

18.07.20

CHAPTER-03

ATOMS AND MOLECULES

CLASS-IX

SUB-SCIENCE

Lecture-03

Atomic mass unit

**Significance of the symbol of
an element**

How do atoms exist ?

Atomic mass unit (1u):- The atomic mass unit is defined as exactly one –twelfth the mass of an atom of carbon-12 .

Atomic mass unit = $\frac{1}{12}$ the mass of a carbon -12 atom

relative atomic mass

relative atomic mass of an element

Relative atomic masses of common elements:

Elements	Relative Atomic Mass	Symbol
hydrogen	1	H
helium	4	He
carbon	12	C
nitrogen	14	N
oxygen	16	O
sodium	23	Na
magnesium	24	Mg
aluminium	27	Al
silicon	28	Si
phosphorus	31	P
sulphur	32	S

Significance of the symbol of an element

- 1. Symbol represents name of the element.**
- 2. Symbol represents one atom of the element.**
- 3. Symbol also represents one mole of atoms of the element.**
- 4. Symbol represents a definite mass of the element.**

How do atoms exist:-

- 1. in the form of molecules**

- 2. in the form of ions**

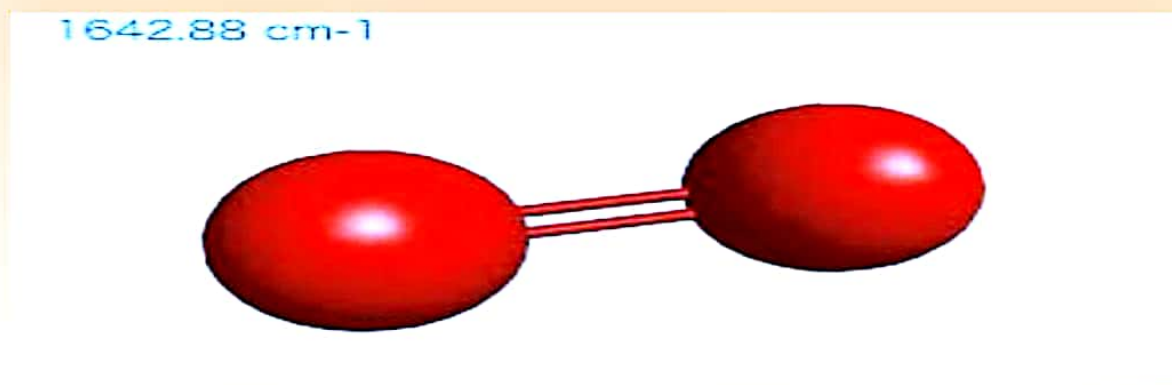
In the form of molecules : a molecule is an electrically neutral group of atoms chemically bonded together

“A molecule is the smallest particle of a substance which has the properties of that

substance and can exist in free state.”

Molecule can be formed by combination of atoms of the same element or of different element. Depending on this there are two types of molecules. Molecules of elements and molecules of compound.

1.Molecules of element:- the molecules of an element contains of two or more similar atoms chemically combined together .example $\text{H}_2, \text{Cl}_2, \text{O}_2, \text{N}_2, \text{I}_2$





Hydrogen
(H₂)



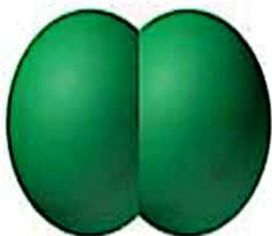
Nitrogen
(N₂)



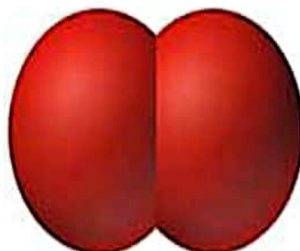
Oxygen
(O₂)



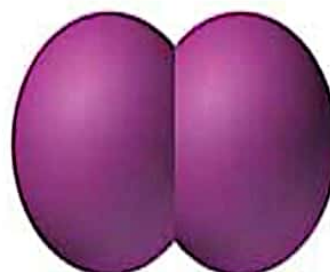
Fluorine
(F₂)



