LIVE

ALKYL HALIDE

(FREE RADICAL & ELECTROPHILIC ADDITION REACTION)

for JEE-MAIN

One Shot

4:00 PM Thursday

By SKM Sir

Nishant Jindal

Alkyl halide - Free Radical

Wurtz Reaction :-

$$2R-X \xrightarrow[Et_2O]{2Na} R-R + 2NaX$$

Aliphatic halide

Fittig Reaction :-

$$2Ar-X \xrightarrow[Et_2O]{2Na} Ar-Ar + 2NaX$$

Aryl halide

Wurtz-Fittig Reaction :-

$$R-X + Ar-X \xrightarrow[Et_2O]{2Na} \underbrace{R-Ar}_{\text{Major Product}}$$

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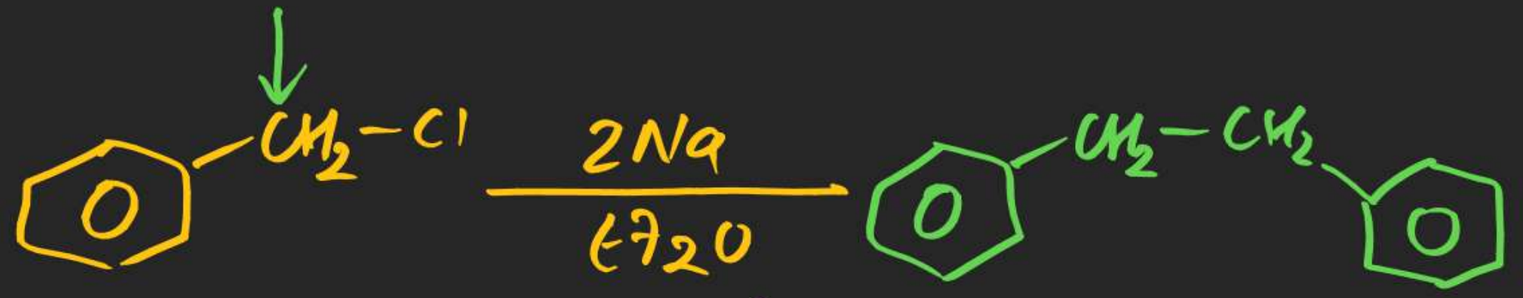
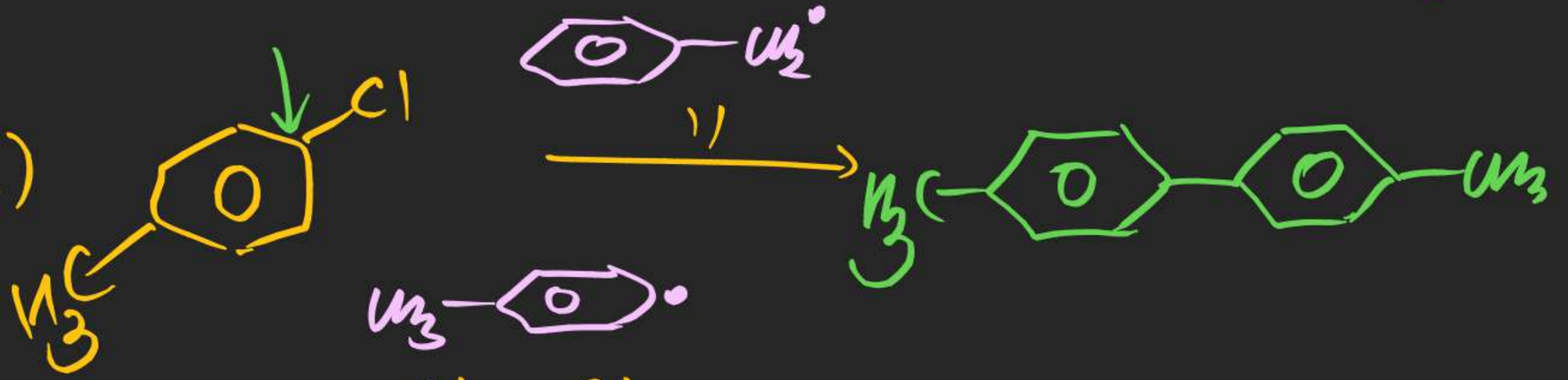
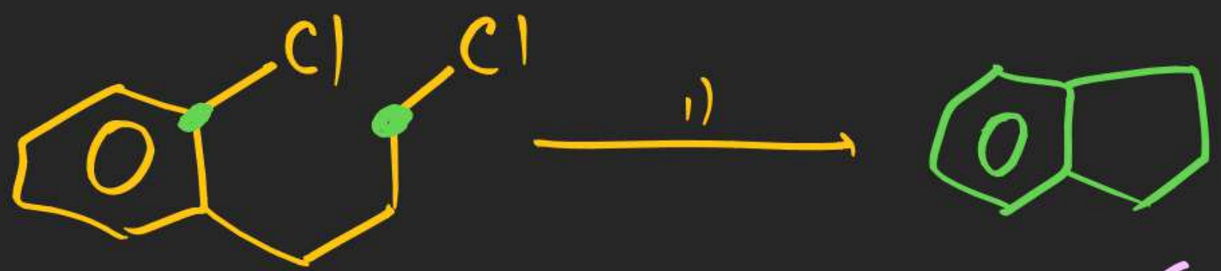
(1) 

