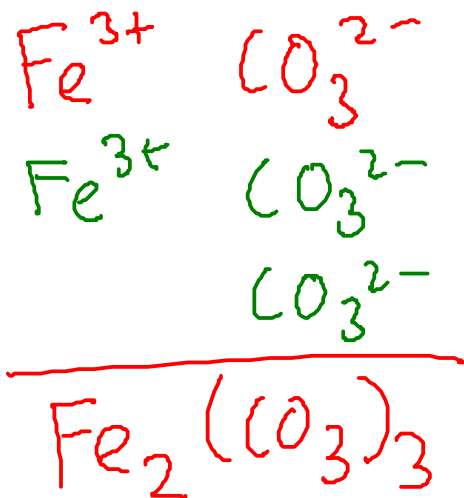


DETERMINING THE FORMULA OF AN IONIC COMPOUND FROM THE NAME

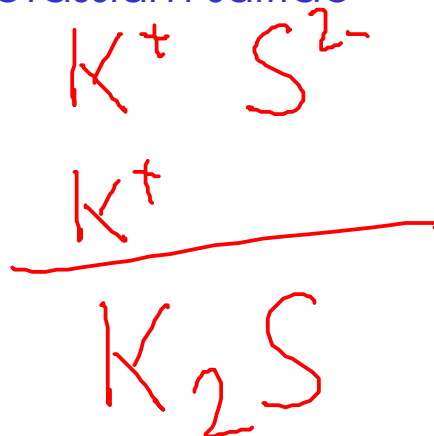
- The name of an ionic compound is made of the names of the CATION and ANION in the compound.
- To get the FORMULA, you must figure out the SMALLEST RATIO of cation to anion that makes the charges balance out

Examples:

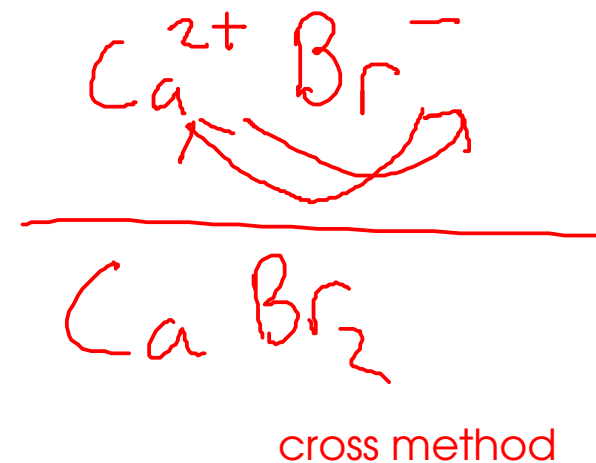
iron(III) carbonate



potassium sulfide

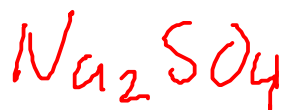


calcium bromide

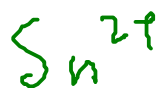


DETERMINING IONIC FORMULAS

sodium sulfate



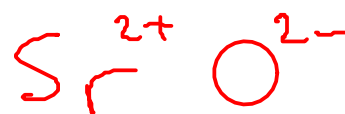
tin(II) phosphate



barium hydroxide



strontium oxide



chromium(III) nitrate



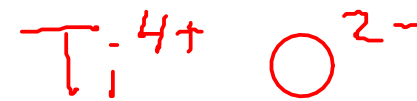
titanium(IV) chloride



chromium(III) nitride



titanium(IV) oxide



Be careful with polyatomic ions that don't end in subscripts. You still need parenthesis to indicate more than one of these polyatomics. Most common: hydroxide or cyanide.

