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# Binary Ionic Compounds

- When making a binary compound the metal is listed first and the nonmetal is listed second
  - NaCl – Sodium is the positive ion and Chlorine is the negative ion
  - CaF – Calcium is the positive ion and Flourine is the negative
  - BaBr – Barium is the positive ion and Bromine is the negative one

# Try These

- Write the correct chemical formula for the ionic compounds containing the following elements
  - Fluorine and Lithium
  - Strontium and Sulfur
  - Aluminum and Nitrogen
  - Phosphorus and Boron
  - Tellurium and Radium

# Naming Binary Ionic Compounds

- When naming these compounds, the name of the positive ion stays the same while the negative ion changes from –ium so to –ide
  - MgN – Magnesium Nitride
  - NaCl – Sodium Chloride
  - BaBr – Barium Bromide
  - LiF – Lithium Fluoride

# Try These on your Own

- SnS
- BeO
- RbI (that is a capital I on the end there)
- BaTe

# To Determine the formula for Ionic Compounds

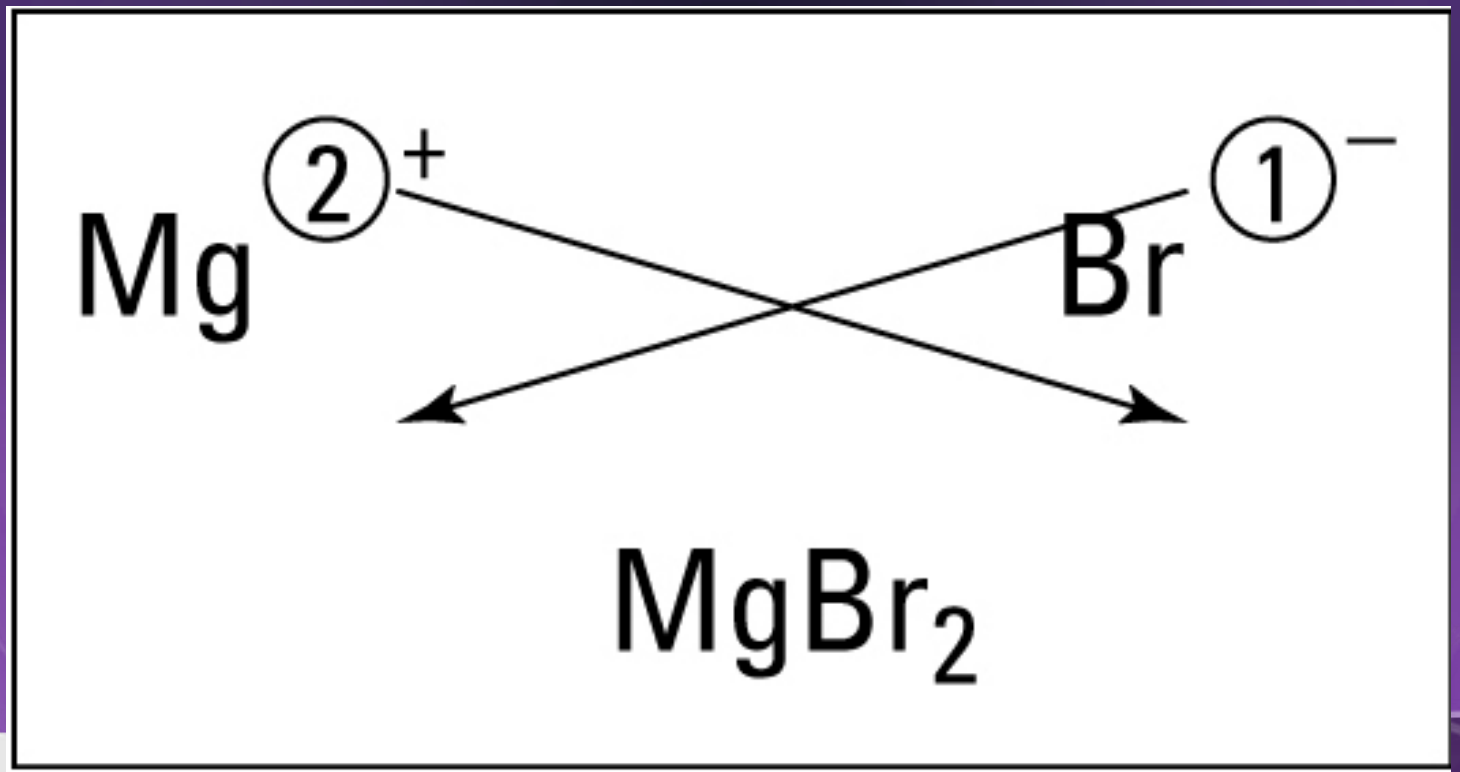
- The charge on the final molecule should be neutral.
- If you combine an element that will lose 2 electrons with one that will gain only 1 electron, there will have to be two of the element that only gains 1 electron so that the charge will be neutral
- Magnesium and Bromine
  - Magnesium has two valence electrons that it will lose. Bromine has 7 valence electron so it can only gain 1. Mg will be a $^{2+}$ Ion and Bromine will be a $^{-}$ ion.

