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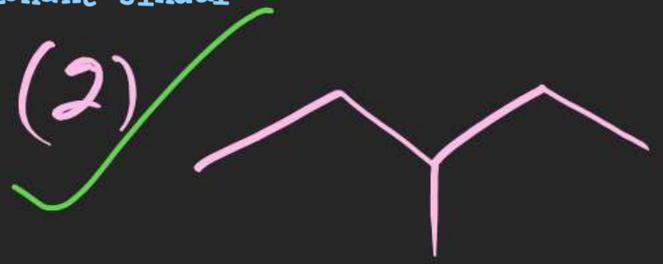
(2)



$\xrightarrow[h\nu]{Cl_2}$

+

+

+

$a=4, b=8, c=6, d=3, e = b-d = 5$

$2(d+l)$

$4[(d'+l')+(d''+l'')]$

1

1

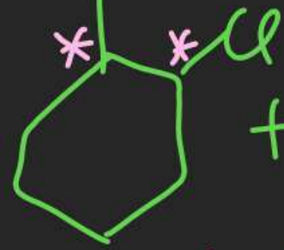
(3)

(4)

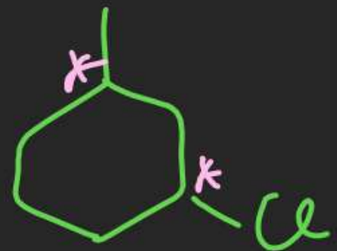
$\longrightarrow$

+

+



+



+

$a=5, b=12, c=8, d=4, e=8$

1

1

$4[(d+l)+(d'+l'')]$

$4[(d''+l''')+(d'''+l''')]$

$2(C+T)$

(5)

$\longrightarrow$

+

+

+

$a=4, b=10$
$c=8, d=4$
$e=6$

1

1

$4[(d+l)+(d'+l')]$

$4[(d''+l'')+(d'''+l''')]$

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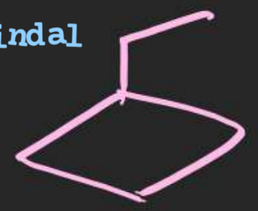
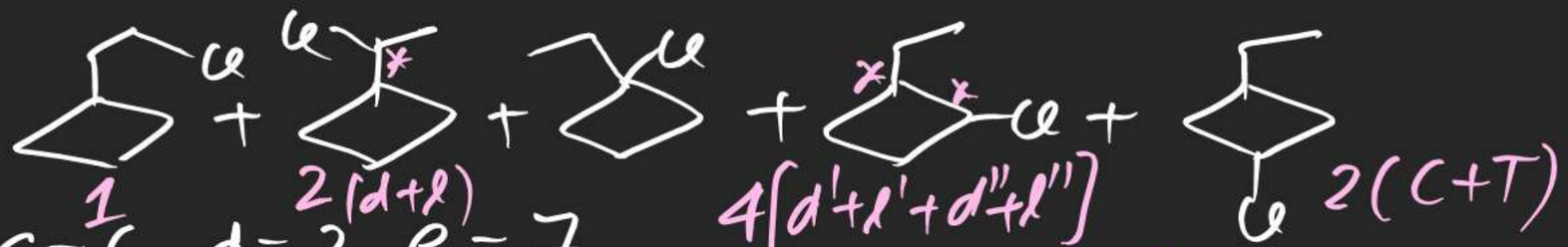
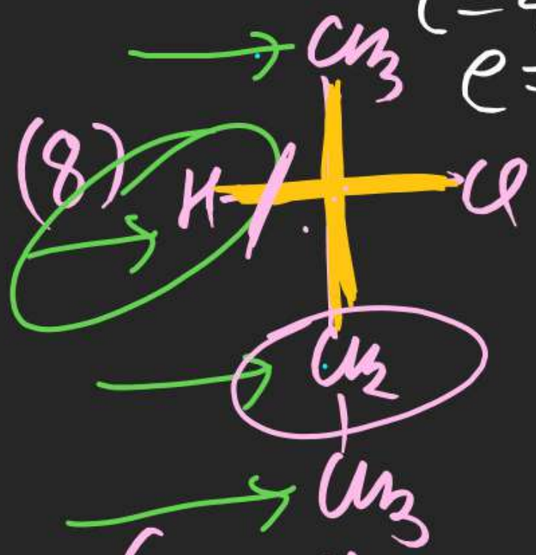
(6)  $\xrightarrow[h\nu]{Cl_2}$ 

1 + 2(d+l) + 4[d'+l'+d''+l''] + 2(C+T)

$a=5, b=10, c=6, d=3, e=7$

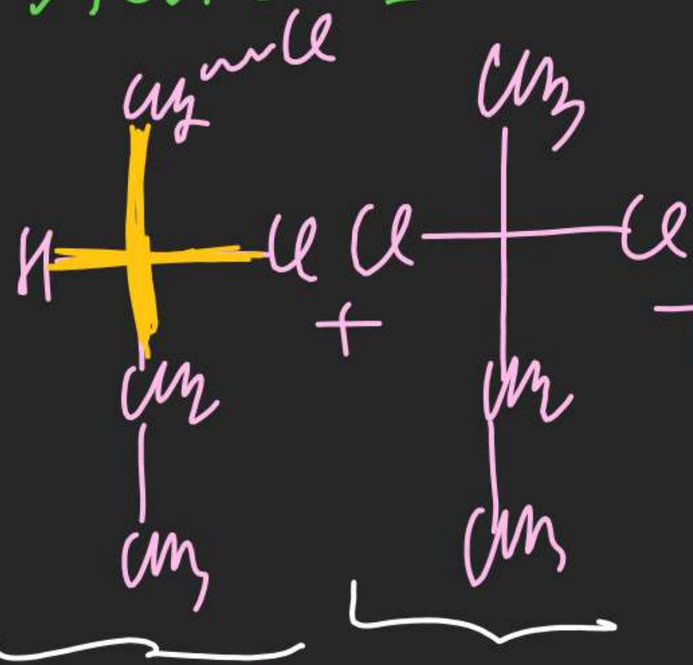
(7) 

$a=4, b=8$
$c=4, d=2$
$e=6$

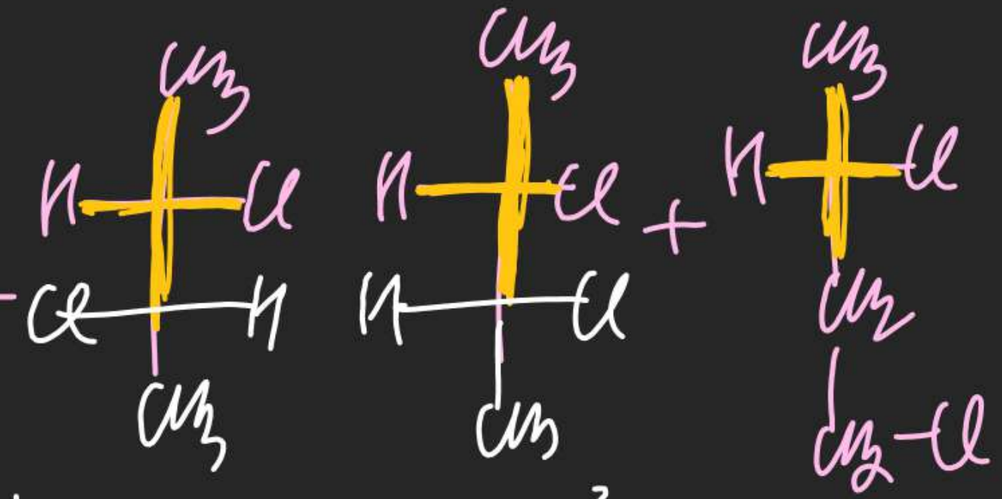
(8) 

(Optically pure)

