

Isomerism

Compounds having same MF But diff. in molecular formula -----

(same MF
diff. SF)

(same MF
same SF)

Structural Isomerism

or

Constitutional isomerism

Chain Iso

Ring
Chain Iso

Position
Iso

Functional
Iso

metamerism

tautomerism

Configurational
Isomerism

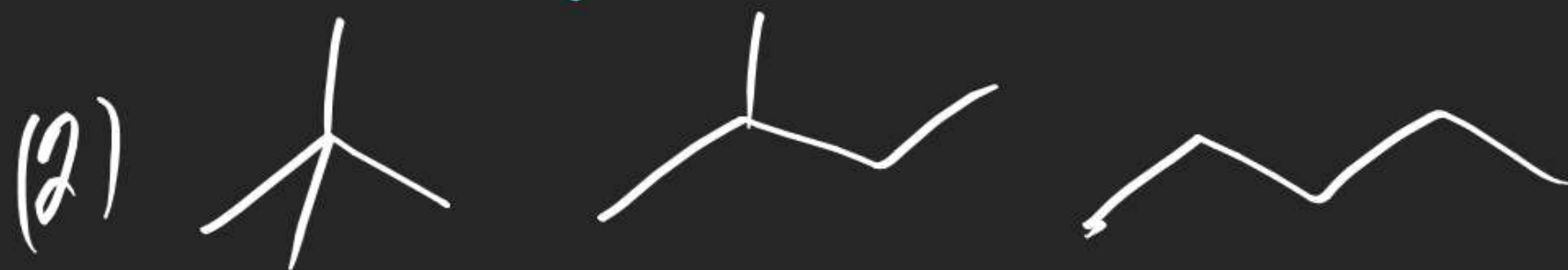
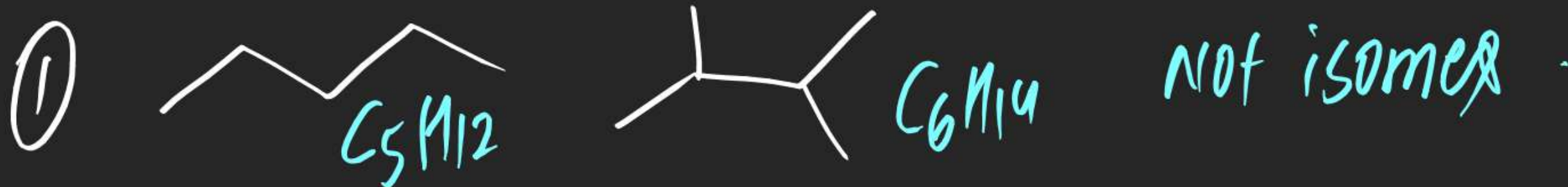
Conformational
Isomerism

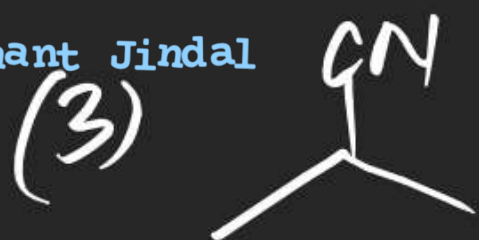
Geometrical Iso. Optical Iso.

Structural Isomerism

Compounds having same molecular formula But difference in structural formula are known as Structural isomers / Constitutional isomers.

(1) Chain Isomerism: Compounds having same MF But difference in length of Principal carbon chain / Side chain





MF $C_5H_6N_2$ (chain isomers)
 $C_5H_6N_2$

~~(7)~~

(Chain Isomerism)



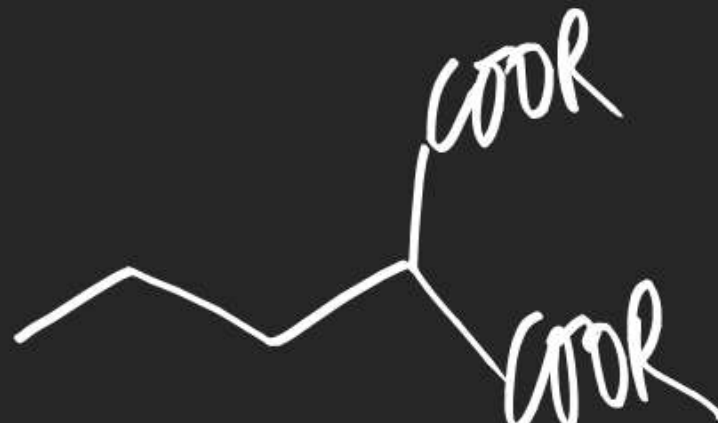
(8)



(9)



(10)



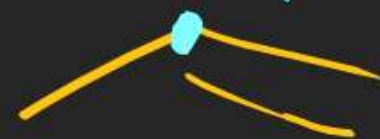
~~XXXX~~

Structural Isomerism

Ring-chain Isomerism:

Compounds having same molecular formula But difference in Ring (Cyclic) & chain (Acyclic) form.

(11)



Acyclic



Cyclic

(Ring-chain Isomers)



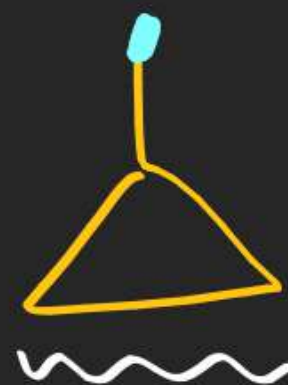
(14)



(12)



(13)

