

## **CHEMISTRY DICTIONARY**



**Recommended by CMC of Vinnytsia National Medical University (protocol № 5 from 2.03.2011)**

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**Reviewer:**

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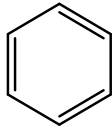
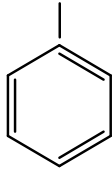
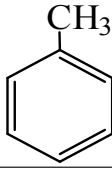
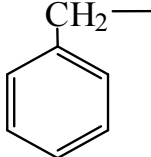
**Marchak T.V.- Candidate of chemistry science, assistant professor  
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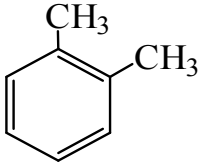
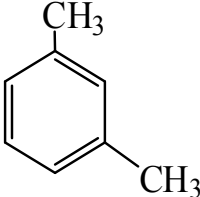
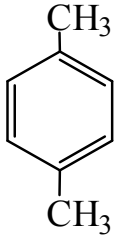
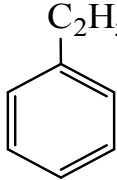
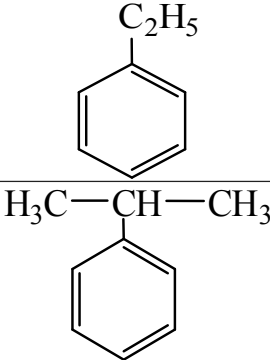
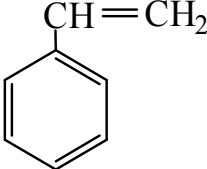
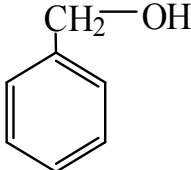
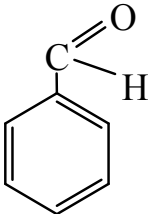
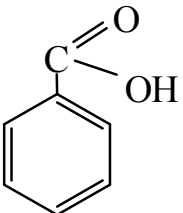
**Shitova T.V. – Senior-lecturer  
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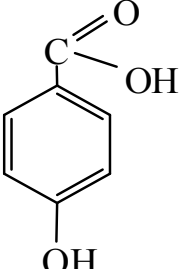
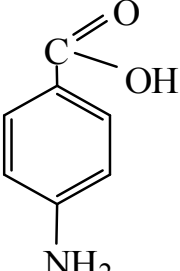
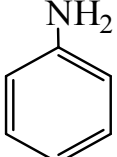
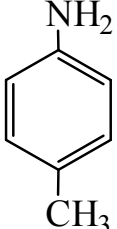
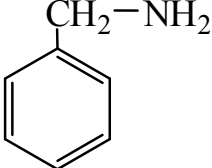
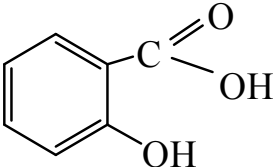
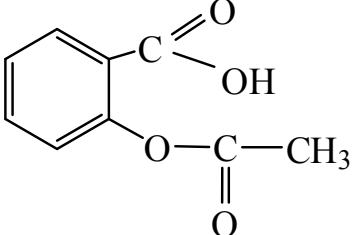
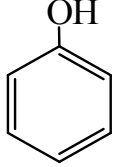
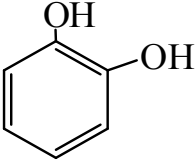
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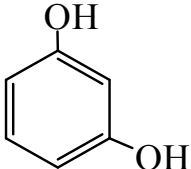
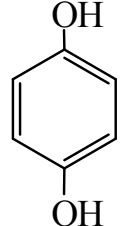
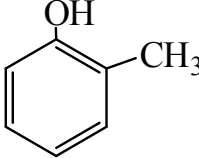
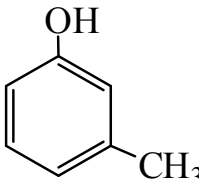
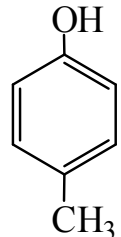
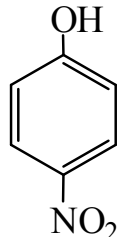
## CHEMISTRY DICTIONARY

