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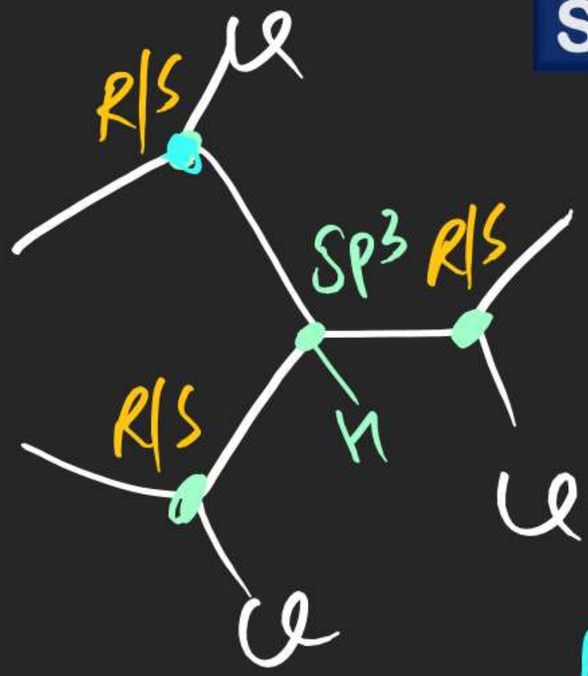
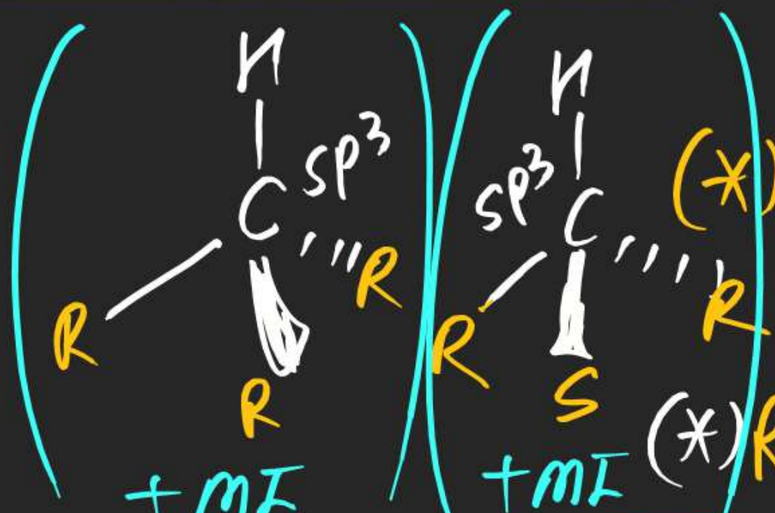
STEREOISOMERISM

R/S

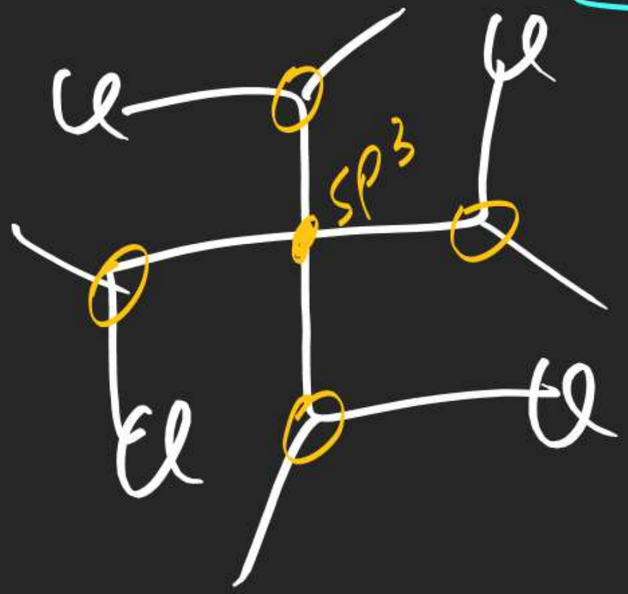
(27)





(*) R की Mirror image "S" होती है

(28)



