

Nomenclature of organic Compound

IUPAC System [International Union of Pure and applied Chemistry]

In 1958 a scientific and well arranged system of nomenclature of organic Compounds was developed.

Later on in 1993, some Rules were formed for writing the names of organic Compounds.

They were as follow's -

- ① ⇒ To write the name of any organic Compound, its Root word was used. From this its longest chain was known. First of all choose the longest chain. Some prefixes are given below:-

C₁ Meth

C₅ = Pent

C₉ = Non

C₂ Eth

C₆ = Hex

C₁₀ = Dec

C₃ Prop

C₇ = Hept

C₄ But

C₈ = Oct

- ② ⇒ According to the name of organic Compound primary suffix was linked with the ~~name~~ Root word.

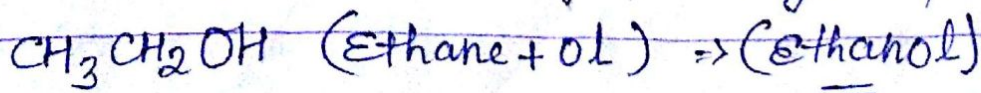
(C-C) Single bond ⇒ ane

(C=C) Double bond ⇒ ene

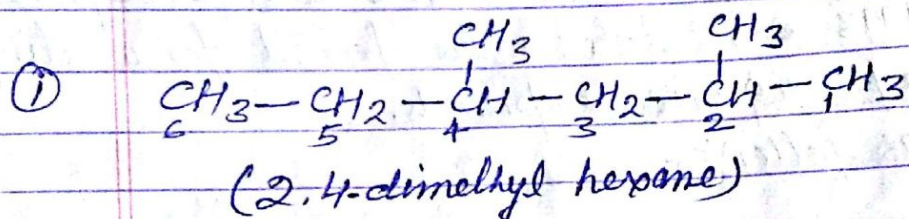
(C≡C) Triple bond ⇒ yne

Organic Comp.	Root word	Primary Suffix	Name
CH ₄	Meth	ane	Methane
CH ₂ -CH=CH ₂	Prop	ene	Propene
CH ₃ -C≡C-CH ₃	But	yne	Butyne

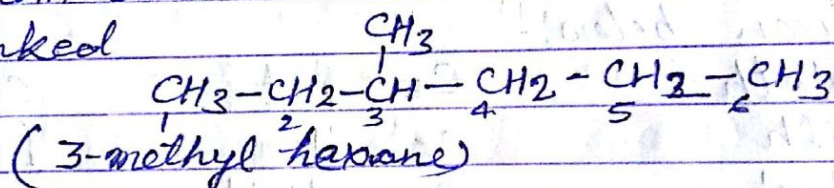
- ③ ⇒ If any functional group is present in an organic Compound then its position is represented by a secondary suffix. Generally, it is added by replacing 'e' letter from the end of primary suffix.



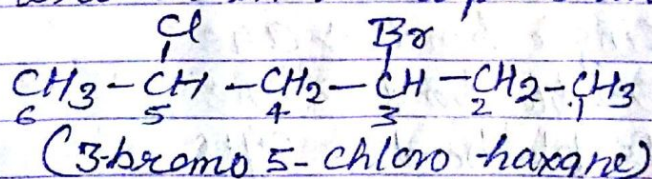
- ④ If two or more substituted alkyl group of the same nature are present in a compound the priorities is set as follows -



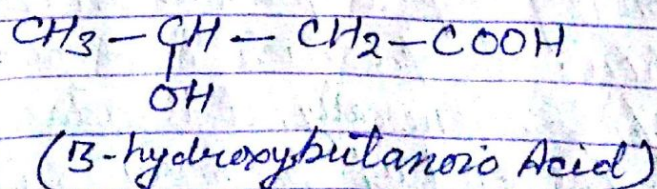
- ② If only one substituted group is added in any organic compound then numbering is started from that end at which it is nearestly linked



- ③ If two or more halogen atom (Cl, Br, I) are linked are linked in organic compound then their name is written in the alphabetical order:



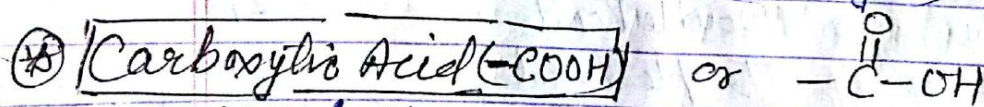
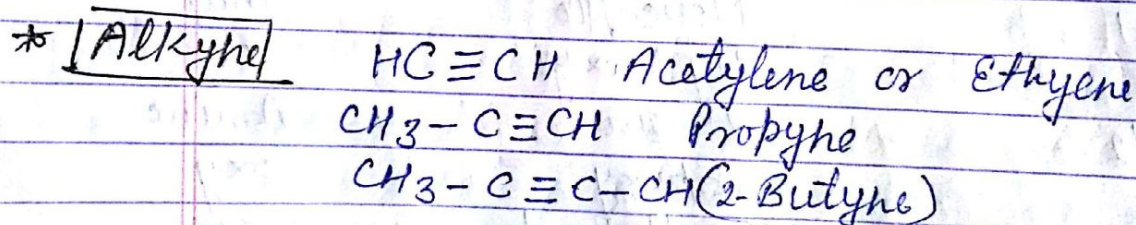
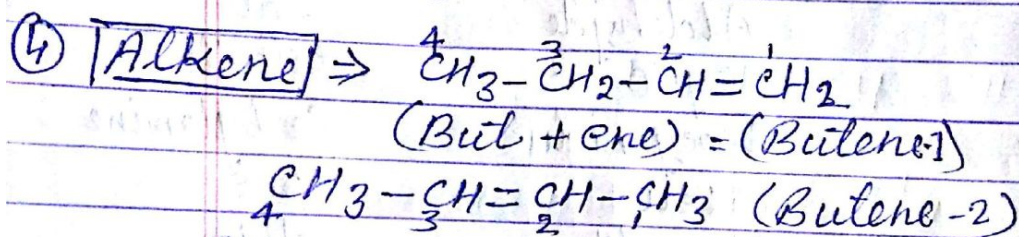
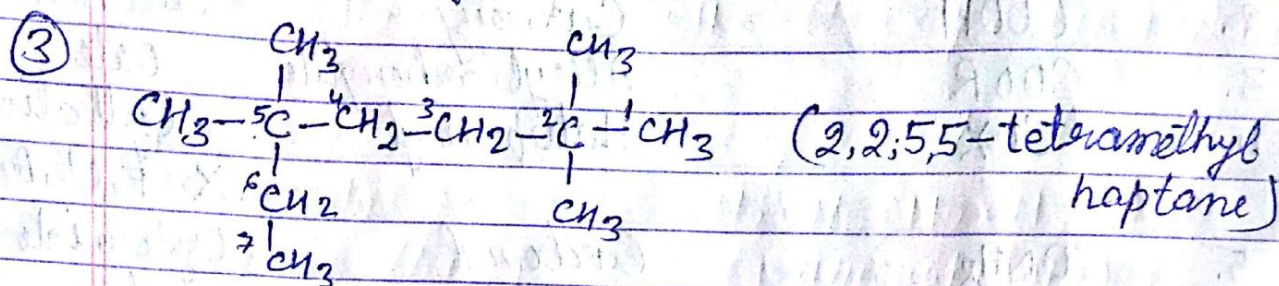
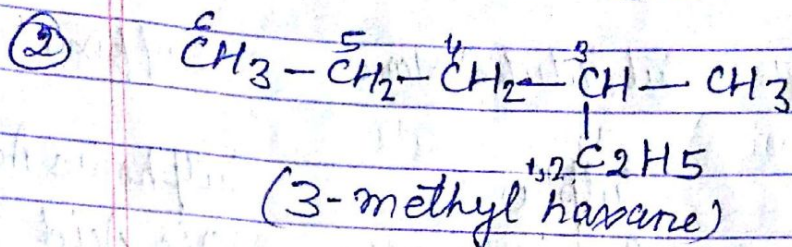
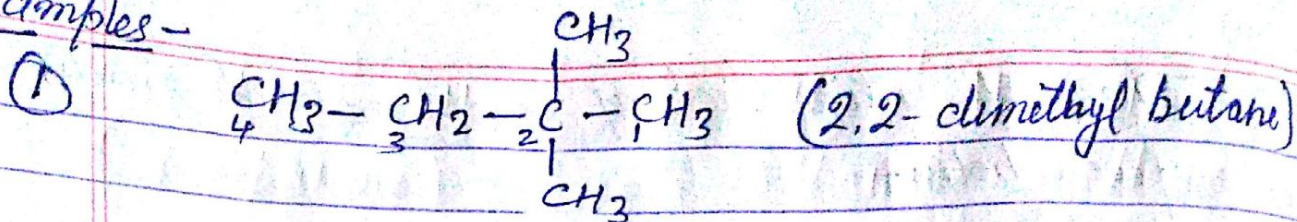
- ④ When two or more functional group and substituted group are present in organic compound, the functional group is preferred first is treated as suffix and other functional group are treated as prefix.