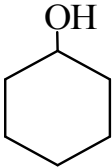
Alkanes		Radicals	
Name	Formula	Name	Formula
Methane	CH <sub>4</sub>	Methyl	CH <sub>3</sub> —
Ethane	CH <sub>3</sub> —CH <sub>3</sub>	Ethyl	CH <sub>3</sub> —CH <sub>2</sub> —
Propane	CH <sub>3</sub> —CH <sub>2</sub> —CH <sub>3</sub>	Propyl	CH <sub>3</sub> —CH <sub>2</sub> —CH <sub>2</sub> —
		Isopropyl	$\begin{array}{c} \text{CH}_3-\text{CH}-\text{CH}_3 \\   \\ \text{---} \end{array}$
Butane	CH <sub>3</sub> —CH <sub>2</sub> —CH <sub>2</sub> —CH <sub>3</sub>	Butyl	CH <sub>3</sub> —CH <sub>2</sub> —CH <sub>2</sub> —CH <sub>2</sub> —
		Secondary butyl	$\begin{array}{c} \text{CH}_3-\text{CH}_2-\text{CH}-\text{CH}_3 \\   \\ \text{---} \end{array}$
Isobutane (2 – Methyl – propane)	$\begin{array}{c} \text{CH}_3-\text{CH}-\text{CH}_3 \\   \\ \text{CH}_3 \end{array}$	Isobutyl	$\begin{array}{c} \text{CH}_3-\text{CH}-\text{CH}_2-\text{---} \\   \\ \text{CH}_3 \end{array}$
		Tertiary butyl	$\begin{array}{c}   \\ \text{CH}_3-\text{C}-\text{CH}_3 \\   \\ \text{CH}_3 \end{array}$
Pentane	CH <sub>3</sub> —CH <sub>2</sub> —CH <sub>2</sub> —CH <sub>2</sub> —CH <sub>3</sub>	Pentyl	CH <sub>3</sub> —CH <sub>2</sub> —CH <sub>2</sub> —CH <sub>2</sub> —CH <sub>2</sub> —
		Secondary pentyl	$\begin{array}{c} \text{CH}_3-\text{CH}_2-\text{CH}_2-\text{CH}-\text{CH}_3 \\   \\ \text{---} \end{array}$
Isopentane (2 – Methylbutane)	$\begin{array}{c} \text{CH}_3-\text{CH}_2-\text{CH}-\text{CH}_3 \\   \\ \text{CH}_3 \end{array}$	Isopentyl	$\begin{array}{c} \text{CH}_3-\text{CH}_2-\text{CH}-\text{CH}_2-\text{---} \\   \\ \text{CH}_3 \end{array}$
		Tertiarypentyl	$\begin{array}{c}   \\ \text{CH}_3-\text{CH}_2-\text{C}-\text{CH}_3 \\   \\ \text{CH}_3 \end{array}$
2,2 – dimethyl – propane	$\begin{array}{c} \text{CH}_3 \\   \\ \text{CH}_3-\text{C}-\text{CH}_3 \\   \\ \text{CH}_3 \end{array}$		
Halogenoalkanes			
Chloromethane			CH <sub>3</sub> Cl
Trichloromethane (chloroform)			CHCl <sub>3</sub>
Carbon tetrachloride			CCl <sub>4</sub>

Triiodide (iodoform)	$\text{CHI}_3$
Chloroethane	$\text{CH}_3\text{—CH}_2\text{—Cl}$
Chloropropane	$\text{CH}_3\text{—CH}_2\text{—CH}_2\text{—Cl}$
2 – Chloropropane	$\begin{array}{c} \text{CH}_3\text{—CH—CH}_3 \\   \\ \text{Cl} \end{array}$
Chlorobutane	$\text{CH}_3\text{—CH}_2\text{—CH}_2\text{—CH}_2\text{—Cl}$
2 – Chlorobutane	$\begin{array}{c} \text{CH}_3\text{—CH}_2\text{—CH—CH}_3 \\   \\ \text{Cl} \end{array}$
<b>Alkenes</b>	
Ethene	$\text{H}_2\text{C}=\text{CH}_2$
Propene	$\text{H}_2\text{C}=\text{CH—CH}_3$
Butene –1	$\text{H}_2\text{C}=\text{CH—CH}_2\text{—CH}_3$
Butene – 2	$\text{H}_3\text{C—CH}=\text{CH—CH}_3$
Pentene – 1	$\text{H}_2\text{C}=\text{CH—CH}_2\text{—CH}_2\text{—CH}_3$
Pentene – 2	$\text{H}_3\text{C—CH}_2\text{—CH}=\text{CH—CH}_3$
<b>Arenes (Benzene and its derivatives)</b>	
Benzene	
Phenyl	
Toluene	
Benzyl	

<p>Xylene: o – xylene (o – dimethylbenzene)</p>	
<p>m – xylene (m – dimethylbenzene)</p>	
<p>p – xylene (p – dimethylbenzene)</p>	
<p>Ethylbenzene</p>	
<p>Isopropylbenzene (cumene)</p>	
<p>Sterol (vinyl benzene)</p>	
<p>Benzyl alcohol</p>	
<p>Benzaldehyde</p>	
<p>Benzoic acid</p>	

