

MIND MAP

- **Law of conservation of mass:** In any chemical reaction the total mass of the reactants is equal to the total mass of the products.
- **Law of constant proportions:** A chemical compound is always made up of the same elements combined together in the same fixed proportion by mass.
- **Dalton's Atomic theory:** Matter is made up of atoms which are:
 1. Indivisible, can neither be created nor destroyed.
 2. Identical for same element.
 3. Different for different element.
 4. Constant with respect to number and kind for a given compound.

- **Mole concept**
- **Mole in terms of mass:** A mole of particle (atoms, molecules, ion) is the amount of the substance which has mass equal to its gram atomic mass or gram molecular mass or gram formula unit mass.
- **Mole in terms of number** is that amount of the substance which contains the same number of particles as there are C-12 atoms in 12 g of carbon.
- Avogadro's number (N_0) = 6.022×10^{23} .
- **Formula for calculation**
 1. $n = \frac{m}{M}$
 2. $n = \frac{N}{N_0}$

- **Atoms:** smallest particle that can take part in a chemical reaction.
- **Symbol:** A short method of representing the full name of an element.
- **Atomic mass:** The number of times an atom of that element is heavier than $1/12^{\text{th}}$ of the mass of an atom of C-12 isotope. Its units amu or u.
- **Gram atomic mass:** Atomic mass expressed in grams.
- **Molecule:** Smallest particle of an element compound which can exist freely and possess all the properties of that substance.
- **Atomicity:** The number of atoms present in one molecule of a substance.
- **Molecular mass:** Represents the number of times the molecule of that substance is heavier than $1/12^{\text{th}}$ of the mass of an atom of C-12 isotope.
- **Gram molecular mass:** Is molecular mass expressed in gram.
- **Ions:** are charged species
 1. **Cations:** are positively charged e.g., Na^+ , Mg^{++} .
 2. **Anions:** are negatively charged e.g., Cl^- .
 3. **Polyatomic ions:** Ions formed from a group of atoms and carrying a charge.
- **Formula unit:** is the simplest combination of ions that produces an electrically neutral unit.
- **Formula unit mass** of an ionic compound is the sum of the atomic mass of all the atoms present in one formula unit of the compound.
- **Gram Formula unit mass** is the formula unit mass expressed in g.

- **Chemical formula** of a molecular compound represents the actual number of atoms present in one molecule of the compound.
- **Valency:** Combining capacity of a particular element.