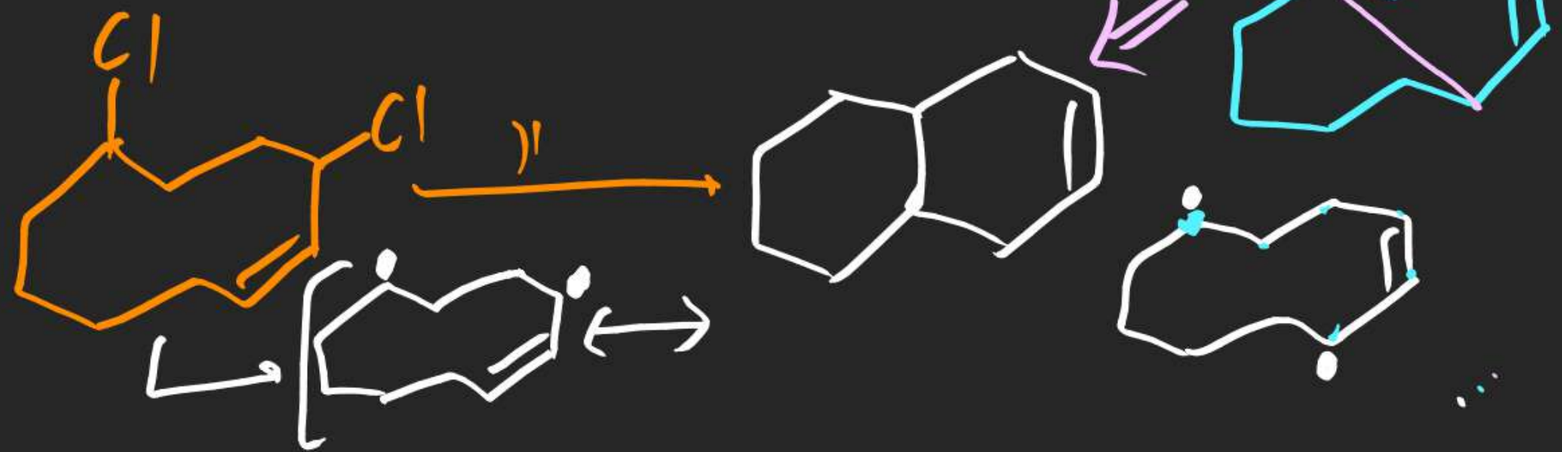
(Wrtz Rxn)

(2) 

(Fittig Reaction)

(3) 

Wrtz Fittig Reaction

(4) 

M.IV

(5) $R-C(X)(X)-C(X)(X)-R \xrightarrow{6Ag} R-C\equiv C-R + 6AgX$

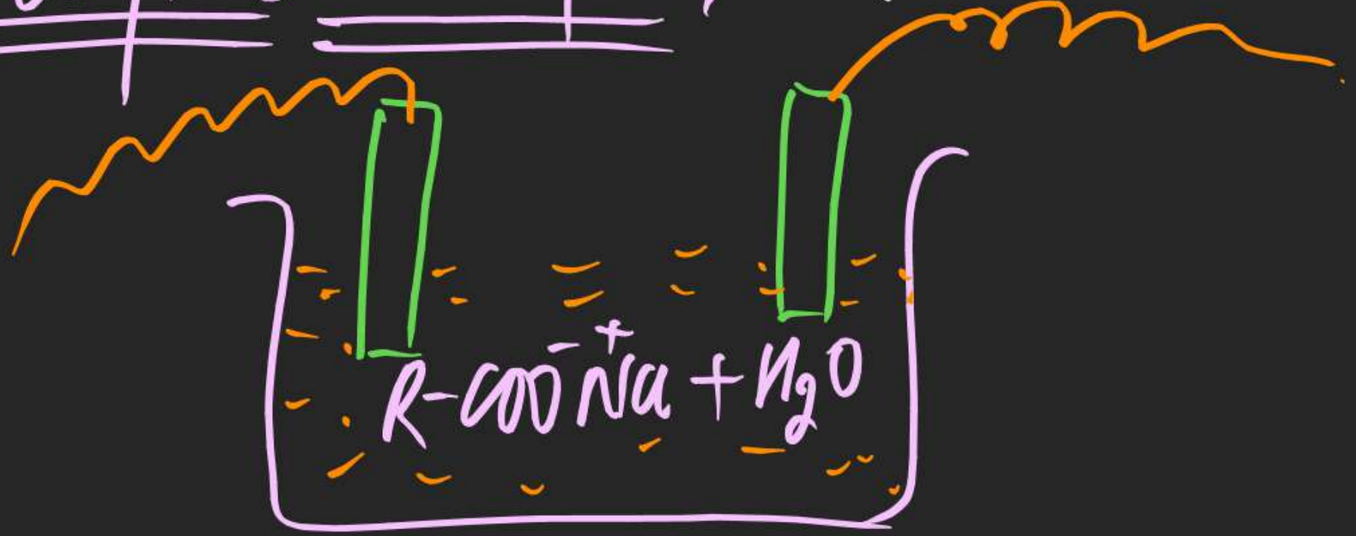
mEs

(6) $2CHCl_3 + 6Ag \longrightarrow$

$R(X \quad X)R \xrightarrow[Et_2O]{Na}$

$R-R$

Kolbe's Electrolysis: $2R\text{-}COONa + 2H_2O \longrightarrow R-R + \underset{\text{Anode}}{2CO_2} + 2NaOH + H_2\ (\text{Cathode})$



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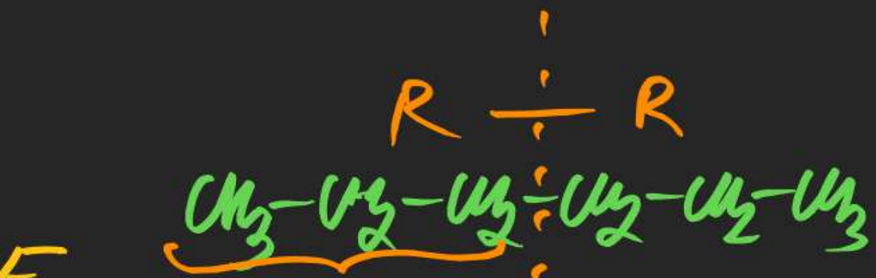
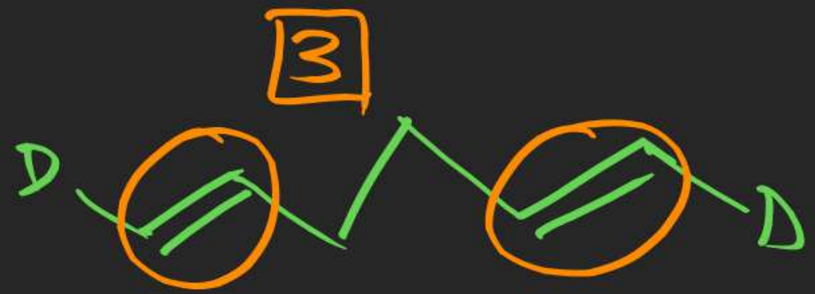
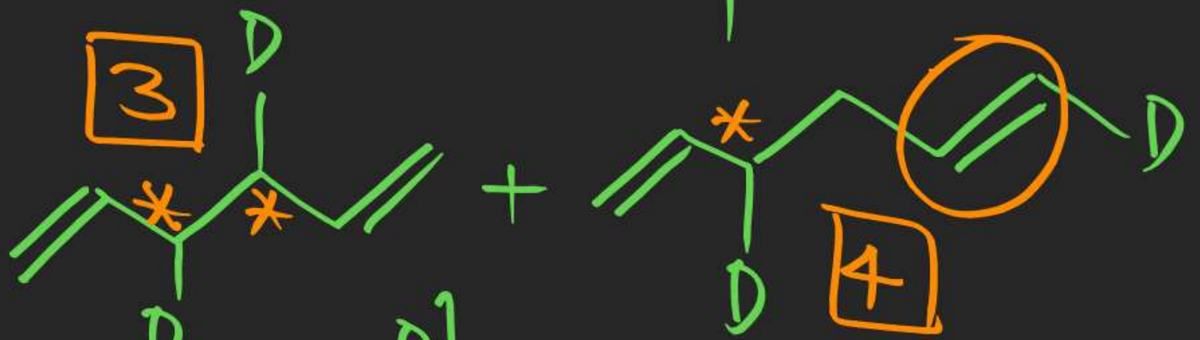
(7) $CH_3-CH_2-COONa \xrightarrow[(Aq)]{KE}$