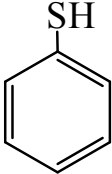
<p>Paraoxybenzoic acid</p>	
<p>Para-aminobenzoic acid</p>	
<p>Aniline (aminobenzene)</p>	
<p>Para-Methylaniline</p>	
<p>Benzylamine</p>	
<p>Salicylic acid</p>	
<p>Acetylsalicylic acid</p>	
<p>Phenol</p>	
<p>Ortho-dioxybenzene (pirokatekhin )</p>	

Meta-dioxybenzene (resorcin)	
Para-dioxybenzene (hydroquinone)	
Cresol: ortho – cresol (ortho – methylphenol)	
meta – cresol (meta – methylphenol)	
para – cresol (para – methylphenol )	
Para – nitrophenol	
<b>Alcohols (R–O– alkoxy group)</b>	
Methanol	$\text{CH}_3\text{—OH}$
Methoxy	$\text{CH}_3\text{—O—}$
Ethanol	$\text{CH}_3\text{—CH}_2\text{—OH}$
Ethoxy	$\text{CH}_3\text{—CH}_2\text{—O—}$
Propanol	$\text{CH}_3\text{—CH}_2\text{—CH}_2\text{—OH}$
Isopropanol	$\begin{array}{c} \text{CH}_3\text{—CH—CH}_3 \\   \\ \text{OH} \end{array}$

Butanol	$\text{CH}_3\text{—CH}_2\text{—CH}_2\text{—CH}_2\text{—OH}$
Secondary butanol	$\begin{array}{c} \text{H}_3\text{C—CH}_2\text{—CH—CH}_3 \\   \\ \text{OH} \end{array}$
Isobutanol	$\begin{array}{c} \text{HO—CH}_2\text{—CH—CH}_3 \\   \\ \text{CH}_3 \end{array}$
Tributanol	$\begin{array}{c} \text{OH} \\   \\ \text{CH}_3\text{—C—CH}_3 \\   \\ \text{CH}_3 \end{array}$
Cyclohexanol	
Vinyl alcohol	$\text{H}_2\text{C=CH—OH}$
<b>Polyatomic alcohols</b>	
Ethylene glycol (ethandiol)	$\begin{array}{c} \text{CH}_2\text{—CH}_2 \\   \quad   \\ \text{OH} \quad \text{OH} \end{array}$
Glycerol (propantriol)	$\begin{array}{c} \text{CH}_2\text{—CH—CH}_2 \\   \quad   \quad   \\ \text{OH} \quad \text{OH} \quad \text{OH} \end{array}$
Xylitol	$\begin{array}{c} \text{CH}_2\text{—CH—CH—CH—CH}_2 \\   \quad   \quad   \quad   \quad   \\ \text{OH} \quad \text{OH} \quad \text{OH} \quad \text{OH} \quad \text{OH} \end{array}$
Sorbitol	$\begin{array}{c} \text{CH}_2\text{—CH—CH—CH—CH—CH}_2 \\   \quad   \quad   \quad   \quad   \quad   \\ \text{OH} \quad \text{OH} \quad \text{OH} \quad \text{OH} \quad \text{OH} \quad \text{OH} \end{array}$
<b>Ester (ethers)</b>	
Dimethyl ether	$\text{CH}_3\text{—O—CH}_3$
Diethyl ether (medical ether)	$\text{C}_2\text{H}_5\text{—O—C}_2\text{H}_5$
Phenyl ethyl ether	$\text{C}_6\text{H}_5\text{—O—C}_2\text{H}_5$
<b>Amines</b>	
Methylamine	$\text{CH}_3\text{—NH}_2$
Ethylamine	$\text{CH}_3\text{—CH}_2\text{—NH}_2$
Propylamine	$\text{CH}_3\text{—CH}_2\text{—CH}_2\text{—NH}_2$



