



(CHEMISTRY)

Elements, Mixtures and Compounds

1. **Elements** : A pure substance which can neither be decomposed into nor built from simple substances is etc. Elements are further classified into : (i) Metals. (ii) Non-metals, (iii) Metalloids.

Note:-

Elements may be found in all the three forms as solid, liquid or gas.

Solid : Sodium (Na), Carbon (C), Aluminium (Al) etc.

Liquid : Mercury (Hg), Bromine (Br), etc.

Gas : Oxygen (CO_2), Hydrogen(H_2) etc.

2. **Types of Elements**

1. Metals are elements having luster ductility malleability, conductivity etc.
2. Aluminium is the most abundant metal in the earths crust.

3. **Non-metals**

1. The elements which have a tendency to form negative ion by gain of electrons are called non-metals e.g., hydrogen. oxygen. sulphur etc.

Note:-

1. Non-metals are bad conductors of heat and electricity. They are soft and brittle.
2. Oxides of non-metals are neutral (in lower oxidation state) or acidic (in higher oxidation states) in nature.
3. Bromine is the only exception amongst non-metals which is liquid in ordinary conditions. Rest of the non-metals are either solid or gas.

Metalloids

1. They are the elements whose properties fall between those of metals and non-metals. e.g. Germanium, arsenic, selenium and tellurium etc.

4. **Symbols derived from latin names of elements**

English name of the element	Symbol	Latin name of the element
Copper	Cu	Cuprum
Gold	Au	Aurum
Iron	Fe	Ferrum
Lead	Pb	Plumbum
Mercury	Hg	Hydrargyrum
Potassium	K	Kalium
Silver	Na	Natrum
Tin	Sn	Stannum
Tungsten	W	Wolfram

5. **Mixture** : A mixture is a substance which consists of two or more elements or compound not chemically combined together. e.g., air, milk, ink, brine, lime water, glass, paints, soil, food, wood, kerosene etc.

6. **Type of Mixtures:** Mixtures are of two types

1. **Homogeneous Mixture:** A homogeneous mixture has a same composition throughout its mass. It has no visible boundaries of separation between the various constituents. e.g., solution of sugar in water, solution of salt in water, a mixture of alcohol and water etc.



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2. **Heterogeneous Mixture** : A heterogeneous mixture which does not have a uniform composition throughout its mass. A heterogeneous mixture has visible boundaries of separation between the various components. e.g., solution of $K_2Cr_2O_7$ in water, solution of $CaCO_3$ in water, solution of oil in water, gun powder, soil, etc.

7. Properties of a Mixture

1. The components of a mixture are present in any ratio.
2. The mixture is the result of a physical change.
3. The properties of a mixture are the average of the properties of its constituents.
4. A mixture can be separated into its constituents by simple mechanical means.
5. Generally, energy is neither released nor absorbed during the formation of mixture.

8. Methods of Separation of Mixture

1. **Sublimation**: This process is used for the separation of those solids which sublime from a non-volatile solid. This process is generally used for the separation of naphthalene, anthracene, benzoic acid, camphor, NH_4Cl , iodine etc.
2. **Chromatography**: Chromatography is a modern method proposed by Tswett in 1903. This method is based on the difference in the rates at which the components of a mixture are adsorbed on a suitable adsorbent.
3. **Atmolysis**: It is used for separating the mixture of gases. This method is based on the difference in their rates of diffusion.

9. **Compound**: A substance which can be obtained by the union of two or more elements in a definite proportion by weight and into which it may be decomposed by suitable chemical methods. e.g., carbon dioxide, water, methane etc.

10. Properties of Compounds

1. A compound cannot be separated into its components by physical methods.
2. The properties of a compound are entirely different from those of its constituent elements.
3. The composition of a compound is fixed i.e., the constituents are present in fixed proportion by weight.
4. Compounds have fixed melting point, boiling point etc.