Aim: How do we get the name of a binary ionic compound?

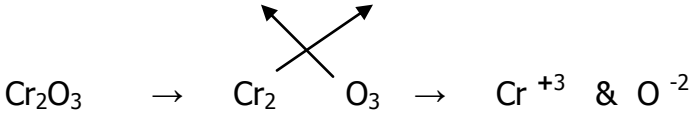
Given**: Cr_2O_3** What is the chemical name of this compound?

1st) Write the names of the elements side by side. (Refer to Table S, if you don't know them.) The element on the left side of the formula comes first.

chromium oxygen **ide**

2nd) Change the ending of the 2nd element to -**ide**

3rd) Going backwards, **"cross-criss"** to get the oxidation states of the elements. Write in the **+** and **–** signs; the first element is always positive.

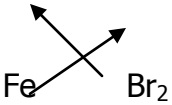


4th) If the **first** element has multiple oxidation states, write a Roman Numeral to indicate its oxidation state in the compound.

Cr can be $^{+2}$ or $^{+3}$. Since it's +3 in this compound, you must write chromium (III).

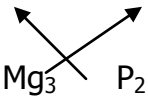
Answer: **chromium (III) oxide**

More examples:

$FeBr_2$  Fe^{+2} & Br^{-1}

Since Fe can be $^{+2}$ or $^{+3}$, you must write a Roman Numeral to indicate its oxidation state in this compound.

Answer: **iron (II) bromide**

Mg_3P_2  Mg^{+2} & P^{-3}

Since Mg has only one oxidation state, don't write (II).

Answer: **magnesium phosphide**

Chemistry 1 / Chille — Formula Writing 2

It's a "Cross-Criss" — Going in reverse direction, subscripts become oxid. states

Name the following compounds & indicate the charges of the ions involved.

1) Fe_2S_3 (+3, −2)

NOTE: Fe^{+2} II, Fe^{+3} III — Iron (III) sulfide

Since Fe has more than one oxid. state, you must write a Rom. Num'

2) $BaCl_2$ (+2, −1)

Ba^{+2}

Don't write a Rom. Num' if it has only (1) oxid. state — Barium Chloride

3) SnO_2 (+2, −1)

Problem: O can't be -1.

5th) Check the Periodic Table. If the oxidation state of an element you got from "cross-criss" is wrong, do the following:

a) correct the oxidation state by multiplying or dividing
b) then do the same to the oxidation state of the other element

For example,

$SnO_2 \rightarrow Sn \; O_2 \rightarrow Sn^{+2}$ & O^{-1} This is wrong. Oxygen can't be -1; it must be -2.

Therefore, $O^{-1} \times 2 = O^{-2}$, & $Sn^{+2} \times = Sn^{+4}$. Answer: **tin (IV) oxide**

OK, let's do another one. Refer to problem f) on the bottom of today's handout.

f) HgO

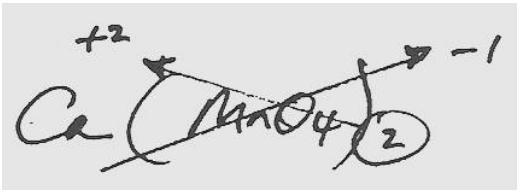
$Hg^{+1}O^{-1}$ If $O^{-2} \rightarrow Hg^{+2}$

Mercury (II) oxide

I. CROSS-CRISS with "POLYS"

given formula, write name:

$Ca(MnO_4)_2$

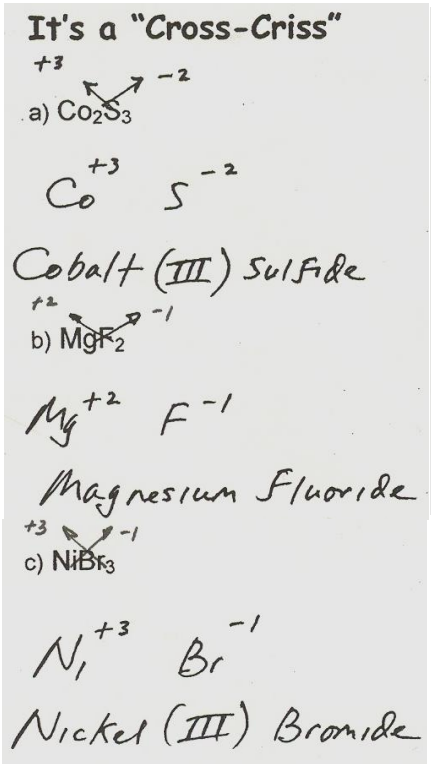


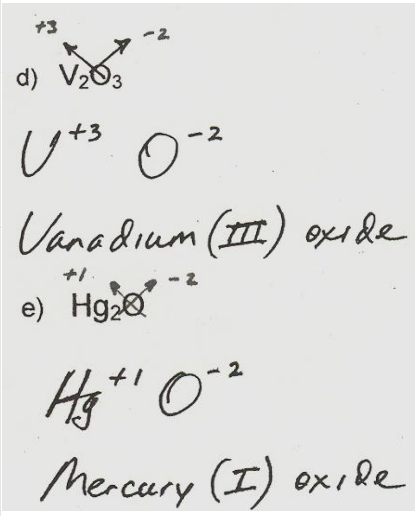
Answer: calcium permanganate

$Mn_2(Cr_2O_7)_3$

Answer:manganese (III) dichromate

Let's finish the handout.





Let's go to today's HW sheet!

NAMING IONIC COMPOUNDS

Name the following compounds using the Stock Naming System.

1. $CaCO_3$ _____

NO !

WHY not? polyatomic ion

How can you tell? The formula contains more than 2 elements. Go to Table E.

For "polys", you can "cross-criss" only subscripts that are outside the parentheses.

Answer: **$CaCO_3$** is **calcium carbonate.**