a=4, m=0, ep=2, T=4

(*) R/S के through POS नहीं डाल सकते क्योंकि ये chiral centre पर होते हैं

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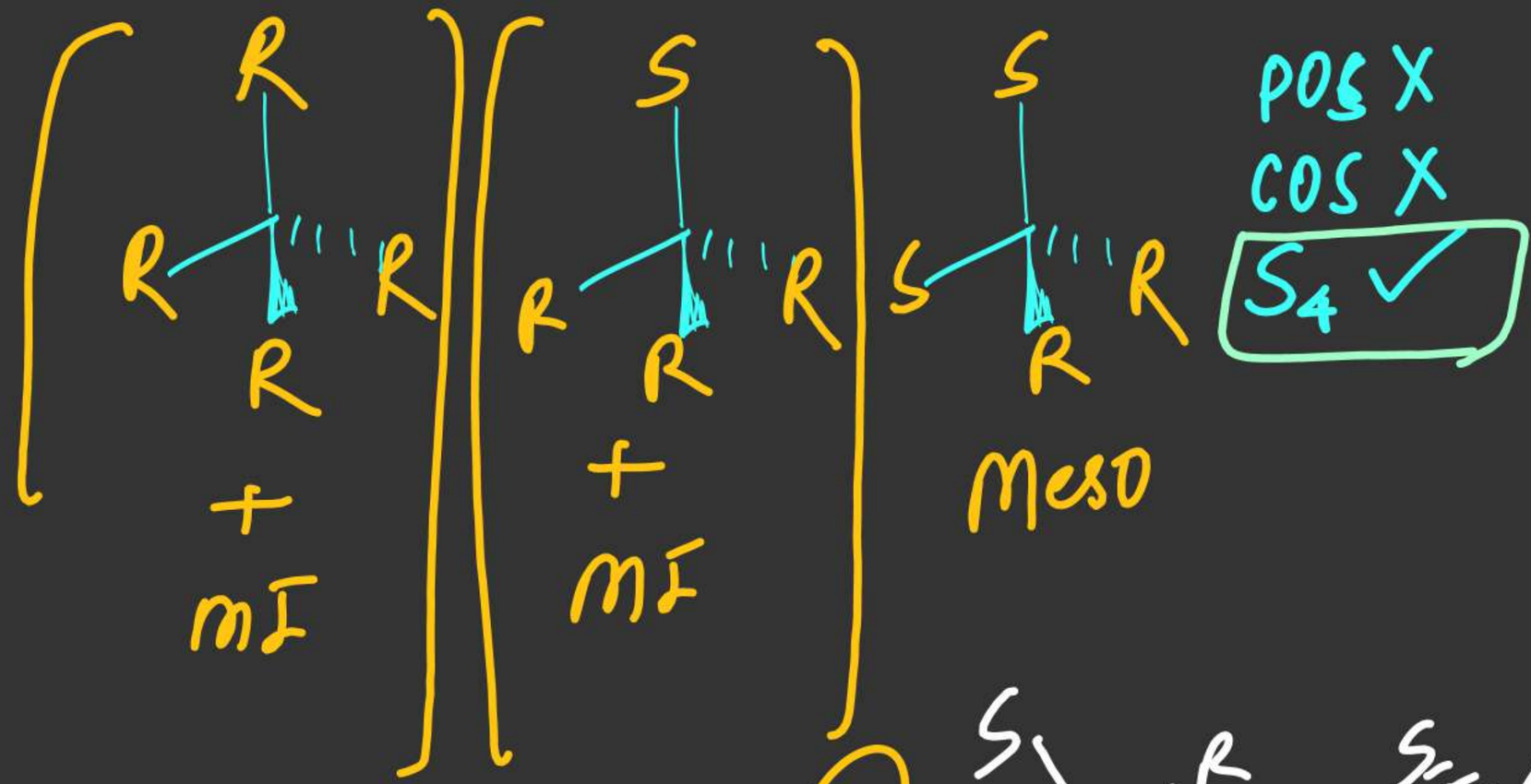
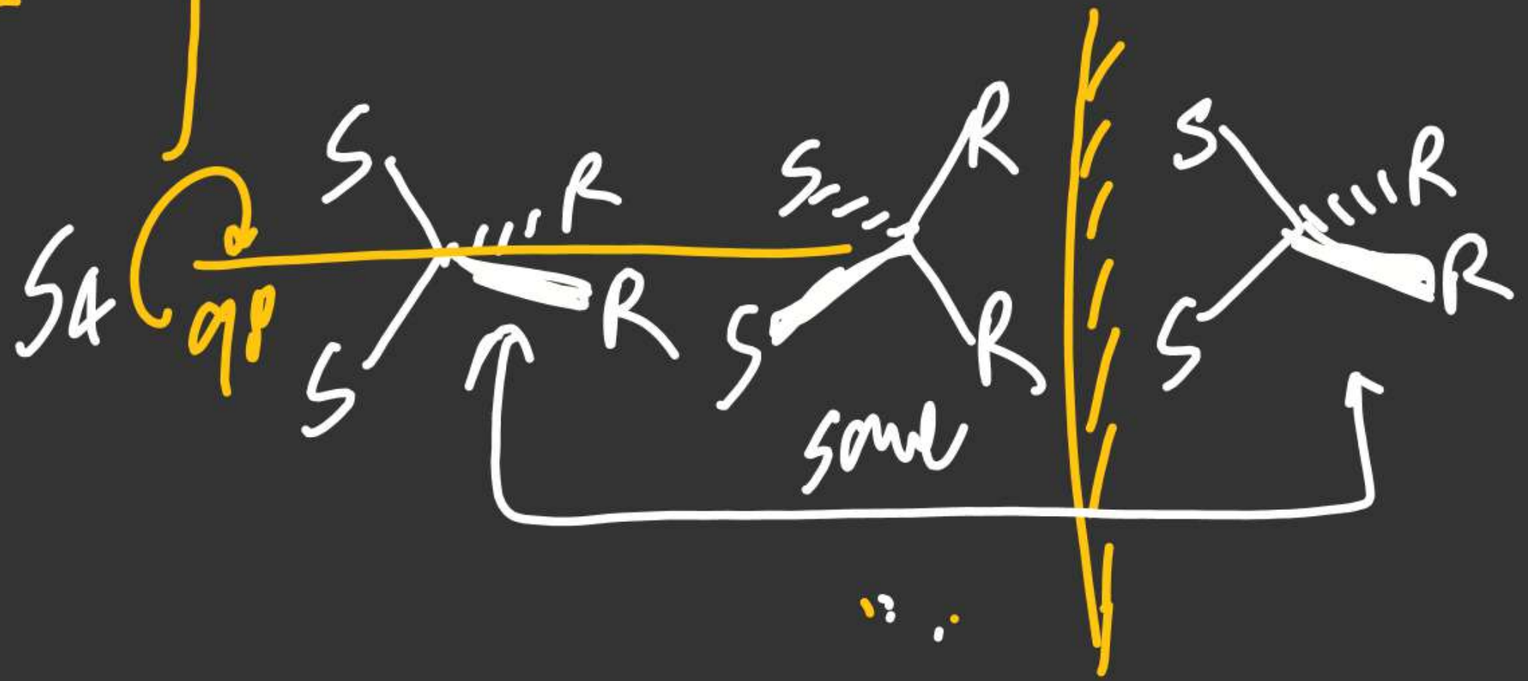