(POS) Active + (POS) Inactive



Active + Inactive + Active



$a=4, b=5, c=3, d=0, e=5$

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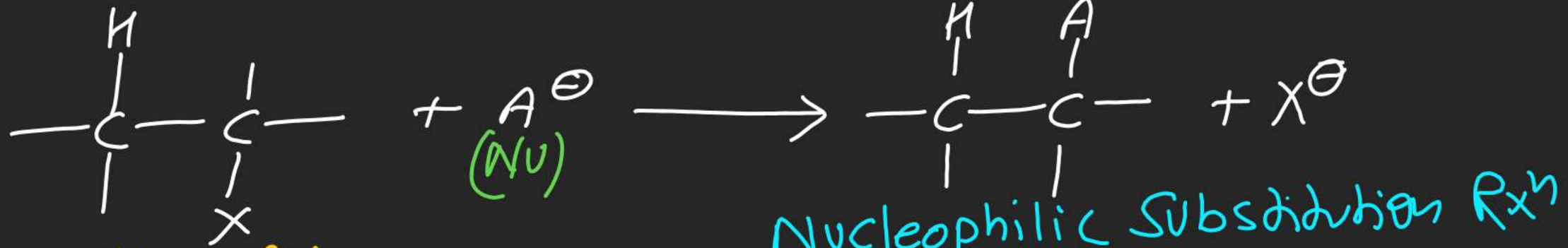
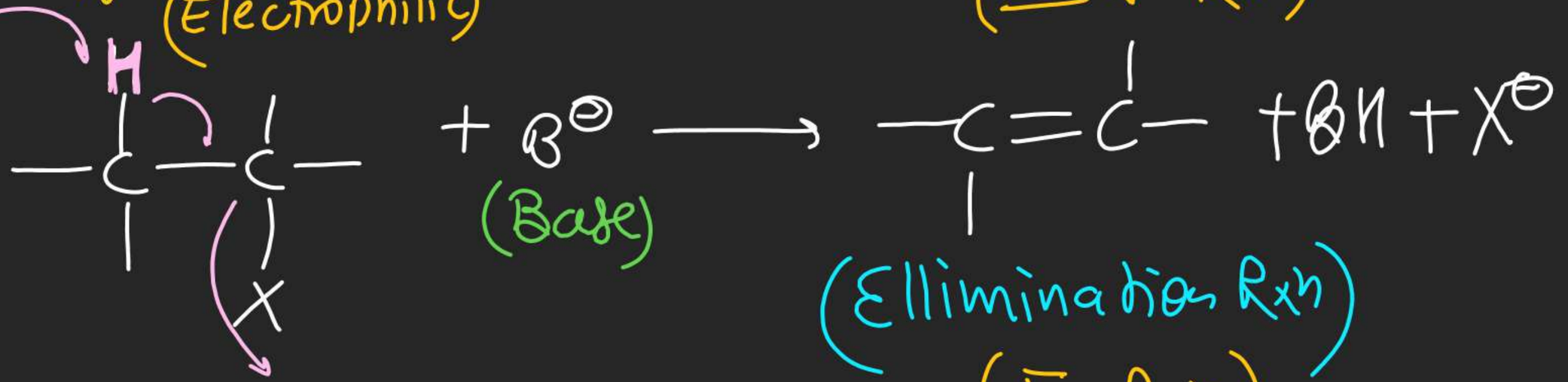
(#) Reactions shown By Alkyl Halide :

(i) 

Alkyl halide (Electrophilic)

Nucleophilic Substitution Rxn (SN Rxn)

(ii) 

(Elimination Rxn) (E Rxn)

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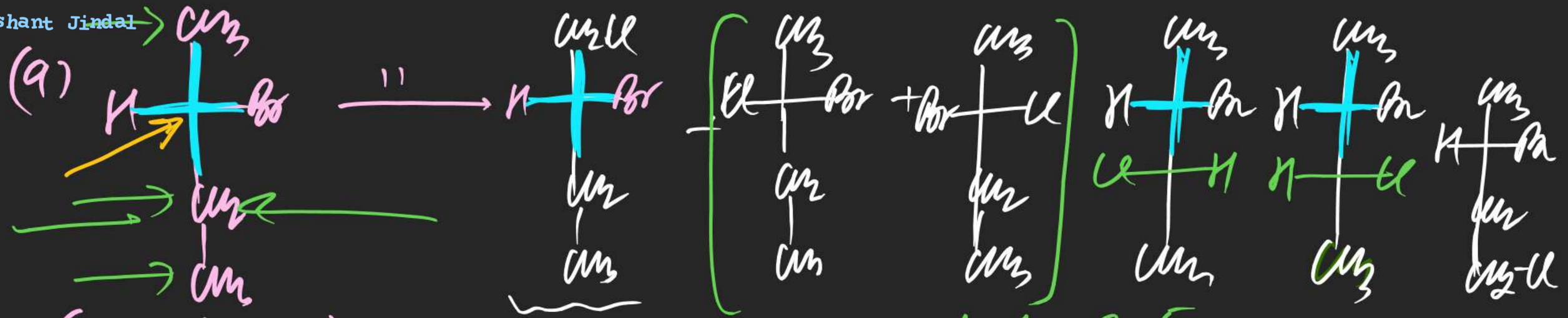
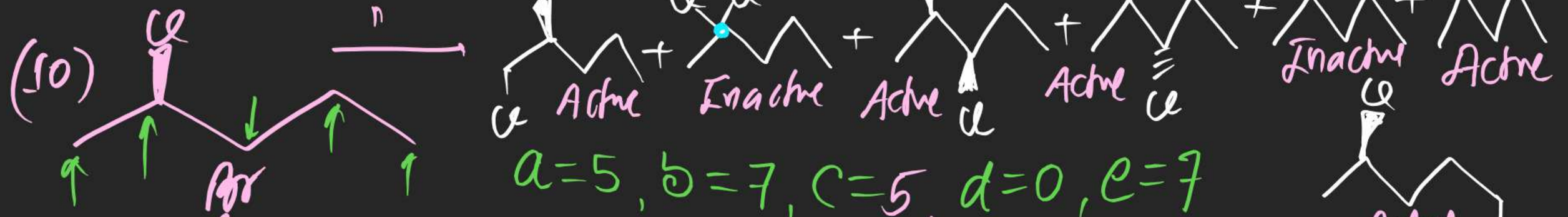
(9)



(optically pure)

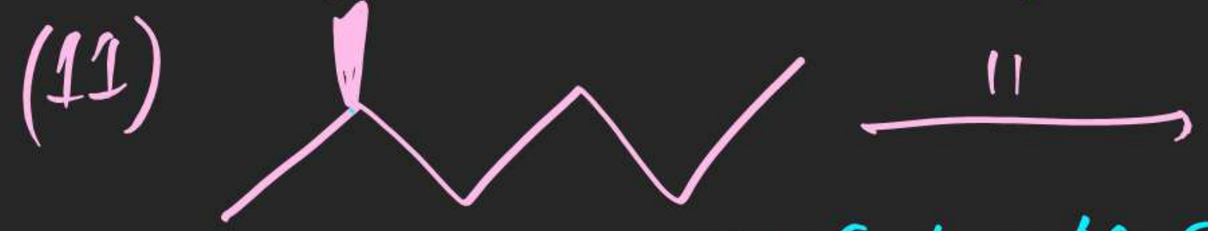
a = 4, b = 6, c = 6, d = 1, e = 5

(10)



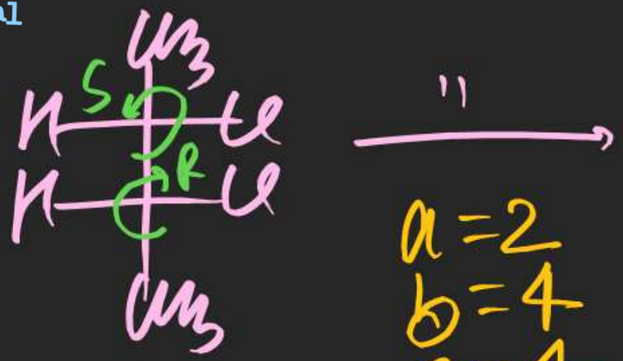
a = 5, b = 7, c = 5, d = 0, e = 7

(11)



a = 6, b = 10, c = 10, d = 1, e = 9

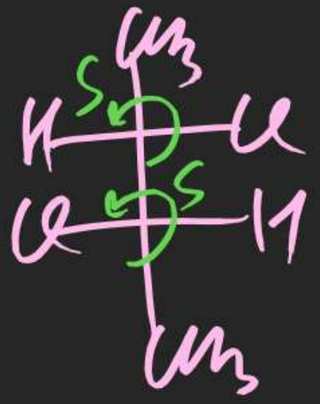
(12)