Isopropylamine (2 – aminopropane)	$\begin{array}{c} \text{CH}_3\text{—CH—CH}_3 \\   \\ \text{NH}_2 \end{array}$
Butylamine	$\text{CH}_3\text{—CH}_2\text{—CH}_2\text{—CH}_2\text{—NH}_2$
Secondary – butylamine	$\begin{array}{c} \text{H}_3\text{C—CH}_2\text{—CH—CH}_3 \\   \\ \text{NH}_2 \end{array}$
Primary amine (methylamine)	$\text{CH}_3\text{—NH}_2$
Secondary –amine (dimethylamine)	$\text{CH}_3\text{—NH—CH}_3$
Tertiary amine (trimethylamine)	$\begin{array}{c} \text{CH}_3\text{—N—CH}_3 \\   \\ \text{CH}_3 \end{array}$
Quaternary basis	$\begin{array}{c} \text{CH}_3 \\   \\ \text{CH}_3\text{—N}^+\text{—CH}_3 \\   \\ \text{CH}_3 \end{array}$
<b>Biogenic amines</b>	
Calamine (ethanolamine)	$\begin{array}{c} \text{CH}_2\text{—CH}_2 \\   \quad   \\ \text{NH}_2 \quad \text{OH} \end{array}$
Histamine	$\begin{array}{c} \text{N} \\ \diagup \quad \diagdown \\ \text{CH}_2\text{—CH}_2 \\   \\ \text{NH}_2 \\   \\ \text{H} \end{array}$
Tryptamine	$\begin{array}{c} \text{CH}_2\text{—CH}_2 \\   \\ \text{NH}_2 \\   \\ \text{H} \end{array}$
Serotonin	$\begin{array}{c} \text{HO—C}_6\text{H}_4\text{—} \\   \\ \text{CH}_2\text{—CH}_2 \\   \\ \text{NH}_2 \\   \\ \text{H} \end{array}$
Norepinephrine	$\begin{array}{c} \text{OH} \\   \\ \text{C}_6\text{H}_3\text{—} \\   \\ \text{HO—CH—CH}_2\text{—NH}_2 \end{array}$
Adrenaline	$\begin{array}{c} \text{OH} \\   \\ \text{C}_6\text{H}_3\text{—} \\   \\ \text{HO—CH—CH}_2\text{—NH—CH}_3 \end{array}$

Choline	$\begin{array}{c} \text{CH}_3 \\   \\ \text{CH}_3-\text{N}^+-\text{CH}_2-\text{CH}_2-\text{OH} \\   \\ \text{CH}_3 \end{array}$
Acetylcholine	$\begin{array}{c} \text{CH}_3 \\   \\ \text{CH}_3-\text{N}^+-\text{CH}_2-\text{CH}_2-\text{O}-\text{C}(=\text{O})-\text{CH}_3 \\   \\ \text{CH}_3 \end{array}$
Putrescine	$\begin{array}{c} \text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2 \\   \qquad \qquad \qquad   \\ \text{NH}_2 \qquad \qquad \qquad \text{NH}_2 \end{array}$
Cadaverine	$\begin{array}{c} \text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2 \\   \qquad \qquad \qquad \qquad \qquad   \\ \text{NH}_2 \qquad \qquad \qquad \qquad \qquad \text{NH}_2 \end{array}$
<b>Thiols (mercaptans)</b>	
Methanethiol (mercaptomethane)	$\text{CH}_3-\text{SH}$
Ethanethiol	$\text{CH}_3-\text{CH}_2-\text{SH}$
Propanethiol	$\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{SH}$
Isopropanethiol	$\begin{array}{c} \text{CH}_3-\text{CH}-\text{CH}_3 \\   \\ \text{SH} \end{array}$
Dimethyl sulfide	$\text{CH}_3-\text{S}-\text{CH}_3$
Thiophenol	
<b>Aldehydes</b>	
Methanal (formaldehyde, formic)	$\begin{array}{c} \text{O} \\ // \\ \text{H}-\text{C} \\ \backslash \\ \text{H} \end{array}$
Ethanal (acetaldehyde, acetic)	$\begin{array}{c} \text{O} \\ // \\ \text{H}_3\text{C}-\text{C} \\ \backslash \\ \text{H} \end{array}$
Trichloroacetic aldehyde	$\begin{array}{c} \text{O} \\ // \\ \text{Cl}_3\text{C}-\text{C} \\ \backslash \\ \text{H} \end{array}$
Propanal (propionic)	$\begin{array}{c} \text{O} \\ // \\ \text{CH}_3-\text{CH}_2-\text{C} \\ \backslash \\ \text{H} \end{array}$
Butanal (oil)	$\begin{array}{c} \text{O} \\ // \\ \text{CH}_3-\text{CH}_2-\text{CH}_2-\text{C} \\ \backslash \\ \text{H} \end{array}$
<b>Ketones</b>	


