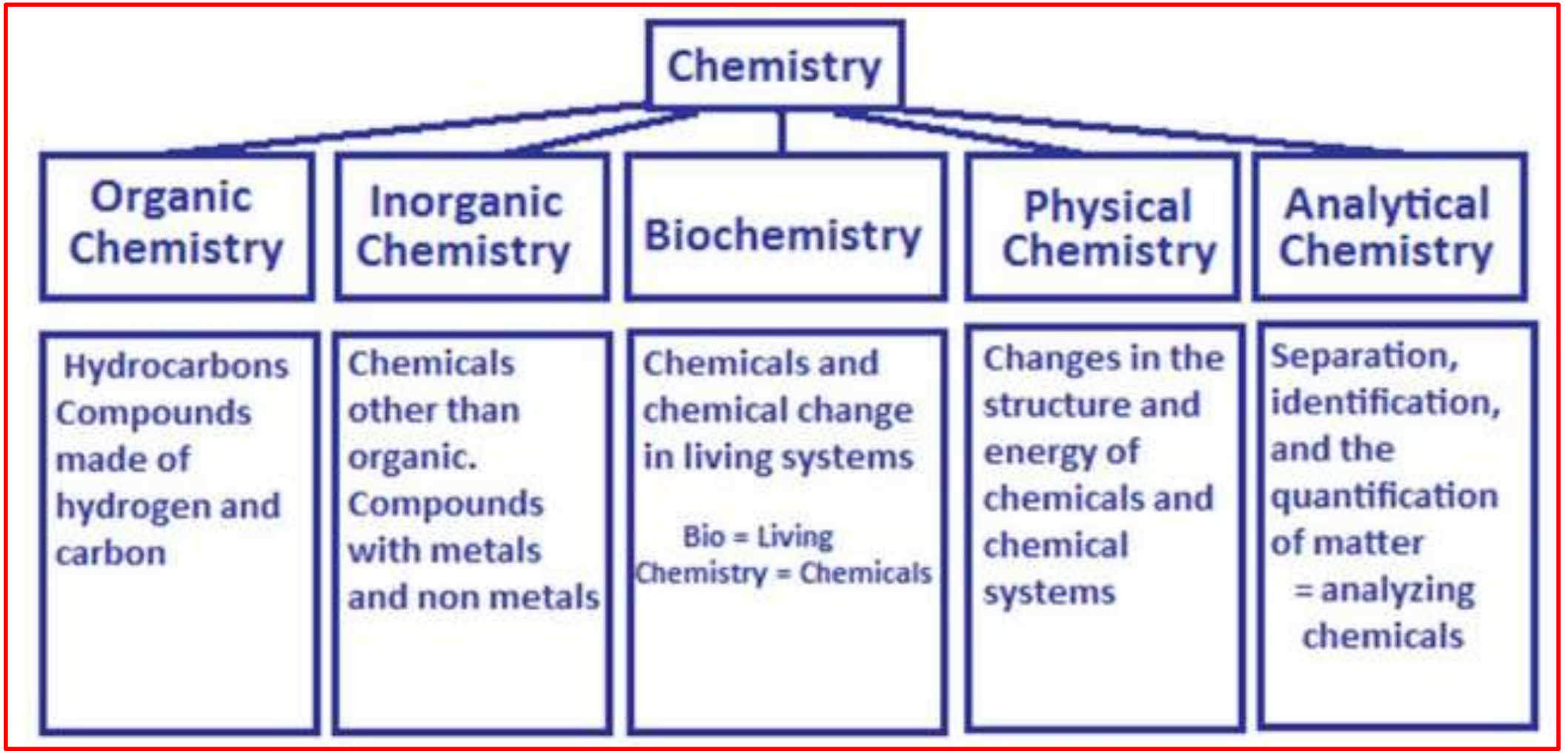
Introduction and Basic definition
Chapter: 1(Class 11)

Some Basic Concept of chemistry

Dr. Sibaji Sarkar Ph.D (Pharma. Chemistry)

SOME BASIC CONCEPTS OF CHEMISTRY

Chemistry: Chemistry is the branch of science that deals with the composition, structure and properties of matter. Chemistry is call the science of atoms and molecule.



Classification and properties of matter

Based on Physical property

Matter

Anything that has mass and takes up space (solid, liquid, or gas)

Mixture

A system of matter that is made up of 2 or more substances that are not chemically combined

Pure Substance

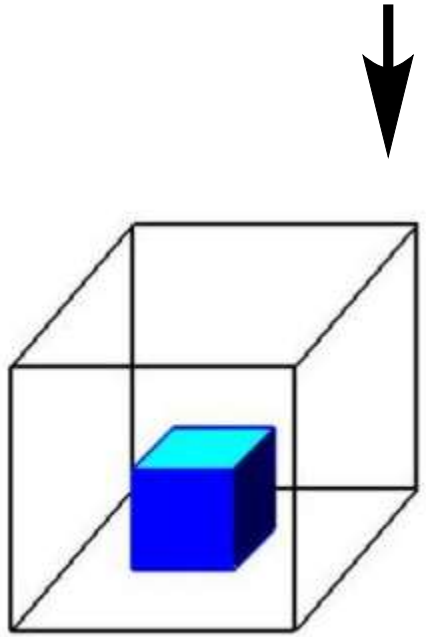
A substance that cannot be physically separated any further into other substances

