

Structure of matter-3

Definitions:

- **Atoms** - Building blocks of matter. The smallest unit (particle) of an element that has all of the properties of that element (may or may not exist independently) Ex: Hydrogen, Helium, Sodium, chlorine..
- **Molecules** - Atoms of different elements combine together to form molecules (Exist independently)
- Ex: NaCl, HCl, NH₃, NaOH, H₂O

Definitions:

- **Compounds** - Elements combine each other to form compounds. Compound always contain the same number of elements combined together chemically in a fixed ratio.
- Covalent bond: Sharing of electrons for stability
- Ionic bond : Transfer of electrons

Definitions:

- **Mixture:** Elements or compounds mixed together physically but not chemically.
- No new molecules are formed here
- Example: Air, tap water

Definitions:

- **Symbols** - used to represent elements
- **Formulas** – used to represent group of elements that are connected (molecule / compound)

Difference between compounds and mixtures:

Property	Compounds	Mixtures
Combination of constituents	Constituents are combined together chemically	Constituents are combined together physically
Ratio of constituents	Fixed ratio	Any ratio
Separation of constituents	By chemical methods	By physical methods
Properties	Have properties different from those of constituents	Have properties those of their constituents
Energy Changes	Energy is absorbed or released during the formation of compounds	No energy is absorbed or released

Atomicity:

Atomicity

The number of atoms constituting a molecule is known as its atomicity.

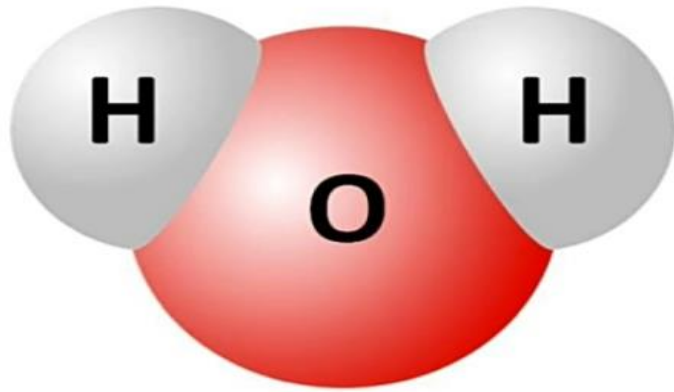
Ca \longrightarrow **Atomicity - 1**

Monoatomic molecule

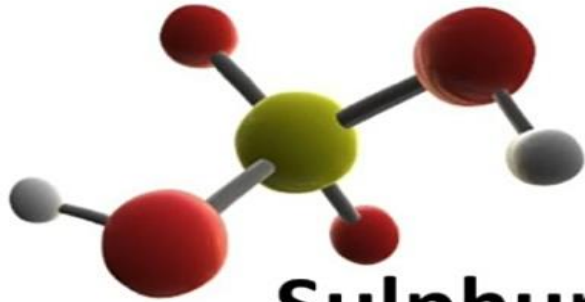
H₂O \longrightarrow **Atomicity - 3**

Atomicity:

Water - H₂O



Atomicity - 3



Atomicity - 7

Sulphuric acid – H₂SO₄

Atomicity:

He \longrightarrow **Atomicity - 1**

Monoatomic molecule

O₂ \longrightarrow **Atomicity - 2**

Diatomic molecule

O₃ \longrightarrow **Atomicity - 3**

Triatomic molecule

Atomicity of elements

Valency: (The number of electrons an atom can donate or accept is called the combining power)