pos X
cos X
S_4 ✓

a=4
m=1
CP=2
T=5



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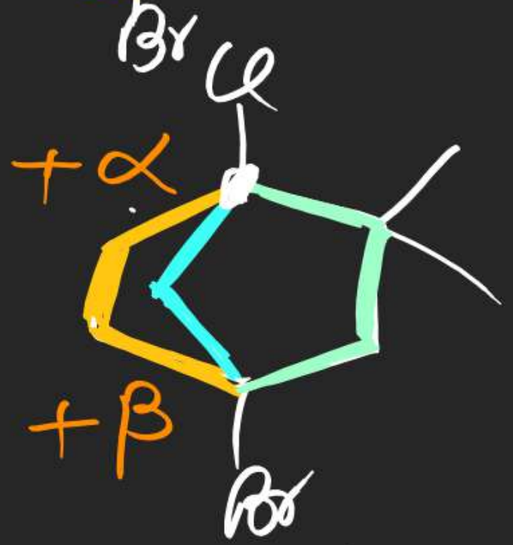
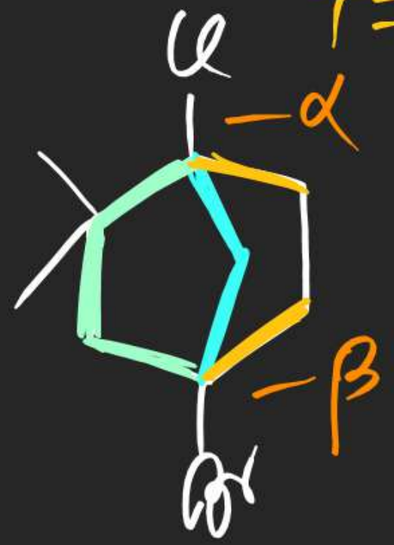
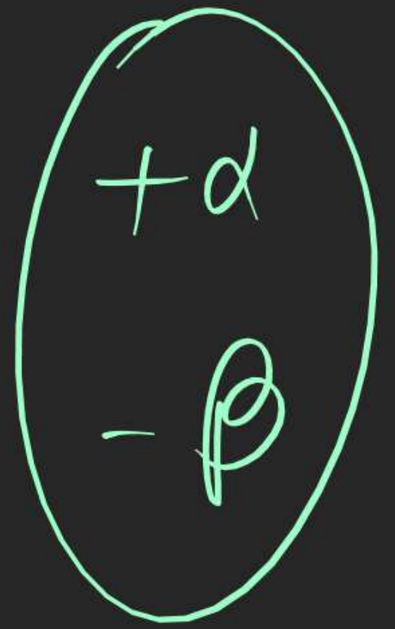
(30)