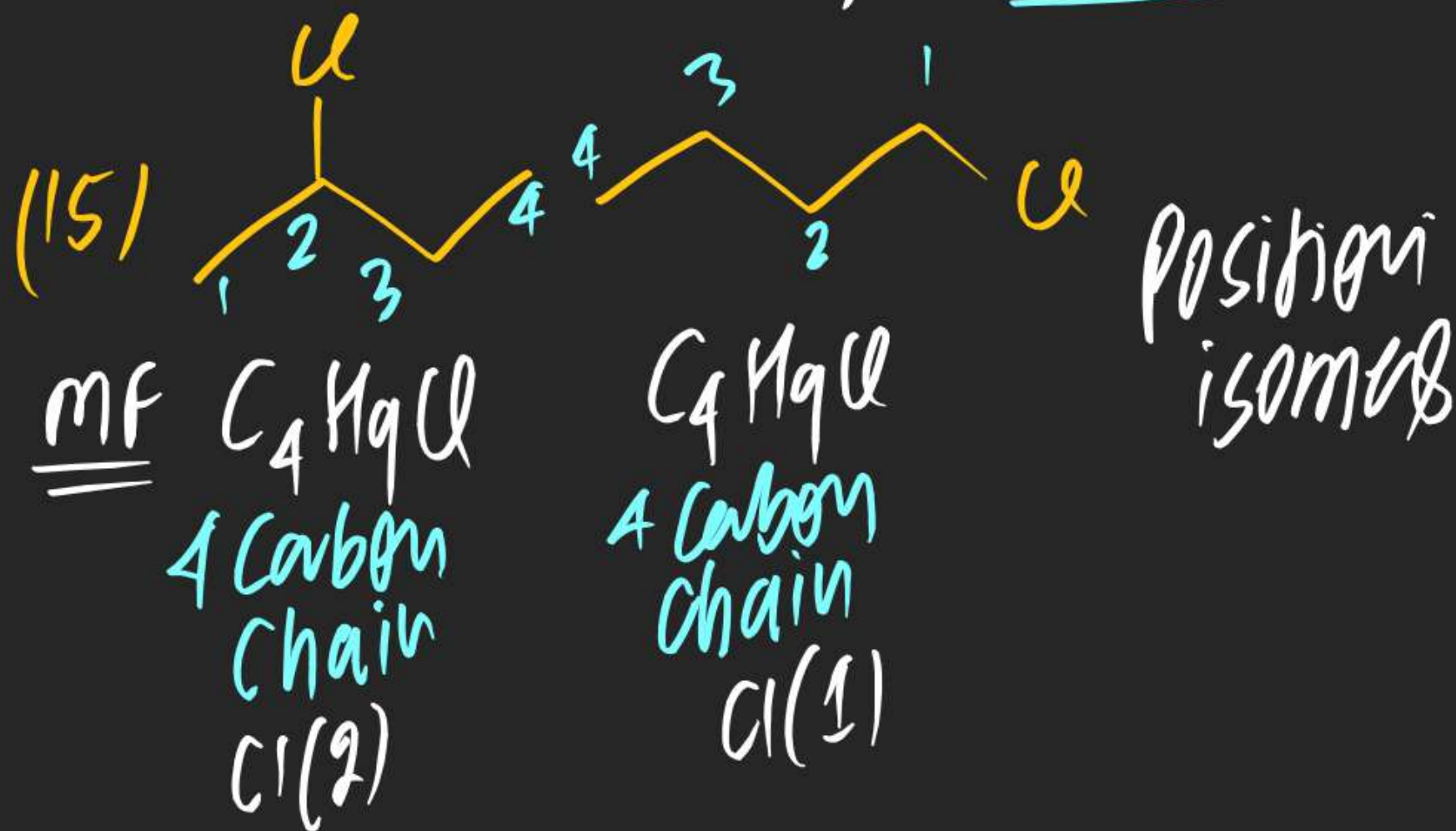


I II \Rightarrow Ring chain
 II III \Rightarrow Ring chain
 I III \Rightarrow Ring chain

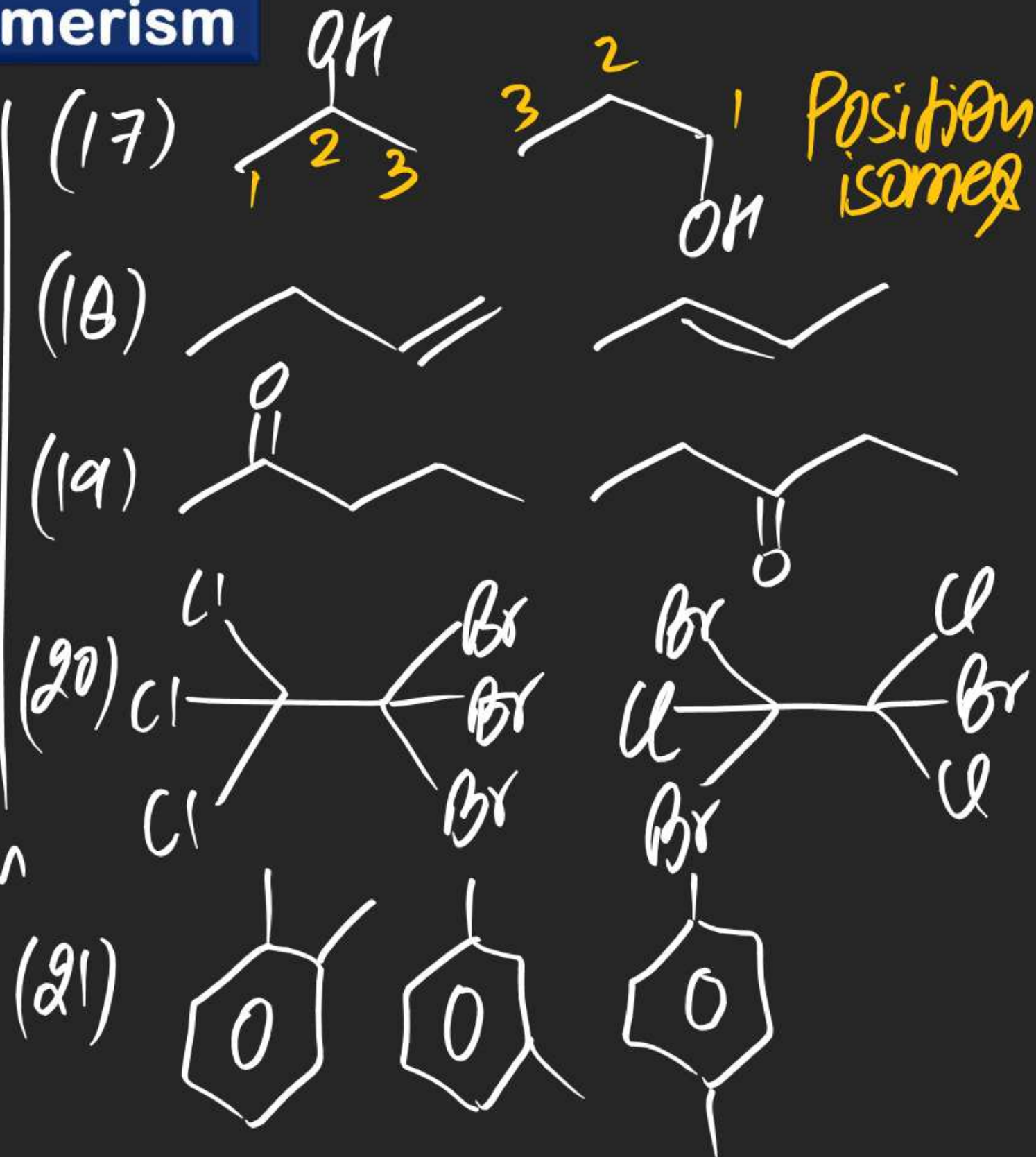
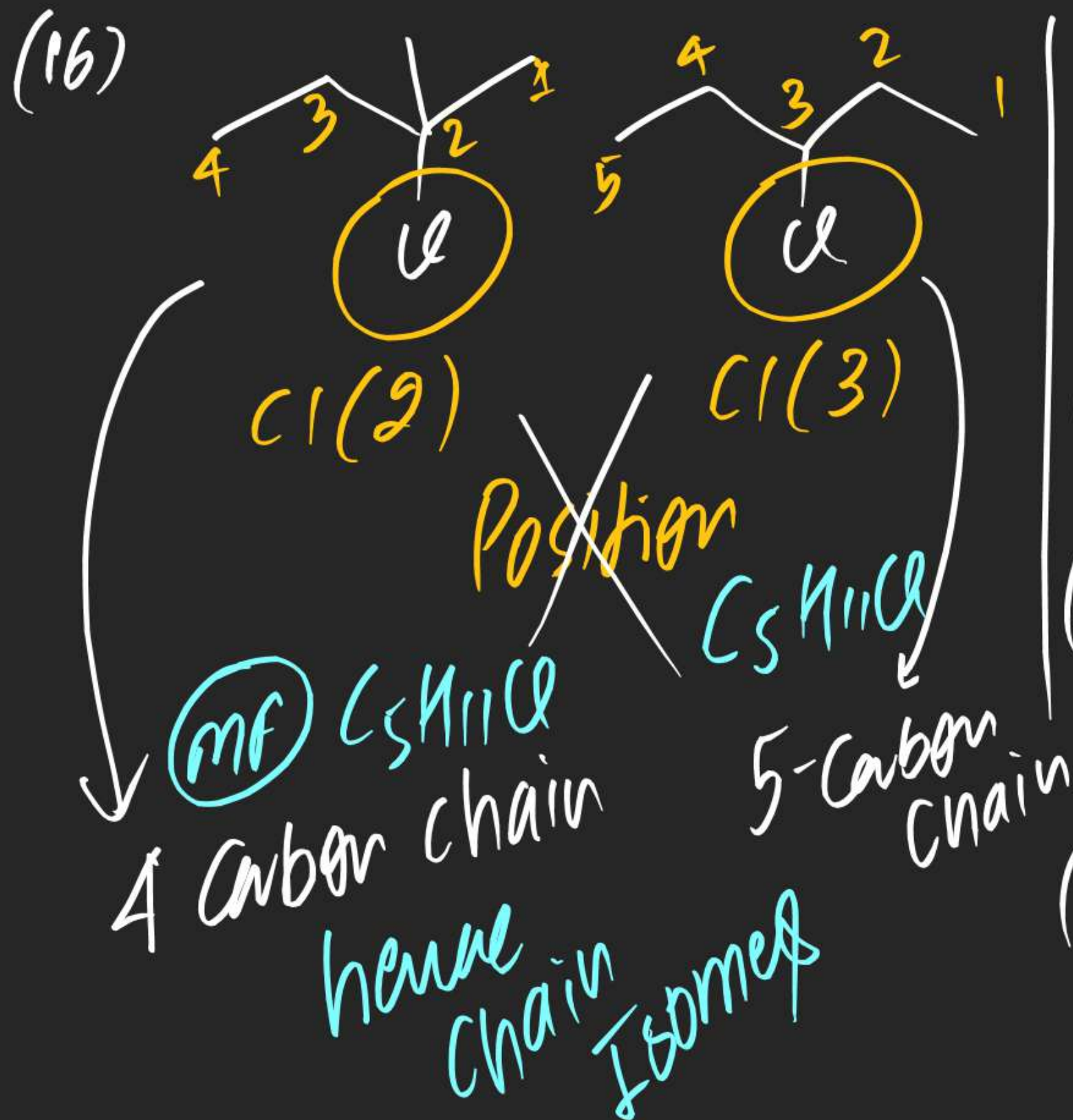
Structural Isomerism