# Therefore…

- The formula must reflect enough of each ion to equate a neutral charge
- $Mg^{2+}$ and $B^{-}$
- There needs to be 2 total Bromine ions in order to satisfy the need for a total of 2 negative charges.
- The formula is $MgB_2$
- What is the formula for a compound with
  - Lithium and Oxygen
  - Calcium and Phosphorus

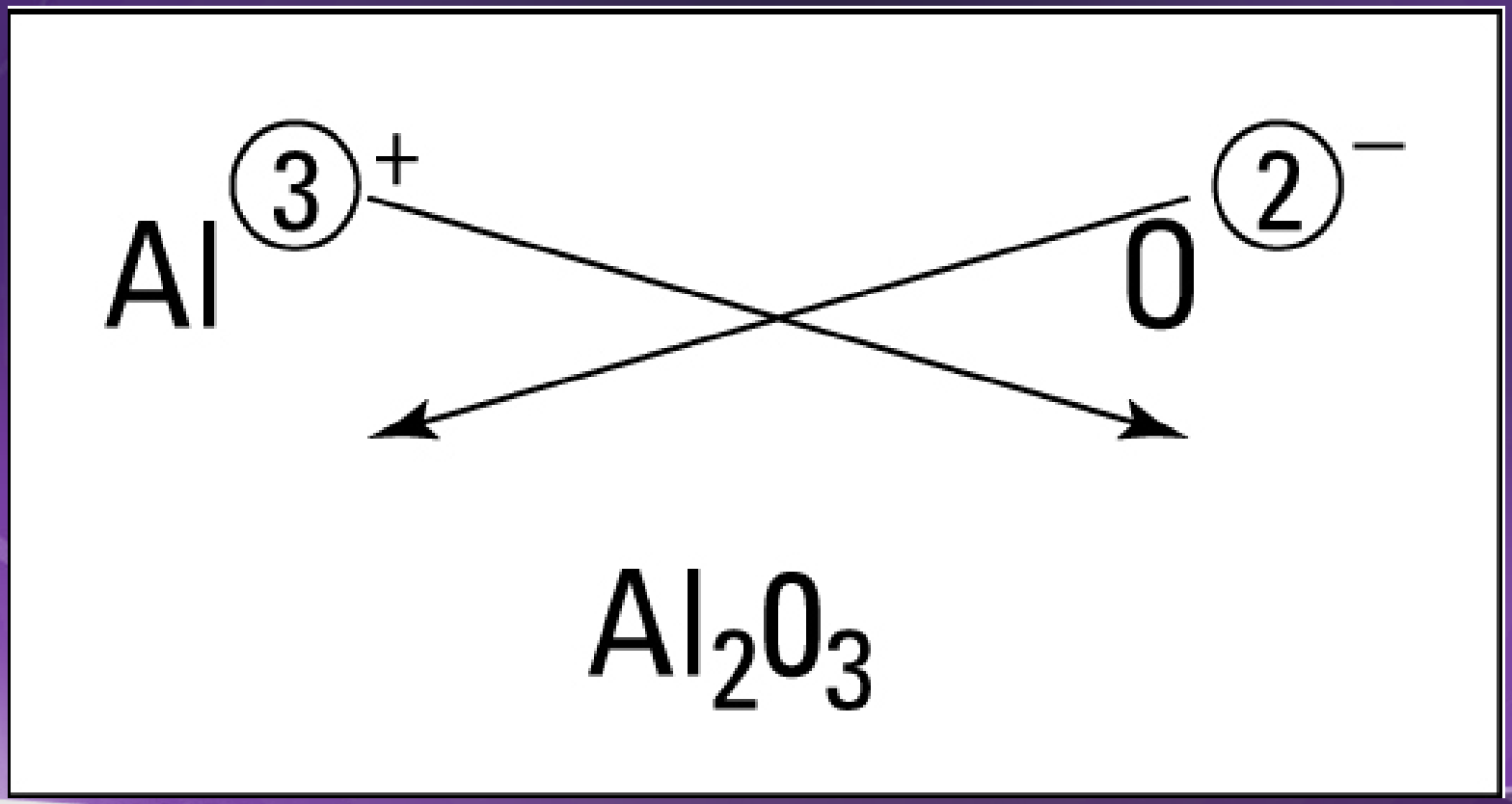
# CrissCross Method

- After you determine the charges of the ions, you can simply crisscross them to determine the formula



# CrissCross

- We can do the same thing for Aluminum and Oxygen



# Covalent Compounds

| Number of Atoms | Prefix |
|---|---|
| 1 | mono- |
| 2 | di- |
| 3 | tri- |
| 4 | tetra- |
| 5 | penta- |
| 6 | hexa- |
| 7 | hepta- |
| 8 | octa- |
| 9 | nona- |
| 10 | deca- |

- When naming covalent compounds you need to include a prefix to tell how many of each are in the compound
- -mono is rarely used. It is in some cases, though such as carbon monoxide – CO
- Note that chemists try to avoid putting an *a* and an *o* together with the oxide name, as in dec**ao**xide, so they normally drop the *a*off the prefix.

# Try Naming These on your own

- $P_2O_5$
- $N_2O$
- $SiO_2$
- $CBr_4$
- $ICl_3$
- $N_2O_3$

# A Few Examples

- $Co_2$ – Carbon *Di*oxide
- $P_4O_{10}$ – *Tetra*phosphorus *De*coxide
- $SO_3$ – Sulfer *Tri*oxide
- $N_2O_4$ – *Di*nitrogen *Tetr*oxide

# Common Compounds you should know

- Write these formulas and their names
  - $H_2O$
  - NaCl
  - $H_2SO_4$
  - $CO_2$
  - CO
  - HCl