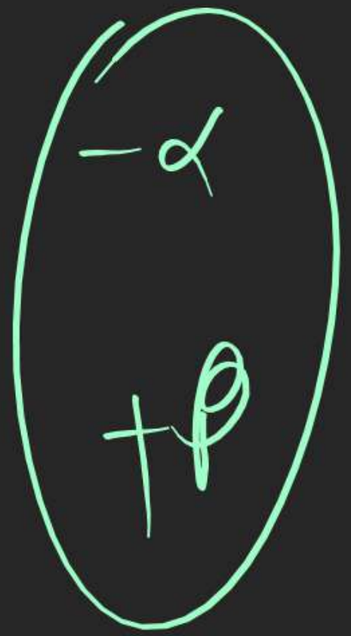
CC = 2

a = 2
m = 0
EP = 1
T = 2

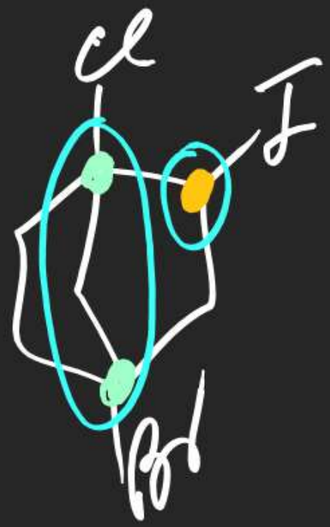








(31)



CC = 3

$TSI = 2^2$

$= 4$

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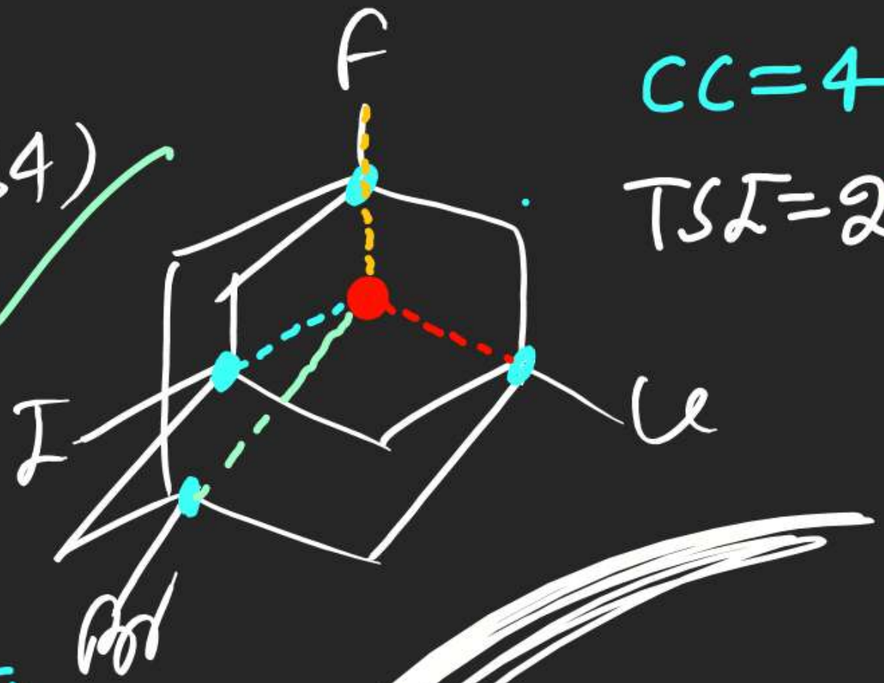
(32)

a=2

TSI=2^1

=2

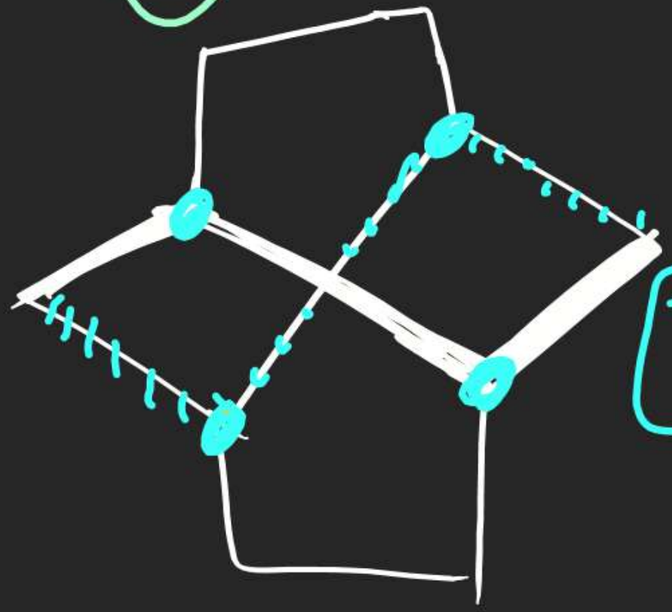
(34)



CC=4

TSI=2^1=2

(33)