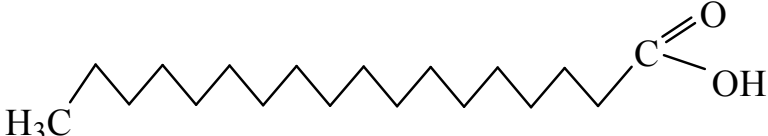
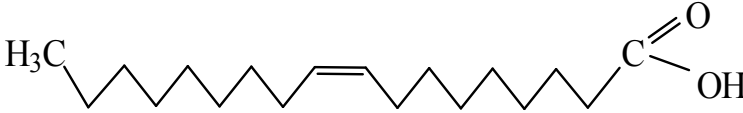
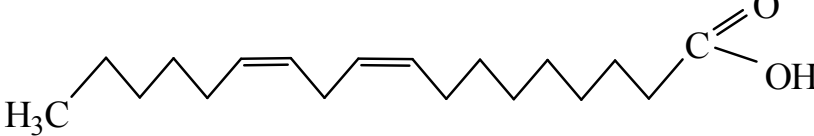
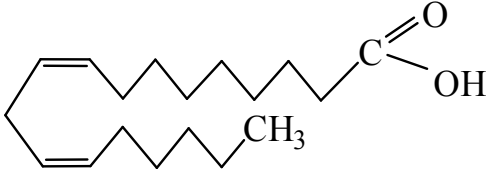
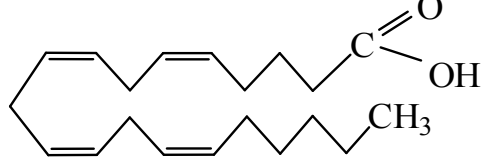
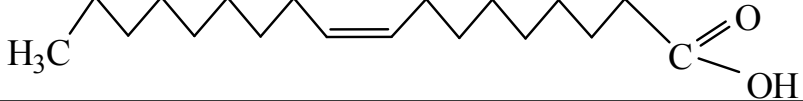
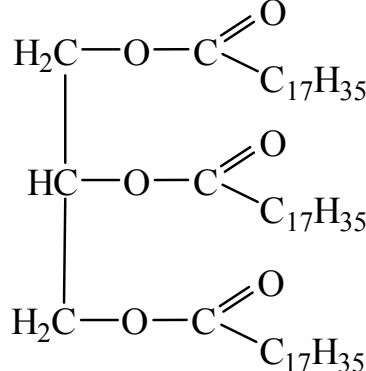
Acetone (dimethylketone)	$\begin{array}{c} \text{CH}_3-\text{C}-\text{CH}_3 \\ \parallel \\ \text{O} \end{array}$
Methylethylketone	$\begin{array}{c} \text{CH}_3-\text{C}-\text{C}_2\text{H}_5 \\ \parallel \\ \text{O} \end{array}$
Phenylethylketone (propiophenone)	$\begin{array}{c} \text{C}_6\text{H}_5-\text{C}-\text{C}_2\text{H}_5 \\ \parallel \\ \text{O} \end{array}$
<b>Carbonic acid</b>	
Formate (methanoic, formic)	$\begin{array}{c} \text{H}-\text{C} \\ \parallel \quad \backslash \\ \text{O} \quad \text{OH} \end{array}$
Acetate (ethanoic, acetic)	$\begin{array}{c} \text{H}_3\text{C}-\text{C} \\ \parallel \quad \backslash \\ \text{O} \quad \text{OH} \end{array}$
Propionate (propanoic)	$\text{CH}_3-\text{CH}_2-\text{C} \begin{array}{l} \parallel \\ \text{O} \\ \backslash \\ \text{OH} \end{array}$
Butyrate (butanoic, oil)	$\text{CH}_3-\text{CH}_2-\text{CH}_2-\text{C} \begin{array}{l} \parallel \\ \text{O} \\ \backslash \\ \text{OH} \end{array}$
<b>Dicarboxylic acids</b>	
Oxalate (sorrel)	$\begin{array}{c} \text{O} \quad \quad \text{O} \\ \parallel \quad \parallel \\ \text{HO}-\text{C}-\text{C}-\text{OH} \end{array}$
Malonate (malonic)	$\begin{array}{c} \text{O} \quad \quad \text{O} \\ \parallel \quad \parallel \\ \text{HO}-\text{C}-\text{CH}_2-\text{C}-\text{OH} \end{array}$
Succinate (amber, butanedioic acid)	$\begin{array}{c} \text{O} \quad \quad \text{O} \\ \parallel \quad \parallel \\ \text{HO}-\text{C}-\text{CH}_2-\text{CH}_2-\text{C}-\text{OH} \end{array}$
Glucarate (glutaric)	$\begin{array}{c} \text{O} \quad \quad \text{O} \\ \parallel \quad \parallel \\ \text{HO}-\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{C}-\text{OH} \end{array}$
<b>Oxyacids</b>	
Lactate (milk, 2 – oxypropane)	$\begin{array}{c} \text{CH}_3-\text{CH}-\text{C} \\ \quad \quad \parallel \quad \backslash \\ \quad \quad \text{O} \quad \text{OH} \\ \quad \quad   \\ \quad \quad \text{OH} \end{array}$
$\beta$ – Oxybutyrate ( $\beta$ – hydroxybutyric, 3 – oxobutanoate)	$\begin{array}{c} \text{CH}_3-\text{CH}-\text{CH}_2-\text{C} \\ \quad \quad \quad \quad \parallel \quad \backslash \\ \quad \quad \quad \quad \text{O} \quad \text{OH} \\ \quad \quad \quad \quad   \\ \quad \quad \quad \quad \text{OH} \end{array}$
Malate (apple, 2 – oxybutanedioic)	$\begin{array}{c} \text{O} \quad \quad \text{O} \\ \parallel \quad \parallel \\ \text{HO}-\text{C}-\text{CH}_2-\text{CH}-\text{C}-\text{OH} \\ \quad \quad \quad \quad   \\ \quad \quad \quad \quad \text{OH} \end{array}$



