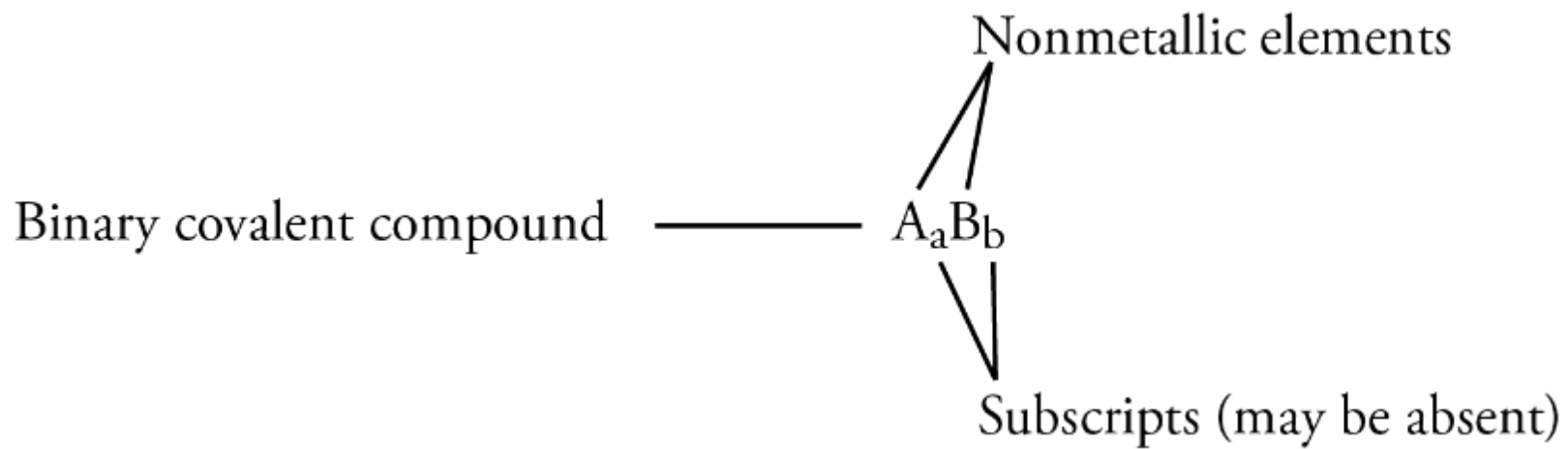


Binary Covalent



Common Names



- H_2O , water
- NH_3 , ammonia
- CH_4 , methane
- C_2H_6 , ethane
- C_3H_8 , propane
- C_4H_{10} , butane
- C_5H_{12} , pentane
- C_6H_{14} , hexane

Naming Binary Covalent Compounds



- If the subscript for the first element is greater than one, indicate the subscript with a prefix.
 - We do not write mono- on the first name.
 - Leave the "a" off the end of the prefixes that end in "a" and the "o" off of mono- if they are placed in front of an element that begins with a vowel (oxygen or iodine).

Prefixes



mon(o)

di

tri

tetr(a)

pent(a)

hex(a)

hept(a)

oct(a)

non(a)

dec(a)

Nitrogen Oxide Names

- N_2O_3 – name starts with *di*
- N_2O_5 – name starts with *di*
- NO_2 – no initial prefix
- NO – no initial prefix

Naming Binary Covalent Compounds

- Follow the prefix with the name of the first element in the formula.
 - N_2O_3 – *dinitrogen*
 - N_2O_3 – *dinitrogen*
 - NO_2 – *nitrogen*
 - NO – *nitrogen*

Naming Binary Covalent Compounds

- Write a prefix to indicate the subscript for the second element. (Remember to leave the “o” off of mono- and the “a” off of the prefixes that end in “a” when they are placed in front of a name that begins with a vowel.)
 - N_2O_3 – *dinitrogen tri*
 - N_2O_5 – *dinitrogen pent*
 - NO_2 – *nitrogen di*
 - NO – *nitrogen mon*

Naming Binary Covalent Compounds

- Write the root of the name of the second symbol in the formula. (See the next slide.)
 - N_2O_3 – *dinitrogen triox*
 - N_2O_5 – *dinitrogen pentox*
 - NO_2 – *nitrogen diox*
 - NO – *nitrogen monox*

Roots of Nonmetals

H hydr-

C carb-

N nitr-

P phosph-

O ox-

S sulf-

Se selen-

F fluor-

Cl chlor-

Br brom-

I iod-

Naming Binary Covalent Compounds

- Add -ide to the end of the name.
 - N_2O_3 – *dinitrogen trioxide*
 - N_2O_5 – *dinitrogen pentoxide*
 - NO_2 – *nitrogen dioxide*
 - NO – *nitrogen monoxide*

Name of Br_2O_7

- Br and O both represent nonmetallic elements, so this formula represents a binary covalent compound.
- di
- dibromine
- dibromine hept
- dibromine heptox
- dibromine heptoxide

Name of PCl_3

- P and Cl both represent nonmetallic elements, so this formula represents a binary covalent compound.
- No prefix at the beginning
- phosphorus
- phosphorus tri
- phosphorus trichlor
- phosphorus trichloride

Name of CO



- C and O both represent nonmetallic elements, so this formula represents a binary covalent compound.
- No prefix at the beginning
- carbon
- carbon mon
- carbon monox
- carbon monoxide

Name of H_2S

- H and S both represent nonmetallic elements, so this formula represents a binary covalent compound.
- di
- dihydrogen
- dihydrogen mono
- dihydrogen monosulf
- dihydrogen monosulfide
- dihydrogen sulfide or hydrogen sulfide

Binary Covalent Compounds Without Prefixes

- The following binary covalent compounds are often named without prefixes
 - HF – hydrogen fluoride
 - HCl – hydrogen chloride
 - HBr – hydrogen bromide
 - HI – hydrogen iodide
 - H₂S – hydrogen sulfide

Name

NH_3

- N and H both represent nonmetallic elements, so this formula represents a binary covalent compound.
- Memorized name - ammonia

Forms of Binary Covalent Names



- prefix(name of nonmetal) prefix(root of name of nonmetal)ide
(for example, dinitrogen pentoxide)
- or (name of nonmetal) prefix(root of name of nonmetal)ide
(for example, carbon dioxide)
- or (name of nonmetal) (root of nonmetal)ide
(for example, hydrogen fluoride)

Writing Binary Covalent Formulas



- If the name is a memorized name that is not a systematic name, just write the memorized formula.
- Write the symbols for the elements in the order mentioned in the name.
- Write subscripts indicated by the prefixes. If the first part of the name has no prefix, assume it is mono-.

Converting from Names to Formulas

- dinitrogen tetroxide
 - N_2O_4
- phosphorus tribromide
 - PBr_3
- hydrogen iodide
 - HI
- Methane
 - CH_4

Converting between Binary Covalent Formulas and Names

- There is a tool on the textbook's website that will allow you to practice this task.

https://preparatorychemistry.com/binary_covalent_nomenclature_Canvas.html