TSI=2

Twistane

CC=4

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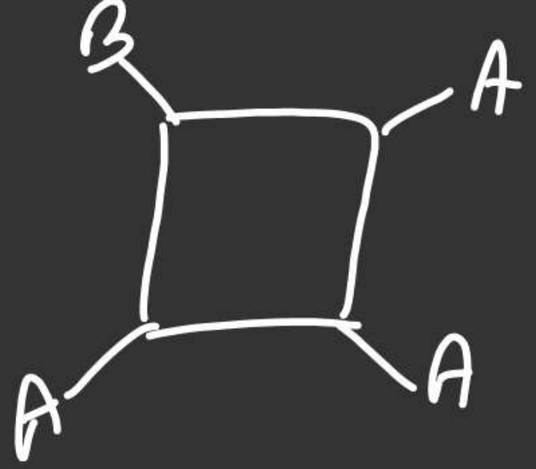
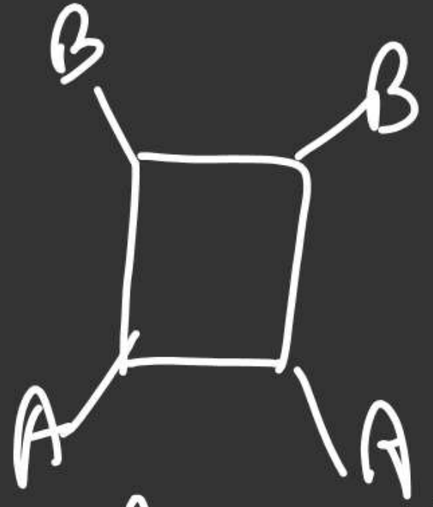
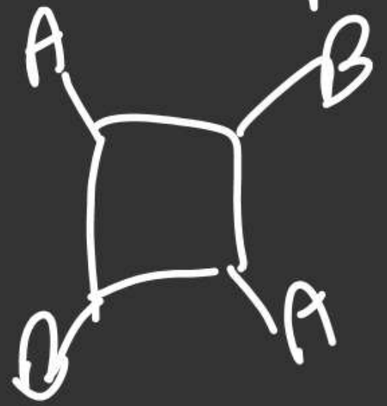
(24)



(25)

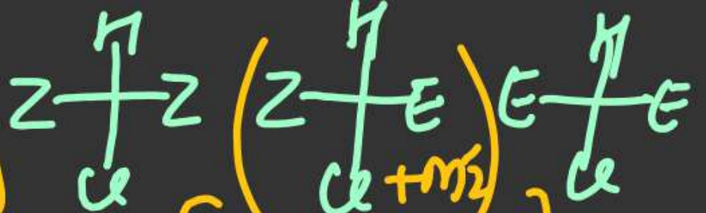


(26)



(24) $CH_3-CH=CH-CH-CH=CH-CH_3$ (Cl)

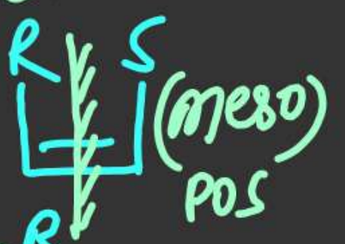
TSI = 4

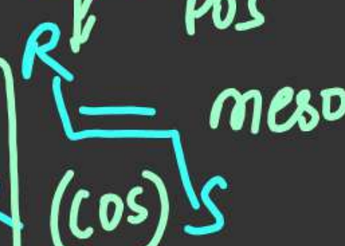


(25) $CH_3-CH-CH=CH-CH-CH_3$ (Cl)

OI GI OI

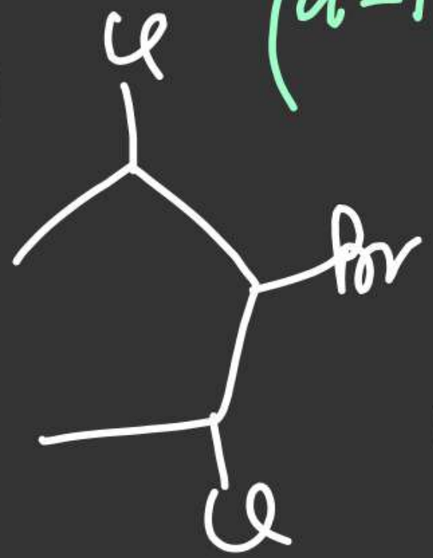
mI +





(a=4, m=2, Ep=2) T=6

(26)

