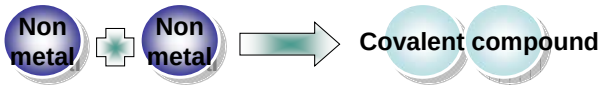
Covalent Compounds
Formula to Name

Binary Covalent Compounds

Definition

Covalent bond atoms share electrons

Binary Covalent Compound
compound made from two non-metals that share electrons



Identifying & Naming Binary Covalent

- These compounds have:
  - 2 elements (“binary”)
  - Both non-metals (“covalent”)
- To name these compounds:
  - Write the name of the first element with the prefix indicating the number of atoms (except don’t use “mono-”)
  - Write the name of the second element with the prefix indicating the number of atoms (including “mono-”) and the suffix “ide”

Covalent Prefixes

The Appendix of your book (Page A-2) has the following chart

PREFIXES USED IN MOLECULAR COMPOUNDS
1. mono-
2. di-
3. tri-
4. tetra-
5. penta-
6. hexa-
7. hepta-
8. octa-
9. nona-
10. deca-

Example #10

P_2O_5

Example #10

2 = “di-”

Phosphorus

P_2O_5

Oxygen

5 = “penta-”

Use “-ide”

Diphosphorus pentaoxide

Example #11

SiO_2

Example #11

Don't use "mono-" on first element

Silicon

SiO_2

Oxygen

2 = "di-"

Use "-ide"

Silicon dioxide

Let's Practice

Example: Write the name for the following compounds

CO_2

N_2O_4

P_4O_{10}

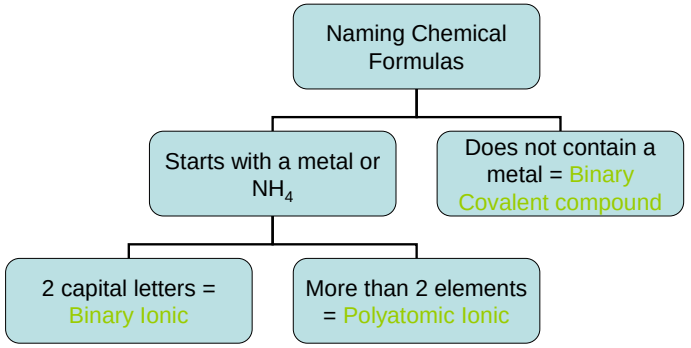
CO

Let's Practice

Example: Write the name for the following compounds

CO_2	Carbon dioxide
N_2O_4	Dinitrogen tetraoxide
P_4O_{10}	Tetraphosphorus decaoxide
CO	Carbon monoxide

Nomenclature Summary



Mixed Practice

Example: Write the name for the following compounds

Na_2O

K_3PO_4

$Cu(OH)_2$

$(NH_4)_2S$

$MgCl_2$

Mixed Practice

Example: Write the name for the following compounds

Na_2O	Sodium oxide
K_3PO_4	Potassium phosphate
$Cu(OH)_2$	Copper (II) hydroxide
$(NH_4)_2S$	Ammonium sulfide
$MgCl_2$	Magnesium chloride

Covalent Compounds Name to Formula

Identifying & Naming Binary Covalent

- These compounds:
  - Use covalent prefixes
- To write these formulas:
  - Write the symbols of the first and second element
  - Use the covalent prefixes (assume the first element is “1” if there’s no prefix) as the subscripts to show number of atoms.

Atoms do not form charges when bonding covalently…you DO NOT need to worry about charges with this type!

Example #7

Dinitrogen Tetraoxide

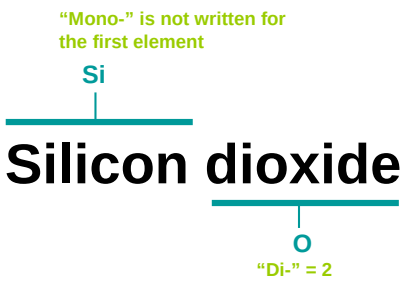
Example #7

N_2O_4

Example #8

Silicon dioxide

Example #8



SiO_2

CAUTION!!!

"di" and "bi" do not mean the same thing!

di-	bi-
Stands for "2" in covalent compounds	Means there's a hydrogen in the polyatomic anion
Carbon dioxide = CO_2	Sodium biphosphate = Na_2HPO_4

Let's Practice

Example: Write the following chemical formulas

Carbon monoxide

Nitrogen dioxide

Diphosphorus pentaoxide

Let's Practice

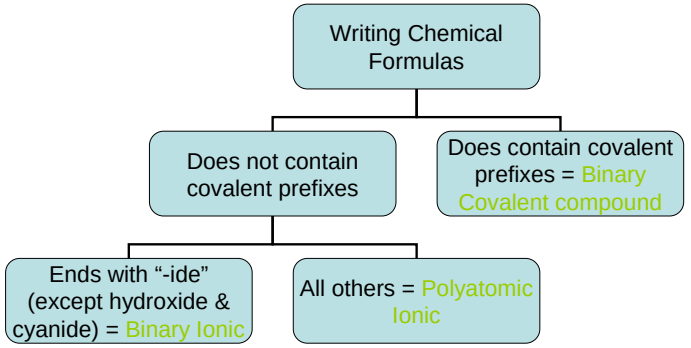
Example: Write the following chemical formulas

Carbon monoxide CO

Nitrogen dioxide NO_2

Diphosphorus pentaoxide P_2O_5

Nomenclature Summary



Mixed Practice

Example: Write the following chemical formulas

- Magnesium hydroxide
- Copper (II) nitrate
- Iron (III) oxide
- Nitrogen dioxide
- Sodium bicarbonate

Mixed Practice

Example: Write the following chemical formulas

- Magnesium hydroxide $Mg(OH)_2$
- Copper (II) nitrate $Cu(NO_3)_2$
- Iron (III) oxide Fe_2O_3
- Nitrogen dioxide NO_2
- Sodium bicarbonate $NaHCO_3$