11

$a=2$
$b=4$
$c=4$
$d=2$
$e=2$

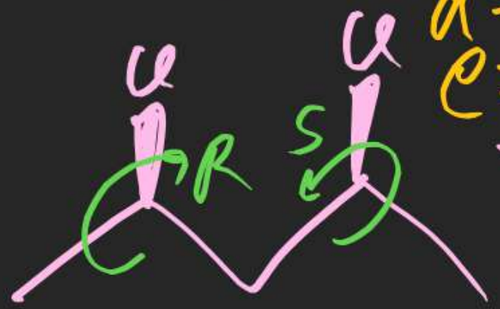
(13)



11

$a=2$
$b=2$
$c=2$
$d=0$
$e=2$

(14)



11

$a=3$ $c=6$ $e=3$
$b=6$ $d=3$

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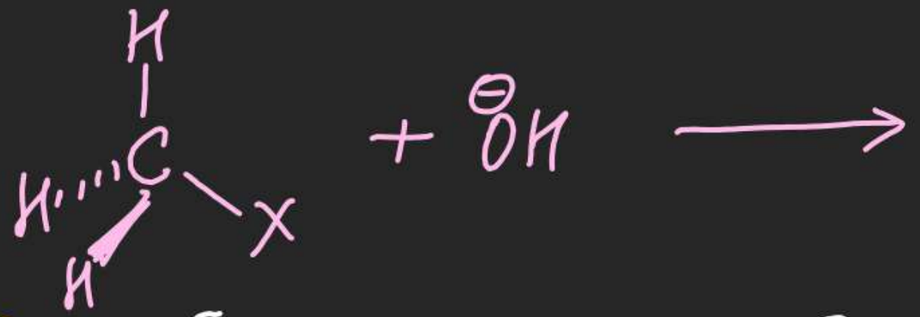
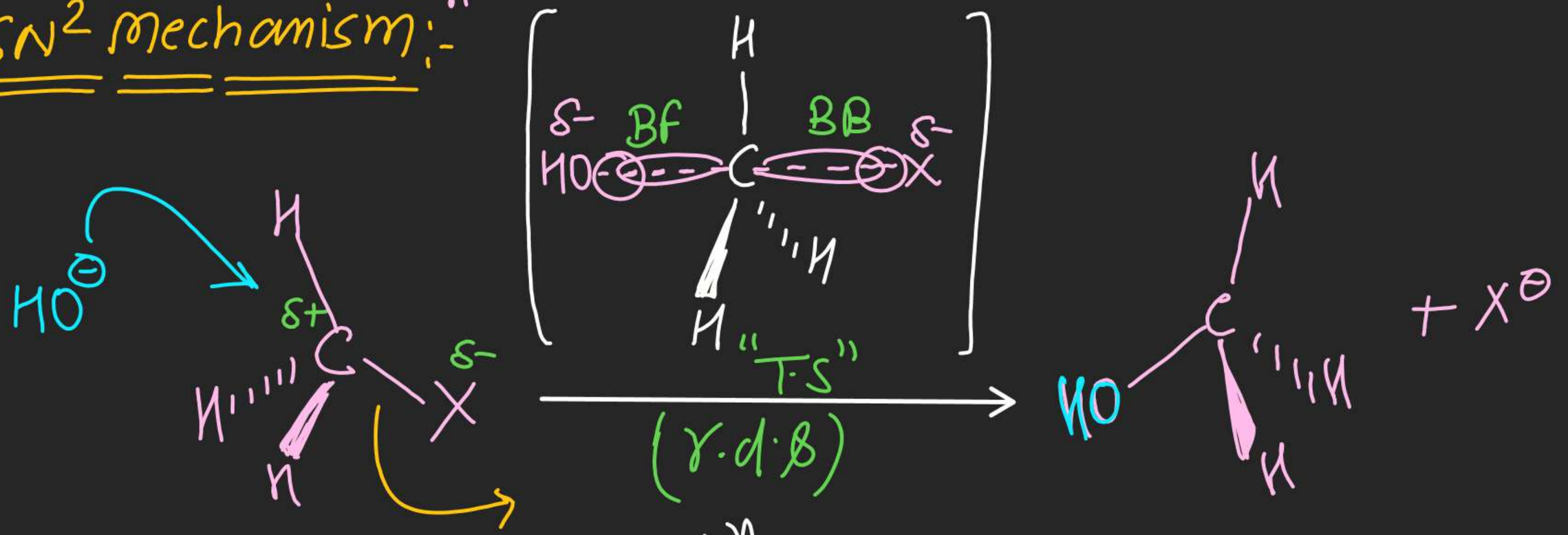
Ex-1



+ $\overset{\ominus}{O}H$ ⟶

SN^2 Mechanism :-



+ $X^{\ominus}$

Note (i) One step mechⁿ

(ii) No Carbocation Intermidiate

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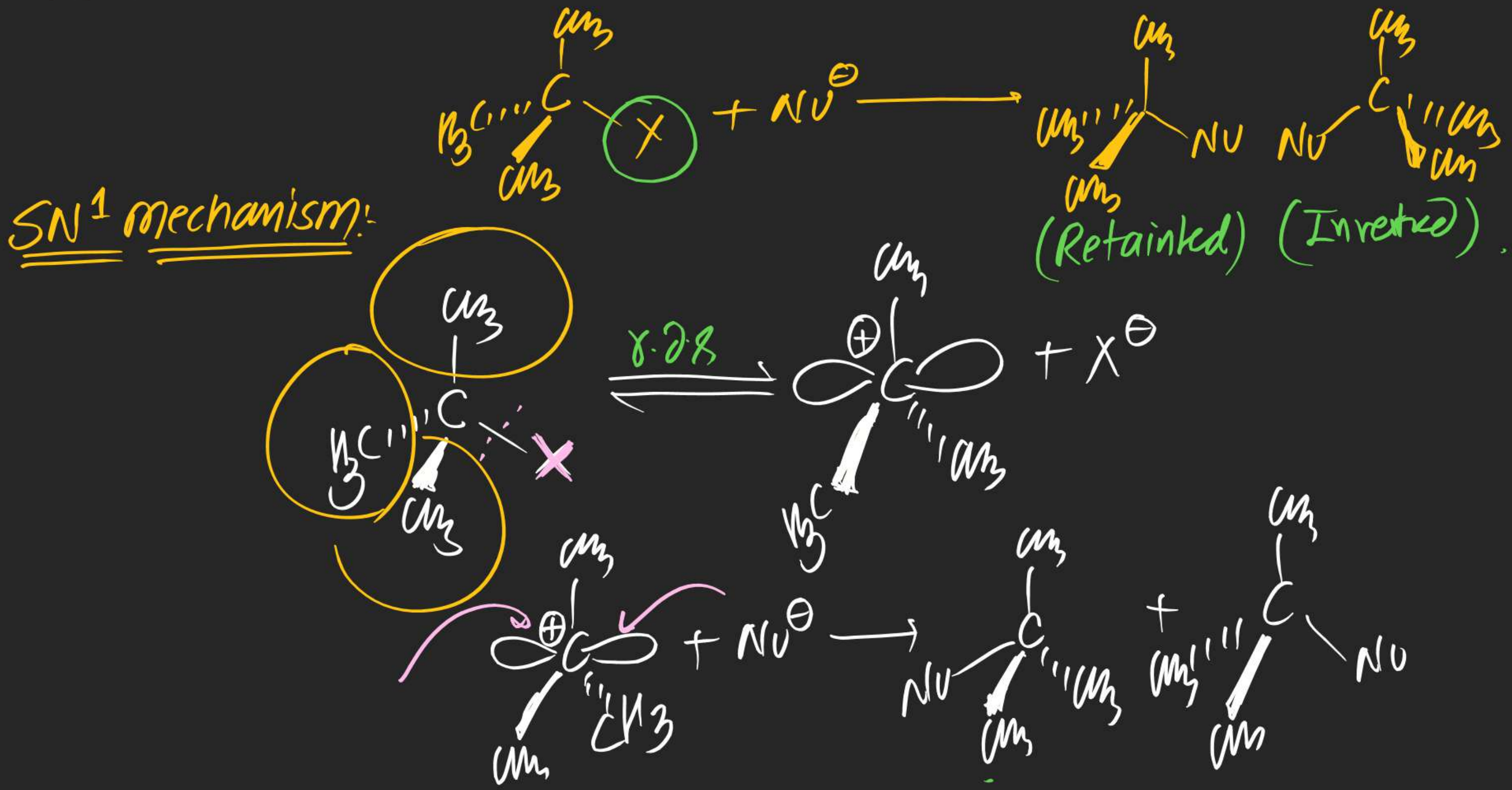

