



# Vidya Bhawan Balika Vidyapith

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Chapter:- 3. ATOMS AND MOLECULES.

CLASS:- IX<sup>th</sup>

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SUBJECT:-CHEMISTRY

DATE :-07/06/2020



Topic:- Molecular Mass.

## ➤ Molecular Mass:-

Just as an atom has atomic mass, in the same way, a molecule has a molecular mass. The molecular mass of a substance is the relative mass of its molecule as compared with the mass of a carbon-12 atom taken as 12 units. The molecular mass of a substance indicates the number of times one molecule of the substance is heavier than  $\frac{1}{12}$  (one-twelfth) of a carbon-12 atom. For example, the molecular mass of

$\frac{1}{12}$

Hydrogen is 2, which means that a molecule of hydrogen is 2 times heavier than  $\frac{1}{12}$  of a carbon-12 atom. The molecular mass is expressed in atomic mass units (u).

## ➤ Calculation of Molecular Mass:-

If the molecular formula of a substance is known, its molecular mass can be calculated, because the molecular mass is equal to sum of the atomic masses of all the atoms present in one molecule of the substance. For example, one molecule of water (H<sub>2</sub>O) contains 2 atoms of hydrogen and 1 atom of oxygen. So, the molecular mass of water will be equal to the sum of the masses of 2 hydrogen atoms and 1 oxygen atom. Knowing that the atomic mass of hydrogen is 1 u and that of oxygen is 16 u, the molecular mass of water can be calculated as follows:

Mass of H atom = 1 u

Mass of 2H atoms = 2 × 1 = 2 u

Mass of O atom = 16 u

Now, Molecular mass of H<sub>2</sub>O = Mass of 2H atoms + Mass of O atom  
= 2 + 16  
= 18 u

Thus, the molecular mass of water (H<sub>2</sub>O) is 18 u.

☞ Ionic compounds like sodium chloride which consist of ions (and not molecules) the term formula mass is sometimes used in place of molecular mass. The molecular masses of some common elements, which exist as molecules, are given below:

### Molecular Masses of Some Common Elements

Element	Symbol	Atomic mass	Molecular formula	Molecular mass
1. Hydrogen	H	1 u	H <sub>2</sub>	2 × 1 = 2 u
2. Nitrogen	N	14 u	N <sub>2</sub>	2 × 14 = 28 u
3. Oxygen	O	16 u	O <sub>2</sub>	2 × 16 = 32 u
4. Chlorine	Cl	35.5 u	Cl <sub>2</sub>	2 × 35.5 = 71 u

☞ Home Work (Based on study material of 06-06-20)

Answer the following questions:-

1. What is Chemical Formulae?
2. Define Formulae of Compounds?
3. What is Barometer?
4. Write the Molecular Formula of given Compounds?  
(i) Ammonia (ii) Alcohol (iii) Hydrogen Sulphide (iv) Methane (v) Hydrogen Chloride  
(vi) Sulphuric Acid (vii) Hydrogen Nitrate.