Position Isomerism:

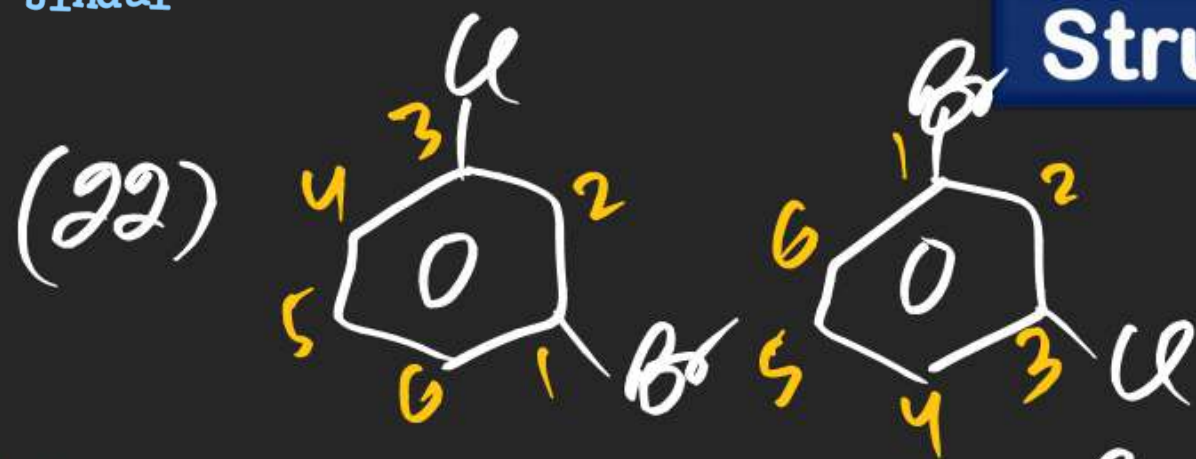
Compounds having same MF But
different in position of substituents
/ functional groups (For Position isomerism
Carbon chain length must be
same).



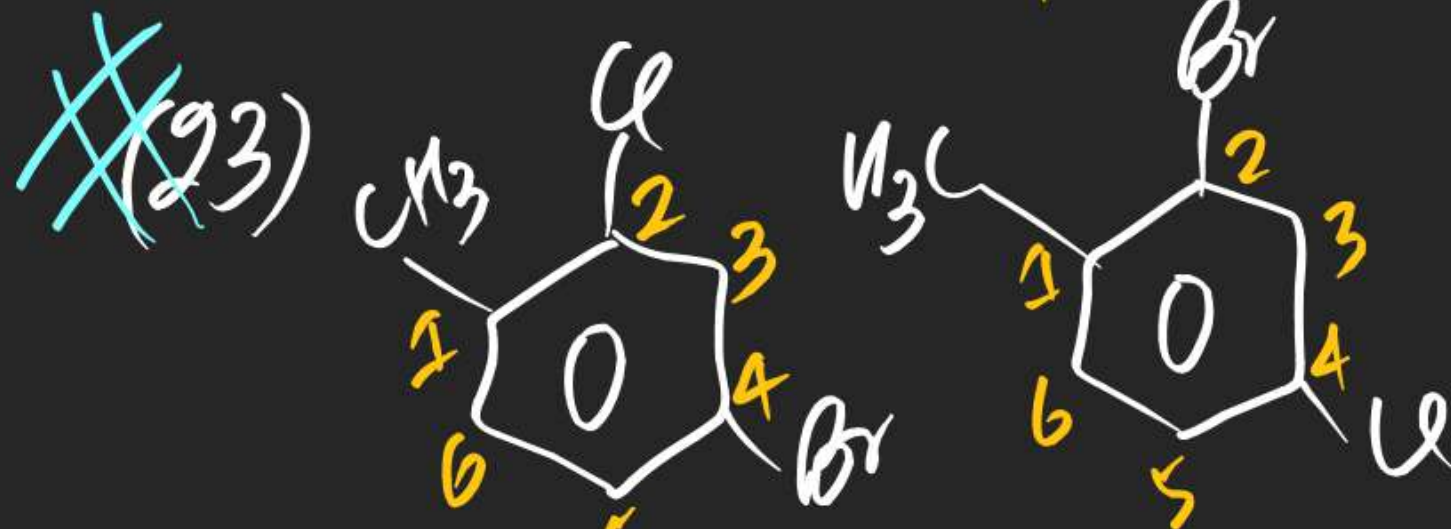
Structural Isomerism



Structural Isomerism



1-Bromo-3-chloro Benzene
(Identical)