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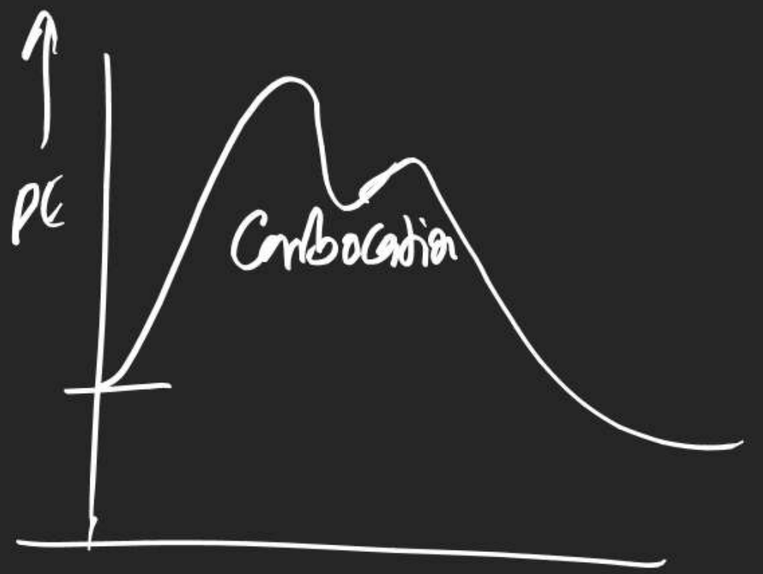
Note

(i) Two step mechanism
(ii) Carbocation intermidiate
(iii) Rearrangement possible
(iv) Rate Expression

$$\gamma_{SN^1} = K_{SN^1}[R-X]$$

(v) Unimolecular γx^n
(vi) hence SN^1 mech^n
(vii) Pseudo I-order Rx^n

(viii) P.E diagram



(ix) No Kinetic isotopic effect.
(x) Elemental effect observed
(xi) Both Retention & inverted product is formed.

Factor for SN mechn:

(1) Structure of substrate
(2) Nature of leaving group
(3) effect of Nucleophile
(4) effect of Temperature

Structure of substrate

(#) For SN^1:

(a)  $\longrightarrow$ $CH_3-\overset{\oplus}{C}H_2 + X^{\ominus}$

(b)  $\longrightarrow$ $CH_3-\overset{\oplus}{C}H-CH_3 + X^{\ominus}$

(c)  $\longrightarrow$  $+ X^{\ominus}$

(d) $Me-O-CH_2-X \longrightarrow Me-O-\overset{\oplus}{C}H_2 + X^{\ominus}$

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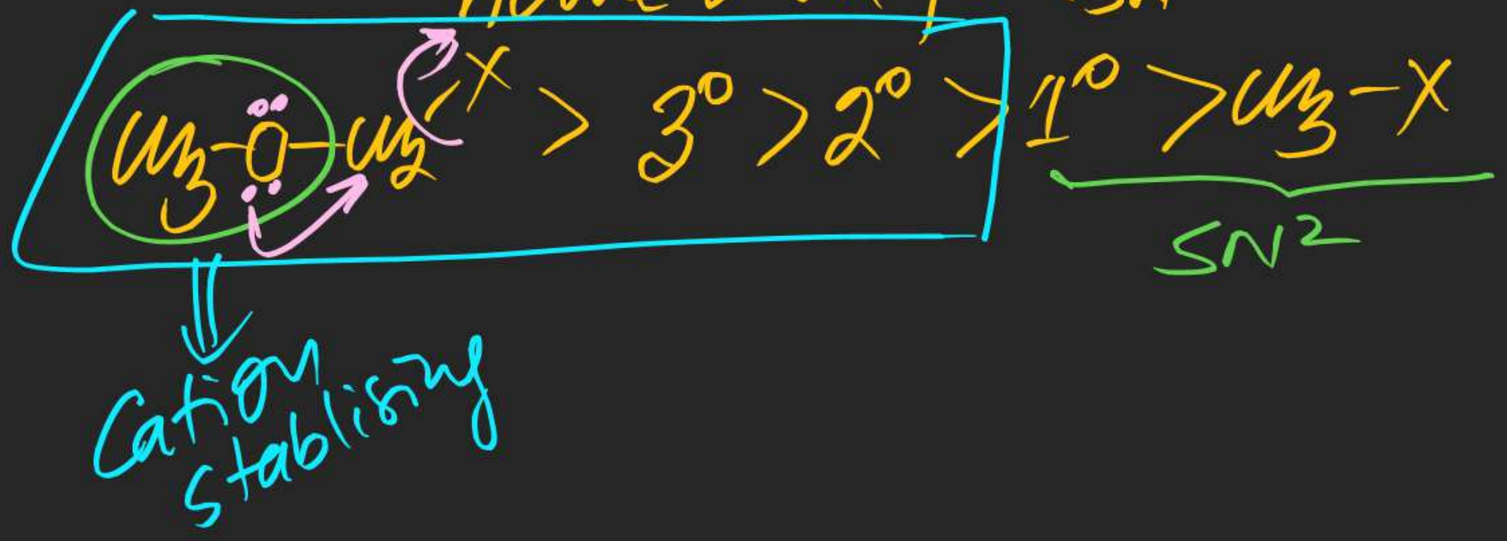
Since higher the Ease of dissociation higher wd be γ_{SN1}
Since higher the stability of CaboCation $\Rightarrow$ higher wd be γ_{SN1}
hence order for γ_{SN^2}



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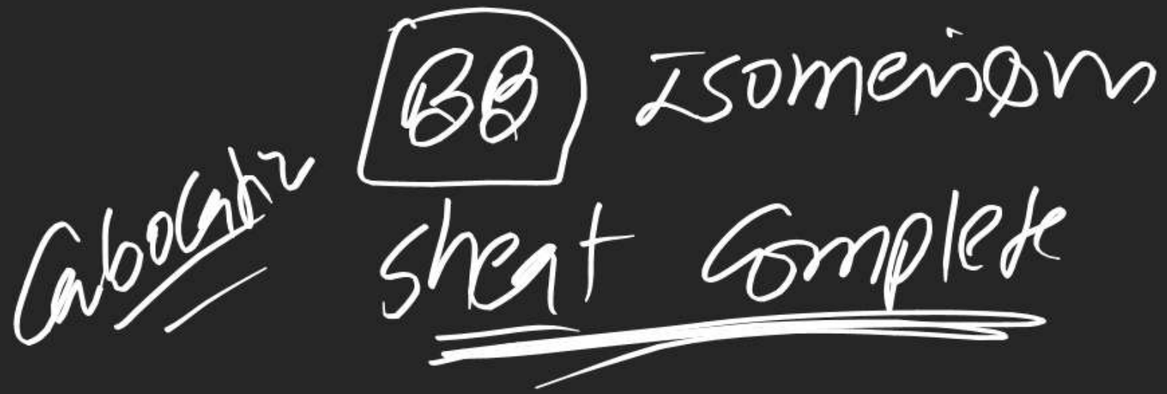
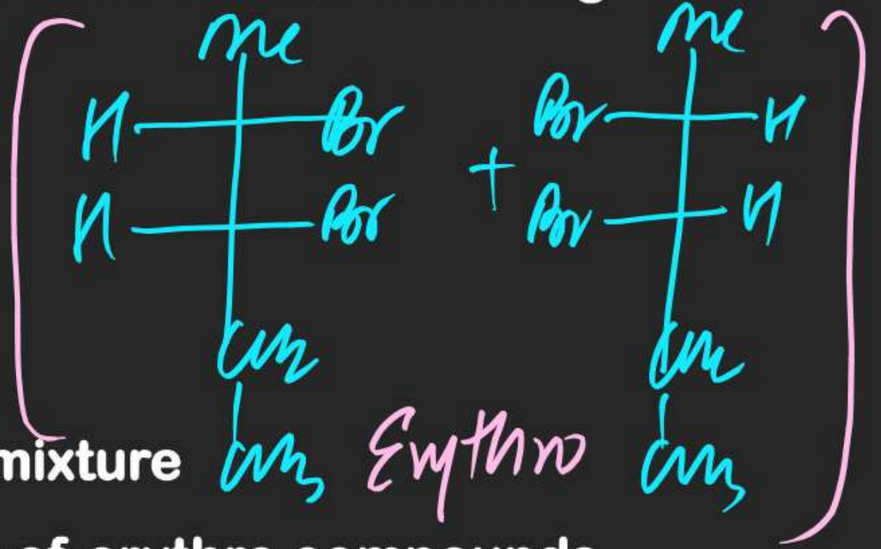


