

Nomenclature

Binary Inorganic compounds

- The first term is name first followed by the second term
Example: CO_2 = carbon dioxide NO = nitrogen monoxide
- The endings of oxygen, sulfur, and the halogens will be change to **-ide** if they are the second term in the compound
Example: carbon monoxide, bromine trifluoride
- Hydrogen is named first in compounds containing the oxygen group and the halogens
Example: hydrogen iodide, hydrogen selenide
- Prefixes are used to indicate the number of atoms that are bonded in a binary compound on both terms
Example: SF_6 = sulfur hexafluoride, P_4O_{10} tetraphosphorus decoxide

Prefixes Used For Naming Binary Compounds

Mono-	1
Di-	2
Tri-	3
Tetra-	4
Penta-	5
Hexa-	6
Hepta-	7
Octa-	8
Nona-	9
Deca-	10

For prefixes 4-10, the a is dropped when the ion begins with a vowel
Ex. pentoxide

Acids

- If the anion ends in **-ate**, the acid ending is **-ic acid**
Example: sulfate = sulfuric acid nitrate = nitric acid
- If the anion ends in **-ite**, the acid ending is **-ous acid**
Example: sulfite = sulfurous acid nitrite = nitrous acid
- If the anion has prefixes **-per** or **-hypo**, than the prefixes stays and the suffix changes based on the **-ate** and **-ite** rule
Example: perchlorate = perchloric acid
hypobromite = hypobromous acid

Ionic Compounds

Positive charged ions are called **cations**.

Negative charged ions are called **anions**.

- Cations keep their elemental name and add the word “ion” to the end
Example: K^+ = potassium ion, Ca^{2+} = calcium ion
- For metals who can form different cations, their charge is indicated by putting a Roman numeral in parenthesis after the elemental name and before the ion
Example: Cu^{2+} = copper (II) ion, Fe^{3+} = iron(III) ion
- Monatomic anions are named by changing the suffix to **-ide**
Example: O^{2-} = **oxide** F^- = **fluoride**
- When you have a group of 2 oxoanions, anions paired with oxygen, such as NO_2^- and NO_3^-
 - The root name of the first term is going to be the name of the compound
 - The compound with the lower amount of oxygen ions is going to have a suffix of **-ite**
 - The compound with the higher amount of oxygen ions is going to have a suffix of **-ate**
 NO_2^- = **nitrite** NO_3^- = **nitrate**
 SO_3^{2-} = **sulfite** SO_4^{2-} = **sulfate**
- When you have a group of more than 2 oxoanions such as ClO^- ClO_2^- ClO_3^- ClO_4^-
 - The middle two terms follow the **-ite** and **-ate** rule
 - The oxoanion who has one less oxygen, than the **-ite** oxoanion is going to have a suffix of **-ite** and a prefix of **-hypo**
 - The oxoanion who has one more oxygen than the **-ate** oxoanion, it is going to have a suffix of **-ate** and a prefix of **-per**
 ClO^- ClO_2^- ClO_3^- ClO_4^-
Hypochlorite **Chlorite** **Chlorate** **Perchlorate**
- When naming ionic compounds, the cation is named first followed by the anion
Example: Al_2O_3 = Aluminum oxide Li_2SO_4 = Lithium sulfate