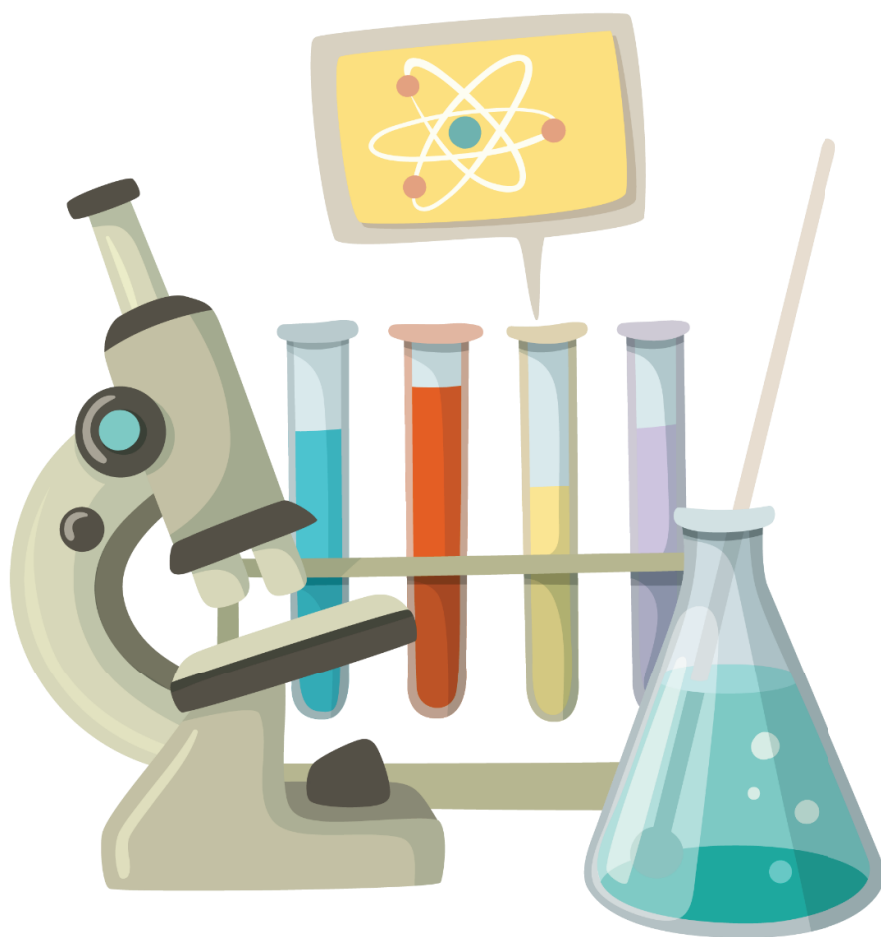


SOME BASIC CONCEPTS OF CHEMISTRY



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Introduction:

Chemistry is the science of molecules and their transformations which deals with the study of matter, its composition, the changes that matter undergoes and the relation between changes in composition and changes in energy. Chemistry plays an important role in meeting human needs for food, health care products.

Branches of Chemistry:

- **Organic Chemistry**- This branch deals with study of carbon compounds especially hydrocarbons and their derivatives.
- **Inorganic Chemistry**- This branch deals with the study of compounds of all other elements except carbon. It largely concerns itself with the study of minerals found in the Earth's crust.
- **Physical Chemistry**- The explanation of fundamental principles governing various chemical phenomena is the main concern of this branch. It is basically concerned with laws and theories of the different branches of chemistry.
- **Industrial Chemistry**- The chemistry involved in industrial processes is studied under this branch. Analytical Chemistry-This branch deals with the qualitative and quantitative analysis of various substances.
- **Biochemistry**- This branch deals with the chemical changes going on in the bodies of living organisms; plants and animals.
- **Nuclear Chemistry**- Nuclear reactions, such as nuclear fission, nuclear fusion, transmutation processes etc. are studied under this branch.

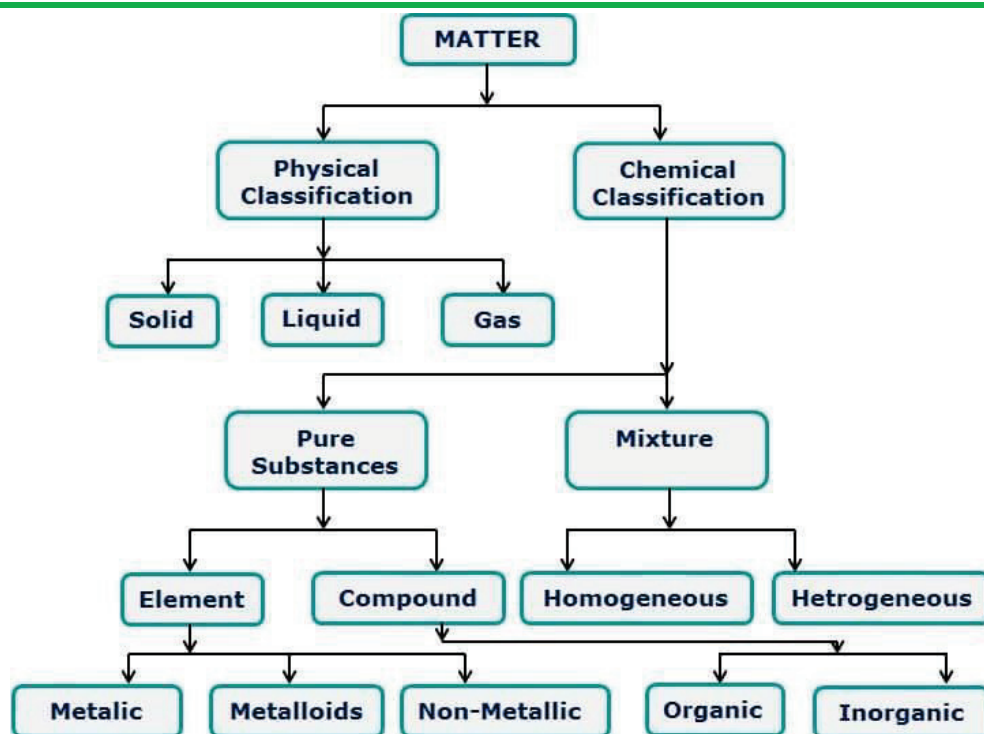
Importance of Chemistry:

Chemistry plays a central role in science and is often intertwined with other branches of science. Principles of chemistry are applicable in diverse areas, such as weather patterns, functioning of brain and operation of a computer, production in chemical industries, manufacturing fertilisers, alkalis, acids, salts, dyes, polymers, drugs, soaps, detergents, metals, alloys, etc., including new material.

Chemistry contributes in a big way to the national economy. It also plays an important role in meeting human needs for food, healthcare products and other material aimed at improving the quality of life.

Matter

Matter is any thing that occupies space, has mass, offer resistance and can be perceived of directly by our senses. For example, book, pen, pencil, water, air, all living beings, etc.



Element

Element is the purest form of matter. It is made up of only one type of atoms, ex.- carbon, iron, copper, oxygen etc.

Compound

Compound is the substance which is made up of two or more elements combined together in a fixed ratio by their weight e.g., carbon dioxide.

Mixture

Mixture is the substance which is made up of two or more substances in any ratio. e.g.,

Sugar + Water, Sodium Chloride + Water, Sand + Water

On the basis of composition, mixtures are of following type:

- **Homogeneous mixture:** The mixture which has uniform composition through out e.g., sugar solution.
- **Heterogeneous mixture:** The mixtures which do not have uniform composition through out. e.g. sand in water.

Atom

Atom is the smallest particle which may or may not exist free but takes part in chemical reaction. Atom word means not to be cut. Ex- H, Na, O etc.

International System of Units (S.I.)

The international system of units (in French Le Systeme International d' Unités - abbreviated as SI) was established in 1960 by the 11th general conference on weights and measures. SI system is a modification of metric system and has seven base units pertaining to the seven fundamental scientific quantities.

Base Physical Quantity	Symbol for Quantity	Name of SI Unit	Symbol for SI Unit
Length	l	metre	m
Mass	m	kilogram	kg
Time	t	second	s
Electric current	I	ampere	A
Thermodynamic temperature	T	kelvin	K
Amount of substance	n	mole	mol
Luminous intensity	I_v	candela	cd

For Quick Revision and Smart Practice
Prefixes in SI system

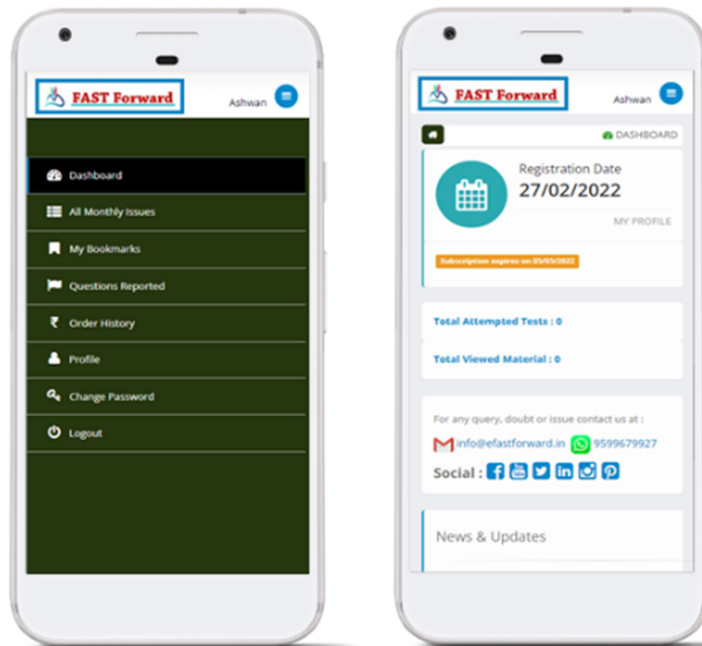
Multiple	Prefix	Symbol	Multiple	Prefix	Symbol
10^{-24}	yocto	y	10	deca	da
10^{-21}	zepto	z	10^2	hecto	h
10^{-18}	atto	a	10^3	kilo	k
10^{-15}	femto	f	10^6	mega	M
10^{-12}	pico	p	10^9	giga	G
10^{-9}	nano	n	10^{12}	tera	T
10^{-6}	micro	μ	10^{15}	peta	P
10^{-3}	milli	m	10^{18}	exa	E
10^{-2}	centi	c	10^{21}	zeta	Z
10^{-1}	deci	d	10^{24}	yotta	Y
10	deca	da			

Definition of SI Base Units

- **Metre:** The metre is the length of the path travelled by light in vacuum during a time interval of $1/(299792458)$ of a second.
- **Kilogram:** The kilogram is the unit of mass; it is equal to the mass of the international prototype of the kilogram.
- **Second:** The second is the duration of 9192631770 periods of the radiation



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