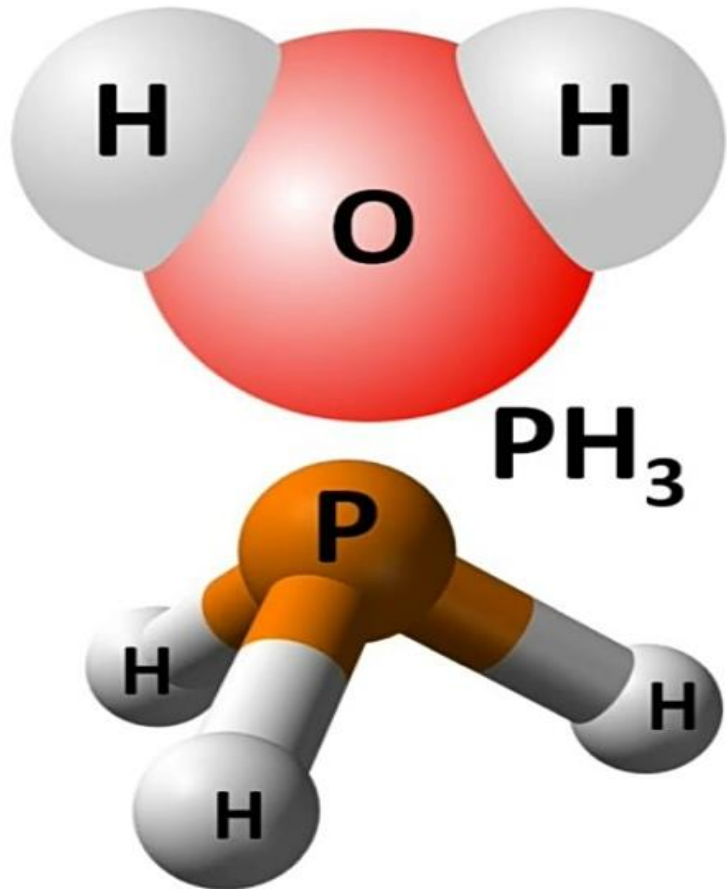
Valency

The combining power (or capacity) of an element is known as its valency.

It is also defined as the number of hydrogen atoms with which one atom of the element would combine.

CH₄ - The valency of carbon is 4.

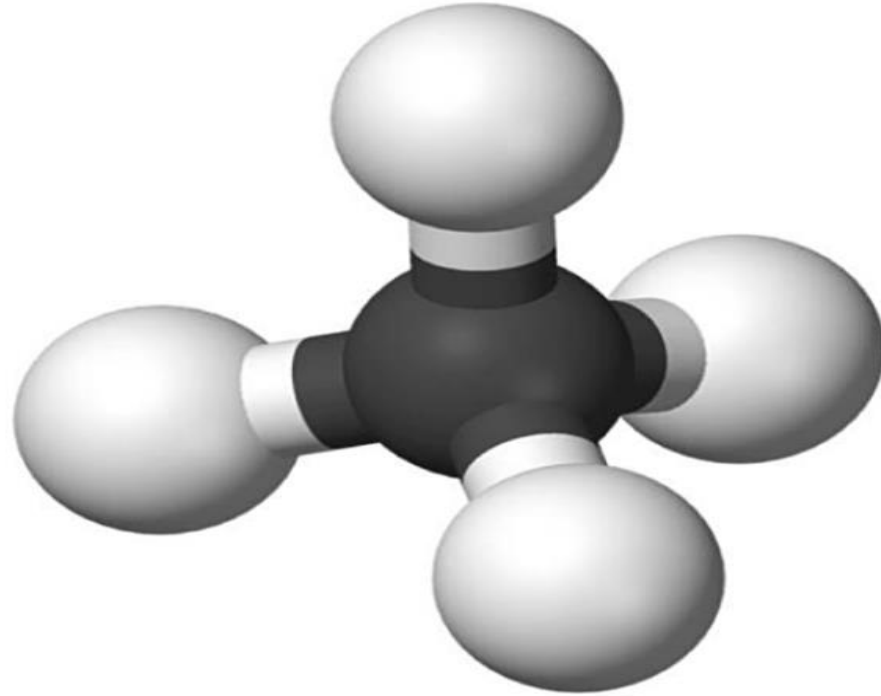
Valency:



Valency of O : 2

Valency of P : 3

Valency:



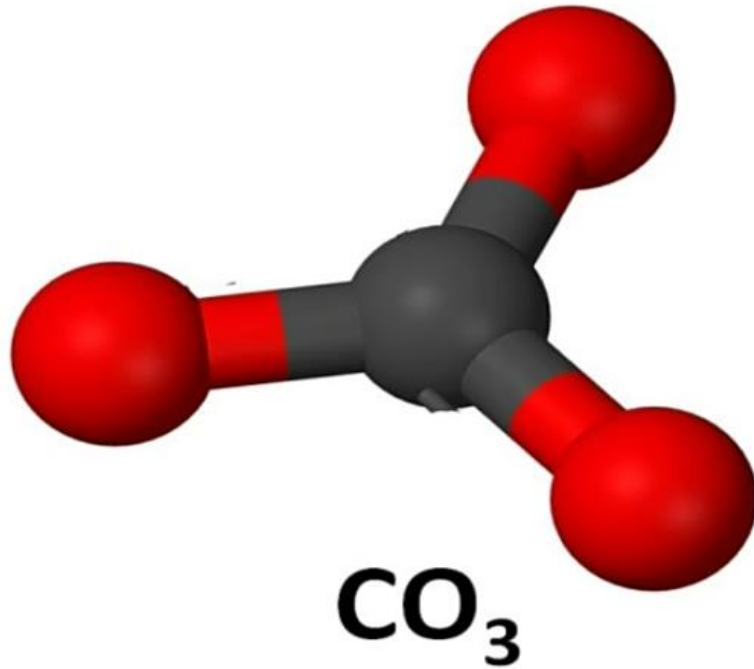
Valency of C : 4

Valency:



Valency of C:4
Valency of O: 2

Valency:



Valency of CO_3 : 2

Write the molecular formula:

- Nitrogen
- Neon
- Aluminium hydroxide
- Ammonium hydroxide