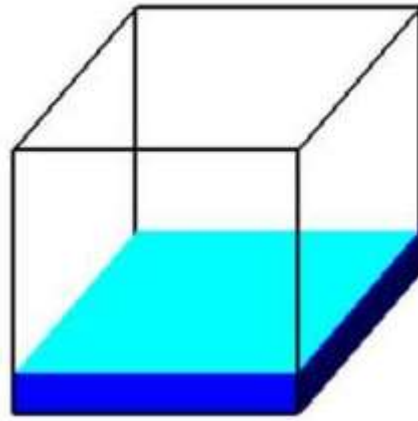
Element

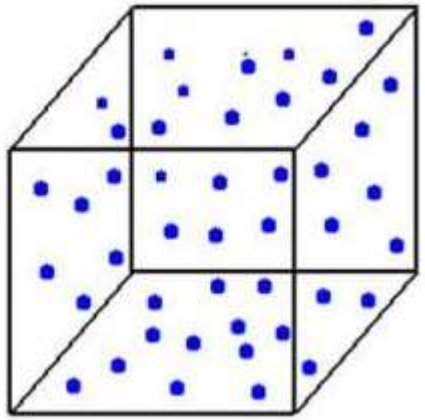
The simplest form of matter that cannot be separated by chemical or physical process.

Compound

Elements that are chemically compound in fixed ratios







Matter
solid liquid gas

Pure Substances
constant composition

physical methods

Mixtures
variable composition

Chemical Elements
118 elements

Binary Compounds
two elements, one type of strong bond

Polyelemental Compounds
many elements, mixed types of bonding

Homogeneous Mixtures
solutions & well stirred fluids

Heterogeneous Mixtures
multi-phase mixtures, poorly stirred fluids

Colloids
clouds
smokes
aerosols
emulsions

Composite Materials
Inorganic: rock
Organic: wood
Biological: yeast
Hybrid: GRP
Product: dynamite

Tetrahedron of Structure, bonding & Material Type

Types of Pure Chemical Substance

Network Covalent Materials	Metallic Elements	Simple Ionic Salts	⟹ Atomic Ions
Molecular Substances	Alloys	Molecular & Complex Salts	⟹ Molecular & Complex Ions
Polymers	Glasses	Minerals	

Hypothesised Entities

Therefore chemists broadly divided the properties of matter in two kinds, named **“physical”** and **“chemical”** properties.

Physical properties are those properties which can be measured or observed without change the identity or the composition of the substance. Eg. Taste, Colour, Melting Point, Boiling Point, Density etc.

Chemical Properties are those which can be measured only by a chemical reaction. These can’t be observed just by touching or viewing the substance. Eg. Acidity, Basicity, Combustibility, Reactivity etc.

Physical quantity

The value of physical quantity is always equal to a definite numeric value and definite unit. It is necessary to describe the physical quantity with the least possible unit. There are various system of unit for physical measurement which were developed at different times.

1. FPS system (Foot, Pound , second) in the year 1588
2. CGS system (Centimeter, Gram , Second) in the year 1791-1795.
3. MKS system (Meter, kilogram, second) in the year 1791-1795. india accept 1956.
4. SI (Le system) in the year 1971

SI units (Basic units)

Physical quantity	Symbol for quantity	Symbol of SI units	Name of SI units
Length	l	m	meter
Mass	m	kg	kilogram
Time	t	s	second
Electric current	I	A	ampere
Thermodynamic temperature	T	K	Kelvin
Amount of substance	n	mole	mole
Luminous intensity	I_v	cd	candela

Prefixes used in the SI system

Multiple	Prefix	Symbol
10^{-15}	femto	f
10^{-12}	pico	p
10^{-9}	nano	n
10^{-6}	micro	μ
10^{-3}	milli	m
10^{-2}	centi	c
10^{-1}	deci	d
10	deca	da
10^{2}	hecta	h
10^{3}	kilo	k
10^{6}	mega	M
10^{9}	giga	G
10^{12}	tera	T
10^{15}	peta	p

1.Which of the following statement is /are true

1) An element of substance contain only one kind of atom
2) A compound can be decomposed its components
3) All homogeneous mixture are called as solution
4) all of these

2. A Pure substance can only be

1) A compound
2) An elements
3) An elements & compounds
4) A heterogenous mixture

3.Which of the following is not a mixture

1) Tap water
2) Distilled water
3) Salt in water
4) Oil in water

4.Which of an example of matter according to physical state at room temperature and pressure

1) solid
2) liquid
3) Gas
4) All of this

Because according to the physical state at room temperature and pressure the matter is present in three state solid, liquid and gas

5 .What are the type of the compound

1) Organic compound
2) Inorganic compound
3) Both 1 & 2
4) None of these

Because compounds is dividend in two types: organic and inorganic

6 .Which of the following example of a homogenous mixture

1) Water & alcohol
2) Water & sand
3) Water & oil
4) None of these

Because water & alcohol because they completely mixed and form solution

7 .Which mixture is called as solution

1) Heterogenous
2) homogeneous
3) Both 1& 2
4) None of these

Because homogeneous mixture is called as solution

7 .Which of the following is a compound

1) Graphite
2) Producer gas
3) Cement
4) Marble

Because Marble = $CaCO_3$ = Compound