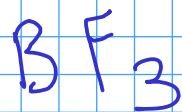
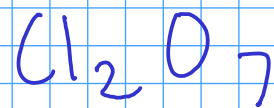


BINARY MOLECULAR COMPOUNDS

Examples:



boron trifluoride



dichlorine hept(a)oxide

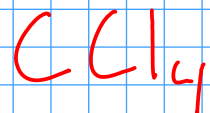


carbon monoxide

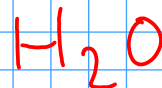


carbon dioxide

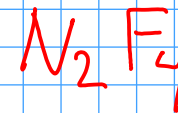
carbon tetrachloride



dihydrogen monoxide



dinitrogen tetrafluoride



MgCl_2 : "magnesium chloride", NOT "magnesium dichloride". Why not? This compound contains a METAL and a nonmetal. It's IONIC.

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

ACIDS

② OXYACIDS

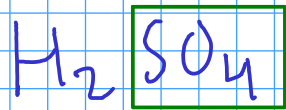
- Easy to think about as HYDROGEN IONS combined with POLYATOMIC IONS

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

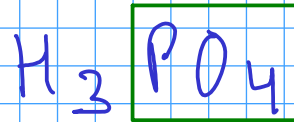
- named based on the polyatomic ion they contain, with an ending change:

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

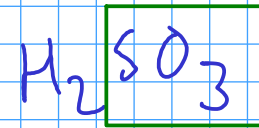
② - ions ending in -ITE form acids ending in -OUS



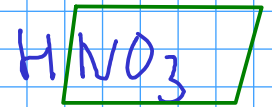
sulfuric acid



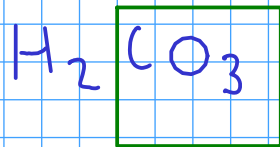
phosphoric acid



sulfurous acid



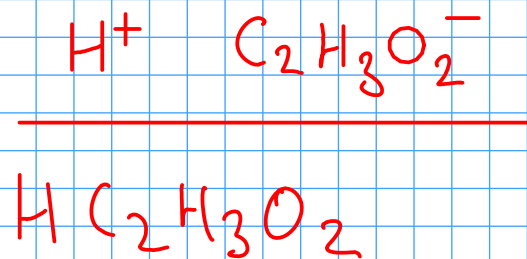
nitric acid



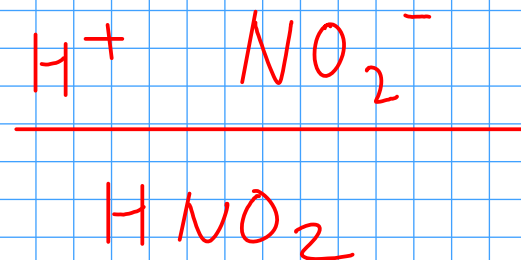
carbonic acid

OXYACID EXAMPLES

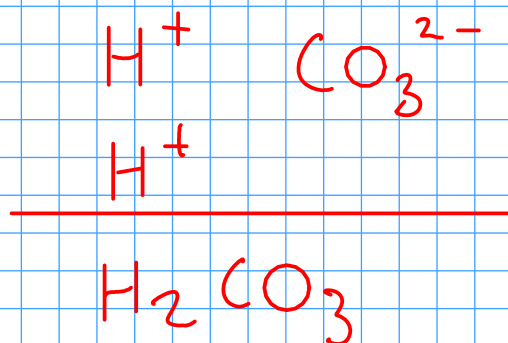
acetic acid



nitrous acid



carbonic acid



SUMMING UP CHEMICAL NOMENCLATURE

- You need to be able to tell, by looking at a name OR a formula, what kind of compound you are working with!

DON'T GET THE NAMING SYSTEMS MIXED UP! EACH KIND OF COMPOUND IS NAMED WITH ITS OWN SYSTEM!

FROM A CHEMICAL NAME

- If the name has a Roman numeral, the name of a metal, or "ammonium", the compound is likely IONIC
- If the name has a Greek prefix, the compound is BINARY MOLECULAR
- If the name contains the word "acid":
 - ... and starts with "hydro-", then the compound is a BINARY ACID
 - ... and does not start with "hydro-", the compound is an OXYACID

FROM A CHEMICAL FORMULA

- if the formula contains a metal or the NH_4^+ ion, it is likely IONIC
- If the formula starts with H and is not either water or hydrogen peroxide, the compound is likely an ACID. Which kind?
 - BINARY ACIDS contain only two elements
 - OXYACIDS contains oxygen
- If the formula contains only nonmetals (and is not an ammonium compound or an acid), the compound is likely MOLECULAR

Examples:

PCl_3 : BINARY MOLECULAR
Name: phosphorus trichloride

NH_4Cl : IONIC (ammonium ion)
Name: ammonium chloride

H_3PO_4 : OXYACID (hydrogen, phosphate)
Name: phosphoric acid

$\text{Fe}_2(\text{SO}_4)_3$: IONIC (iron - metal!)
Name: iron(III) sulfate

