—Nona--Deca

First Element full name

numerical prefix

NO MONO

CO CO_2

Second Element chopped & "IDE"

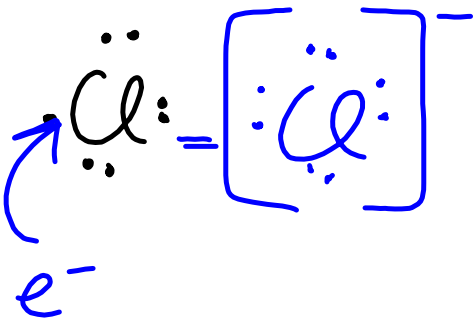
all numerical prefices

e.g. N_2O N_2O_4 NO_2 N_2O_5

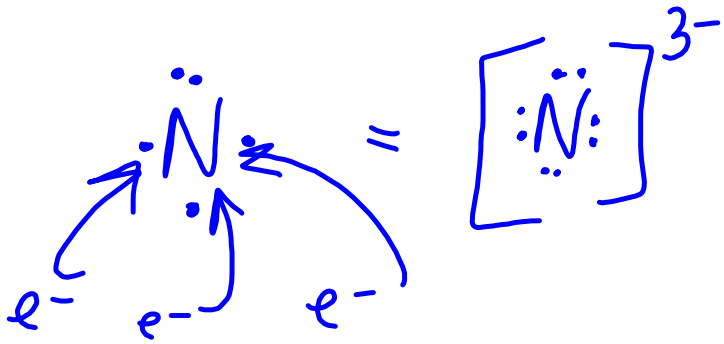
dinitrogen monoxide | dinitrogen tetroxide | nitrogen dioxide | dinitrogen pentoxide

Non-metals gain or share electrons to become negative ions--ANIONS!

e.g. Cl atom



e.g. N atom



Group I, II or III Ionic Cpd or "Normal" Ionic Cpd

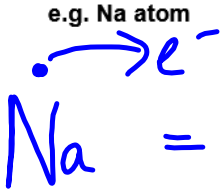
NORMAL

- Metal to non-metal
- Put **charges** in place
- Obtain charges from the Periodic Table

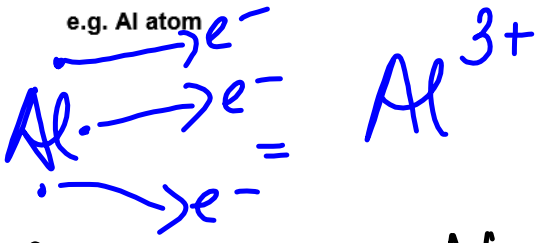
charges M → NM

Metals lose electrons to become positive ions--CATIONS!

e.g. Na atom



e.g. Al atom



First Element full name

Second Element chop "IDE"

NaCl

e.g. NaCl sodium chloride Mg_3N_2 magnesium nitride Al_2O_3 aluminum oxide

calcium nitride

3 Ca atoms each

English sentence as to what just happened!!

lost 2e⁻ to 2 N atoms who each gained 3e⁻

2 ele

Binary Transitional Metal Cpd = Ionic!! All about the charges!!

- Identify the **charge** on the non-metal first.
- Figure out how many electrons the metal would have to lose to satisfy the non-metal's needs!!!!!

First Element full name

Then!! # = Roman = # of e^- lost = charge on the metal

Second Element chop + -IDE

e.g. $Cu_1O_1^{2-}$ ($2+$) copper(II) oxide

$Cu_2O_1^{2-}$ ($1+$) copper(I) oxide

iron(III) sulfide $Fe_2^{3+}S_3^{2-}$

gold(III) phosphide $Au^{3+}P^{3-}$

Question 3

- Is it a **Ternary** cpd?

Ternary Cpd 3 elements

Ending "ATE" for now!

Most of the terrnary cpds are ionic so they are named exactly like "normal" ionic cpds and transitional metal ionic cpds.

e.g. $Mg(NO_3)_2$ magnesium nitrate

$Pb^{2+}(ClO_3)_2^{1-}$ lead(II) chlorate

iron(III) carbonate $Fe_2^{3+}(CO_3)_3^{2-}$

potassium sulfate $K_2^+SO_4^{2-}$

$K_2^+SO_3^{2-}$

Other Stuff

Hydrogen (the Freak) Cpds are <u>covalent</u> but are named as if Gr 1A ionic!!

e.g. $HCl_{(g)}$ NaCl HBr H_2S

$HCl_{(aq)}$ A

hydrogen chloride hydrogen bromide hydrogen sulfide

Metalloid Cpds are named as if the first element were a non-metal therefore as covalent.

e.g. $SiCl_3$ silicon trichloride

"Right Angle Triangle" Compounds—have only 1 valence and therefore have no (#).

$Ag^{+}NO_3^{-}$ silver nitrate

$Zn_3^{2+}N_2^{3-}$ zinc nitride

Exceptions nitride

NaOH sodium hydroxide

KCN potassium cyanide