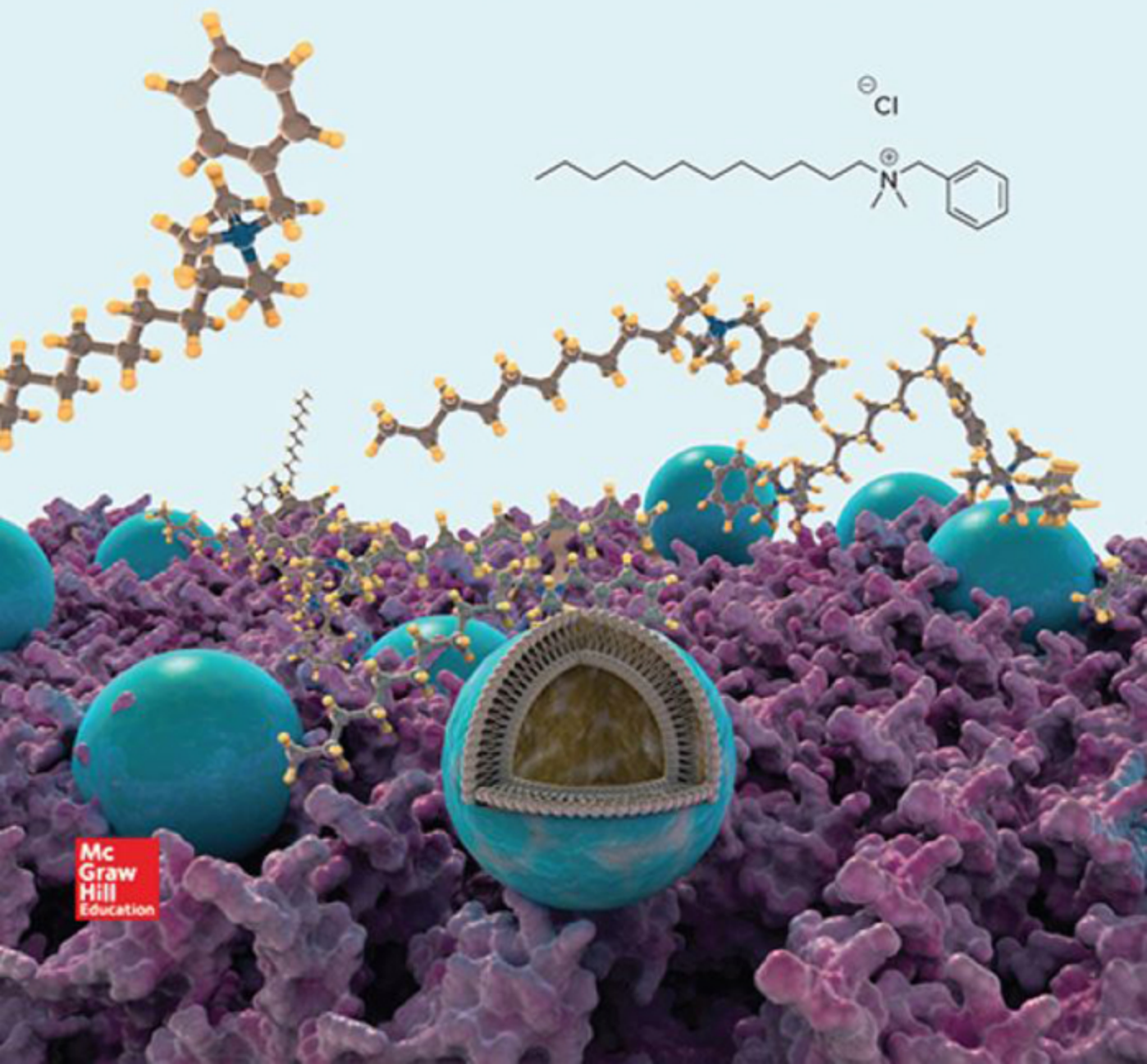


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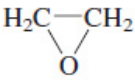

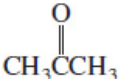
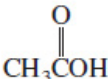
Eleventh Edition

