

Definitions

Organic Molecules: molecules containing carbon atoms

Structural formula: shows which atoms are attached to which within the molecule. Atoms are represented by their chemical symbols and lines are used to represent ALL the bonds that hold the atoms together.

Condensed structural formula: shows the way in which atoms are bonded together in the molecule, but DOES NOT SHOW ALL bond lines

Hydrocarbon: Organic compounds that consist of hydrogen and carbon only

Homologous series: A series of organic compounds that can be described by the same general formula OR in which one member differs from the next with a CH_2 group

Saturated compounds: Compounds in which there are no multiple bonds between C atoms in their hydrocarbon chains

Unsaturated compounds: Compounds with one or more multiple bonds between C atoms in their hydrocarbon chains

Functional group: A bond or an atom or a group of atoms that determine(s) the physical and chemical properties of a group of organic compounds

Structural isomer: Organic molecules with the same molecular formula, but different structural formulae

Chain isomers: Same molecular formula, but different types of chains

Positional isomers: Same molecular formula, but different positions of the side chain, substituents or functional groups on the parent chain

Functional isomers: Same molecular formula, but different functional groups *Aldehydes and Ketones, Esters and Carboxylic Acids*

Molecular Formula: A chemical formula that indicates the type of atoms and the correct number of each in a molecule.

Classification of organic molecules

Classification of organic molecules according to homologous series

Homologous series	General formula	Functional Group	Suffix	Example name	Structural formula	Condensed structural formula	Molecular formula
Hydrocarbon	Alkanes $\text{C}_n\text{H}_{2n+2}$	$\begin{array}{c} \\ -\text{C}-\text{C}- \\ \end{array}$	-ane	propane	$\begin{array}{c} \text{H} & \text{H} & \text{H} \\ & & \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{H} \\ & & \\ \text{H} & \text{H} & \text{H} \end{array}$	$\text{CH}_3\text{CH}_2\text{CH}_3$	C_3H_8
	Alkenes C_nH_{2n}	$\begin{array}{c} \text{C}=\text{C} \\ / \quad \backslash \end{array}$	-ene	propene	$\begin{array}{c} \text{H} & \text{H} & \text{H} \\ & & \\ \text{H}-\text{C}=\text{C}-\text{C}-\text{H} \\ & & \\ \text{H} & \text{H} & \text{H} \end{array}$	$\text{CH}_2=\text{CHCH}_3$	C_3H_6
	Alkynes $\text{C}_n\text{H}_{2n-2}$	$\text{C}\equiv\text{C}$	-yne	propyne	$\begin{array}{c} \text{H} & \text{H} & \text{H} \\ & & \\ \text{H}-\text{C}\equiv\text{C}-\text{C}-\text{H} \\ & & \\ \text{H} & \text{H} & \text{H} \end{array}$	CHCCH_3	C_3H_4
Halalkanes/ alkyl halides	$\text{C}_n\text{H}_{2n+1}\text{X}$ (X = F, Cl, Br, I)	$\begin{array}{c} \\ -\text{C}-\text{X} \\ \end{array}$	-ane	2-bromopropane	$\begin{array}{c} \text{H} & \text{H} & \text{H} \\ & & \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{H} \\ & & \\ \text{H} & \text{H} & \text{Br} \end{array}$	$\text{CH}_3\text{CHBrCH}_3$	$\text{C}_3\text{H}_7\text{Br}$
Alcohols	$\text{C}_n\text{H}_{2n+1}\text{OH}$	$\begin{array}{c} \\ -\text{O}-\text{H} \\ \end{array}$	-ol	propan-2-ol	$\begin{array}{c} \text{H} & \text{H} & \text{H} \\ & & \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{H} \\ & & \\ \text{H} & \text{H} & \text{OH} \end{array}$	$\text{CH}_3\text{CHOHCH}_3$	$\text{C}_3\text{H}_8\text{O}$
Aldehydes	$\text{C}_n\text{H}_n\text{O}$ $n = 1, 2, \dots$	$\begin{array}{c} \text{O} \\ \\ -\text{C}-\text{H} \end{array}$	-al	propanal	$\begin{array}{c} \text{H} & \text{H} & \text{H} \\ & & \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{H} \\ & & \\ \text{H} & \text{H} & \text{O} \end{array}$	$\text{CH}_3\text{CH}_2\text{CHO}$	$\text{C}_3\text{H}_6\text{O}$
Ketones	$\text{C}_n\text{H}_{2n}\text{O}$ $n = 3, 4, \dots$	$\begin{array}{c} \text{O} \\ \\ -\text{C}-\text{C}-\text{C}-\text{H} \end{array}$	-one	propanone	$\begin{array}{c} \text{O} \\ \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{H} \\ & & \\ \text{H} & \text{H} & \text{H} \end{array}$	CH_3COCH_3	$\text{C}_3\text{H}_6\text{O}$
Carboxylic acids	$\text{C}_n\text{H}_{2n}\text{O}_2$ $n = 1, 2, \dots$	$\begin{array}{c} \text{O} \\ \\ -\text{C}-\text{O}-\text{H} \end{array}$	-oic acid	propanoic acid	$\begin{array}{c} \text{O} \\ \\ \text{H}-\text{C}-\text{C}-\text{C}-\text{H} \\ & & \\ \text{H} & \text{H} & \text{O} \end{array}$	$\text{CH}_3\text{CH}_2\text{COOH}$	$\text{C}_3\text{H}_6\text{O}_2$
Esters	$\text{C}_n\text{H}_{2n}\text{O}_2$ $n = 2, 3, \dots$	$\begin{array}{c} \text{O} \\ \\ -\text{C}-\text{O}-\text{C}-\text{H} \end{array}$	-oate	ethyl methanoate	$\begin{array}{c} \text{O} \\ \\ \text{H}-\text{C}-\text{O}-\text{C}-\text{H} \\ & & \\ \text{H} & \text{H} & \text{H} \end{array}$	$\text{CH}_3\text{CH}_2\text{COOH}$	$\text{C}_3\text{H}_6\text{O}_2$

