

Isomerism :- Compounds with same molecular formula. but different structural formula.

Structural Isomerism :-

1) chain Isomerism :-

(i) C_4H_{10} - Butane

n-Butane $CH_3-CH_2-CH_2-CH_3$

Isobutane $CH_3-\underset{\substack{| \\ CH_3}}{CH}-CH_3$

(ii) Butyl Alcohol

C_4H_9OH

$CH_3-CH_2-CH_2-CH_2-OH$

n-butyl alcohol

$CH_3-\underset{\substack{| \\ CH_3}}{CH}-CH_2OH$

Isobutyl alcohol.

2) Position Isomerism :- $\rightarrow$ Same molecular formula (M.F)

$\rightarrow$ Same Carbon chain

$\rightarrow$ Same functional grp.

$\rightarrow$ different Position.

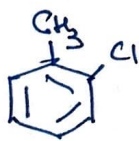
$CH_3-CH_2-CH_2-Cl$

1-chloropropane

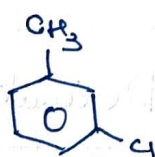
$CH_3-\underset{\substack{| \\ Cl}}{CH_2}-CH_3$

Cl

2-chloropropane.



o-chloro toluene



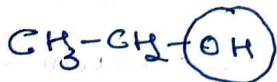
m-chloro toluene



p-chloro toluene.

3) Functional grp Isomerism :- $\rightarrow$ Same molecular formula

i) C_2H_6O



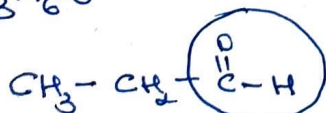
Ethyl alcohol



Dimethyl ether.

$\rightarrow$ different functional groups

ii) C_3H_6O

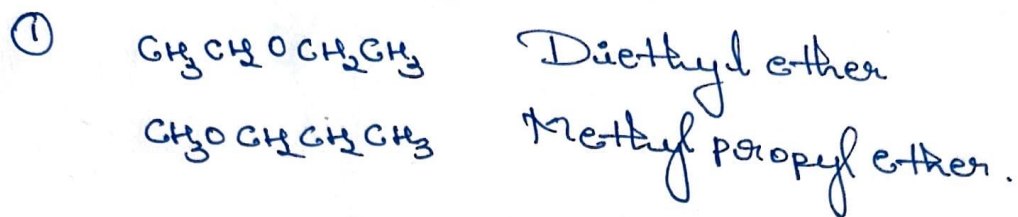


Propanal



Propanone

④ Metamerism :- Unequal distribution of Carbon atom on either side of functional groups.

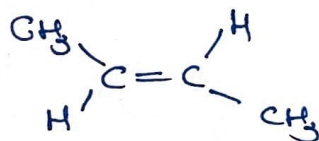


⑤ Stereo isomerism :- same Structural Formula but different Spatial arrangement

1) Geometrical Isomerism $E/Z =$ $\begin{matrix} \text{Entgegen (same)} \\ \downarrow \\ \text{opposite.} \\ \downarrow \\ \text{Zusammen (same)} \end{matrix}$
 cis = same side
 trans = opposite side.

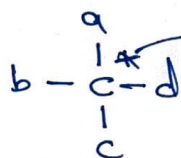


cis-But-2-ene



trans-but-2-ene.

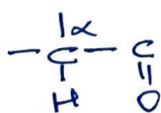
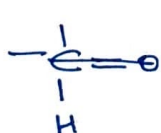
2) Optical Isomerism :- $R/S \leftarrow \begin{matrix} \text{Rectus (Right)} \\ \downarrow \\ \text{sinister (left)} \end{matrix}$



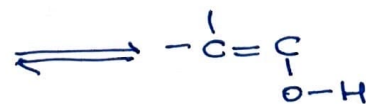
chiral Carbon.

Carbon that is attached to four different groups.

⑥ Tautomerism :- Compounds exist in rapid equilibrium with each other.



Keto form



enol form.