Chlorine
(Cl₂)



Bromine
(Br₂)



Iodine
(I₂)

Atomicity :- The number of atoms present in one molecules of an element is called its atomicity.

a. The atomicity of noble gases is 1

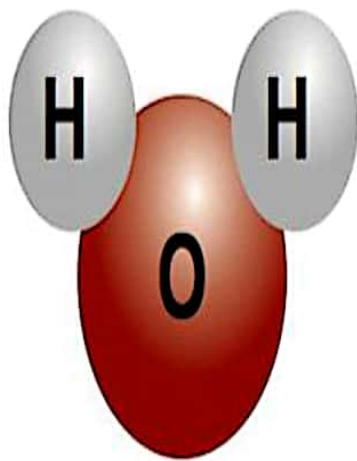
b. The atomicity of metal elements like sodium (Na) ,magnesium(Mg), iron (Fe) etc is also taken to be 1.thus metal are to be considered to be monoatomic.

c. The atomicity of hydrogen, nitrogen, oxygen, chlorine, bromine, and iodine is 2 each.

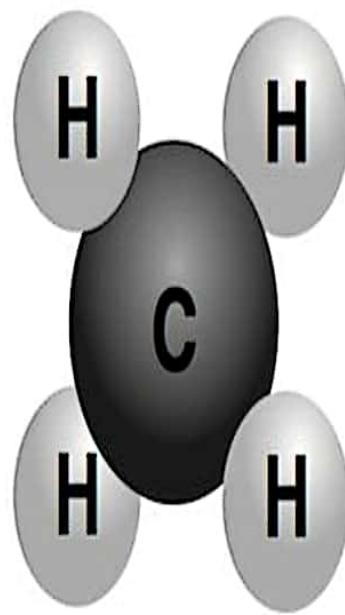
d. Solid sulphur has 8 atoms in its molecules, so the atomicity of sulphur is 8.

2. Molecules of compound : the molecules of compound contains two different types of atoms chemically combined together .example:

H_2O , CO_2 , CH_4 , NH_3 , SO_2



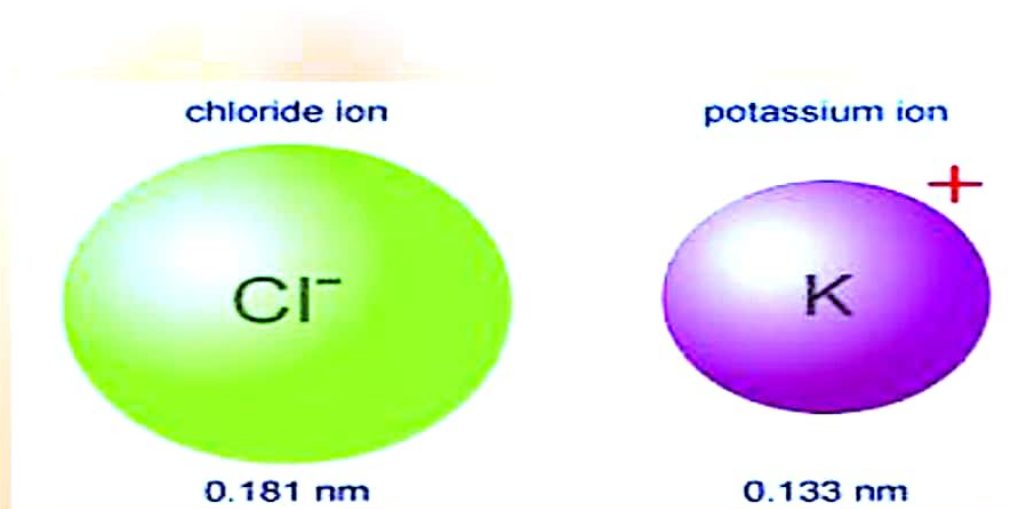
Water
 H_2O



Methane
 CH_4

In the form of ions : an atom or group of atoms having positive or negative charge.

Example Cl^{-1} , Na^{+} , PO_4^{3-} , NH_4^{+}





Phosphate Ion

