

Ap Biology
Notes: Carbon

Organic Chemistry: Chemistry of living things

CHNOPS- Carbon, Hydrogen, Nitrogen, Oxygen, Phosphorus, Sulfur

Vitalism- belief that compounds were mystically being derived from living things

Berzelius: Made this distinction between living and non living chemistry

Wohler: Made Urea from Ammonium and Cyanate

Miller and Urey: Made building blocks of larger molecules with inorganic molecules

Carbon: Most versatile building block of molecules. Base of Organic Chemistry.

Hydrocarbons: Organic molecules made of only hydrogen and carbon atoms.

Isomers- Compounds that have the same molecular formula but different structures causing different properties.

Structural: Variation in Covalent arrangement of atoms.

Geometric: Same Covalent partnerships, but different spatial arrangements.

Enantiomers(article): Molecules that are mirror images of each other. Usually one isomer is biologically active, the other inactive.

Functional Groups: Components of organic molecules that are most commonly involved in chemical reactions.

Functional Groups	Class of Molecules	Formula	Example
Hydroxyl -OH	Alcohols	$R-OH$	$\begin{array}{c} H & H \\ & \\ H-C & -C-OH \\ & \\ H & H \end{array}$ Ethanol
Carbonyl -CHO	Aldehydes	$\begin{array}{c} O \\ \\ R-C \\ \\ H \end{array}$	$\begin{array}{c} H & O \\ & \\ H-C & -C-H \\ & \\ H & H \end{array}$ Acetaldehyde
$\begin{array}{c} \diagup \\ CO \\ \diagdown \end{array}$	Ketones	$\begin{array}{c} O \\ \\ R-C-R \end{array}$	$\begin{array}{c} H & O & H \\ & & \\ H-C & -C & -C-H \\ & & \\ H & & H \end{array}$ Acetone
Carboxyl -COOH	Carboxylic Acids	$\begin{array}{c} O \\ \\ R-C \\ \\ OH \end{array}$	$\begin{array}{c} H & O \\ & \\ H-C & -C-OH \\ & \\ H & H \end{array}$ Acetic Acid
Amino -NH ₂	Amines	$\begin{array}{c} H \\ \\ R-N \\ \\ H \end{array}$	$\begin{array}{c} H & H \\ & \\ H-C & -N-H \\ & \\ H & H \end{array}$ Methylamine
Phosphate -OPO ₃ ⁻²	Organic Phosphates	$\begin{array}{c} O \\ \\ R-O-P-O^- \\ \\ O^- \end{array}$	$\begin{array}{c} HO & O \\ \diagdown & / \\ & C \\ & \\ H-C & -OH & O \\ & & \\ H-C & -O & -P-O^- \\ & & \\ H & & O^- \end{array}$ 3-Phosphoglyceric acid
Sulphydryl -SH	Thiols	$R-SH$	$\begin{array}{c} H & H \\ & \\ H-C & -C-SH \\ & \\ H & H \end{array}$ Mercaptoethanol