ORGANIC CHEMISTRY



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THE PRINCIPAL FUNCTIONAL GROUPS OF ORGANIC CHEMISTRY

	<i>Example</i>	<i>Acceptable Name(s) of Example</i>	<i>Characteristic Reaction Type</i>
Hydrocarbons			
Alkanes	CH_3CH_3	Ethane	Free-radical substitution of hydrogen by halogen
Alkenes	$\text{H}_2\text{C}=\text{CH}_2$	Ethene or ethylene	Electrophilic addition to double bond
Alkynes	$\text{HC}\equiv\text{CH}$	Ethyne or acetylene	Electrophilic addition to triple bond
Dienes	$\text{H}_2\text{C}=\text{CHCH}=\text{CH}_2$	1,3-Butadiene	Electrophilic addition to double bonds
Arenes		Benzene	Electrophilic aromatic substitution
Halogen-substituted derivatives of hydrocarbons			
Alkyl halides	$\text{CH}_3\text{CH}_2\text{Cl}$	Chloroethane or ethyl chloride	Nucleophilic substitution; elimination
Alkenyl halides	$\text{H}_2\text{C}=\text{CHCl}$	Chloroethene or vinyl chloride	Electrophilic addition to double bond; elimination
Aryl halides	$\text{C}_6\text{H}_5\text{Cl}$	Chlorobenzene	Electrophilic aromatic substitution; nucleophilic aromatic substitution
Oxygen-containing organic compounds			
Alcohols	$\text{CH}_3\text{CH}_2\text{OH}$	Ethanol or ethyl alcohol	Dehydration; conversion to alkyl halides; esterification
Phenols	$\text{C}_6\text{H}_5\text{OH}$	Phenol	Electrophilic aromatic substitution
Ethers	$\text{CH}_3\text{CH}_2\text{OCH}_2\text{CH}_3$	Ethoxyethane or diethyl ether	Cleavage by hydrogen halides
Epoxides		Epoxyethane or ethylene oxide or oxirane	Nucleophilic ring opening
Aldehydes		Ethanal or acetaldehyde	Nucleophilic addition to carbonyl group
Ketones		2-Propanone or acetone	Nucleophilic addition to carbonyl group
Carboxylic acids		Ethanoic acid or acetic acid	Ionization of carboxyl; esterification



THE PRINCIPAL FUNCTIONAL GROUPS OF ORGANIC CHEMISTRY

	<i>Example</i>	<i>Acceptable Name(s) of Example</i>	<i>Characteristic Reaction Type</i>
Carboxylic acid derivatives			
Acyl halides	$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3\text{CCl} \end{array}$	Ethanoyl chloride or acetyl chloride	Nucleophilic acyl substitution
Acid anhydrides	$\begin{array}{c} \text{O} \quad \text{O} \\ \parallel \quad \parallel \\ \text{CH}_3\text{COCCH}_3 \end{array}$	Ethanoic anhydride or acetic anhydride	Nucleophilic acyl substitution
Esters	$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3\text{COCH}_2\text{CH}_3 \end{array}$	Ethyl ethanoate or ethyl acetate	Nucleophilic acyl substitution
Amides	$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_3\text{CNHCH}_3 \end{array}$	<i>N</i> -Methylethanamide or <i>N</i> -methylacetamide	Nucleophilic acyl substitution
Nitrogen-containing organic compounds			
Amines	$\text{CH}_3\text{CH}_2\text{NH}_2$	Ethanamine or ethylamine	Nitrogen acts as a base or as a nucleophile
Nitriles	$\text{CH}_3\text{C}\equiv\text{N}$	Ethanenitrile or acetonitrile	Nucleophilic addition to carbon–nitrogen triple bond
Nitro compounds	$\text{C}_6\text{H}_5\text{NO}_2$	Nitrobenzene	Reduction of nitro group to amine
Sulfur-containing organic compounds			
Thiols	$\text{CH}_3\text{CH}_2\text{SH}$	Ethanethiol	Oxidation to a sulfenic, sulfinic, or sulfonic acid or to a disulfide
Sulfides	$\text{CH}_3\text{CH}_2\text{SCH}_2\text{CH}_3$	Diethyl sulfide	Alkylation to a sulfonium salt; oxidation to a sulfoxide or sulfone

Organic Chemistry

ELEVENTH EDITION

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ORGANIC CHEMISTRY, ELEVENTH EDITION

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