

Naming Ionic Compounds

- Write the name of the cation (positive ion).
- Write the name of the anion (negative ion).

- NaCl
 - Sodium chloride
- MgF₂
 - Magnesium fluoride
- Al₂O₃
 - Aluminum oxide

- Some metals form more than one cation.
 - Iron - Fe²⁺, Fe³⁺
 - Copper - Cu⁺, Cu²⁺
 - Lead - Pb⁴⁺, Pb²⁺
- When a compound contains one of these metals, we need to specify which cation is present
- A Roman numeral is used to show which charge is on the cation
 - Fe²⁺ = iron(II)
 - Cu⁺ = copper(I)
 - Pb⁴⁺ = lead(IV)

- FeO
 - Iron could be Fe^{2+} or Fe^{3+}
 - Oxygen has a charge of 2- (O^{2-})
 - The charges must balance
 - Therefore, the iron ion must have a charge of 2+
 - Fe^{2+} = iron(II)
 - iron(II) oxide

- Cu_2O
 - Copper could be Cu^+ or Cu^{2+}
 - Oxygen has a charge of 2- (O^{2-})
 - The charges must balance
 - Therefore, the copper ions must have a total charge of 2+
 - There are 2 copper ions, so each one must have a charge of 1+ (Cu^+)
 - Cu^+ = copper(I)
 - copper(I) oxide

Polyatomic Ions

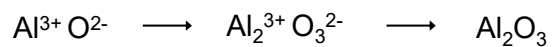
- There are some ions that contain more than one atom
- These ions have their own name
 - OH^- (hydroxide)
 - NO_3^- (nitrate)
 - SO_4^{2-} (sulfate)
 - NH_4^+ (ammonium)

- KNO_3
 - Potassium nitrate
- H_2SO_4
 - Hydrogen sulfate
- $(\text{NH}_4)_2\text{O}$
 - Ammonium oxide

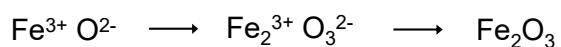
Writing Chemical Formulas for Ionic Compounds

- Write the chemical symbol for both ions, including the charge.
- Check to see if the charges match.
- If necessary, use subscripts to show the number of ions necessary to balance the charges.
- Write the final formula.

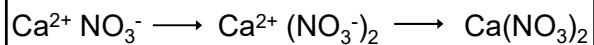
aluminum oxide



iron(III) oxide



calcium nitrate



Examples

- magnesium fluoride
 - MgF_2
- sodium oxide
 - Na_2O
- copper(II) oxide
 - CuO
- potassium phosphate
 - K_3PO_4

Naming Binary Molecular Compounds

- Write the name of the first element.
 - A prefix representing the number of atoms is used if there is more than one.
- Write the name of the second element with the suffix "ide."
 - A prefix representing the number of atoms is always used.

Prefixes

- | | |
|-------------|-------------|
| • 1 = mono | • 6 = hexa |
| • 2 = di | • 7 = hepta |
| • 3 = tri | • 8 = octa |
| • 4 = tetra | • 9 = nona |
| • 5 = penta | • 10 = deca |

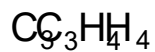
Examples

- CO_2
 - carbon dioxide
- N_2O_5
 - dinitrogen pentoxide
- C_4H_8
 - tetracarbon octahydride

Writing Chemical Formulas for Binary Molecular Compounds

- Write the chemical symbol for both elements
- Write the number(s) indicated by the prefix(es)

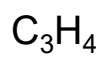
tricarbon tetrahydride



sulfur dioxide



tricarbon tetrahydride



sulfur dioxide



Examples

- Nitrogen monoxide
 - NO
- Sulfur trioxide
 - SO_3
- Carbon tetrachloride
 - CCl_4
- Dicarbon Hexahydride
 - C_2H_6