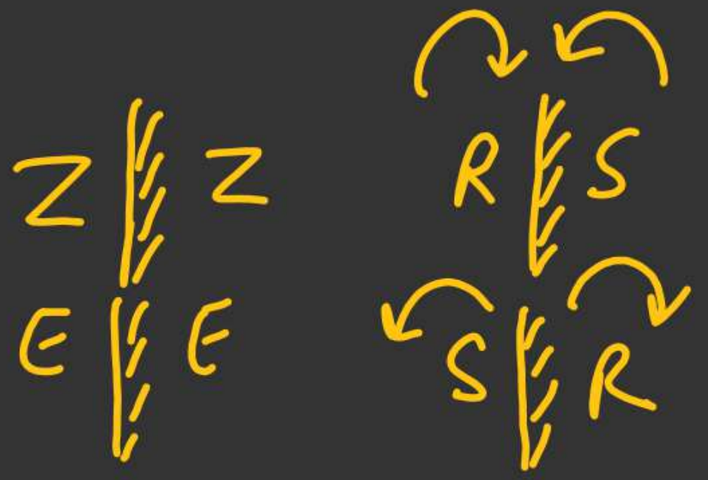


meso

+mI

meso

a=2
m=2
Ep=1
T=4


Z
Z
E
E
R
S
S
R

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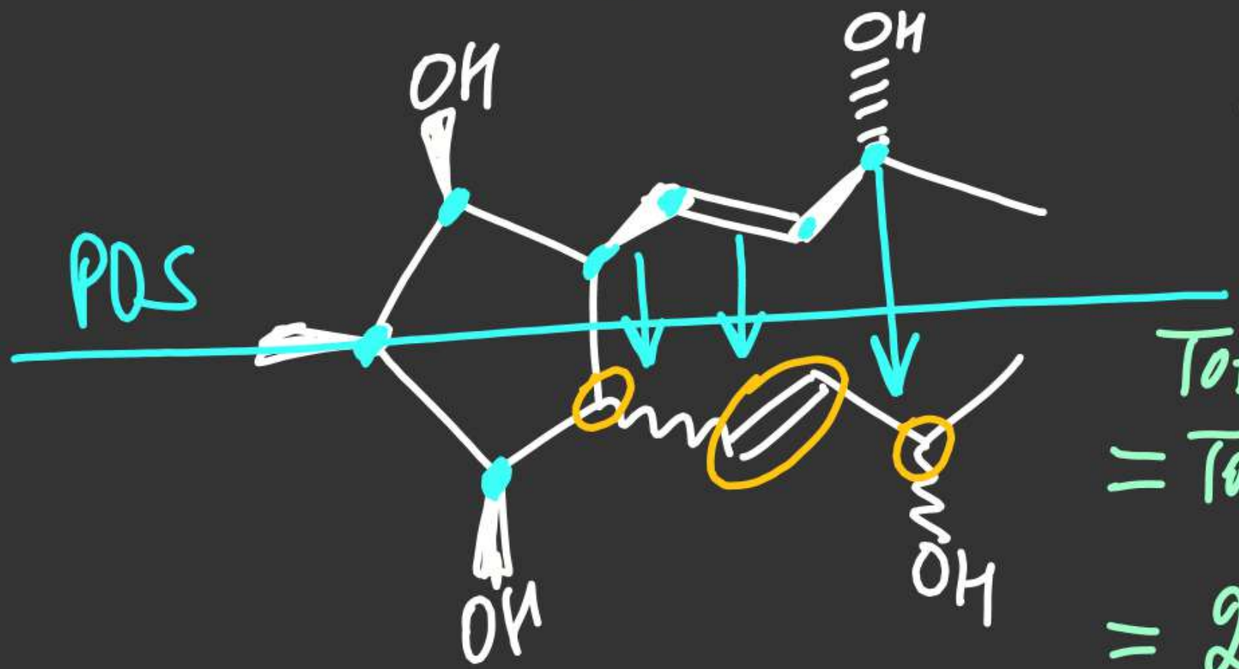
IIT Advance :-

(35) Find Total no. of Chiral product (optically Active) in following compound where —— & ||||| ⇒ Configuration fix