* The preferential list of some functional groups is given below —

S.No.	Functional Group	Substituted Name	Suffix Name
1.	SO_3H	Sulpho	Sulphonic Acid
2.	COOH	Carboxy	oic Acid
3.	COOR	Alkyl Carboxylate	oate
4.	COX	Halocarbonyl	Oxhalide ($\text{X} = \text{F}, \text{Cl}, \text{Br}, \text{I}$)
5.	CONH_2	Carbonyl	Oxamide
6.	CHO	Aldehyde	-al
7.	CN	Cyano	nitrile
8.	NC	Isocyanide	Carbylamine
9.	$>\text{CO}$	Keto	one
10.	SH	Mercapto	thio
11.	OH	Hydroxy	ol
12.	NH_2	Amino	Amine
13.	O	Epoxy	oxy
14.	$>\text{C}=\text{C}<$	Double Bond	ene
15.	$-\text{C}\equiv\text{C}-$	Triple Bond	yne
16.	Halogens ($\text{F}, \text{Cl}, \text{Br}, \text{I}$)	—	(Fluoro, Chloro, Bromo, Iodo)
17.	Alkyl group ($\text{CH}_3, \text{CH}_2\text{CH}_3$) etc — ($-\text{CH}_3 > -\text{C}_2\text{H}_5 > -\text{C}_3\text{H}_7$)	—	—

Examples -



Suffix 'oic acid' is added to root word by replacing 'e' from corresponding alkene.

- HCOOH Methanoic Acid (Formic Acid)
- CH_3COOH Ethanoic Acid (Acetic Acid)
- $\text{CH}_3\text{CH}_2\text{COOH}$ Propanoic Acid
- $\text{CH}_3 - \underset{\text{OH}}{\text{CH}} - \underset{\text{Cl}}{\text{CH}} - \text{CH}_2\text{COOH}$ 3-chloro 4-methyl pentanoic Acid
- $\text{CH}_3 - \text{CH}_2 - \underset{\text{OH}}{\text{CH}} - \text{COOH}$ (2-hydroxybutanoic Acid)

⊛ [Alcohols or Alkanols] Its general formula is $C_n H_{2n+1} OH$
 Suffix 'ol' is added in the corresponding alkane by replacing 'e' eg.