32. Select the incorrect statement about the product mixture in the following reaction :



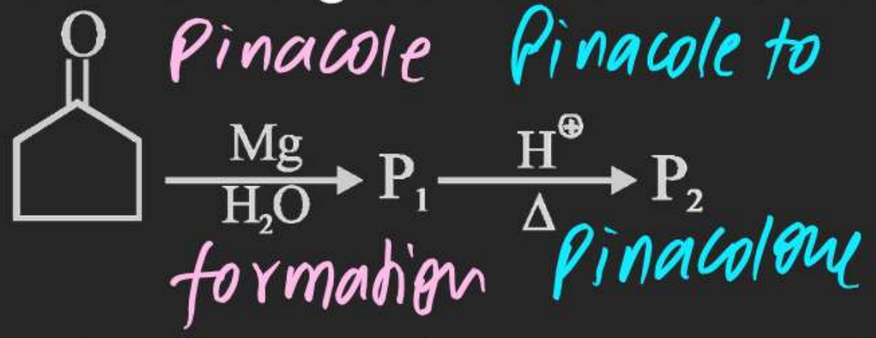
(A) It is optically active

(B) It is racemic mixture

(C) It is a resolvable mixture

(D) It is a mixture of erythro compounds

33. Which of the following is not correct about P_2 :

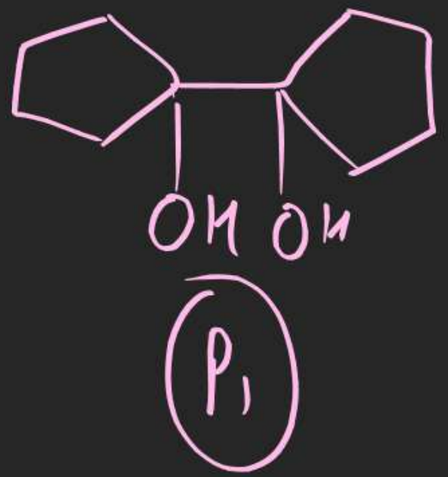


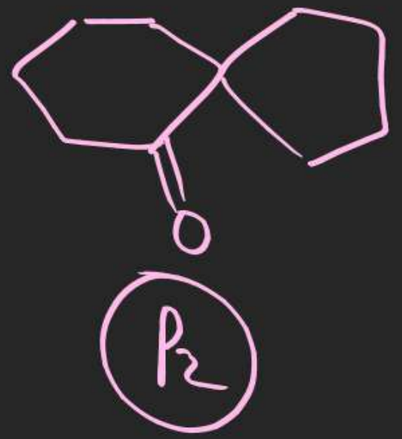
(A) It is a spiro compound

(B) It is a Ketone

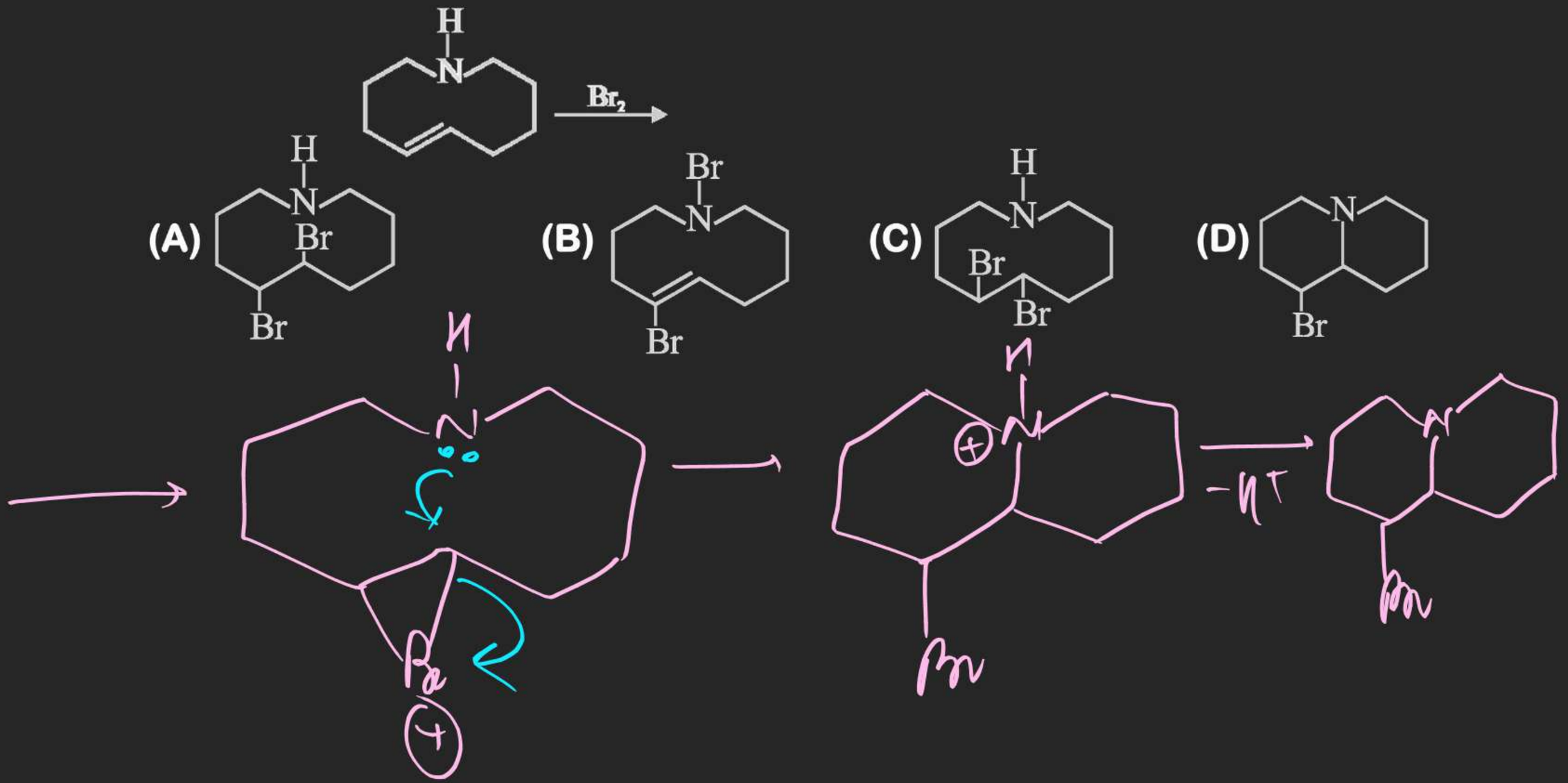
(C) It can show tautomerism

(D) Its double bond equivalent is 4

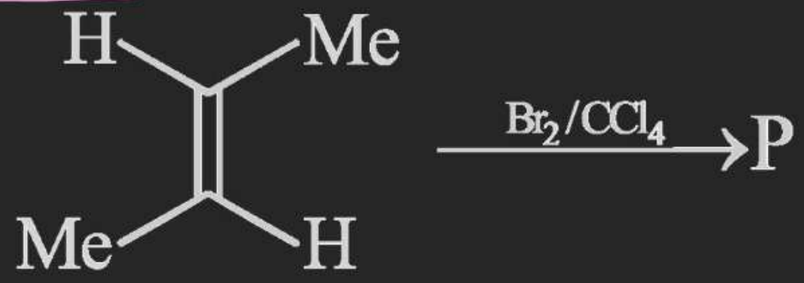


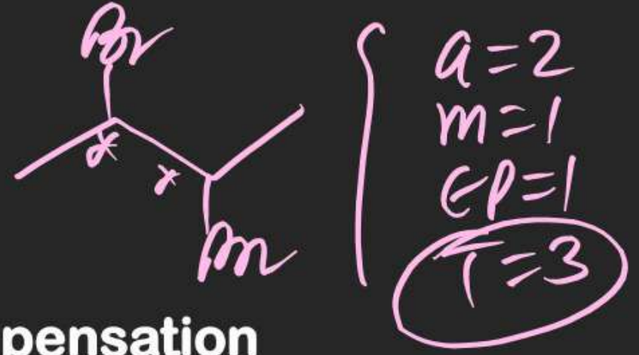


34. Major product of following reaction is :



35. Select incorrect statements about the product (P) of the reaction :





(A) P is optically inactive due to internal compensation

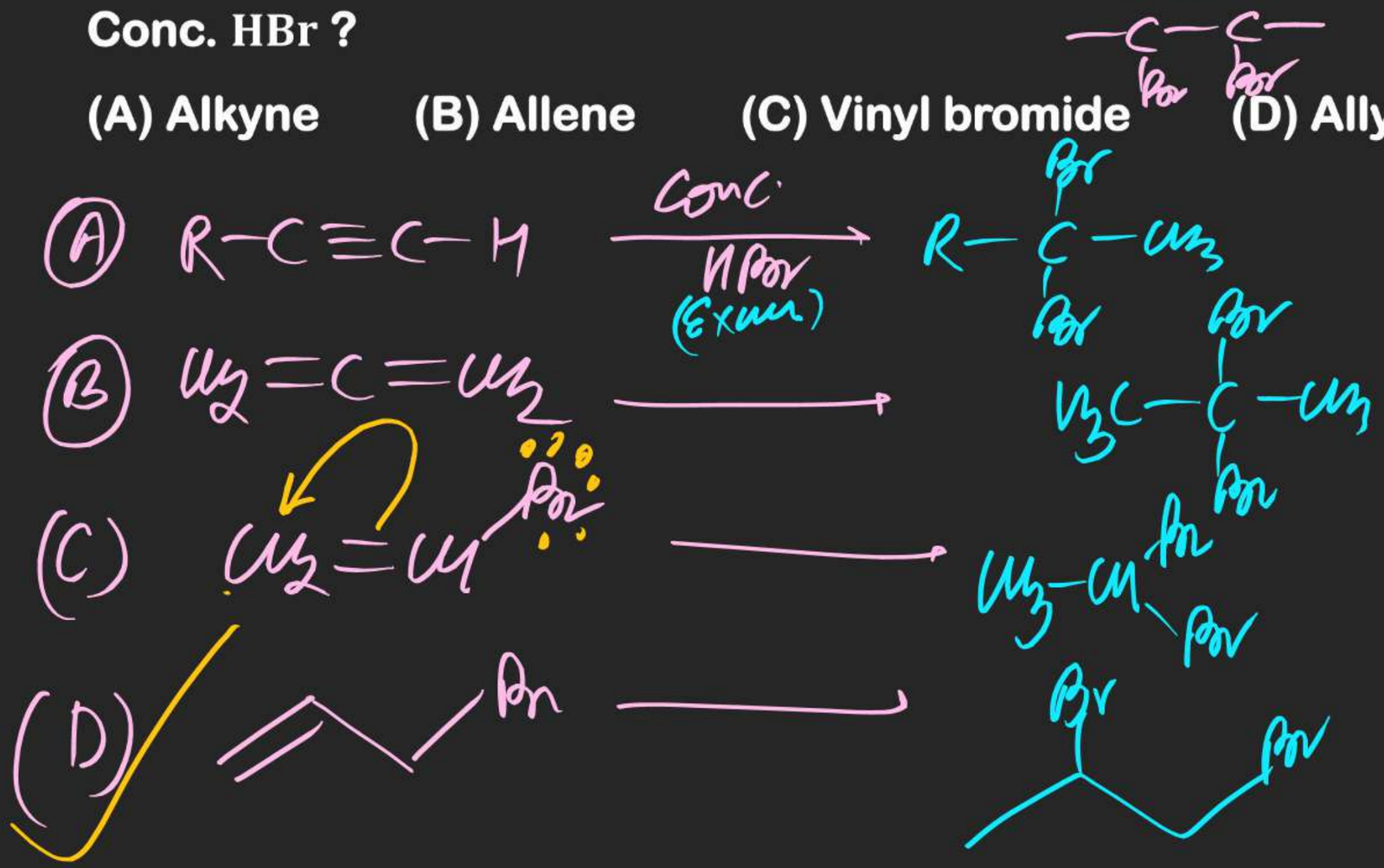
(B) P is optically inactive due to the presence of plane of symmetry in the molecule