(Position isomer)

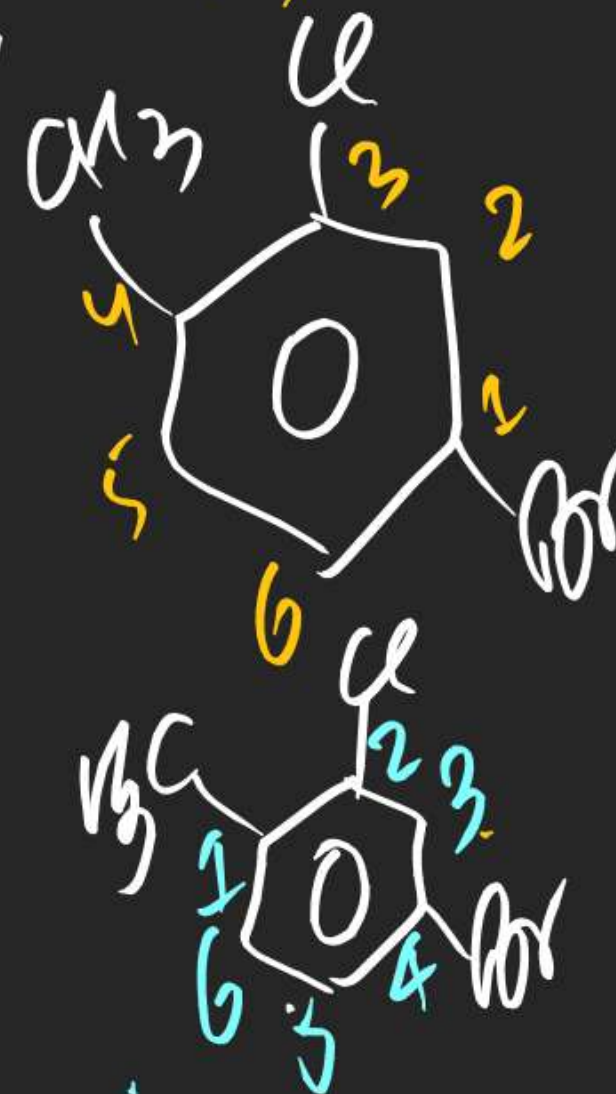
⇒ Cl & Br both are having
diff position in both
compounds.

I
II

CH₃
1
1

Cl
2
4

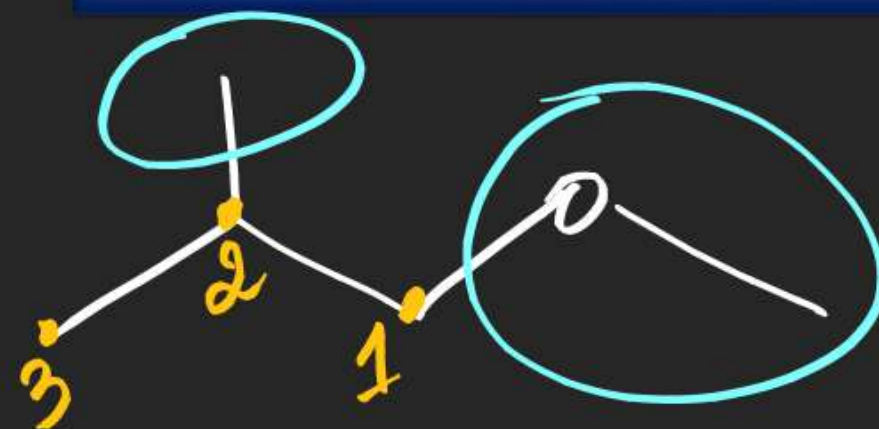
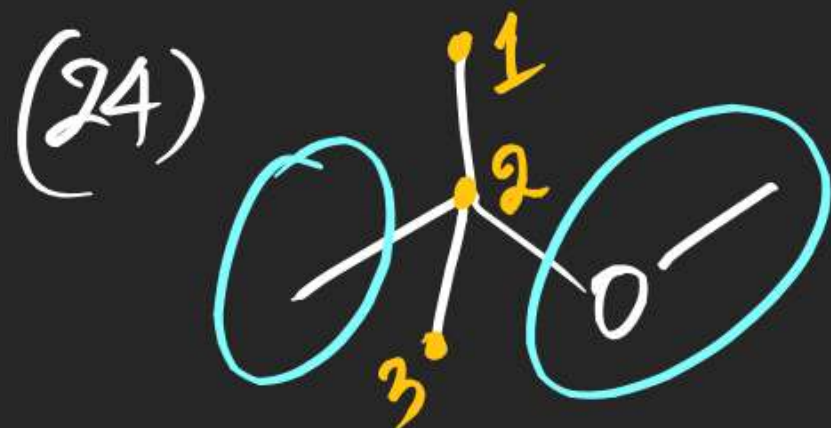
Br
4
2



1, 3, 4

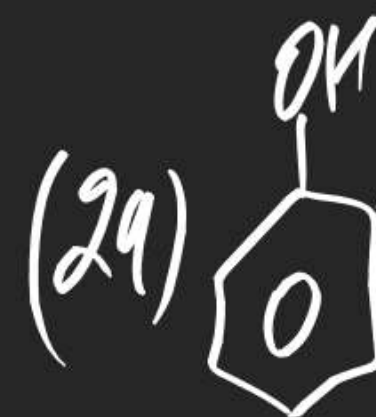
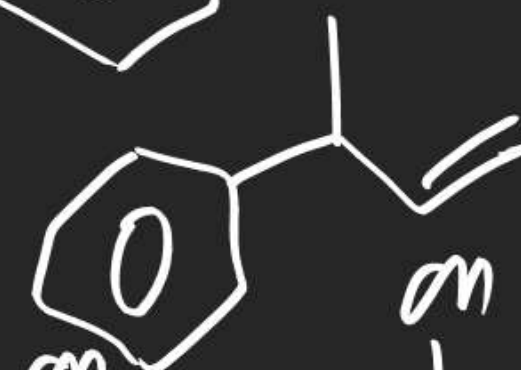
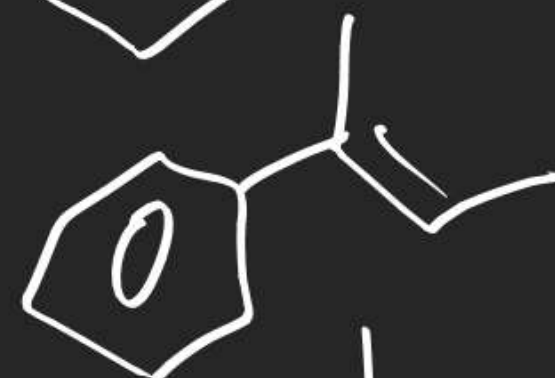
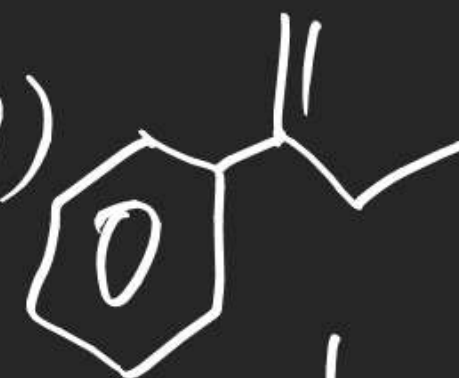
1, 2, 4