wwww ⇒ Variable Configuration



Total chiral isomers

= Total stereoisomers − Total inactive isomers

$= 2^3 - 1$

$= 7$

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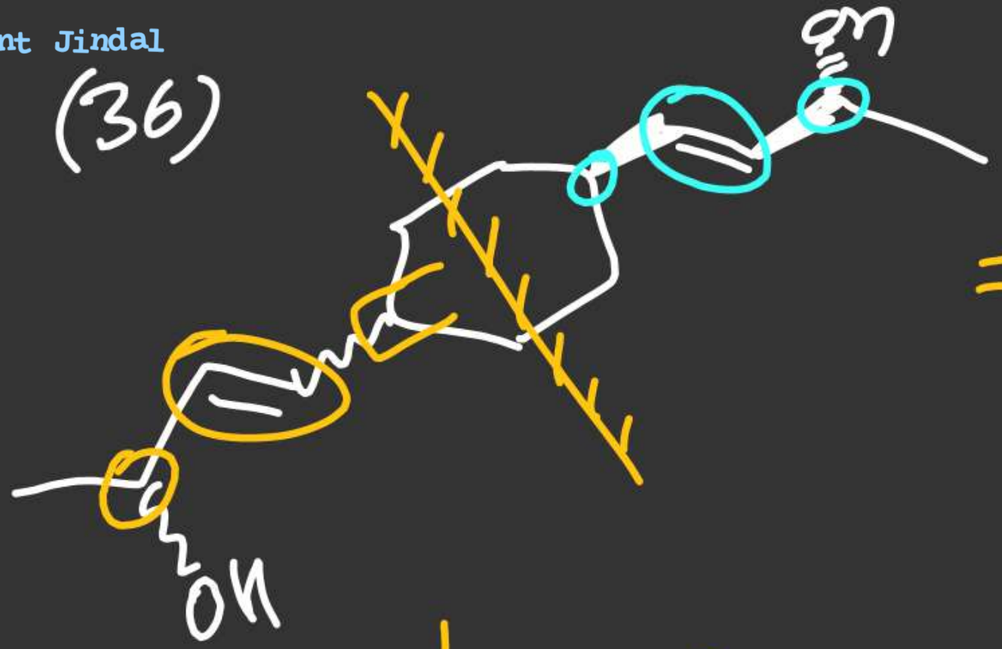
(36)



Total chiral isomers

$= 2^3 - 1 - 1 = 6$

(POS)(COS)

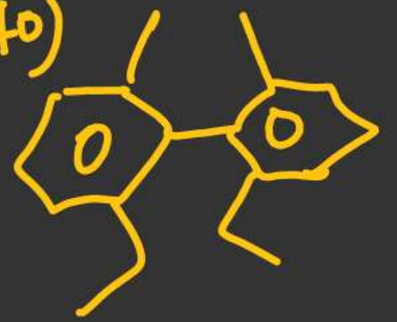
(37)

(TSI=2)

(38) $H_3C-CH=C=CH-CH_3$

(39)

(40)



Each question from (37 – 40) contains Terminal in ⊥ plane hence no Sn present hence achiral

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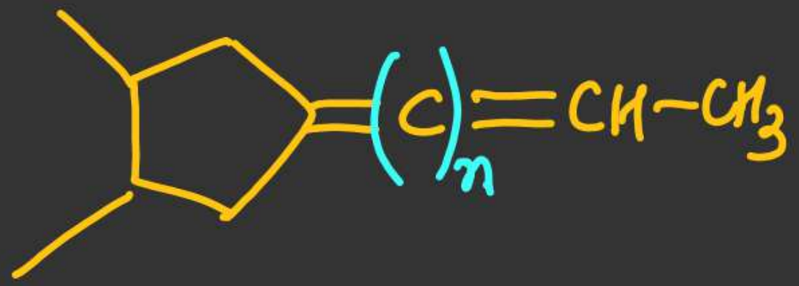
(41) 

(42) 

Find Total stereoisomers for all values of "n"

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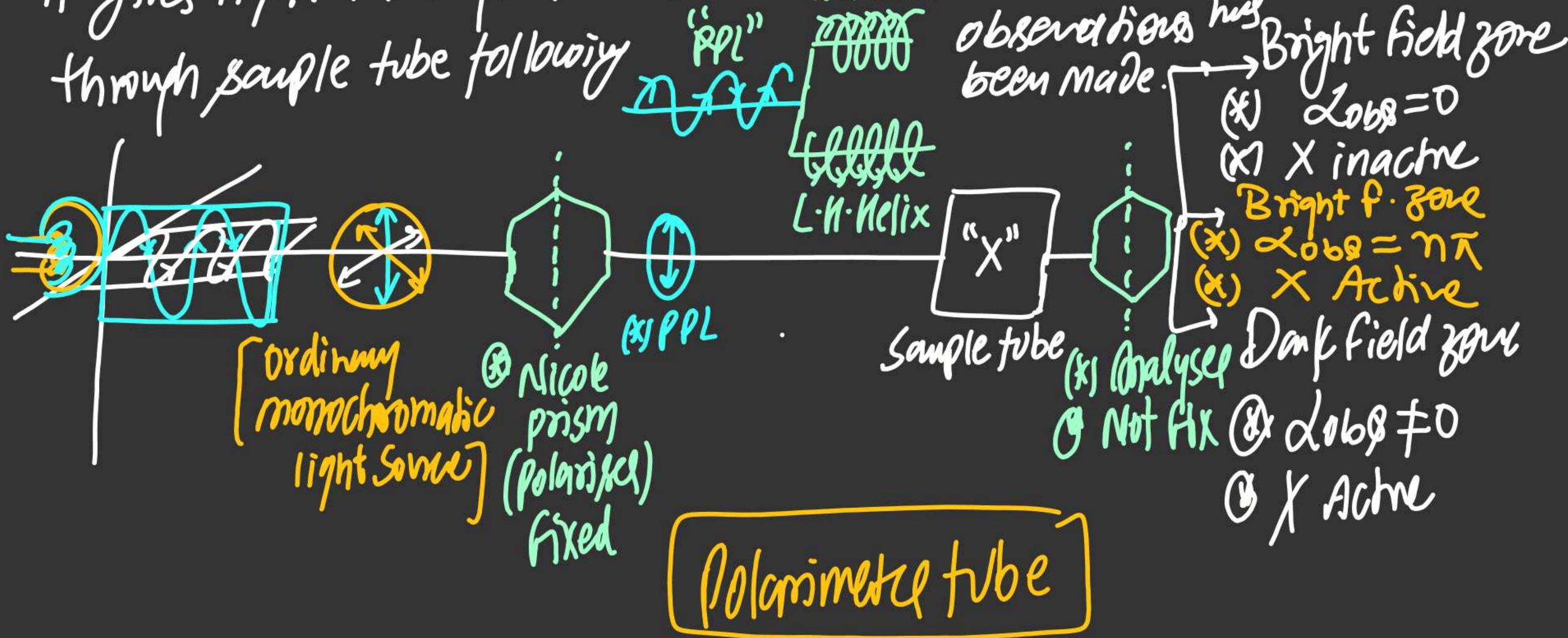
Plane Polarised light (PPL):-