(8) $CH_3-CH_2-CH_2-COOH$ Carboxylic Acid $\xrightarrow[NaOH]{CH_3-CH_2-CH_2-COONa}$ salt $\xrightarrow{KE}$ $CH_3-CH_2-CH_2-CH_2-CH_2-CH_3$ Hexane



(A) Propanoic Acid
(B) Butanoic Acid
(C) Pentanoic Acid
(D) Hexanoic Acid





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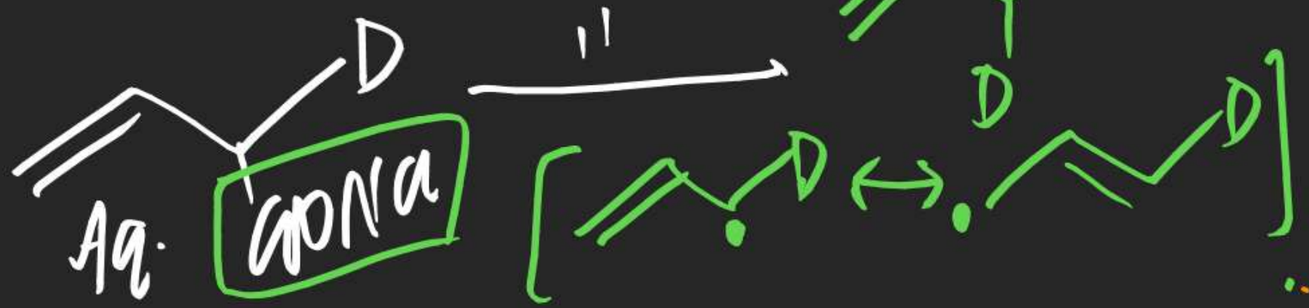

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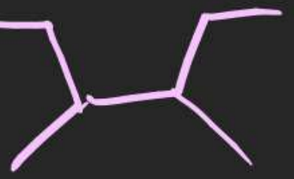
Jund
(10)

Markovnikov's

$\xrightarrow{HBr}$ P $\xrightarrow[Et_2O]{Na}$ Q



less surface Area

Anti mar / ROOR effect

(*) only

Anti mark.

$\xrightarrow[ROOR]{HBr}$ P'

$\xrightarrow[Et_2O]{Na}$ Q'

high surface Area

$BP_{Q'} > BP_Q$

HF	P_1	P_2
HCl	<0	>0
HBr	<0	<0
HI	>0	

Shows Anti Markovnikov

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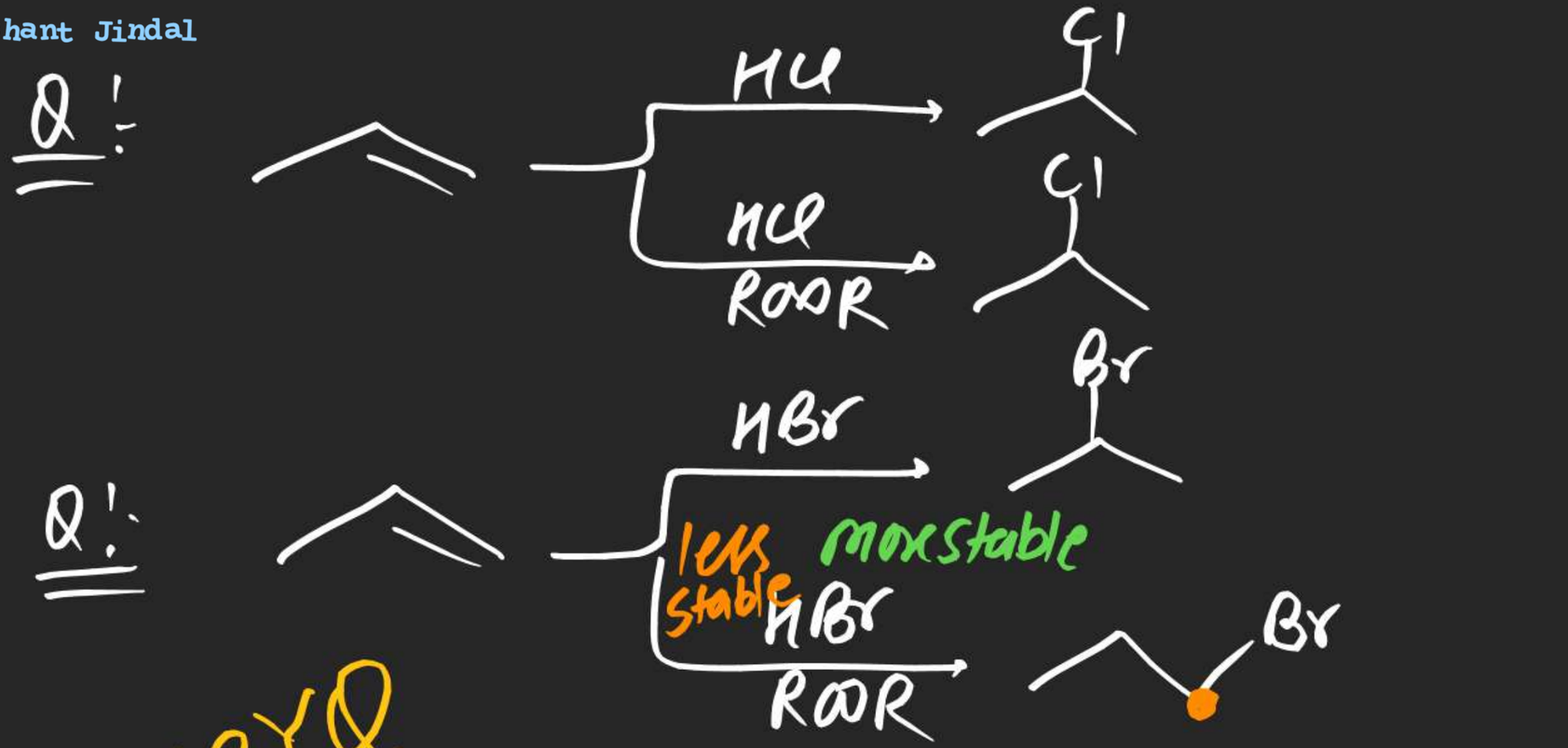