Structural Isomerism



positional isomer

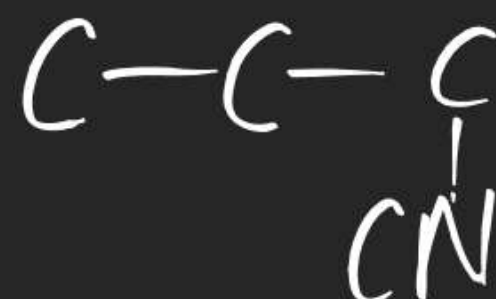
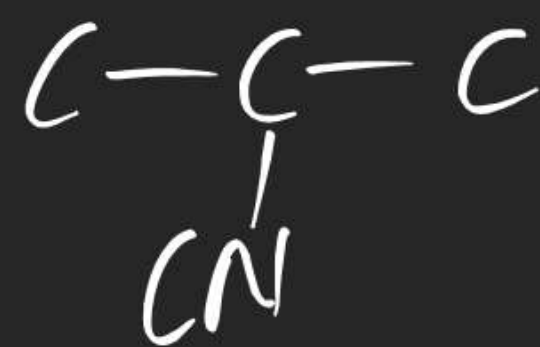
(28)



(30)



(25)



(26)



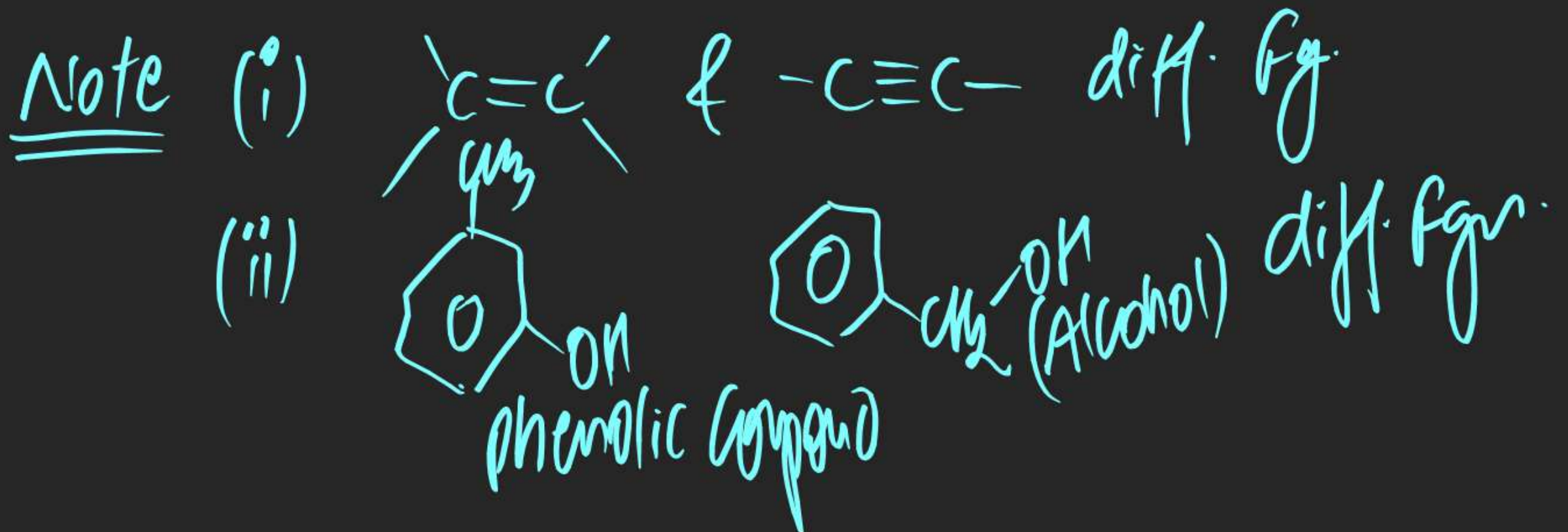
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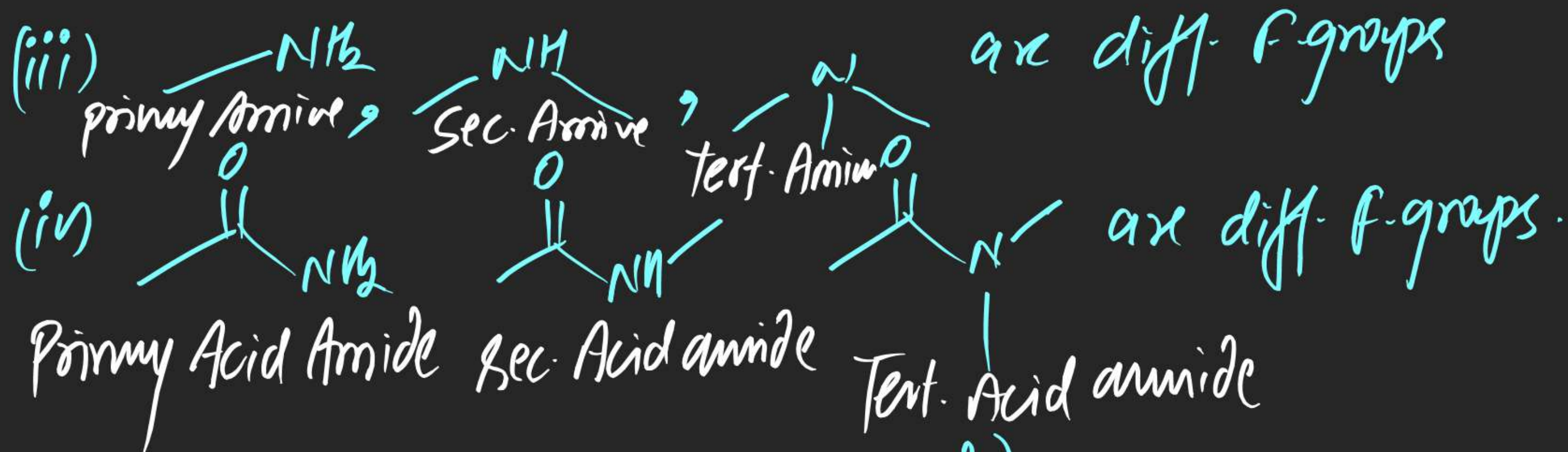
Structural Isomerism

(#) Functional Isomerism:

