UG - Sem - IV
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Unit - 1

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NOMENCLATURE OF ALCOHOLS

The alcohols are named in three ways. Generally the common or trivial names OR the IUPAC name is employed. —

1. Simple alcohols OR the common name of an alcohol can be obtained by adding the word alcohol after the alkyl group.

For example, CH_3OH is a derivative of Methane (CH_4). Therefore, the common name of CH_3OH written as,

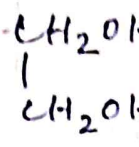
Methane (CH_4) $\xrightarrow[+yl]{-ane}$ Methyl (CH_3) $\xrightarrow{+alcohol}$ Methyl alcohol (CH_3OH)

For alcohols containing three or more carbon atoms, there can be more than one location of the -OH group. Such alcohols are named as primary, secondary or tertiary alcohols. The prefixes such as n, iso- are also used.

For example,

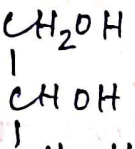
	Alcohol	Alkyl group	Nature of alkyl gr.	Nature of C-atom containing OH gr.	common name of the alcohol
1.	$CH_3-CH_2-CH_2OH$	$CH_3-CH_2-CH_2-$	normal(n)	primary	n-Propyl alcohol
2.	$CH_3-\underset{OH}{CH}-CH_3$	$CH_3>CH-$ CH_3	iso	secondary	iso-Propyl alcohol
3.	$CH_3-\underset{CH_3}{\overset{CH_3}{\underset{\vert}{\overset{\vert}{C}}}}-OH$	$CH_3-\underset{CH_3}{\overset{CH_3}{\underset{\vert}{\overset{\vert}{C}}}}$	-	Tertiary	tert-butyl alcohol

- The dihydric alcohols are named as glycols. The names are derived from the corresponding alkene. For example —



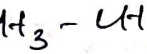
Ethylene glycol

- The trihydric alcohols are generally called by their names derived from their sources of origin. For example —



is termed as glycerol, because it is obtained from oils/fats called glycerides.

2. Under the carbinol system, alcohols are named as derivatives of methyl alcohol, which is termed carbinol.



n-propyl alcohol (common name)
propyl carbinol (carbinol name)

3. IUPAC Name :

In IUPAC system, the name of an alcohol is obtained by replacing the last 'e' in the name of the parent alkane, alkene or alkyene by the suffix 'ol'.

e.g. 

Methanol

For naming higher and branched-chain compounds :—

a. Choose the longest carbon chain containing the hydroxyl group, and identify the parent hydrocarbon.

b. The 'e' of this hydrocarbon is replaced by the suffix 'ol'.

c. The positions of the side-chain, and the hydroxyl group are indicated by the numerals describing the serial number of carbon atoms to which these are attached. These numerals are called Locants. The lowest possible number being given to the carbon attached to the hydroxyl group. The Locant is added in the name of the alcohol just before the suffix – ol.

d. Cyclic alcohols are named using a prefix – cyclo and considering the carbon attached to the – OH group as C-1.

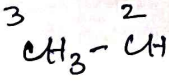
In general,

Alk – ane – ol (For saturated alcohol)

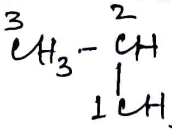
Alk – ene – ol (For unsaturated alcohol containing double bond)

Alk – yn – ol (For unsaturated alcohol containing triple bond)

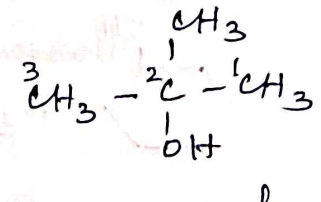
some examples :



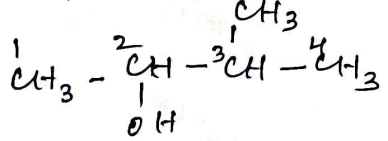
Propane – 1 – ol



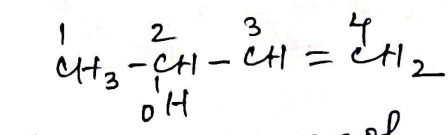
Propane – 2 – ol



2 – methylpropane – 2 – ol

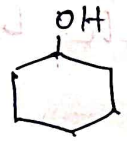
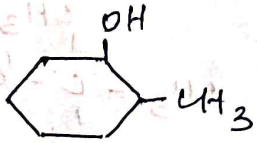


3 – methylbutan – 2 – ol



but – 3 – en – 2 – ol

The trivial and IUPAC names of some simple alcohols are given below:

Structure	Trivial name	IUPAC name
	Monohydric alcohol	
$CH_3-CH_2CH_2CH_2OH$	n-butyl alcohol	butanol
$CH_3-\underset{\underset{OH}{|}}{CH}-CH_2CH_3$	sec-butyl alcohol	butan-2-ol
$CH_3-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-OH$	tert-butyl alcohol	2-methylpropan-2-ol
$CH_3-\underset{\underset{CH_3}{|}}{CH}-CH_2-OH$	isobutyl alcohol	2-methylpropan-1-ol
	Dihydric alcohol	
$\overset{\overset{CH_2OH}{|}}{CH_2OH}$	ethylene glycol	Ethane-1,2-diol
$CH_3-\underset{\underset{OH}{|}}{CH}-CH_2-CH_2OH$		Butane-1,3-diol
	Trihydric alcohol	
$\overset{\overset{CH_2OH}{|}}{\underset{\underset{CH_2OH}{|}}{CH\,OH}}$	Glycerol OR Glycerine	Propane-1,2,3-triol
		cyclohexanol
		2-methylcyclohexanol