Acetyl chloride	$\text{H}_3\text{C}-\text{C}\begin{matrix} \text{=O} \\ \text{-Cl} \end{matrix}$
Benzoyl chloride	$\text{C}_6\text{H}_5-\text{C}\begin{matrix} \text{=O} \\ \text{-Cl} \end{matrix}$
<b>Amides, nitriles</b>	
Acetamide	$\text{H}_3\text{C}-\text{C}\begin{matrix} \text{=O} \\ \text{-NH}_2 \end{matrix}$
Benzamide	$\text{C}_6\text{H}_5-\text{C}\begin{matrix} \text{=O} \\ \text{-NH}_2 \end{matrix}$
Acetonitrile	$\text{H}_3\text{C}-\text{C}\equiv\text{N}$
Benzonitrile	$\text{C}_6\text{H}_5-\text{C}\equiv\text{N}$
<b>Esther</b>	
Methyl formate (methyl methanoate)	$\text{H}-\text{C}\begin{matrix} \text{=O} \\ \text{-O-CH}_3 \end{matrix}$
Ethyl formate	$\text{H}-\text{C}\begin{matrix} \text{=CH}_2 \\ \text{-O-C}_2\text{H}_5 \end{matrix}$
Methyl acetate	$\text{H}_3\text{C}-\text{C}\begin{matrix} \text{=O} \\ \text{-O-CH}_3 \end{matrix}$
Ethyl acetate	$\text{H}_3\text{C}-\text{C}\begin{matrix} \text{=O} \\ \text{-O-C}_2\text{H}_5 \end{matrix}$
Methyl benzoate	$\text{C}_6\text{H}_5-\text{C}\begin{matrix} \text{=O} \\ \text{-O-CH}_3 \end{matrix}$

## Lipids

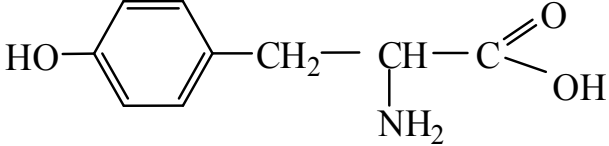
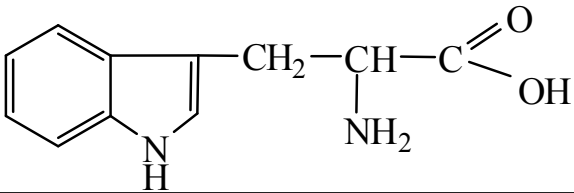
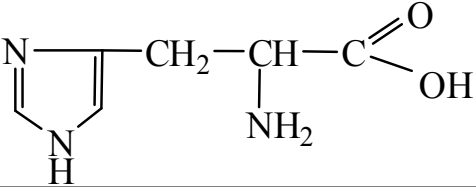
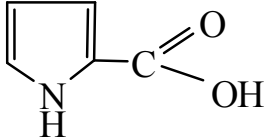
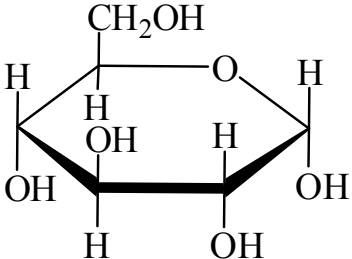
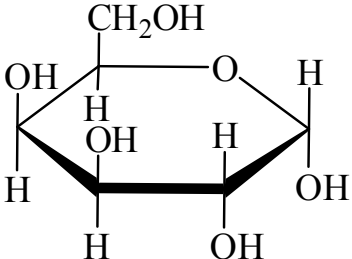
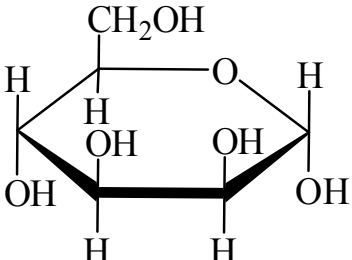
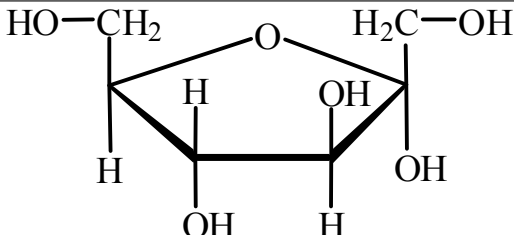
### Higher fatty acids