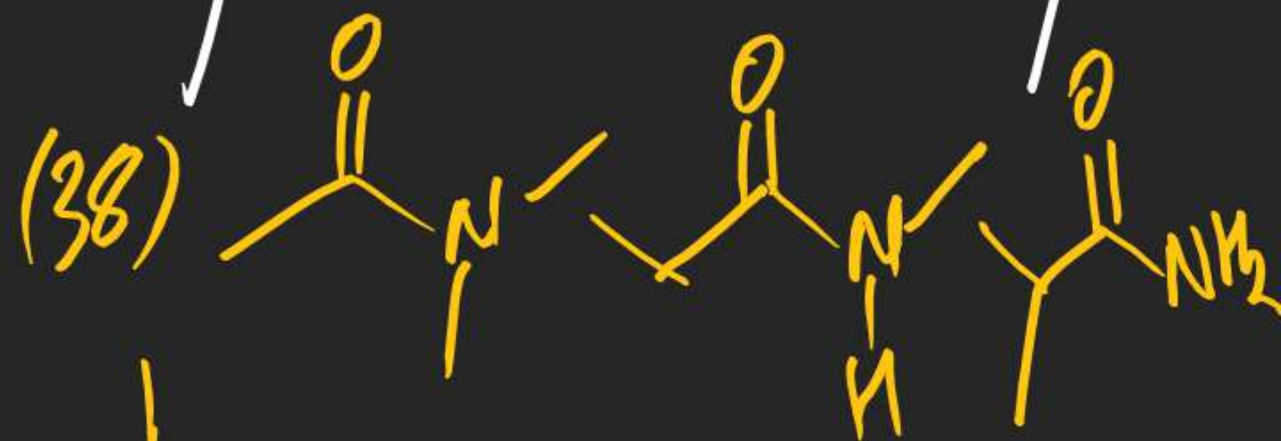
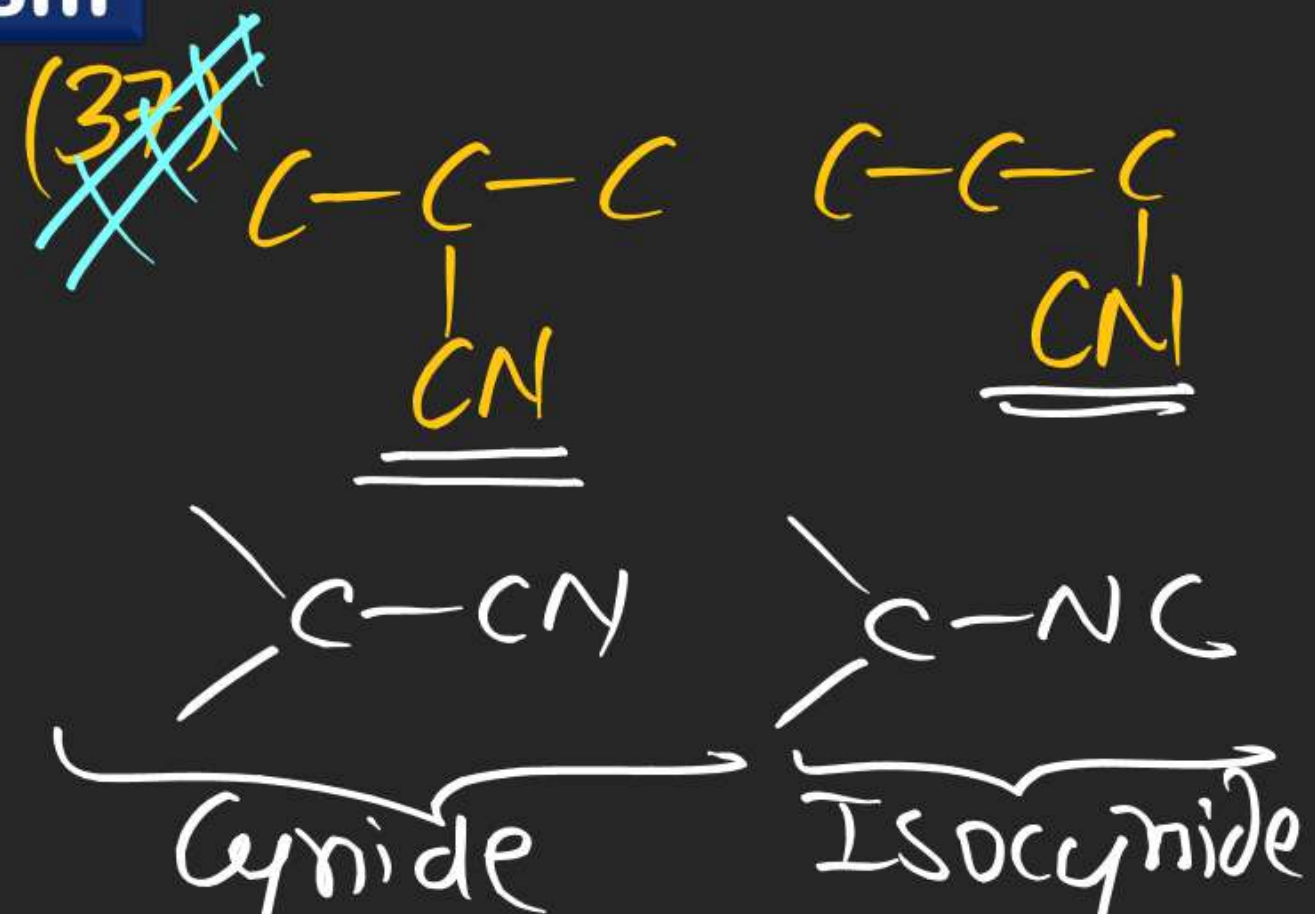
Compounds having same m.f
But difference in type of functional
groups are known as functional
isomers.



Structural Isomerism



Structural Isomerism

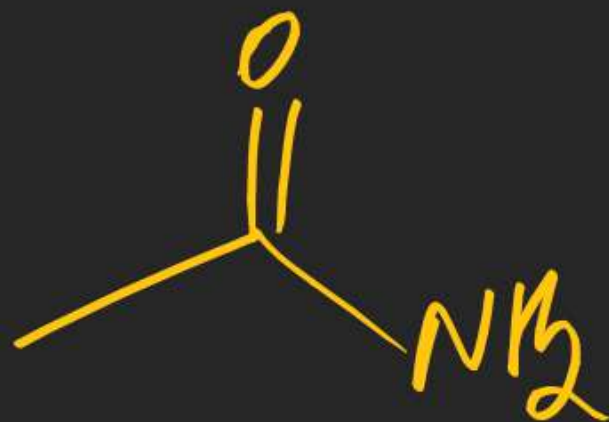


Structural Isomerism

(39)



(40)



(41)



(42)