A ordinary monochromatic light Some whenever passed through nicol prism known as PPL. On passing PPL it gives light in single plane through sample tube following observations has been made.



Polarimeter tube

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(#) Optically Active Compound:

⇒ $\alpha_{obs} \neq 0$
⇒ Sn absent
⇒ Chiral Compound

dextrorotatory Compound

⇒ Compounds which Rotate PPL in clockwise direction
(+) or d

laevorotary Compound

⇒ Compounds ——————
— Anti clockwise ——————
(-) & l

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Note R, S | D, L | Thero, Erythro | d, l

No direct Relation

only this implies about sense of Rotation

⇒ Optically inactive Compound

⇒ $\alpha_{obs} = 0$

⇒ atleast Sn absent for one "n"

(#) **Observed Angle of Rotation** (α'_{obs})

Angle b/w plane of PPL first before & after interaction with sample.

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Factors which affect α_{obs}

(i) **Wavelength of light source:-** Usually Sodium lamp ($\lambda = 5893\ A^\circ$) is used
λ remains constant

(ii) **Temperature:-** Usually Room Temp is maintained ($T = 25^\circ C$)

(iii) **Conc. of Sample:-** On increasing conc. of sample α_{obs} increases.

$$\alpha_{obs} \propto C \longrightarrow (i)$$

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(iv) Length of Sample tube

On ↑ length of sample tube α_{obs} increases.

$$\alpha_{obs} \propto l \longrightarrow (ii)$$

From eqn (i) & eqn (ii)

$$\alpha_{obs} \propto l \times c$$

$$\Rightarrow \alpha_{obs} = [\alpha]^{\lambda}_{t^\circ c}\, l \times c$$

$[\alpha]^{\lambda}_{t^\circ c}$ → specific angle of Rotation

$$[\alpha]^{\lambda}_{t^\circ c} = \frac{\alpha_{obs}}{l \times c}$$

$l \Rightarrow$ dm

$c \Rightarrow$ gm/ml

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Ex-1: 0.5 m 2-Butanol whenever taken in a sample tube of length 100 cm, it shows α_{obs} of $+20^\circ$

(a) Calculate $[\alpha]^{t^\circ C}_{\lambda}$

(b) ——— $[\alpha]^{t^\circ C}_{\lambda}$ & α_{obs} if length is doubled

(c) ——— $[\alpha]^{t^\circ C}_{\lambda}$ & α_{obs} if dilution is doubled.

Soln: $C = 0.5\,m = \underbrace{\frac{0.5 \times 74}{1000}}\ gm/ml$

$l = 100\,cm = \underbrace{\quad}\ dm$

$\alpha_{obs} = +20^\circ$

$[\alpha]^{t^\circ C}_{\lambda} = \frac{\alpha_{obs}}{l \times C}$

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(2) How can we distinguish b/w $\alpha_{obs} = 0$ & $\alpha_{obs} = n\pi$

(3) ——————————— $\alpha_{obs} = +100°$ & $-100°$

(4) why PPL gets Rotated when interm. with Chiral molecule.

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HW: Stereoisomerism sheet / EX-1 (1-30)

BB Main Exercise (1-30)

Blue Book
Problems & Solution
Organic Chemistry
Cengage Publication (3E)
By S.K. Mish Upgraded version