

Some Basic Concepts of Chemistry

matter, its measurement, and the laws that fix how it combines

Nature of Chemistry *

- chemistry studies matter: composition, properties, and the changes it undergoes
- five branches, listed below, each with its own focus
- physical chemistry is the framework the other branches build on
- touches daily life: the air breathed, food, fuels, fabrics, medicines

Branches of Chemistry, in Brief

Organic = compounds of carbon

Inorganic = everything that isn't organic

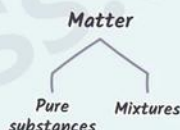
Physical = atoms, molecules, energy, dynamics; the framework beneath the rest

Analytical = what a sample contains, and how much of each thing

Biochemistry = chemistry of living things: proteins, carbohydrates, nucleic acids

Pure Substances vs Mixtures

Pure substance



the first split in classifying matter: a fixed composition, or none

- fixed, definite composition
- same properties whatever the source
- e.g. distilled water, a pure metal
- splits into elements and compounds

Mixture

- no fixed composition, so no fixed properties
- e.g. paint, concrete
- homogeneous: uniform throughout, like a solution
- heterogeneous: not uniform, like a suspension

an element resists breakdown by an ordinary chemical change, a compound splits into a fixed ratio of elements

States of Matter

- solid**: particles in regular order, touching. definite shape and volume
- liquid**: particles close but free to move. definite volume, no fixed shape
- gas**: particles far apart, moving freely. neither shape nor volume of its own
- interconvertible by changing temperature or pressure, the particles themselves stay the same