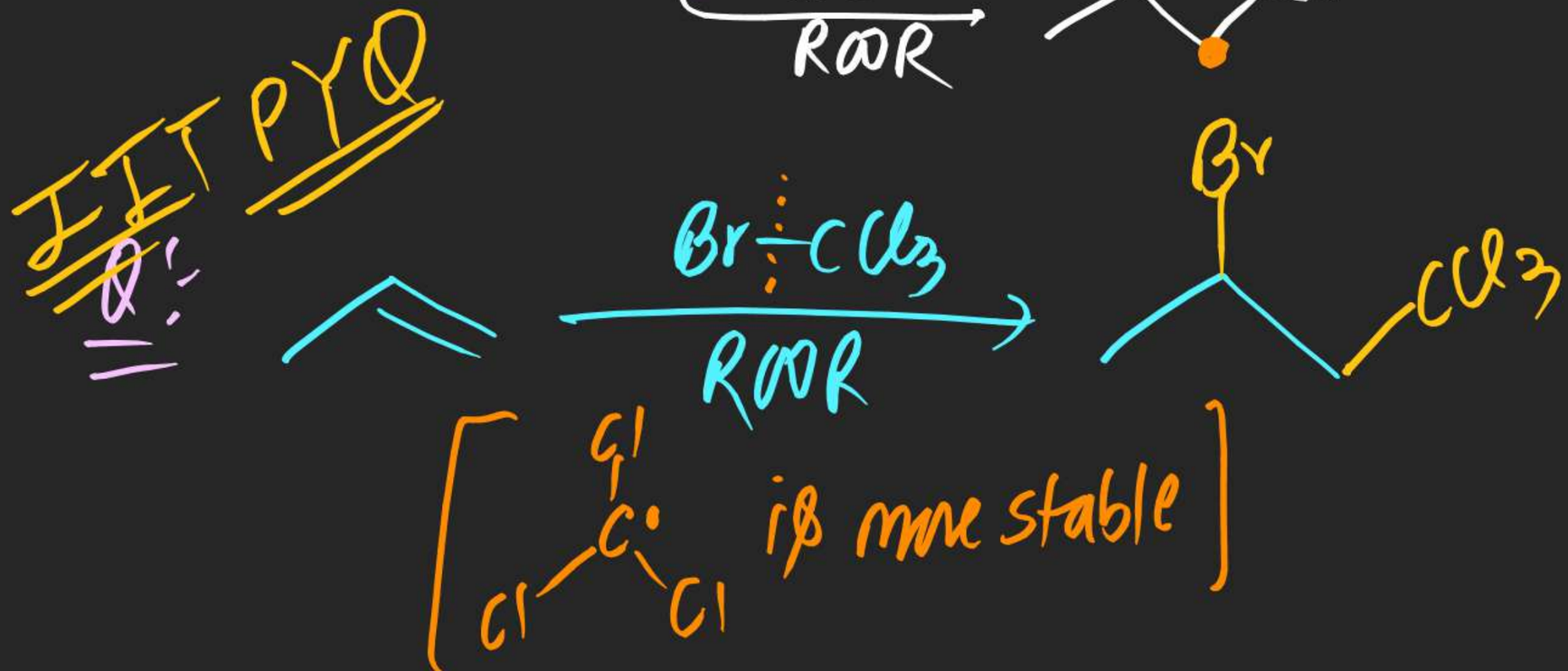

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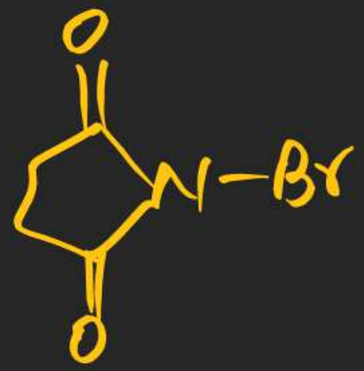
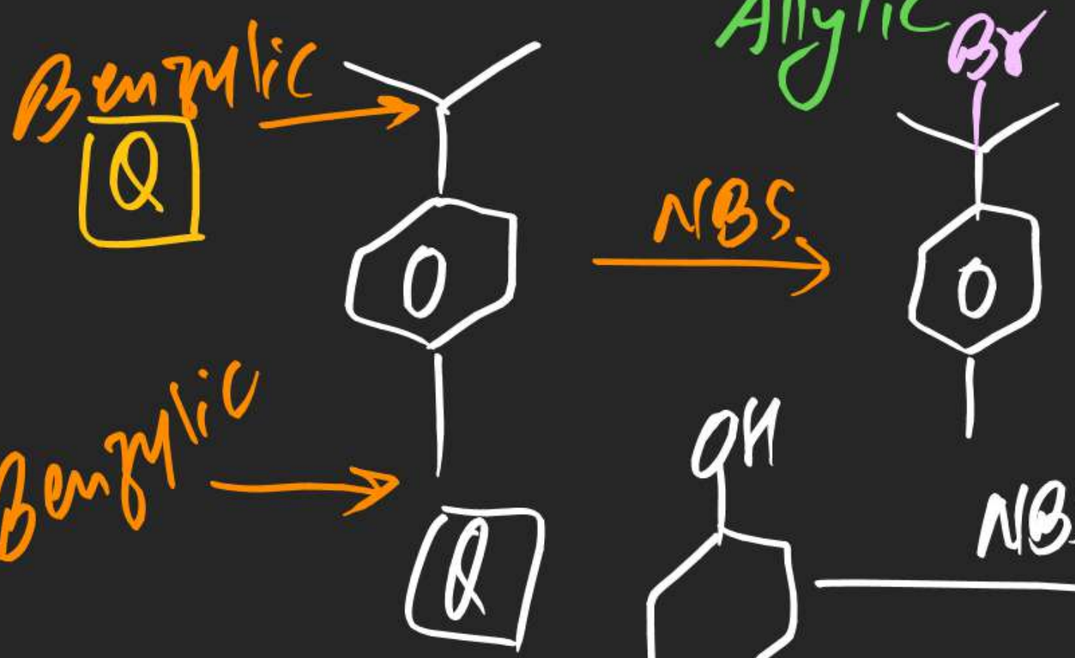
(#) NBS: N-Bromo Succinimide