Palmitic $C_{15}H_{31}COOH$	
Stearic $C_{17}H_{35}COOH$	
Oleic $C_{17}H_{33}COOH$	
Linoleic $C_{17}H_{31}COOH$	
Linolenic $C_{17}H_{29}COOH$	
Arachidonic $C_{19}H_{31}COOH$	
Oleic $C_{17}H_{33}COOH$	
Triacylglycerides (tristearine)	

Phosphatidic acid	$  \begin{array}{c}  \text{H}_2\text{C}-\text{O}-\text{C} \begin{array}{l} \nearrow \text{O} \\ \searrow \text{C}_{17}\text{H}_{35} \end{array} \\    \\  \text{HC}-\text{O}-\text{C} \begin{array}{l} \nearrow \text{O} \\ \searrow \text{C}_{17}\text{H}_{33} \end{array} \\    \\  \text{H}_2\text{C}-\text{O}-\text{PH} \begin{array}{l} \nearrow \text{O} \\ \searrow \text{OH} \end{array}  \end{array}  $
Phosphoglyceride (phosphatidylcholine)	$  \begin{array}{c}  \text{H}_2\text{C}-\text{O}-\text{C} \begin{array}{l} \nearrow \text{O} \\ \searrow \text{C}_{17}\text{H}_{35} \end{array} \\    \\  \text{HC}-\text{O}-\text{C} \begin{array}{l} \nearrow \text{O} \\ \searrow \text{C}_{17}\text{H}_{33} \end{array} \\    \\  \text{H}_2\text{C}-\text{O}-\text{P} \begin{array}{l} \nearrow \text{O} \\ \searrow \text{OH} \end{array} \\    \\  \text{O} \\    \\  \text{H}_2\text{C}-\text{CH}_2-\text{N}^+ \begin{array}{l} \nearrow \text{CH}_3 \\ \searrow \text{CH}_3 \\ \text{CH}_3 \end{array}  \end{array}  $
<b>Amino acids</b>	
<b>Monoaminomonocarboxylic acid</b>	
Glycine (Gly)	$  \begin{array}{c}  \text{CH}_2-\text{C} \begin{array}{l} \nearrow \text{O} \\ \searrow \text{OH} \end{array} \\    \\  \text{NH}_2  \end{array}  $
Alanine (Ala)	$  \begin{array}{c}  \text{CH}_3-\text{CH}-\text{C} \begin{array}{l} \nearrow \text{O} \\ \searrow \text{OH} \end{array} \\    \\  \text{NH}_2  \end{array}  $
Valine* (Val)	$  \begin{array}{c}  \text{CH}_3-\text{CH}-\text{CH}-\text{C} \begin{array}{l} \nearrow \text{O} \\ \searrow \text{OH} \end{array} \\    \quad   \\  \text{CH}_3 \quad \text{NH}_2  \end{array}  $
Leucine* (Leu)	$  \begin{array}{c}  \text{CH}_3-\text{CH}-\text{CH}_2-\text{CH}-\text{C} \begin{array}{l} \nearrow \text{O} \\ \searrow \text{OH} \end{array} \\    \quad \quad   \\  \text{CH}_3 \quad \quad \text{NH}_2  \end{array}  $
Isoleucine* (ile)	$  \begin{array}{c}  \text{CH}_3-\text{CH}_2-\text{CH}-\text{CH}-\text{C} \begin{array}{l} \nearrow \text{O} \\ \searrow \text{OH} \end{array} \\    \quad \quad   \\  \text{CH}_3 \quad \quad \text{NH}_2  \end{array}  $
<b>Monoaminodicarboxylic acid</b>	

