Chemistry

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Types of Molecules (Basis of Atomicity)

- **Monoatomic** → 1 atom (He, Ne)
- **Diatomic** → 2 atoms (O_2, H_2)
- **Triatomic** → 3 atoms (CO_2)
- **Polyatomic** → More than 3 atoms (P_4, S_8)

Substance

- A form of matter that has a **definite composition** and **distinct properties**.
- Types:
  - **Elements** → cannot be broken down (e.g., O_2, Fe).
  - **Compounds** → formed by chemical combination of elements (e.g., H_2O, NaCl).

Types of Molecules (Basis of Kind of Atoms)

- **Homoatomic molecules** → Same type of atoms (O_2, N_2, Cl_2)
- **Heteroatomic molecules** → Different types of atoms (H_2O, CO_2, NH_3)

Types of Molecules (Basis of Size & Molecular Weight)

- **Micromolecules** → Small size, low molecular weight (H_2O, CO_2, O_2)
- **Macromolecules** → Large size, high molecular weight (Proteins, Starch, DNA)

Elements

- Pure substance.
- Made of only one kind of atom.
- Cannot be broken into simpler substances by chemical means.
- Example: O_2, Fe, Au.

Ordinary Microscope

- Atoms are **too small** to be seen by ordinary (light) microscopes.
- Wavelength of visible light (≈ 400–700 nm) is **much larger** than atomic size (≈ 0.1 nm).
- □ Therefore, **atoms cannot be observed** directly with ordinary microscopes.
- Only **indirect evidence** like **Brownian motion** (random motion of pollen grains in water due to invisible atoms/molecules) supported their existence.

Symbols of Elements

- Shorthand representation of elements.
- Mostly derived from English or Latin names.
- Examples:
- H → Hydrogen
- O → Oxygen
- Fe → Iron (from *Ferrum*)
- Na → Sodium (from *Natrium*)