

Naming Ionic Compounds

- Name the positive ion first by writing the full name of the metallic element.
- Name the non-metal ion next by dropping the last syllable(s) of the name of the element and adding the suffix "ide."

- Sodium and chlorine combine to become
 - Sodium chloride
- Mg and O
 - Magnesium oxide
- KF
 - Potassium fluoride

The Stock System

- Used for elements that can have more than one cation.
 - Fe^{2+} - Iron(II); Fe^{3+} - Iron(III)
 - Cu^+ - Copper(I); Cu^{2+} - Copper(II)

Naming with the Stock System

- You must first determine the charge on the cation
 - Determine the charge on the anion
 - The cation must have the same numerical charge to balance to zero

- FeO
 - Oxygen has a charge of 2-
 - Iron must have a charge of 2+ so that the charges are balance
 - Iron(II) oxide
- Cu₂O
 - Oxygen has a charge of 2-
 - Copper must have a charge of 2+ so that the charges are balanced
 - But there are 2 copper ions, so each one must have a charge of 1+
 - Copper(I) oxide

Polyatomic Ions

- There are some special groups of atoms of more than one element.
 - OH⁻ (hydroxide)
 - NH₄⁺ (ammonium)
 - NO₃⁻ (nitrate)
 - SO₄²⁻ (sulfate)

Naming with Polyatomic Ions

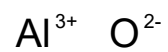
- Name the positive ion first by writing the full name of the metallic element
- Write the name of the polyatomic ion

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

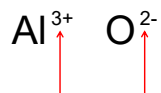
Writing Chemical Formulas for Ionic Compounds

- Write the chemical symbol for both ions, including the charge.
- Check to see if the charges are balanced.
- Balance the charges, if necessary, using subscripts. (If it is a polyatomic ion then it must be placed in parentheses.)

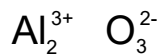
Aluminum Oxide



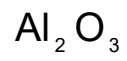
- Write the chemical symbol for both ions, including the charge.



- Check to see if the charges are balanced.

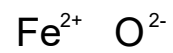


- Balance the charges, if necessary, using subscripts.

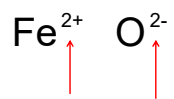


- Final formula

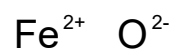
Iron(II) Oxide



- Write the chemical symbol for both ions, including the charge.



- Check to see if the charges are balanced.



- Balance the charges, if necessary, using subscripts.



- Final formula

Examples

- Magnesium Fluoride
 - MgF_2
- Sodium Oxide
 - Na_2O
- Copper(II) Oxide
 - CuO

Naming Binary Molecular Compounds

- The first non-metal name is written in full with a prefix representing the number of atoms if it is greater than 1
- The second non-metal element is named with a prefix representing the number of atoms and the suffix "ide"

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

Writing Chemical Formulas for Binary Molecular Compounds

- Write the chemical symbol for both elements
- Write the number indicated by the prefix

Tricarbon tetrahydride

C H

- Write the chemical symbol for both elements

C_3H_4

- Write the number indicated by the prefix

Examples

- Nitrogen monoxide
 - NO
- Sulfur trioxide
 - SO₃
- Carbon tetrachloride
 - CCl₄
- Dicarbon Hexahydride
 - C₂H₆