(C) The structure of P can have three optical isomers possible.

(D) P can have four possible optical isomers. Incorrect

36. Which of the following will produce vicinal dibromide on reaction with Conc. HBr ?

(A) Alkyne (B) Allene (C) Vinyl bromide (D) Allyl bromide



37. Consider the following groups, the order of leaving group nature is: :

(I) $-OAc$ (II) $-OMe$ (III) $-OSO_2Me$ (IV) $-OSO_2CF_3$

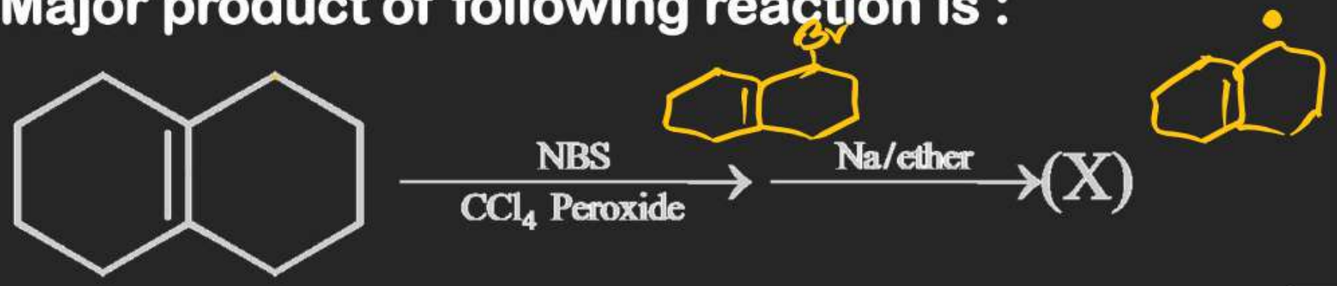
$-OMs$ $-OTf$

(A) I > II > III > IV (B) IV > III > I > II

(C) III > II > I > IV (D) II > III > IV > I

$-OTf > -OMs > -OAc > -OMe$

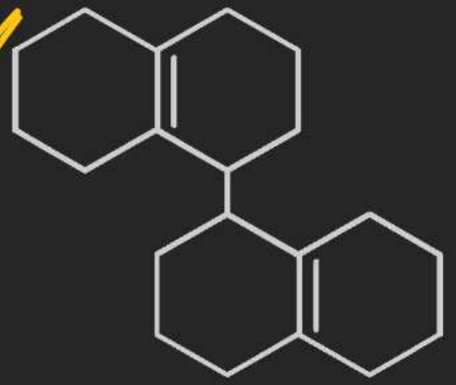
39. Major product of following reaction is :



(A)

(B)

(C)



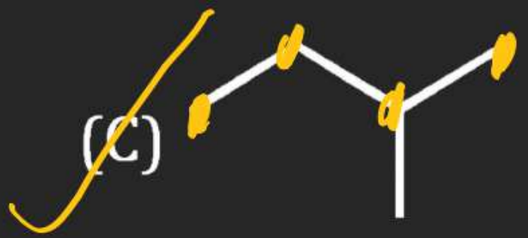
(D) None of these

EXERCISE – II (A)

1. Among the isomeric alkanes of molecular formula "C_5H_{12}", which of the following yields four structures of monochlorides on photochemical chlorination.