(1) Benzylic / Allylic Bromination:

Q $CH_2=CH-CH_3 \xrightarrow{NBS} CH_2=CH-CH_2-Br$

Allylic



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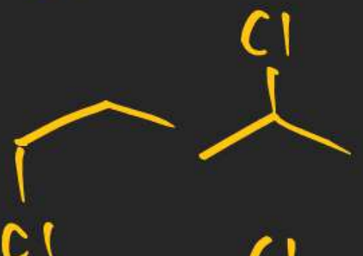
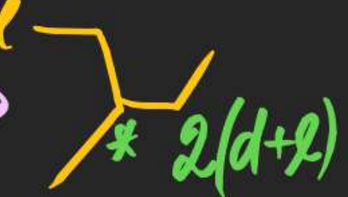
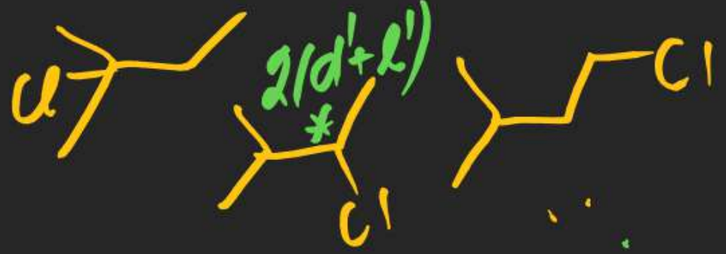
(#) Monochlorinated Product :-

		Excluding stereo	Total possible
(A)	$H_3C-CH_3 \xrightarrow[h\nu]{Cl_2}$ 	(1)	(1)
(B)	$H_3C-CH_2-CH_3 \xrightarrow{//}$ 	(2)	(2)
(C)	$H_3C-CH_2-CH_2-CH_3 \xrightarrow{//}$ 	(2)	(3)
Impl (D)	$H_3C-CH(CH_3)-CH_2-CH_3 \xrightarrow{//}$ 	(4)	(6)

(isopentane)



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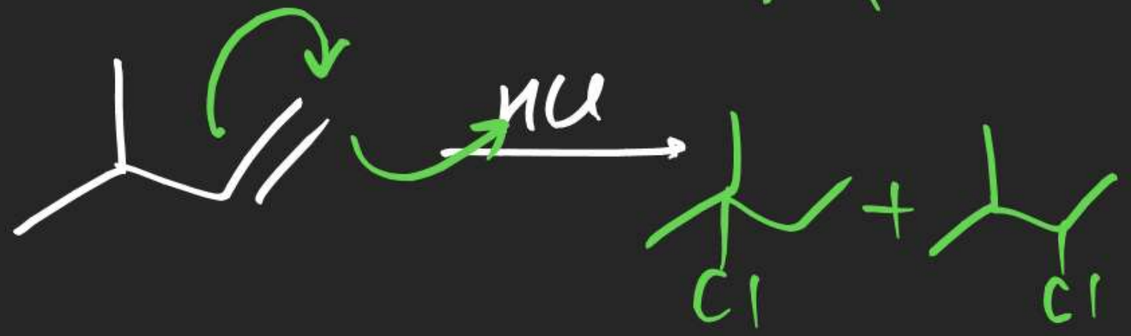
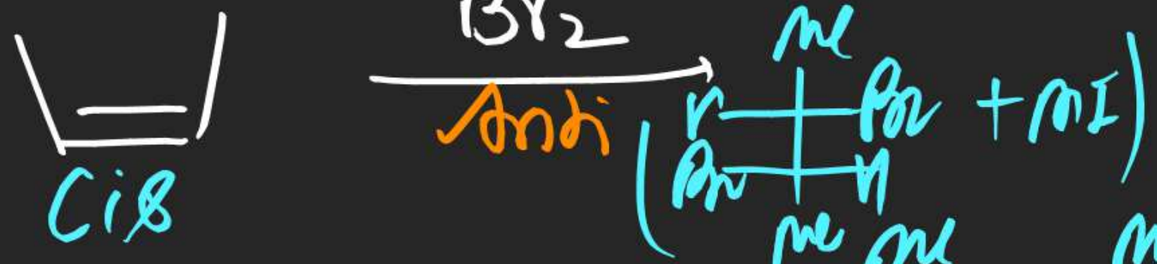
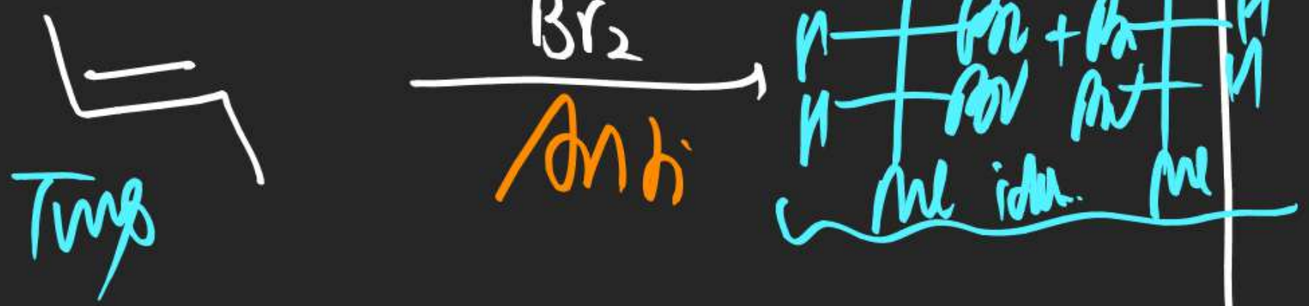
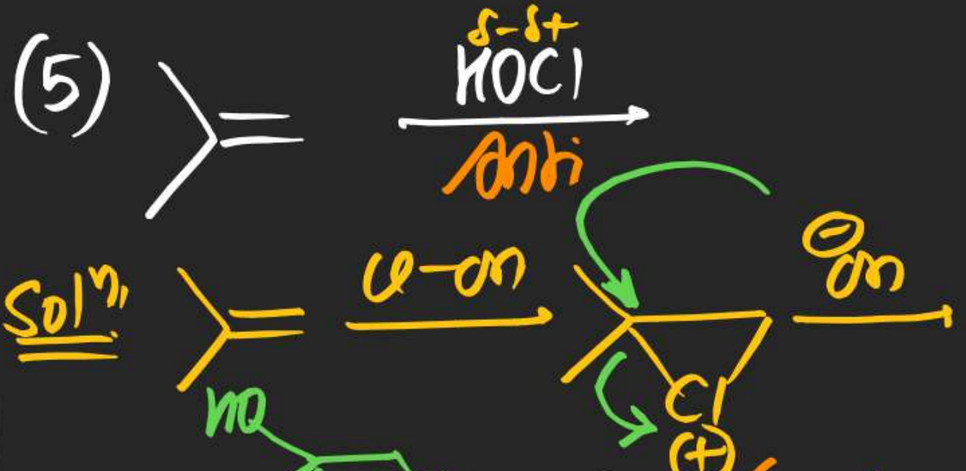
(#) Electrophilic addⁿ:

(1) 

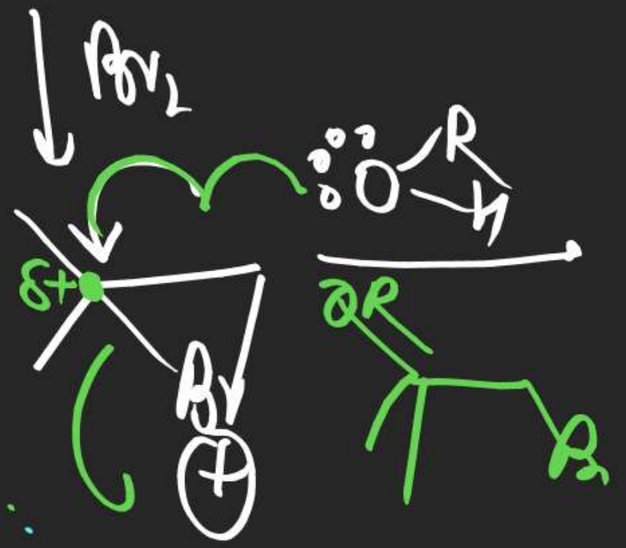
(2) 

(3) 

(4) 

(5) 

(6) 



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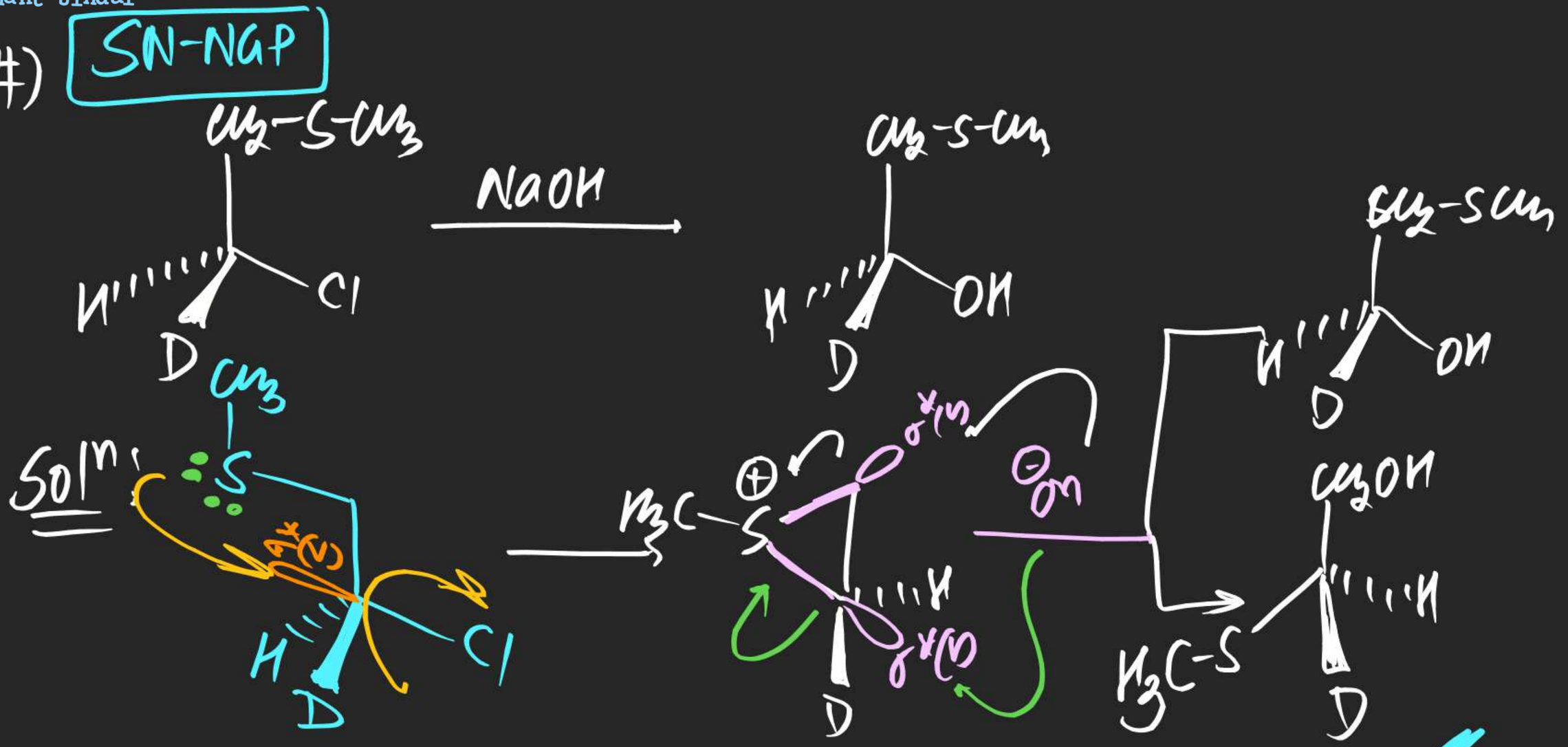
(#) SN-NGP



