

Lesson 12: Molecular Compounds
(Nelson Textbook Pages 184-186)

Learning Goals

- I can name and write formulas for molecular compounds.

- **Molecular Compounds** are formed by **SHARING electrons** between atoms of **NON-METALS**.
- **Molecule:** a group of two or more non-metal atoms joined together.

Naming Molecular Compounds: THE PREFIX METHOD

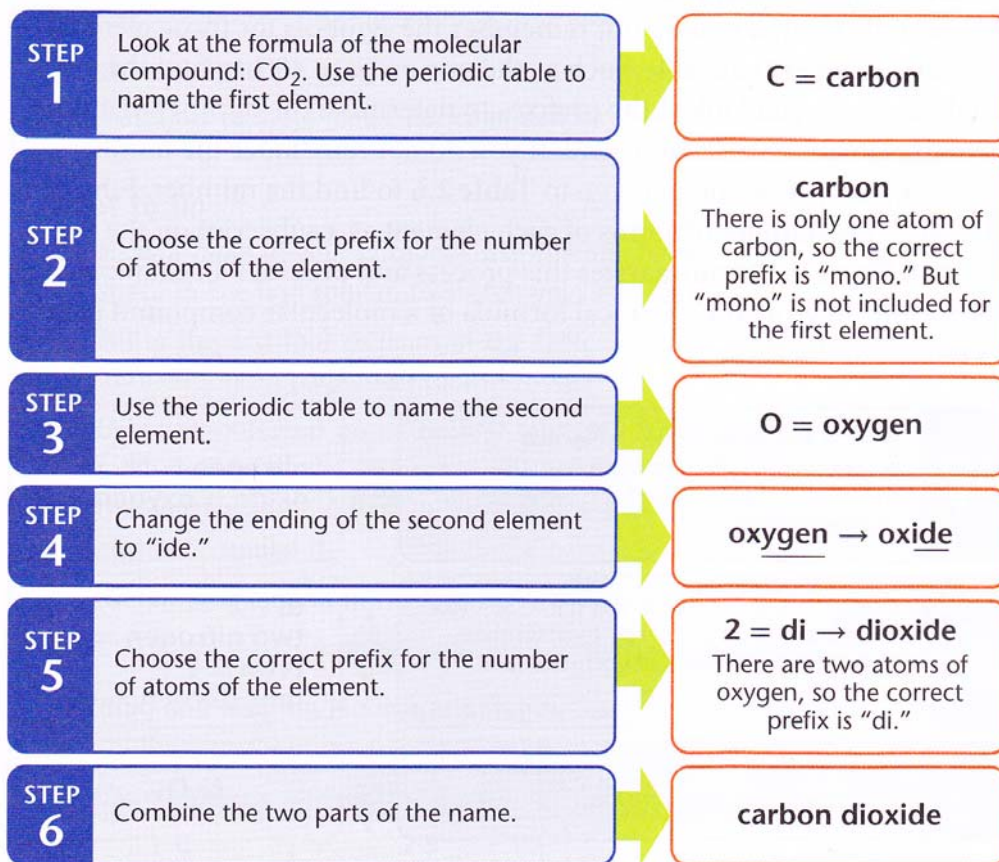


Table 2.6 Numerical Prefixes Used for Molecular Compounds

Numerical Prefix	Number It Represents
mono-	1
di-	2
tri-	3
tetra-	4
penta-	5
hexa-	6
hepta-	7
octa-	8

Note: The prefix "mono" is used only for the second element in the name.

Note: When a prefix ending with a vowel ("o" or "a") is used with oxygen, the vowel is dropped. For example, use "monoxide" not "monooxide" and "tetroxide" not "tetraoxide."

- **Prefixes** are used to **count the number of atoms** when the same two elements from different combinations.
- E.g., **CO₂** (carbon dioxide) & **CO** (carbon monoxide).
- When there is **only one atom of the first element**, the prefix “mono” is NOT necessary.

Table 2.5 Six Molecular Compounds That Contain Nitrogen and Oxygen

Chemical Formula	IUPAC Name	What It Is
NO	nitrogen monoxide	pollutant from car exhaust
N ₂ O	dinitrogen monoxide	used by dentists (laughing gas)
NO ₂	nitrogen dioxide	used to make nitric acid
N ₂ O ₃	dinitrogen trioxide	deep blue liquid
N ₂ O ₄	dinitrogen tetroxide	used in rocket fuel
N ₂ O ₅	dinitrogen pentoxide	dissolves in water to form nitric acid

Examples of Molecular Compounds

Prefix	Number	Example (Formula)
mon(o)-	1	carbon mon oxide (CO)
di-	2	carbon di sulfide (CS ₂)
tri-	3	sulphur tri oxide (SO ₃)
tetra-	4	carbon tetra fluoride (CF ₄)
pent(a)-	5	phosphorus pent abromide (PBr ₅)

Writing Chemical Formulas

STEP
1

Look at the name of the molecular compound: dinitrogen tetroxide. Use the periodic table to find the symbols for the elements.

nitrogen = N
oxide = oxygen = O

STEP
2

Compare the prefixes in the name to those in **Table 2.6** on page 131 to determine the number of atoms of each element.

di = 2
two nitrogen = 2N
tetra = 4
four oxygen = 4O

STEP
3

Write in the subscripts, and write the chemical formula.

N_2O_4