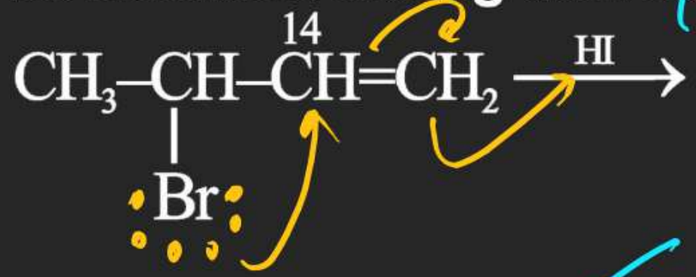
(A) 

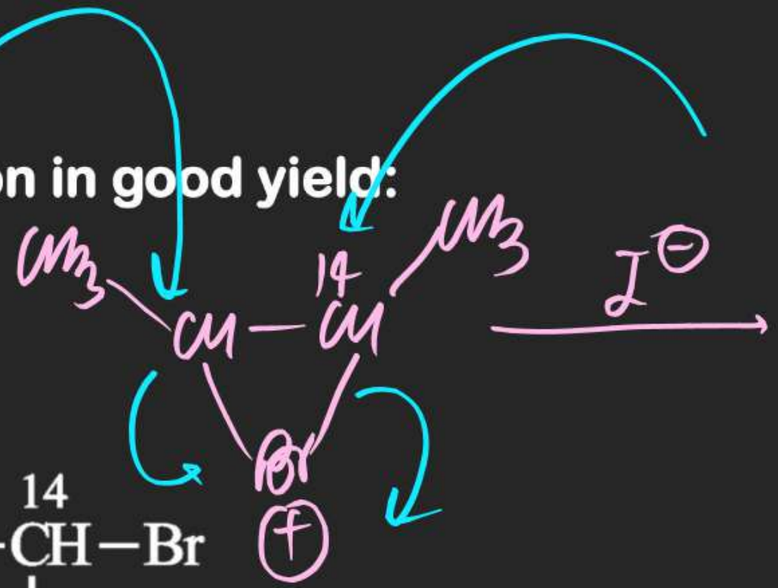
(B) 

(C) 

(D) 

2. **Products which can be obtained during the reaction in good yield:**





(A) $Br-\underset{\displaystyle CH_3}{\underset{|}{CH}}-\overset{14}{\underset{\displaystyle CH_3}{\underset{|}{CH}}}-I$

(B) $I-\underset{\displaystyle CH_3}{\underset{|}{CH}}-\overset{14}{\underset{\displaystyle CH_3}{\underset{|}{CH}}}-Br$

(C) $Br-\underset{\displaystyle CH_3}{\underset{|}{CH}}-\overset{14}{CH_2}-CH_2-I$

(D) $I-\underset{\displaystyle CH_3}{\underset{|}{CH}}-CH_2-\overset{14}{CH_2}-Br$

4. In the given reaction, find out the correct statement(s)

(Copy Question NBS)

(A) It gives total 9 allylic brominated products

(B) 6 fractions are obtained on fractional distillation of product mixture

(C) Substrate has 7 allylic hydrogens

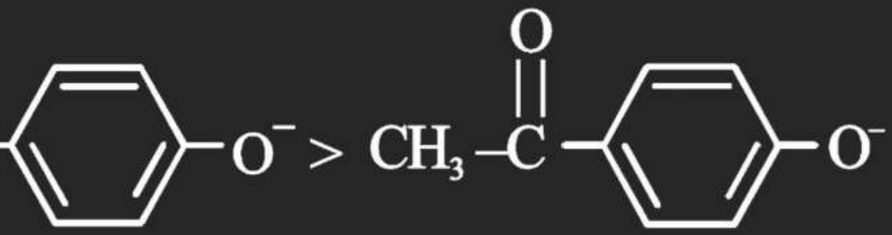
(D) NBS is a brominating agent for allylic positions

8. Which of the following is(are) correct order of nucleophilicity?

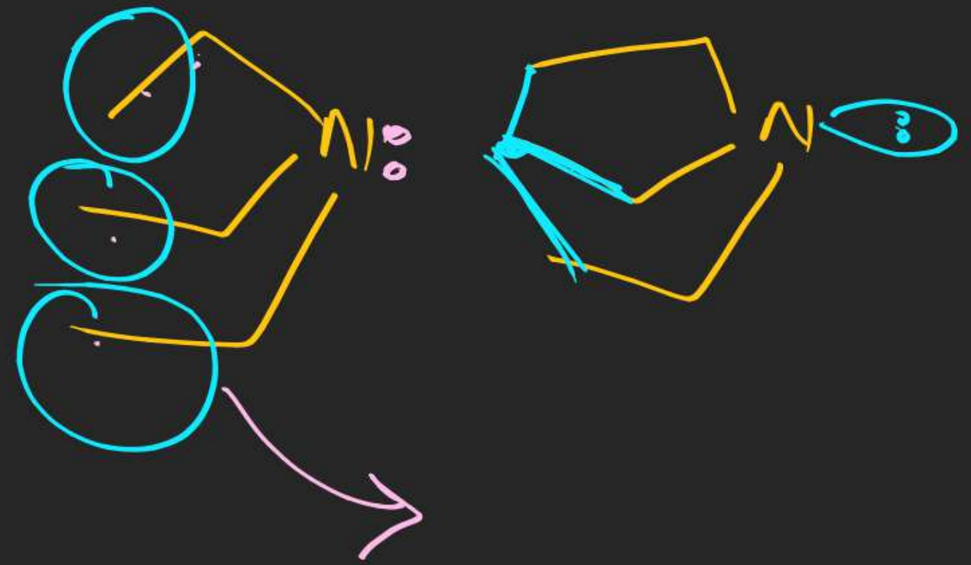
(A) $(CH_3CH_2)_3N >$ 

(B) $HOO^- > HO^-$ in DMSO

(C) $H_2S > H_2O$

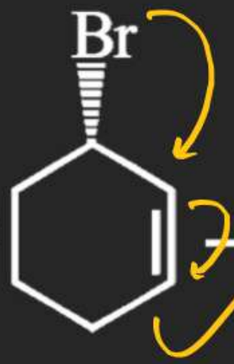
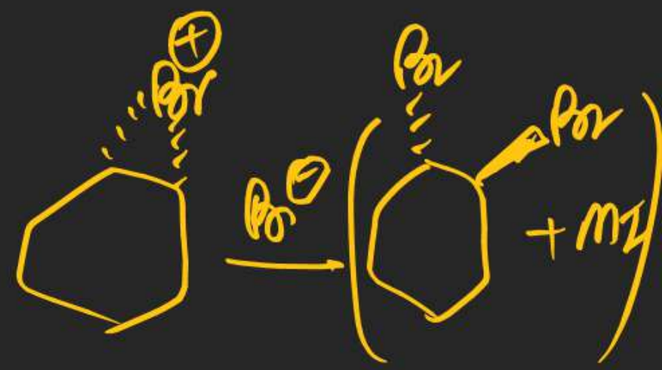
(D) 

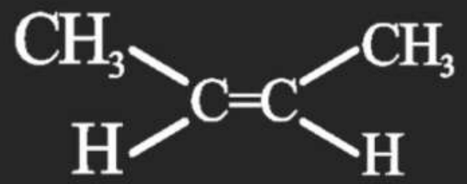
Soln



9. Which of following reaction products are diastereomer of each other:

(A)  $\xrightarrow[CCl_4]{Br_2}$

(B)  $\xrightarrow[CCl_4]{HBr}$ 

(C)  $\xrightarrow[CCl_4]{HBr}$

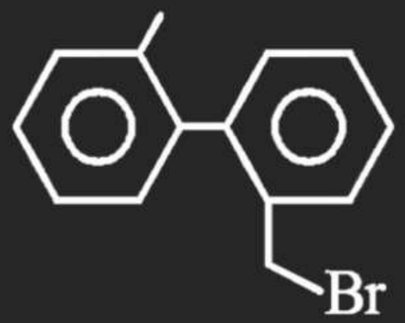
(D) $CH_3-\underset{Et}{\underset{|}{CH}}-CH=CH-Ph \xrightarrow[\text{peroxide}]{HCl}$ (Optically pure)

