

### 3.4 Naming Ionic Compounds

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10:24 AM

The names of ionic compounds are usually the metal followed by the nonmetal name. In the case of polyatomic ions, you use the appropriate name for the form present.

NaO = Sodium Oxide

NaCl = Sodium Chloride

Li<sub>3</sub>PO<sub>4</sub> = Lithium Phosphate

Mg(ClO)<sub>2</sub> = Magnesium Hypochlorite

**Note you do not need to denote the number of each atom present in the formula unit, since it can be deduced from the type of ion.**

Try the following:

A. Ca(NO<sub>3</sub>)<sub>2</sub> = Calcium Nitrate

B. K<sub>2</sub>O = Potassium Oxide

C. LiN = Lithium Nitride

D. Rb<sub>4</sub>SiO<sub>4</sub> = Rheubidium Silicate

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It isn't always so nice and neat, once you get into the transition metals and the metals of Groups IIIA-VIA, many of these exhibit multiple charge states and therefore can have multiple formula units.

Fig 3.24

For example, there is both a CuCl and CuCl<sub>2</sub>...

How can this be, this would mean that sometimes Copper is a +1 cation and sometimes it is a +2 cation... exactly.

We have to have a way to distinguish between these two types of compounds. There are a few ways to do this. The preferred way is simply to designate the charge in the name with roman numerals. Such as...

CuCl = Copper (I) Chloride  
CuCl<sub>2</sub> = Copper (II) Chloride

There is another way, an older but still used methodology, where the lower charge ends the metal is *-ous* and the higher charge ends the metal in *-ic*. Therefore you would get...

CuCl = Copper (I) Chloride = Cuprous Chloride  
CuCl<sub>2</sub> = Copper (II) Chloride = Cupric Chloride

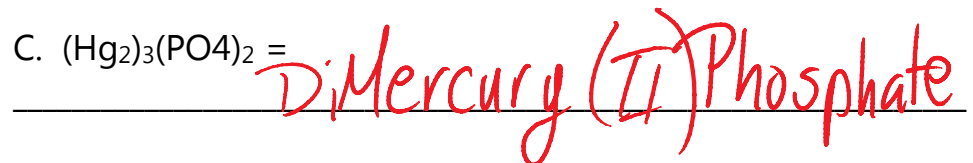
This gets even weirder because the names of the metals don't always match the element.

FeCl<sub>2</sub> = Iron (II) Chloride = Ferrous Chloride  
FeCl<sub>3</sub> = Iron (III) Chloride = Ferric Chloride  
SnO = Tin (II) Oxide = Stannous Oxide

#### PROBLEMS

A. CrO = Chromium (II) Oxide

B. Co(NO<sub>2</sub>)<sub>3</sub> = Cobalt (III) Nitrite



**I advise sticking to the numbering system since it is valid and easier to make sense of. The other system is used and you should be aware of it, but is outdated.**

**Know Figure 3.24**