

## NAMING IONIC COMPOUNDS

- The name of the compound is based on the name of the ions in the compound
- Cation first, anion second

Examples:



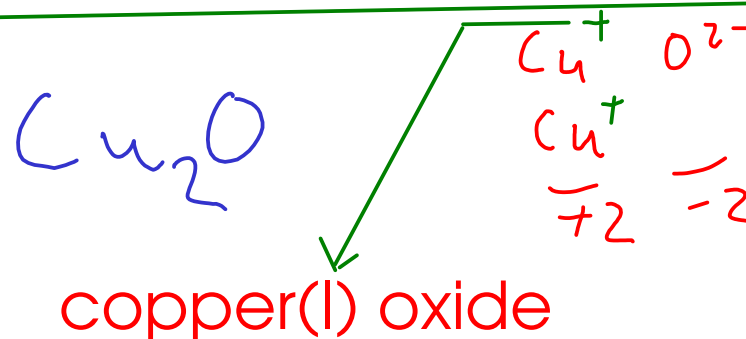
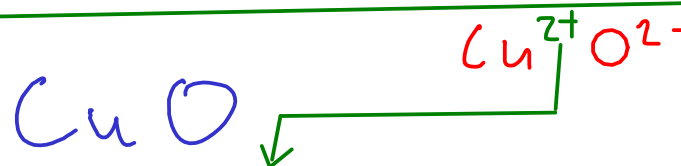
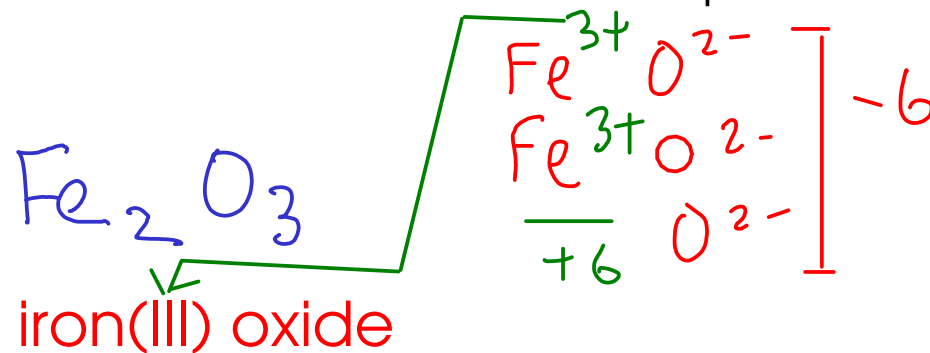
magnesium hydroxide



sodium sulfide



barium phosphate



\* Remember to include the Roman numeral for CHARGE when you're writing transition metal compound names!

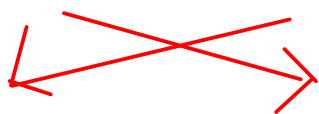
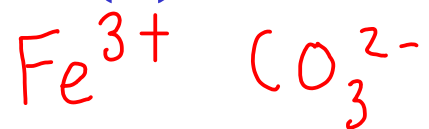
(See Openstax p 100 for a chart of polyatomic ions)

## 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
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Examples:

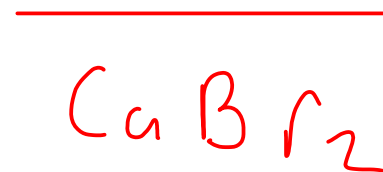
iron(III) carbonate



potassium sulfide



calcium bromide

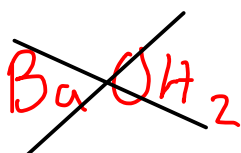


## DETERMINING IONIC FORMULAS

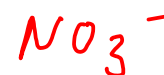
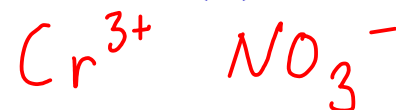
tin(II) phosphate



