

## 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."

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- Sodium and chlorine combine to become
  - Sodium chloride
- Mg and O
  - Magnesium oxide
- HF
  - Hydrogen fluoride

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## The Stock System

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

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## 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

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- FeO
  - Oxygen has a charge of 2-
  - Iron must have a charge of 2+ so that the charges are balance
  - Iron(II) oxide
- Cu<sub>2</sub>O
  - 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

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## Polyatomic Ions

- There are some special groups of atoms of more than one element.
  - OH<sup>-</sup> (hydroxide)
  - NH<sub>4</sub><sup>+</sup> (ammonium)
  - NO<sub>3</sub><sup>-</sup> (nitrate)
  - SO<sub>4</sub><sup>2-</sup> (sulfate)

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## 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

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- $\text{KNO}_3$   
– Potassium nitrate
- $\text{H}_2\text{SO}_4$   
– Hydrogen sulfate
- $(\text{NH}_4)_2\text{O}$   
– Ammonium oxide

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## Writing Chemical Formulas for Ionic Compounds

- Write the chemical symbol for both ions (including the charge)
- Add ions until total charge is zero (lowest common multiple)

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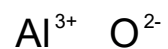
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## Aluminum Oxide



- Write the chemical symbol for both ions (including the charge)

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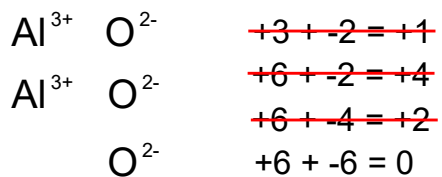
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- Add ions until charge is zero (lowest common multiple)

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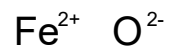
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Iron(II) Oxide



- Write the chemical symbol for both ions (including the charge)

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- Add ions until charge is zero (lowest common multiple)

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## Examples

- Magnesium Fluoride
  - $\text{MgF}_2$
- Sodium Oxide
  - $\text{Na}_2\text{O}$
- Copper(II) Oxide
  - $\text{CuO}$

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## Naming Binary Molecular Compounds

- The first non-metal name is written in full.
- The second non-metal element is named with the suffix “ide” ending.
- Assign a prefix to each element expressing the number of atoms present in the molecule.

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## Prefixes

- Mono=1 (only used with the second element)
- Di = 2
- Tri = 3
- Tetra = 4
- Penta = 5
- Hexa = 6

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## Examples

- $\text{CO}_2$   
– Carbon dioxide
- $\text{N}_2\text{O}_5$   
– Dinitrogen pentoxide

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## Writing Chemical Formulas for Binary Molecular Compounds

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

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## Tricarbon tetrahydride

C H

- Write the chemical symbol for both elements

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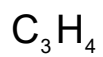
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- Write the number indicated by the prefix

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### Examples

- Nitrogen monoxide  
– NO
- Sulfur trioxide  
– SO<sub>3</sub>
- Carbon tetrachloride  
– CCl<sub>4</sub>
- Dicarbon Hexahydride  
– C<sub>2</sub>H<sub>6</sub>

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