Atoms and Molecules

500 BC maharishi Kanad → Padarth (matter) → Parmanu (Atom)

Rice grains

Democritus and Leucippus → Matter & Atoms

Pakudha Katyayama

He states that atoms may not exist in to be free state but may exist in the combined state in the form of molecules.

oxygen $O_2 \longrightarrow O = O$ (2 oxygen atoms, bond) — molecule

$CO_2 \longrightarrow$ 1 carbon atom & 2 oxygen atom

$H_2O \longrightarrow$ 2 Hydrogen atom & 1 oxygen atom.

Atom combine to form molecules — Element (Same atoms), Compound (diff atoms)

O_2 is an element while CO_2 & H_2O are compounds.

they combine.
Antoine L. Lavoisier laid the foundation of chemical sciences by establishing two important laws of chemical combination.

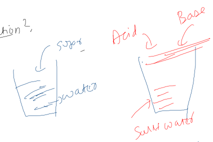
1. Law of chemical Combination

Elements — substances those molecules are made up of only one type of atoms.

Compounds :- Substances whose molecules are made up of more than one type of atoms are called compounds.

- Properties of compound are different from the properties of elements they are made up of.
- The combination takes place via chemical reaction following certain laws called laws of chemical combination

Chemical reaction?



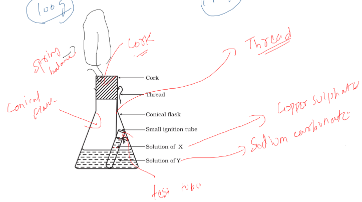
When two or more substances combine to form an entirely different product

Antoine Lavoisier gave 1st law of chemical combination

LAW OF CONSERVATION OF MASS

Acid + Base ⟶ Salt water

Reactants (100g) — Products (100g)



i) X gm

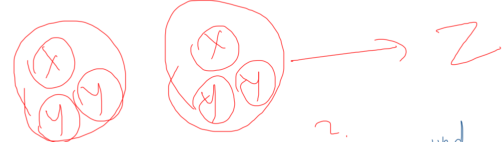
ii) X gm

Copper Sulphate + Sodium Carbonate ⟶ Copper Carbonate + Sodium Sulphate

In any chemical reaction, the total mass of reactants is equal to the total mass of the products.

Law of conservation of mass states that mass can neither be created nor destroyed in a chemical reaction.

a) Compound
b) Molecule
c) Element
d) Both a & b ✓



Z - ?
a) compound
b) Molecule
c) Element
d) Both a & b.

✓ Mass can created in chemical reaction.

If (x^3+ax^2+bx+6) has $(x-2)$ as a factor and leaves a remainder 3 when divided by $(x-3)$, find the values of a and b.

→ $f(x) = x^3 + ax^2 + bx + 6$

$(x-2)$ is a factor

$f(2) = 0$

$8 + 4a + 2b + 6$

$14 + 4a + 2b = 0$ (i)

$2a + b + 7 = 0$

$2(2a + b + 7) = 0$

$2a + b + 7 = 0$