barium hydroxide



chromium(III) nitrate



titanium(IV) chloride

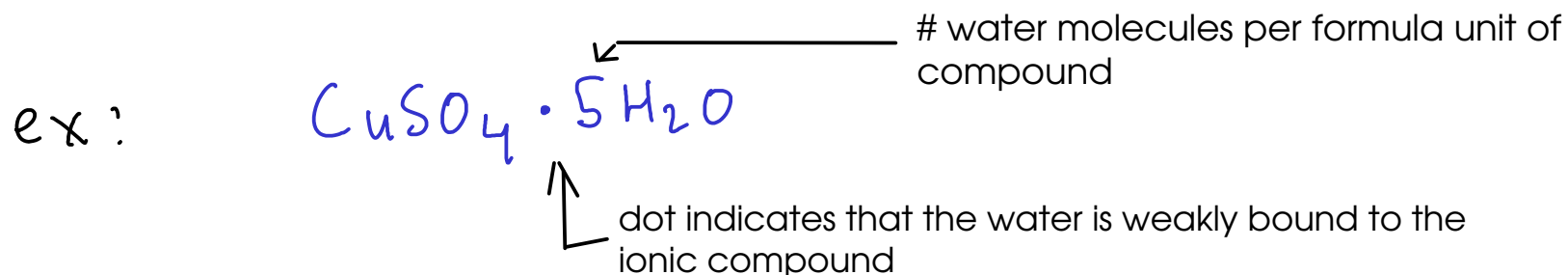


When indicating MORE THAN ONE polyatomic ion in a formula, you MUST enclose the polyatomic in parenthesis before adding the subscript. Watch out for CYANIDE, HYDROXIDE, and HYPOCHLORITE ions here!

## HYDRATES

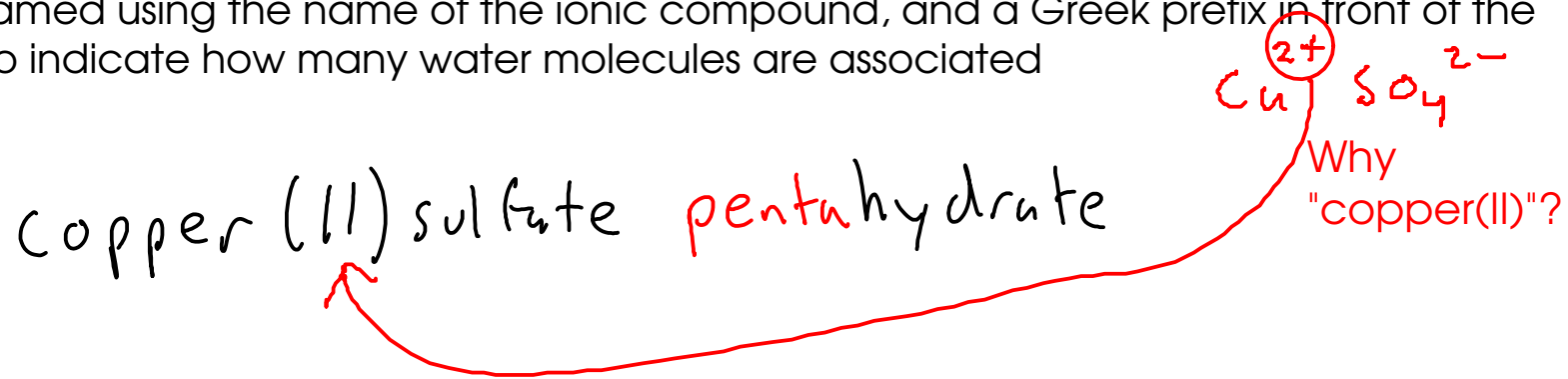
- many ionic compounds are formed by crystallizing the compound from water. Sometimes, this causes water molecules to become part of the crystal structure.

- This water is present in a definite ratio to the ions in the compound. Can be removed by heating, but will NOT evaporate if the compound is left standing.



- many DESSICANTS are hydrates that have had their water molecules driven off. They will slowly reabsorb water from the air (and keep the environment in a dessicator at a low humidity)

- Hydrates are named using the name of the ionic compound, and a Greek prefix in front of the word "hydrate" to indicate how many water molecules are associated



## 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

#### ② OXYACIDS

- contain hydrogen, OXYGEN, and another element

Usually from  
Group VIIA



## 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

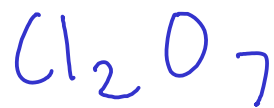
SEE COURSE WEB SITE FOR A LIST OF GREEK PREFIXES!  
THESE ARE THE SAME PREFIXES USED FOR THE HYDRATES!

## BINARY MOLECULAR COMPOUNDS

Examples:



boron  
trifluoride



dichlorine  
heptaoxide



carbon  
monoxide



carbon  
dioxide

\*Note: metalloids like boron behave chemically like nonmetals do.

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carbon tetrachloride



dihydrogen monoxide



dinitrogen tetrafluoride

