Subscripts and Coefficients

Understanding the numbers in chemical formulas and chemical equations



Subscript

Definition: The small numbers that come after the atom in a chemical formula.

Example: CO₂

What it means: The subscript tells you the number of the type of atom that are in the molecule. This molecule has 2 atoms of O (oxygen).

Coefficient

Definition: The big numbers that come before the atom or molecule in a chemical equation.

Example: $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O_2$

What it means: The coefficient tells you the number of the type of particle that are in the chemical reaction equation. This chemical reaction equation has 2 molecules of O_2 and 2 molecules of H_2O .

Implied Numbers

- If an atom does not have a subscript after it, we assume the subscript is 1. In other words, no subscript implies the subscript is 1.
 - Example: CO₂

There is no subscript after the C, so there is 1 C atom in the molecule.

- If a molecule does not have a coefficient after it, we assume the coefficient is 1. In other words, no coefficient implies the coefficient is 1.
 - Example: $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O_2$

There is no coefficient before the CH_4 or CO_2 , so there is 1 CH_4 molecule and 1 CO_2 molecule.

Practice

- 1. Circle the subscripts underline the coefficients $PCI_5 + 4H_2O \rightarrow H_3PO_4 + 5HCI$
- 2. How many Cl atoms are there in HCl?
- 3. How many H atoms are there in H_3PO_4 ?
- 4. How many PCI₅ molecules are there in the chemical equation?
- 5. How many H₂O molecules are there in the chemical equation?