CARBOCATION FREE RADICAL

7. Which is not the correct statement for given compound :

(I)

Ionic

Aromatic

$\mu = q \times d$

(A) I is more soluble than bromocyclopropane

(B) I gives pale yellow ppt. on addition with $AgNO_3$

(C) I has lower dipole moment than bromocyclopropane

(D) On reaction with $AlBr_3$, I will produce aromatic compound having 3 equivalent resonating structures

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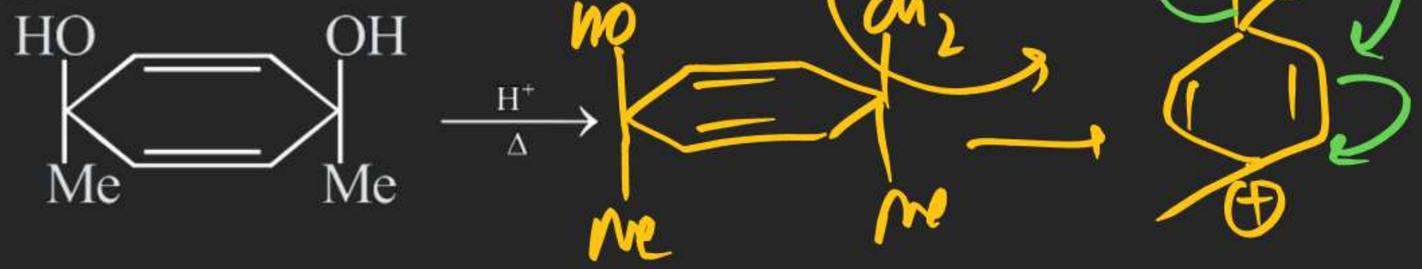
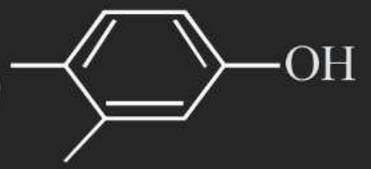
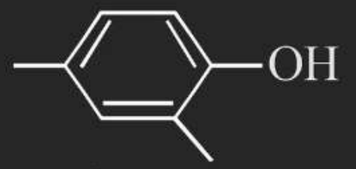
13. **Major product of following reaction is :**

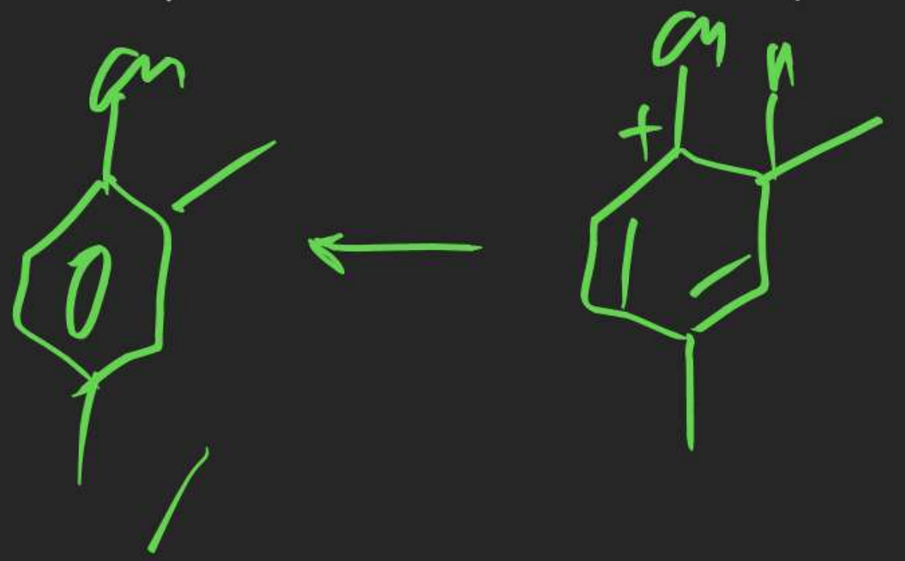


(A) 

(B) 

(C) 

(D) 



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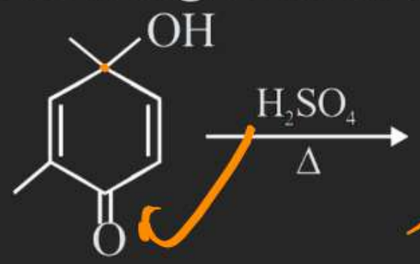
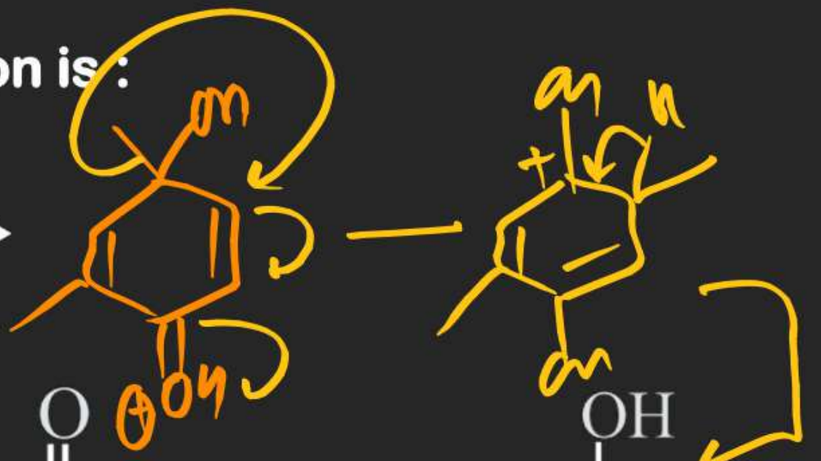
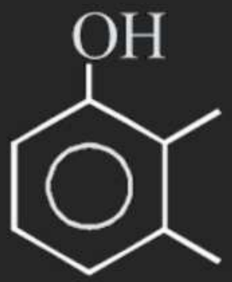
15. One of the major product of following reaction is :