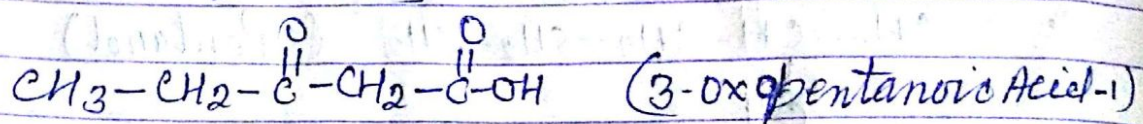
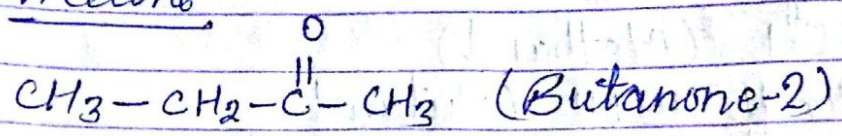
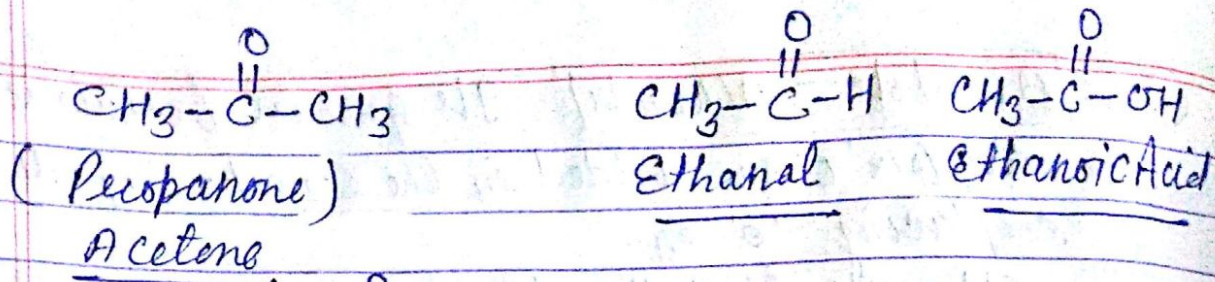
- CH_3-OH (Methanol)
- $CH_3CH_2CH_2CH_2OH$ (Butanol)
- $CH_3-\underset{\substack{| \\ OH}}{CH}-CH_2-CH_2-CH_3$ (2-Pentanol)
- $CH_3-CH_2-\underset{\substack{| \\ OH}}{CH}-CH_2-\underset{\substack{| \\ CH_3}}{CH}-CH_3$
 (3-methylhexanol-3)
- $\begin{array}{c} CH_2-OH \\ | \\ CH-OH \\ | \\ CH_2-OH \end{array}$ (Propane-1,2,3-triol)
- $\begin{array}{ccccccc} & & OH & & & & \\ & & | & & & & \\ CH_3-CH_2-CH-CH_2-CH_2-COOH \\ & & 4 & & 3 & & 1 \end{array}$
 (4-hydroxyhexanoic Acid)

⊛ [Aldehydes] = Suffix 'al' is added in the corresponding alkane by replacing 'e' -
 (Alkanal)

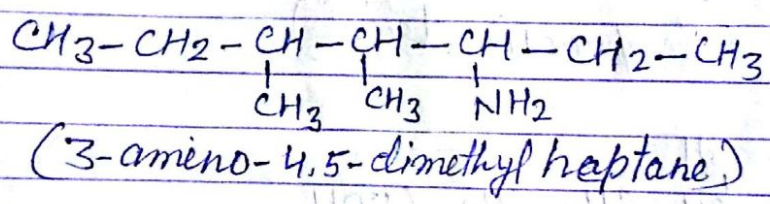
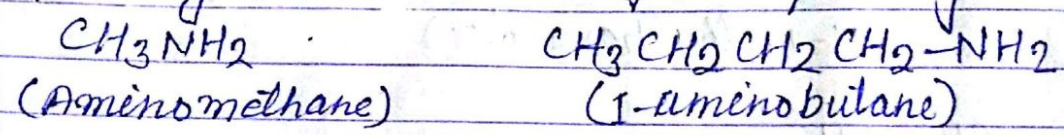
- $(C_n H_{2n+1} \cdot CHO)$
- $HCHO$ (methanal or formaldehyde)
- CH_3CHO (Ethanal)
- $\begin{array}{c} Cl \\ | \\ CH_3-CH-CH_2-CH-CH_2-CHO \\ | \\ CH_3 \end{array}$
 (3-chloro, 5-methyl hexanal-1)
- $\begin{array}{c} Cl \\ | \\ Cl-C-CHO \\ | \\ Cl \end{array}$
 (Trichloro ethanal-1)

