

Molecular Classes

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Compound Class	General Structure	Functional Group	Example
Alcohols	$R-OH$	$-OH$ Hydroxyl group	$\begin{array}{c} H \\ \\ CH_3C-OH \\ \\ H \end{array}$ Ethanol
Aldehydes	$\begin{array}{c} O \\ \\ R-C-H \end{array}$	$\begin{array}{c} O \\ \\ -C-H \end{array}$ Carbonyl group	$\begin{array}{c} O \\ \\ CH_3CH_2C-H \end{array}$ Propanal
Alkanes	$R-H$	None	$CH_3CH_2CH_2CH_2CH_3$ Pentane
Alkenes	$\begin{array}{ccc} (H)R & & R(H) \\ & \diagdown \quad \diagup & \\ & C=C & \\ & \diagup \quad \diagdown & \\ (H)R & & R(H) \end{array}$	$\begin{array}{c} \diagdown \quad \diagup \\ C=C \\ \diagup \quad \diagdown \end{array}$ Carbon-carbon double bond	$\begin{array}{ccc} H_3C & & CH_3 \\ & \diagdown \quad \diagup & \\ & C=C & \\ & \diagup \quad \diagdown & \\ H & & H \end{array}$ <i>cis</i> -2-Butene

Alkynes	$(\text{H})\text{R}-\text{C}\equiv\text{C}-\text{R}(\text{H})$	$-\text{C}\equiv\text{C}-$ Carbon-carbon triple bond	$\text{CH}_3\text{C}\equiv\text{CCH}_3$ 2-Butyne
Amides	$\begin{array}{c} \text{O} \\ \parallel \\ \text{R}-\text{C}-\text{N}-\text{R}'(\text{H}) \\ \\ \text{R}''(\text{H}) \end{array}$	$\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{N}- \\ \end{array}$ Carboxamide group	$\text{CH}_3\text{CH}_2\text{CH}_2\text{C}(=\text{O})\text{NH}_2$ Butanamide
Amines	$\begin{array}{c} \text{R}-\text{N}-\text{R}'(\text{H}) \\ \\ \text{R}''(\text{H}) \end{array}$	$\begin{array}{c} -\text{N}- \\ \end{array}$ Amino group	$\begin{array}{c} \text{H}_3\text{C}-\text{N}-\text{CH}_3 \\ \\ \text{CH}_3 \end{array}$ <i>N,N</i> -Dimethylmethanamine (Trimethylamine)
Anhydrides	$\begin{array}{c} \text{O} \quad \text{O} \\ \parallel \quad \parallel \\ \text{R}-\text{C}-\text{O}-\text{C}-\text{R}'(\text{H}) \end{array}$	$\begin{array}{c} \text{O} \quad \text{O} \\ \parallel \quad \parallel \\ -\text{C}-\text{O}-\text{C}- \end{array}$	$\text{CH}_3\text{CH}_2-\text{C}(=\text{O})-\text{O}-\text{C}(=\text{O})-\text{CH}_2\text{CH}_3$ Propanoic anhydride
Aromatics	$\begin{array}{c} \text{R}(\text{H}) \\ \\ (\text{H})\text{R}-\text{C}_6\text{H}_4-\text{R}(\text{H}) \\ \\ (\text{H})\text{R}-\text{C}_6\text{H}_4-\text{R}(\text{H}) \\ \\ \text{R}(\text{H}) \end{array}$	$\begin{array}{c} \text{CH}_3 \\ \\ \text{H}-\text{C}_6\text{H}_5-\text{H} \\ \\ \text{H} \end{array}$ Methylbenzene (Toluene)	$\begin{array}{c} \text{CH}_3 \\ \\ \text{H}-\text{C}_6\text{H}_5-\text{H} \\ \\ \text{H} \end{array}$ Methylbenzene (Toluene)
Carboxylic Acids	$\begin{array}{c} \text{O} \\ \parallel \\ \text{R}-\text{C}-\text{OH} \end{array}$	$\begin{array}{c} \text{O} \\ \parallel \\ -\text{C}-\text{OH} \end{array}$ Carboxyl group	$\text{CH}_3\text{CH}_2-\text{C}(=\text{O})\text{OH}$ Propanoic acid

Esters	$\text{R}-\overset{\text{O}}{\underset{\parallel}{\text{C}}}-\text{O}-\text{R}'$	$\text{---}\overset{\text{O}}{\underset{\parallel}{\text{C}}}-\text{O}\text{---}$ Carboalkoxy group	$\text{CH}_3\text{CH}_2-\overset{\text{O}}{\underset{\parallel}{\text{C}}}-\text{O}-\text{CH}_3$ Methyl propanoate (Methyl propionate)
Ethers	$\text{R}-\text{O}-\text{R}'$	---O--- Oxygen between two alkyl groups	$\text{CH}_3\text{CH}_2-\text{O}-\text{CH}_3$ Methoxymethane (Ethyl methyl ether)
Haloalkanes	$\text{R}-\text{X}$	---X X = F, Cl, Br, I	$\text{CH}_3\text{CH}_2\text{CH}_2-\text{Br}$ Bromopropane
Ketones	$\text{R}-\overset{\text{O}}{\underset{\parallel}{\text{C}}}-\text{R}'$	$\text{---}\overset{\text{O}}{\underset{\parallel}{\text{C}}}\text{---}$ Carbonyl group	$\text{CH}_3\text{CH}_2-\overset{\text{O}}{\underset{\parallel}{\text{C}}}-\text{CH}_2\text{CH}_3$ 3-Pentanone
Nitriles	$\text{R}-\text{C}\equiv\text{N}$	$\text{---C}\equiv\text{N}$ Cyano group	$\text{CH}_3-\text{C}\equiv\text{N}$ Ethanenitrile (Acetonitrile)
Thiols	$\text{R}-\text{SH}$	---SH Sulfhydryl group	$\text{CH}_3\text{CH}_2\text{CH}_2-\text{SH}$ Propanethiol