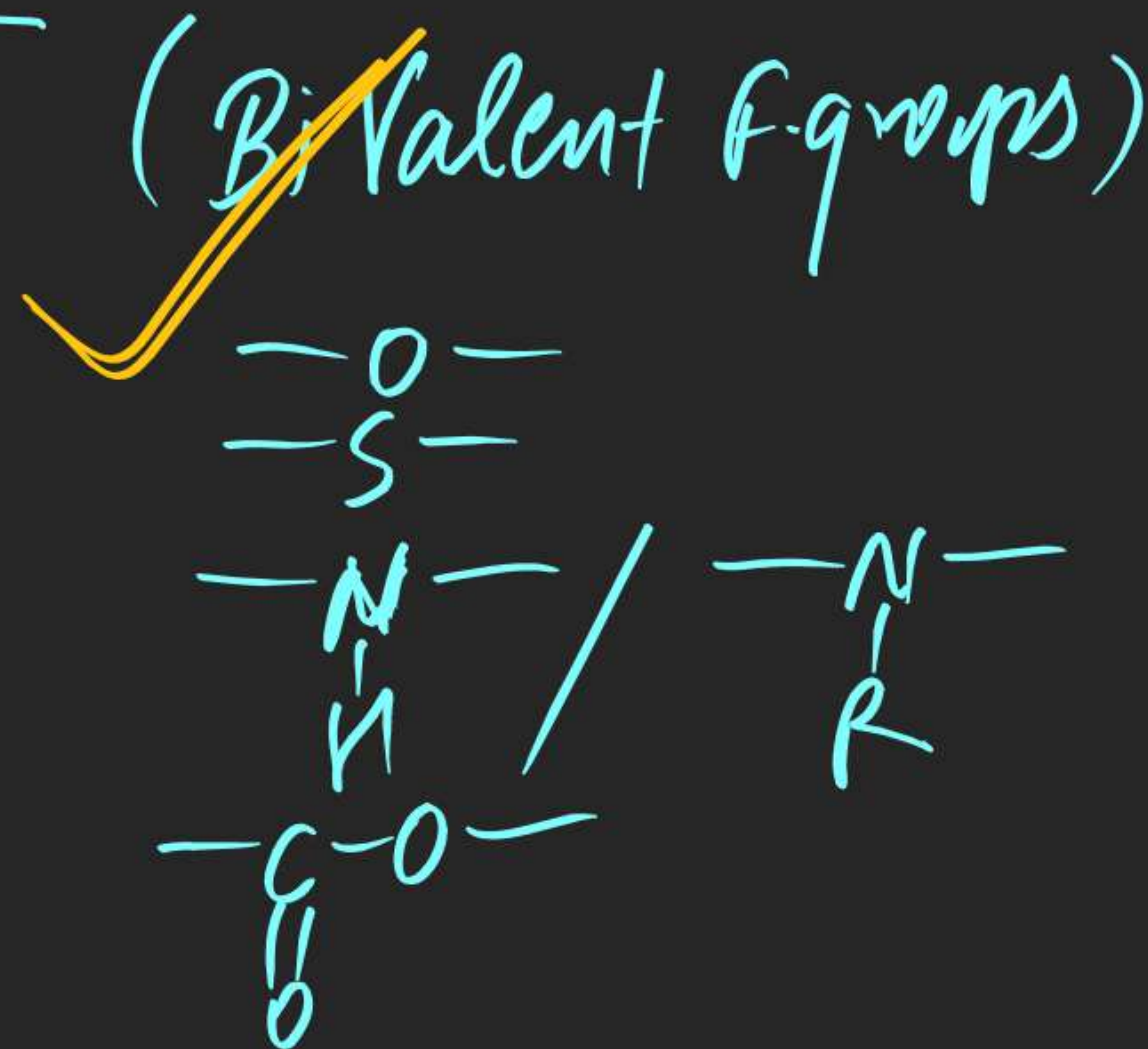


Structural Isomerism

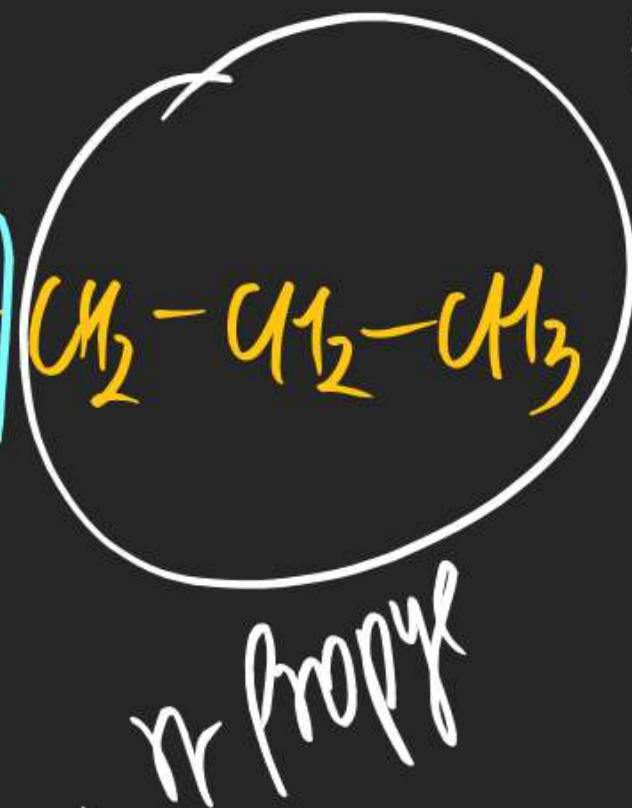
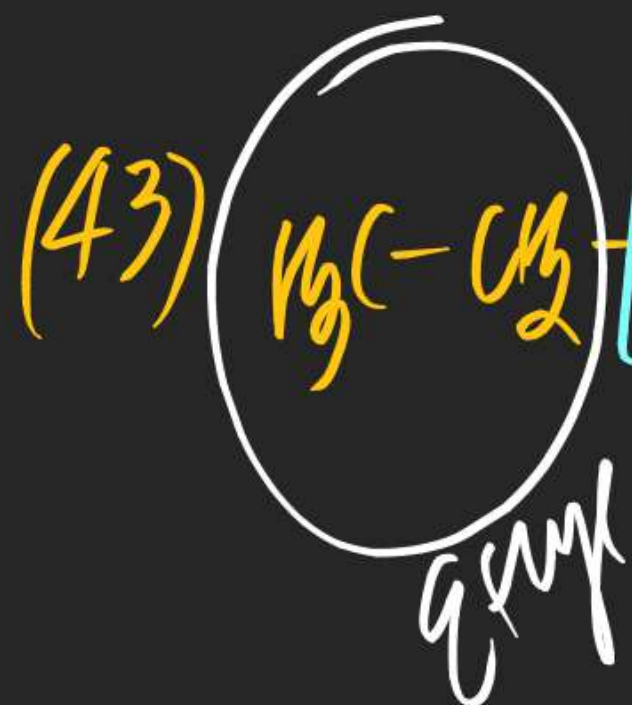
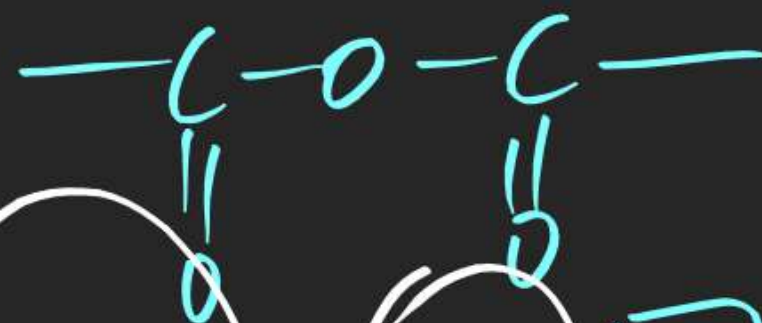
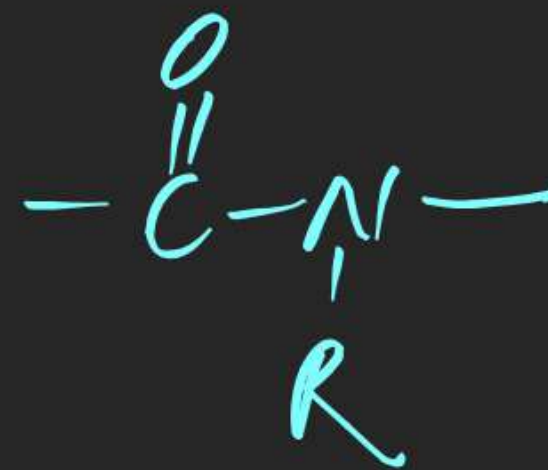
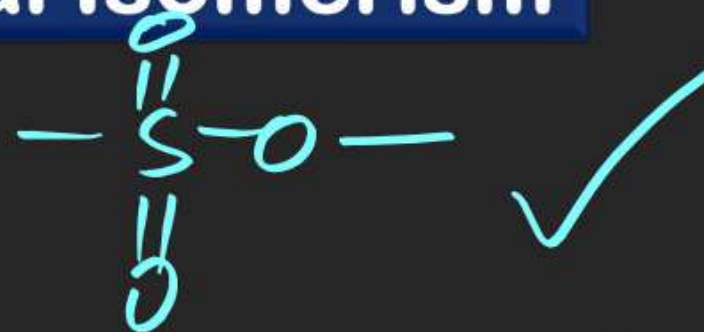
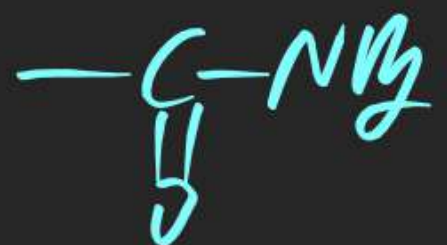
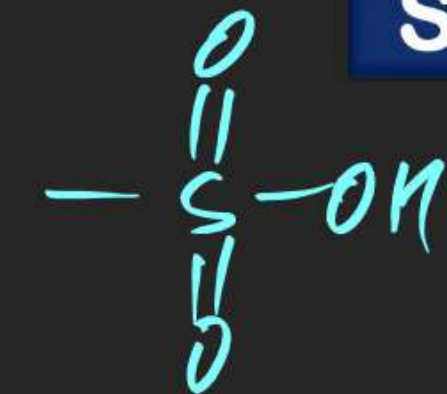
metamerism:

Compounds having same m.f. But difference in alkyl groups w.r. to Bivalent functional groups.

(mono valent F-group)



Structural Isomerism



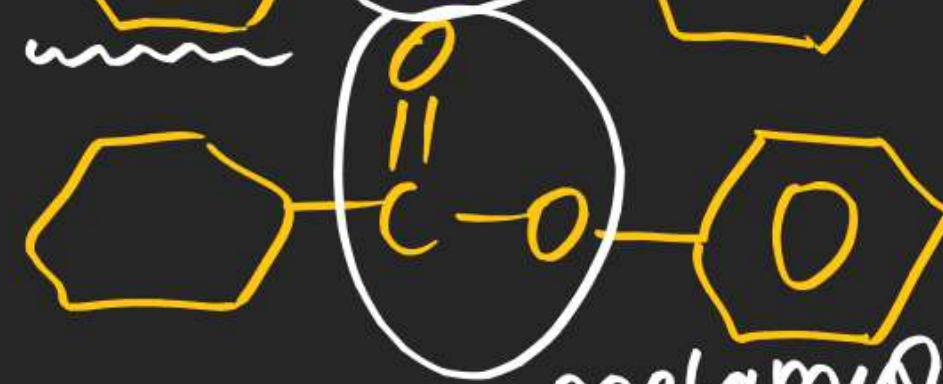
metamers

Structural Isomerism

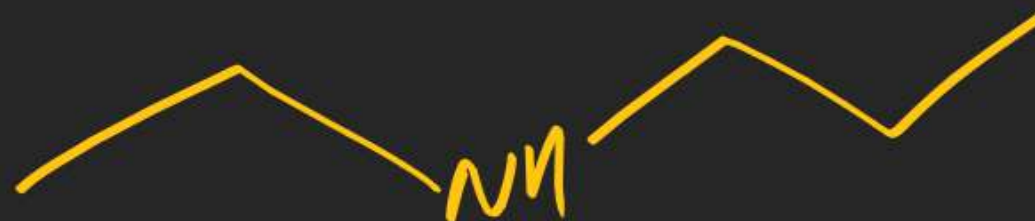
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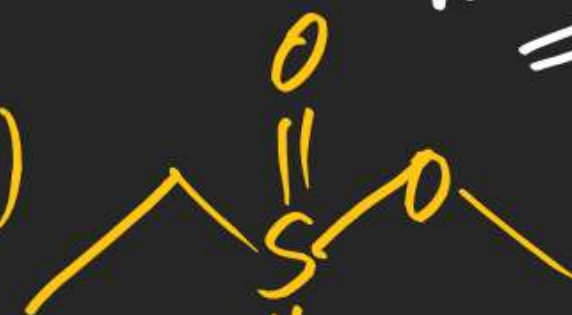
(45)

~~(48)~~metamers

(46)



(49)

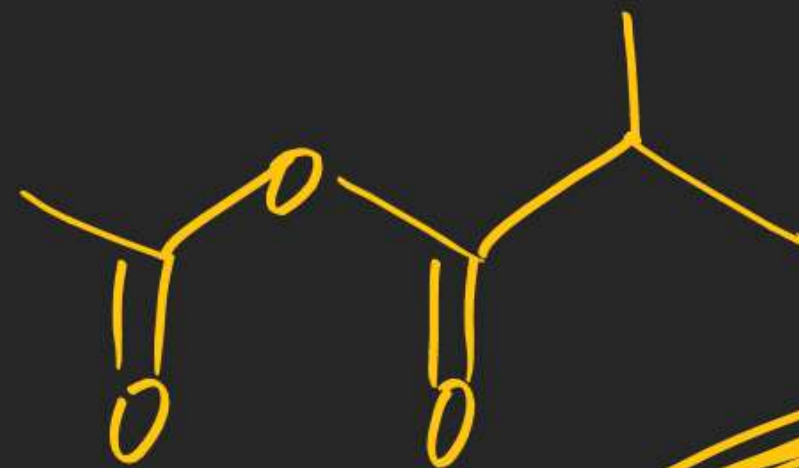
~~(47)~~

(Identical)



Structural Isomerism

(50)



Preferrence
order

Ring chain > Tautomers > metamer

> functional > positional > chain