

Writing Formulas and Naming Ionic Compounds

REMEMBER: Ionic compounds are made up of a metal and a nonmetal.

1. Writing Formulas for Ionic Compounds

- Write the symbol of the positive element and its oxidation number.
- Write the symbol for the negative element and its oxidation number.
- If the oxidation numbers are equal and opposite, then rewrite the symbols in the above order without subscripts and oxidation numbers.

Eg. Sodium and Chlorine



- If the oxidation numbers are NOT equal and opposite criss-cross the oxidation numbers, so that the numbers become subscripts.

***Note - Do not pull the charges with the numbers when you criss-cross.

Eg. Lead (IV) and Oxygen



- Simplify the subscripts if necessary.

Eg. (2 and 4 can be simplified to 1 and 2—both are divisible by 2)



necessary after Pb. The presence of the element in the chemical formula indicates there is at least one atom of the element present.)

- Check to see if the total number of atoms has a sum of zero.

1 atom of Lead with a 4+ oxidation number and 2 atoms of oxygen with a 2- oxidation number can be represented mathematically:

$$\begin{aligned} 1(+4) + 2(-2) &= \\ (+4) + (-4) &= 0 \end{aligned}$$

2. Naming Ionic Compounds

- Write the name of the positive element.
- If an element has more than one oxidation number, then place () after the name of the first element. You will need to place a roman numeral in the () to indicate the oxidation number. (You can find out if an atom has more than one oxidation number by looking at the periodic table in your planner.) If the atom has only one oxidation number, you DO NOT need roman numerals.
- Write the root of the negative (second) element and add the ending of *-ide*.

Some negative elements with -ide endings.

Element Name	nitrogen	phosphorus	oxygen	sulfur	fluorine	chlorine	bromine	iodine
-ide ending	nitride	phosphide	oxide	sulfide	fluoride	chloride	bromide	iodide

- To find the oxidation number of the positive element with more than one oxidation number, do a reverse criss-cross and check to negative element. Or you can set up a mathematical calculation, like the check, placing "x" as the oxidation number for the positive element, and solving for "x".

****NOTE: DO NOT USE PREFIXES IN THE NAMES OF IONIC COMPOUNDS!!!!**