

Points to Remember

Organic Compound | One or more carbon atoms are covalently linked to atoms of other elements.

Classification of Organic compounds

Based on the pattern of Carbon chain

1. **Acyclic or Open chain compound**: Carbon atoms linked in a linear or open pattern.
 - *Saturated* – Single bond **Ex** : Ethane $\text{CH}_3 - \text{CH}_3$
 - *Unsaturated* – Double or Triple bond **Ex** : Ethene $\text{CH}_2 = \text{CH}_2$, Ethyne $\text{CH} \equiv \text{CH}$
2. **Cyclic or Closed chain compounds** : Carbon atoms linked in a cyclic or closed pattern.
 - a) **Carbocyclic (Homocyclic)** – Chain contains Carbon atom only.
 - i) *Alicyclic* – It contains carbocyclic rings. **Ex** : Cyclobutane
 - ii) *Aromatic* – It contains benzene rings. (alternate double bond). **Ex** : Benzene
 - b) **Heterocyclic** – It contains carbon and other elements. **Ex** : Pyridine, Furan

Hydrocarbons

- The organic compounds that are composed of only carbon and hydrogen atoms.
- Types :**
1. *Alkanes* – It contains only single bond, saturated compound. **Ex** : Alkane, $\text{C}_n\text{H}_{2n+2}$
 2. *Alkenes* – It contains double bond, unsaturated compound. **Ex** : Alkene, C_nH_{2n}
 3. *Alkynes* – It contains triple bond, unsaturated compound. **Ex** : Alkyne, $\text{C}_n\text{H}_{2n-2}$

Nomenclature of Organic Compounds

A systematic method for naming the organic compounds based on their structures.

IUPAC – International Union of Pure and Applied Chemistry (set of rules)

Components of IUPAC : Prefix + Root word + Suffix

Prefix (Rule 2) (Substituent/Branch)		Root words (Rule 1) (No of Carbon atoms)		Suffix			
Substituent	Name	No of 'C' atoms	Name	Primary (Bond type) (Rule 3)		Secondary (Functional group) (Rule 4)	
				Bond	Name	Group	Name
-F	Fluoro	1	Meth -	Single	-ane	Alcohol (-OH)	-ol
-Cl	Chloro	2	Eth -			Aldehyde (CHO)	-al
-Br	Bromo	3	Prop -	Double	-ene	Ketone (-CO-)	-one
-I	Iodo	4	But -			Carboxylic acid (-COOH)	-oic acid
-NH ₂	Amino	5	Pent -	Triple	-yne	Rule 5 - When the primary & secondary suffixes are joined, the terminal 'e' of the primary suffix is removed. Rule 6 - Identify the substituent and use a number followed by a dash and a prefix to specify its location and identity.	
-CH ₃	Methyl	6	Hex -				
-CH ₂ CH ₃	Ethyl	8	Oct -				
		9	Non -				
		10	Dec -				

Classification of Organic compounds based on Functional group

Functional Group : An atom or group of atoms in a molecule, which gives its characteristic chemical properties.

Class of the Compound	Alcohol	Aldehyde	Ketone	Carboxylic acid	Ester (Fruity odour)	Ether
Functional group	-OH	$\begin{array}{c} \text{O} \\ \\ -\text{C} - \text{H} \end{array}$	$\begin{array}{c} \text{O} \\ \\ -\text{C} - \end{array}$	$\begin{array}{c} \text{O} \\ \\ -\text{C} - \text{OH} \end{array}$	$\begin{array}{c} \text{O} \\ \\ -\text{C} - \text{OR} \end{array}$	-O - R
Common Formula	R - OH	R - CHO	R - CO - R	R - COOH	R - COOR	R - O - R
Example	Ethanol $\text{CH}_3\text{CH}_2\text{OH}$	Acetaldehyde CH_3CHO	Acetone CH_3COCH_3	Acetic acid CH_3COOH	Methyl acetate $\text{CH}_3\text{COOCH}_3$	Dimethyl ether CH_3OCH_3
uses	solvent, antiseptic agent	disinfectant	solvent, Stain remover	making dyes, pigments & paint	cooking oils and lipids contain esters	anaesthetic agents, Pain Killer

