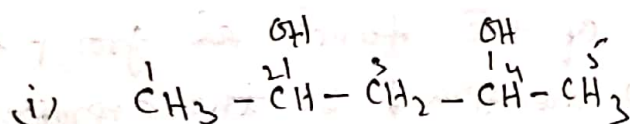
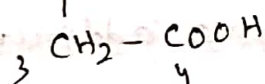
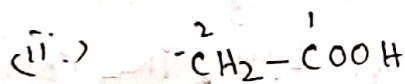


[B] Compounds containing Two or more similar functional group! -

When the compound contains two or more similar functional groups, the term -di-, -tri- etc are added before the suffix or prefix of the functional group. While doing so, the terminal 'e' of the parent alkane is retained. For example.



Pentane-2,4-diol

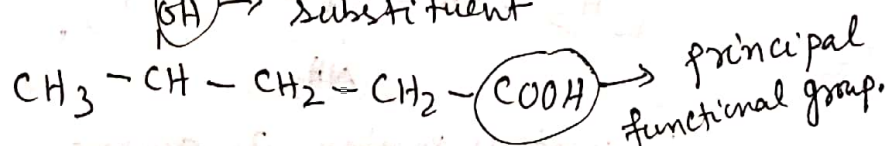


Butane-1,4-dicarboxylic acid.

[C] Compounds containing Two or more different functional group! -

A compound is said to be polyfunctional compound if it contains more than one functional group. The multiple bond ($\text{C}=\text{C}$) or ($\text{C}\equiv\text{C}$) is also considered as a functional group. In IUPAC system, one of the functional group is chosen as the principal functional group (secondary suffix) and the remaining functional groups (secondary functional groups) are treated as substituents and indicated by prefixes.

For example:- $(\text{OH}) \rightarrow$ substituent



The $-\text{COOH}$ group is the principal functional group, while $-\text{OH}$ group is a substituent.

The principal functional group is mentioned with the suffix name while secondary functional groups are mentioned only with their prefix name.

The choice of the principal functional group is made on the basis of the following order of preference.

Carboxylic acid > Sulphonic acid > acid anhydrides > esters > acid halides > acid amides > cyanides > aldehydes > Ketone > alcohol, phenols, thiols > amines > ether > alkene > alkynes.

Alkyl (R-), Cl, Br, I, F, NO₂ etc are prefix substituents.

The order of seniority among the principal group is given according to the following table along with their prefix and suffix names. The functional group which occurs higher up in the table is the principal functional group.

Seniority Table for principal groups. (Highest priority Group at the Top.)

Group	prefix name	suffix name
-COOH	carboxy-	-oic acid,
-SO ₃ H	sulpho-	-sulphonic acid,
-COOR	Alkoxy carbonyl-	-alkyl oate.
-COX	Halo formyl-	-oyl halide.
-CONH ₂	Carbamoyl-	-amide
-C≡N	Cyano-	-nitrile
-NC	Isocyano-	-carbamine
-CHO	Formyl-	-al
>C=O	Keto- or oxo-	-one
-OH	hydroxy-	-ol
-NH ₂	Amino-	-amine
-OR	Alkoxy-	-
>C=C<	-	-ene
-C≡C-	-	-yne

Group	Prefix name	Suffix name
-NO ₂	nitro -	-
-NO	nitroso -	-
-X	Halo - (Fluor-, Chloro-, Bromo-, Iodo-)	-

1. The first step in the naming of polyfunctional compounds is the selection of principal functional group. The principal functional group gives the class name of the structure.

2. The second step is the selection of parent chain. The parent chain is so selected that it includes the maximum number of functional groups including the principal group.

3. The third ~~group~~ step is the numbering of parent chain. The parent chain is numbered from the side of principal functional group, i.e. it gets lowest numbers.

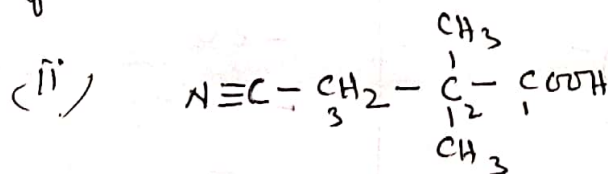
The following decreasing order of preference for giving the lowest number is followed.