⊛ [Ketone Alkanone] $\Rightarrow (C_n H_{2n} O)$, $R-\overset{\overset{O}{||}}{C}-R$
 $R = \text{Alkyl group}$

- Suffix 'One'

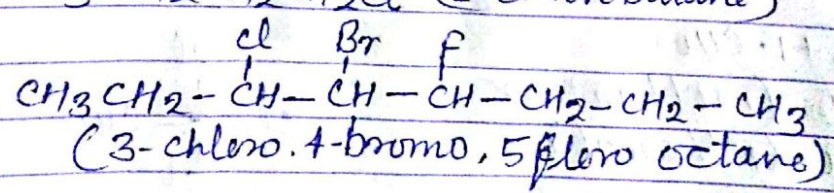
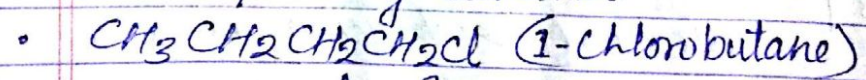


⊛ **Amines** They are derivatives of corresponding alkanes.

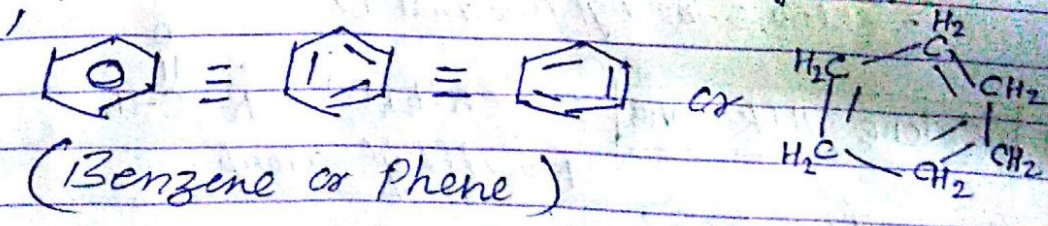


⊛ **Alkyl halides** $[\text{C}_n\text{H}_{2n+1}\cdot\text{X}]$ ($\text{X} = \text{F}, \text{Cl}, \text{Br}, \text{I}$)

Fluoro, Chloro, Bromo, iodo are added in the corresponding alkane.

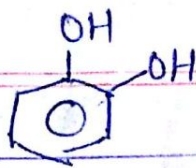


⊛ **Phenols** In these organic compounds one or more hydroxyl group are linked to the benzene ring directly. They are also called di, tri, mono hydrophenols.

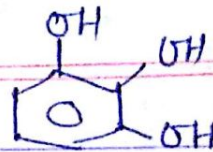




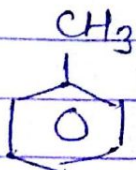
Phenol



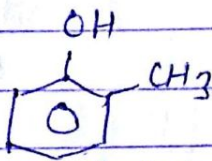
(Benzene-1,2-diol)



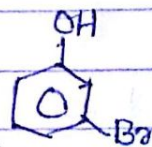
(Benzene-1,2,3-triol)



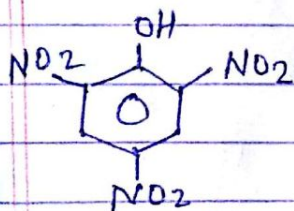
Methyl benzene
(Toluene)



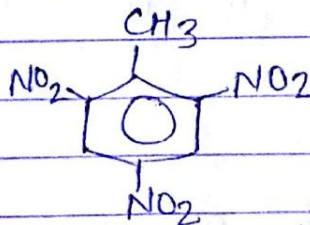
(2-methylphenol)



(3-bromophenol)



(2,4,6-trinitrophenol)



(Trinitrotoluene)