Diastereomers

10. Which of following reaction products are diastereomer of each other:

(A) 

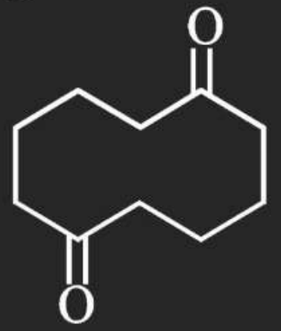
(B) 

(C) 

(D) $CH_3-\underset{\underset{Et}{|}}{CH}-CH=CH-Ph$ $\xrightarrow[\text{peroxide}]{HCl}$

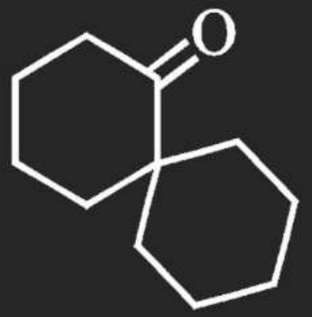
(Optically pure)

14. Major product (Q) of following reaction is :

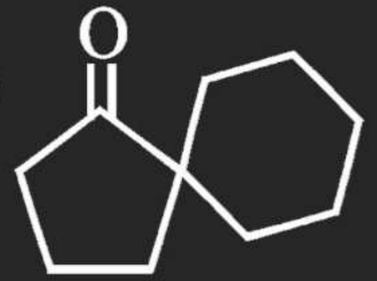


$\xrightarrow[(ii)\ H_2O]{(i)\ Mg\text{-}Hg} P \xrightarrow[\Delta]{H^+} Q$

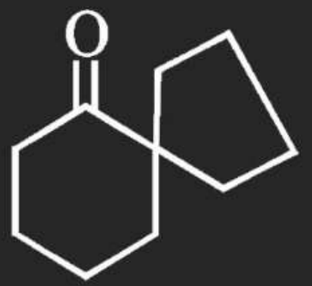
(A)



(B)



(C)



(D)

15. Select True statement(s) :

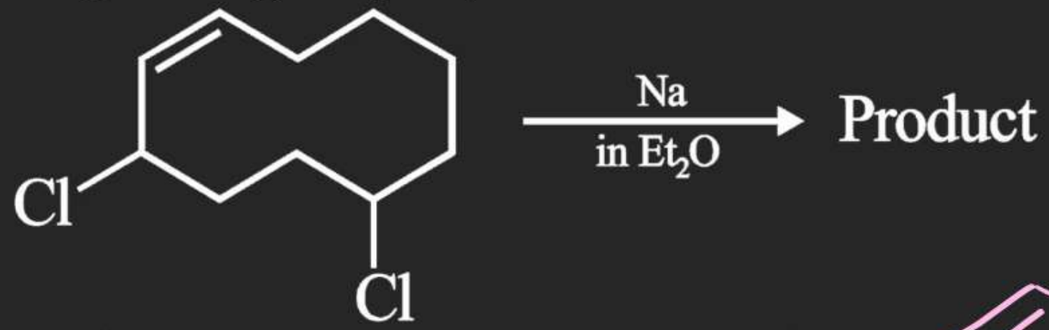
(A) Cyclopropane decolorizes bromine water

(B) In general, bromination is more selective than chlorination.

(C) The 2,4,6-tri-tert, butylphenoxy radical is resistant to dimerization.

(D) The radical-catalysed chlorination, $\mathrm{ArCH_3} \rightarrow \mathrm{ArCH_2Cl}$, occurs faster when $\mathrm{Ar} =$ phenyl than when $\mathrm{Ar} =$ p-nitrophenyl.

17. Correct statement regarding major product is/are :

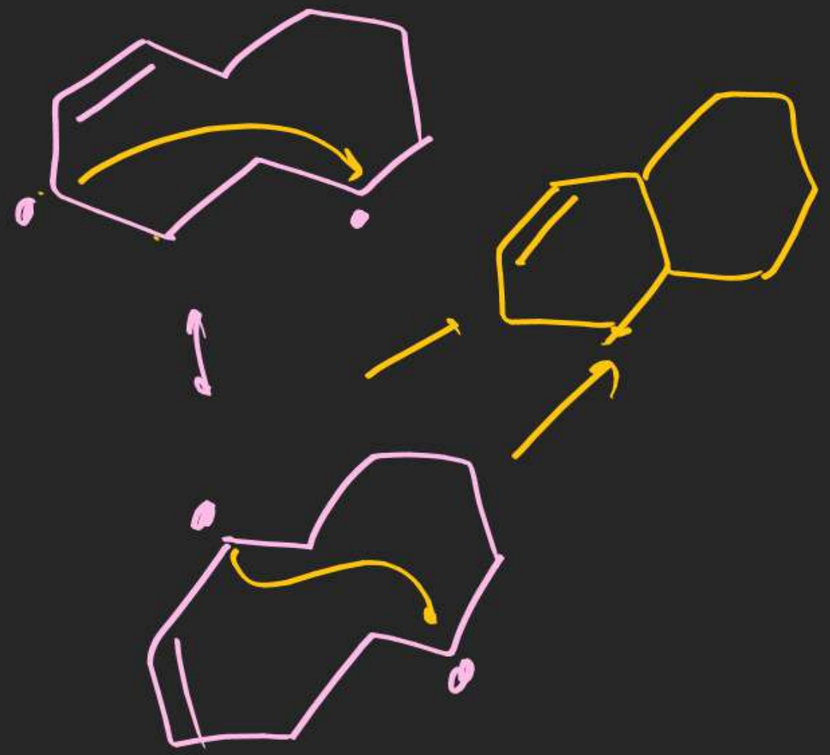


(A) odd no. of double bond equivalent in product

(B) product is bicyclic compound

(C) product can show geometrical isomerism

(D) reaction involve carbocation as intermediate



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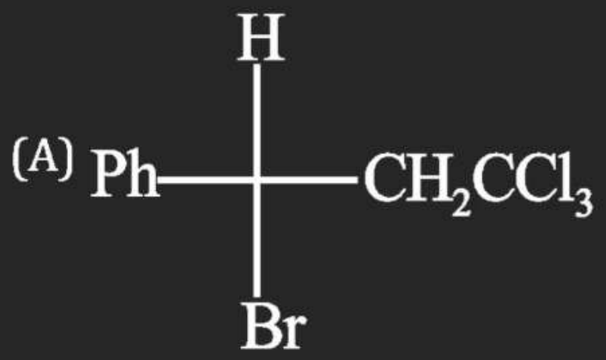
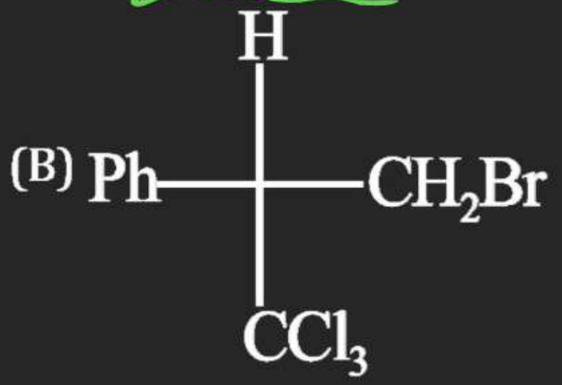
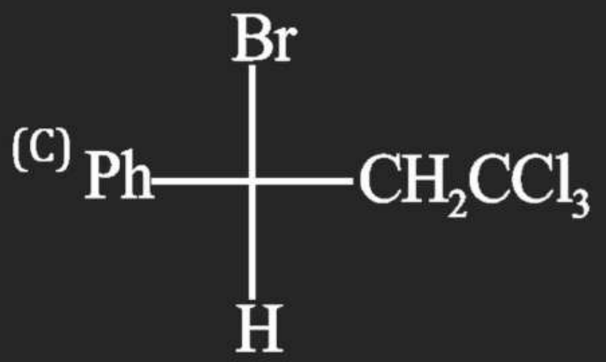
18. Major product of following reaction is :

$$Ph—CH=CH_2 + BrCCl_3 \xrightarrow{\text{Peroxide}}$$

(A) 

(B) 

(C) 

(D)