Principal functional group > double bond or triple bond > substituent

4. Substituents, side chain and secondary functional groups are named in alphabetical order.

Ex: - (i) $\text{O}=\overset{\text{H}}{\underset{1}{\text{C}}}-\overset{2}{\text{CH}_2}-\overset{1}{\text{COOH}}$, in the priority list -COOH > -CHO

~~3-oxopropanoic acid~~ 3-formyl propanoic acid.



primary functional group
-COOH

secondary functional group
-C≡N

~~3-cyano-2,2-dimethyl propanoic acid~~
3-cyano-2,2-dimethyl propanoic acid.

Writing The Structural Formula From The Given IUPAC

Name:-

The IUPAC name of an organic compound consists two, three or all the following parts.

- a) Root word b) Primary suffix c) Secondary suffix
d) Prefixes.

a) Root word:-

Root word indicates the longest carbon chain. Thus the first step is to locate the longest chain from the root word. Write the number of carbon atoms in a straight chain and number them from one end.

b) Primary suffix:-

Primary suffix (-ane, -ene, or -yne) indicates the nature of the chain. In case multiple bonds are present, place them at proper places in the chain and rest by single bonds.

c) Secondary suffix:-

Secondary suffix indicates the principle functional group. Place it at proper place in the chain. ~~terminating group, put~~ In case the principal functional group is the chain terminating group, put it at carbon-1. (If the functional group does not carry any numerical number, it is assumed that it is located at carbon-1).

d) Prefixes:

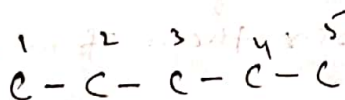
Prefixes are the substituents or secondary functional groups. Place them at the proper places with the help of locants.

e) Skeleton formula is obtained by considering the above steps. Now add hydrogen atoms to satisfy four valencies of each carbon atom to get the structural formula.

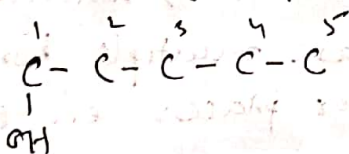
Ex 1 Write the structural formula of ~~2-methylpentan-1-ol~~
2-methylpentan-1-ol.

Here, Root word - pent, primary suffix - ane,

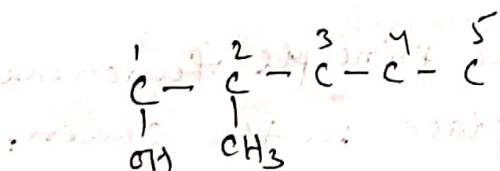
Thus the carbon consists five carbon atom, all linked by single bond



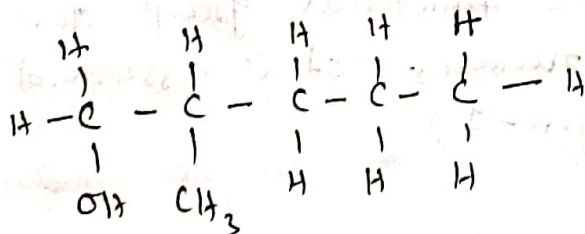
Functional group = -ol = -OH at carbon-1



Substituent = methyl group at carbon-2



Satisfying four valencies of carbon atom, the structural formula is obtained as



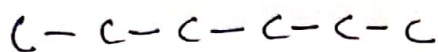
Ex-2

Write the structure of 3-chloro-5-hydroxyhex-3-enal

Aus:-

root word = hex

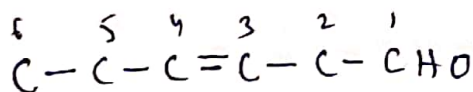
Thus, the chain consists six carbon atoms,



functional group = 3-enal

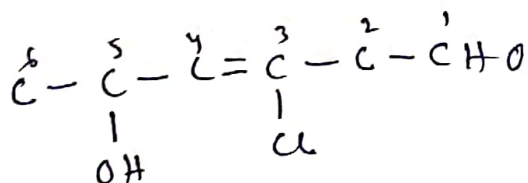
and

The primary functional group = 1-al



Substituents = 3-chloro

secondary functional group - 5-hydroxy



Satisfying four valencies of carbon atoms, the structural formula obtained is