Aspartic (Asp) (aspartate)	$\begin{array}{c} \text{O} \\ \parallel \\ \text{HO}-\text{C}-\text{CH}_2-\text{CH}-\text{C} \\ \quad \quad \quad   \quad \quad \quad \parallel \\ \quad \quad \quad \text{NH}_2 \quad \quad \quad \text{OH} \end{array}$
Glutamic acid (Glu)	$\begin{array}{c} \text{O} \\ \parallel \\ \text{HO}-\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}-\text{C} \\ \quad \quad \quad \quad \quad   \quad \quad \quad \parallel \\ \quad \quad \quad \quad \quad \text{NH}_2 \quad \quad \quad \text{OH} \end{array}$
Asparagine (Asn)	$\begin{array}{c} \text{O} \\ \parallel \\ \text{H}_2\text{N}-\text{C}-\text{CH}_2-\text{CH}-\text{C} \\ \quad \quad \quad   \quad \quad \quad \parallel \\ \quad \quad \quad \text{NH}_2 \quad \quad \quad \text{OH} \end{array}$
Glutamine (Gln)	$\begin{array}{c} \text{O} \\ \parallel \\ \text{H}_2\text{N}-\text{C}-\text{CH}_2-\text{CH}_2-\text{CH}-\text{C} \\ \quad \quad \quad \quad \quad   \quad \quad \quad \parallel \\ \quad \quad \quad \quad \quad \text{NH}_2 \quad \quad \quad \text{OH} \end{array}$
<b>Diaminomonocarboxylic acid</b>	
Lysine*(Lys)	$\begin{array}{c} \text{H}_2\text{N}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}-\text{C} \\ \quad \quad \quad \quad \quad \quad \quad   \quad \quad \quad \parallel \\ \quad \quad \quad \quad \quad \quad \quad \text{NH}_2 \quad \quad \quad \text{OH} \end{array}$
Arginine (Arg)	$\begin{array}{c} \text{NH}_2-\text{C}-\text{NH}-\text{CH}_2-\text{CH}_2-\text{CH}_2-\text{CH}-\text{C} \\ \quad \quad \parallel \quad \quad \quad \quad \quad   \quad \quad \quad \parallel \\ \quad \quad \text{NH} \quad \quad \quad \quad \quad \text{NH}_2 \quad \quad \quad \text{OH} \end{array}$
<b>Oxyamino acid</b>	
Serine*(Ser)	$\begin{array}{c} \text{CH}_2-\text{CH}-\text{C} \\   \quad   \quad \parallel \\ \text{OH} \quad \text{NH}_2 \quad \text{OH} \end{array}$
Threonine (Thr)	$\begin{array}{c} \text{H}_3\text{C}-\text{CH}-\text{CH}-\text{C} \\   \quad   \quad \parallel \\ \text{OH} \quad \text{NH}_2 \quad \text{OH} \end{array}$
<b>Sulfur-containing amino acids</b>	
Cysteine (Cys)	$\begin{array}{c} \text{CH}_2-\text{CH}-\text{C} \\   \quad   \quad \parallel \\ \text{SH} \quad \text{NH}_2 \quad \text{OH} \end{array}$
Methionine*(Met)	$\text{H}_3\text{C}-\text{S}-\text{CH}_2-\text{CH}_2-\text{CH}-\text{C} \\ \quad \quad \quad \quad \quad   \quad \quad \quad \parallel \\ \quad \quad \quad \quad \quad \text{NH}_2 \quad \quad \quad \text{OH}$
<b>Aromatic amino acids</b>	
Phenylalanine*(Phe)	$\begin{array}{c} \text{C}_6\text{H}_5-\text{CH}_2-\text{CH}-\text{C} \\ \quad \quad \quad   \quad \quad \quad \parallel \\ \quad \quad \quad \text{NH}_2 \quad \quad \quad \text{OH} \end{array}$



Tyrosine (Tyr)	
<b>Heterocyclic amino acids</b>	
Tryptophan*(Trp)	
Histidine (His)	
Proline (Pro)	
<b>Carbohydrates</b>	
<b>Monosaccharides</b>	
Glucose	
Galactose	
Mannose	
Fructose	

Ribose	
Deoxyribose	
Xylose	
Glucose - 6 phosphate	
Glucosamine	
<b>Disaccharides</b>	
Sucrose	
Lactose	

Maltose	
Cellobiose	
<b>Nitrogenous base</b>	
<b>Pyrimidine line</b>	
Uracil	
Thymine	
Cytosine	
<b>Purine line</b>	
Adenine	
Guanine	