MOLECULAR COMPOUNDS

- There are several kinds of molecular compound. We will learn to name two simple but important classes

① BINARY MOLECULAR COMPOUNDS

- molecular compounds containing only two elements

② ACIDS

- molecular compounds that dissolve in water to release H^+ ions
- corrosive to metals (react with many to produce hydrogen gas)
- contact hazard: can cause chemical burns to eyes and skin
- sour taste
- turn litmus indicator RED
- two kinds of acids:

① BINARY ACIDS

- contain hydrogen and one other element

usually
Group VIIA

② OXYACIDS

- contain hydrogen, OXYGEN, and another element

BINARY MOLECULAR COMPOUNDS

- Named based on the elements they contain, plus prefixes to indicate the number of atoms of each element in each molecule

① FIRST ELEMENT

- Add a GREEK PREFIX to the name of the element.
- Omit the "MONO-" (1) prefix if there is only one atom of the first element

② SECOND ELEMENT

- Add a GREEK PREFIX to the STEM NAME of the element
- Add the suffix "-ide" (as if you were naming an anion)
- DO NOT omit the "mono-" prefix if there is only one atom of the second element

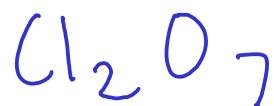
MEMORIZE THE GREEK PREFIXES. SEE COURSE WEB SITE FOR A LIST!

BINARY MOLECULAR COMPOUNDS

Examples:



boron trifluoride

dichlorine
hept(a)oxidecarbon
monoxidecarbon
dioxide H_2O dihydrogen monoxide (... but we always use "water")

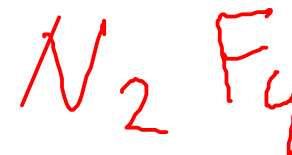
carbon tetrachloride



iodine trichloride



dinitrogen tetrafluoride



This one is magnesium CHLORIDE, not magnesium DICHLORIDE, Why not?
It's IONIC ... and should be named using the ionic naming system we
discussed before.

(How can we tell? Remember, ionic compounds usually contain a metal, and
molecular compounds usually don't!)

ACIDS

① BINARY ACIDS

- named after the element (other than hydrogen) they contain
- common binary acids include a Group VIIA element
- named: "Hydro-" + STEM NAME OF ELEMENT+ "-ic acid"

Four
common
binary
acids

HF : hydrofluoric acid ✖ dissolves glass!

HCl : hydrochloric acid ✖ most common binary acid!

HBr hydrobromic acid

HI : hydroiodic acid

② OXYACIDS

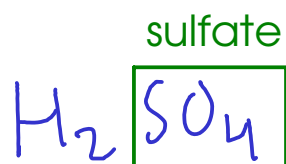
- Easy to think about as HYDROGEN IONS combined with POLYATOMIC IONS

- These acids are not true ionic compounds, but they interact with water to PRODUCE ions!

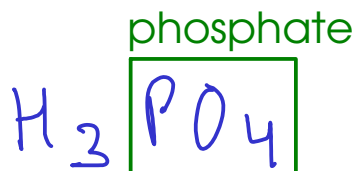
- named based on the polyatomic ion they contain, with an ending change:

① - ions ending in -ATE form acids ending in -IC

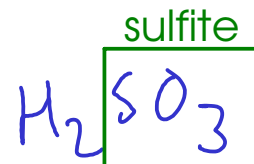
② - ions ending in -ITE form acids ending in -OUS



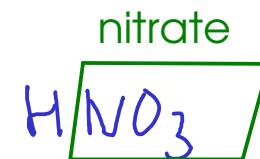
sulfuric acid



phosphoric acid



sulfurous acid

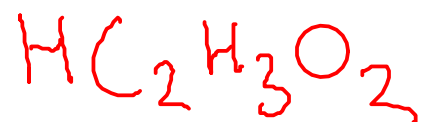
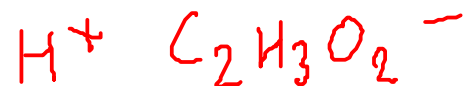


nitric acid

OXYACID EXAMPLES

acetic acid

└ based on ACETATE ion



nitrous acid

└ based on NITRITE



carbonic acid

└ based on CARBONATE



* The number of hydrogen ions to add to the polyatomic to make the acid equals the charge of the polyatomic.