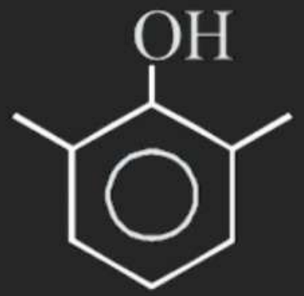




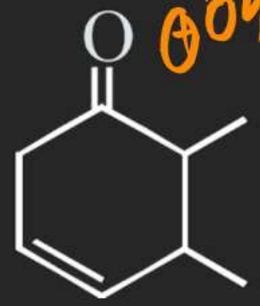
(A)



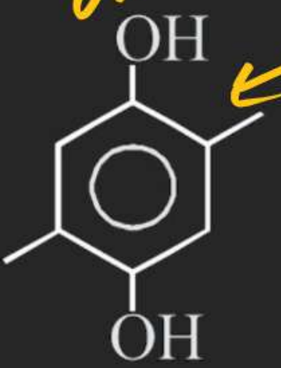
(B)



(C)

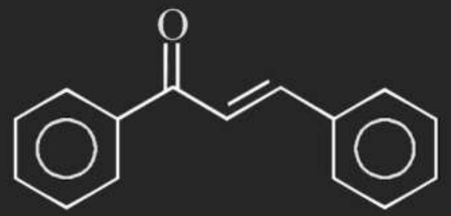


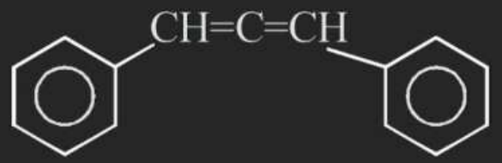
(D)

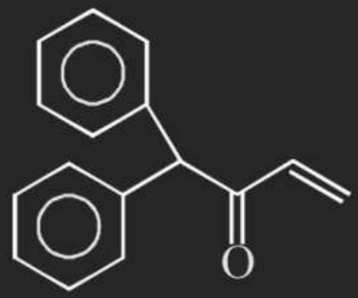


CARBOCATION FREE RADICAL

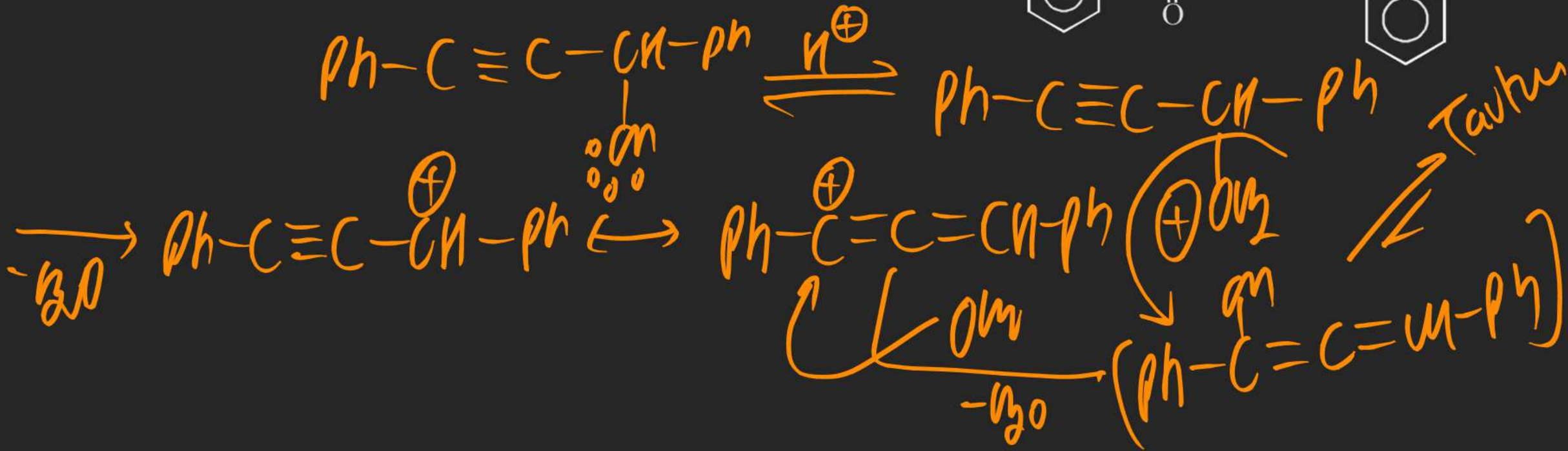
17. **Major product of following reaction is :**

(A) 

(B) 

(C) 

(D) 



CARBOCATION FREE RADICAL

E1

19. Which will dehydrate at fastest rate by H_3PO_4 :

(A) 2-methyl butan-2-ol

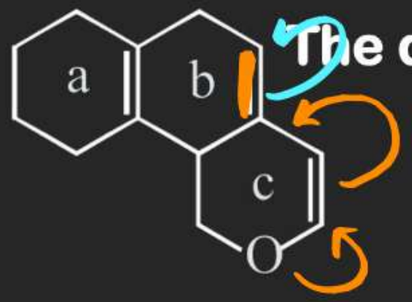
(B) 3-methyl butan-2-ol

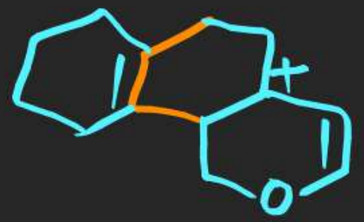
(C) Butan-1-ol

(D) 2-methyl butan-1-ol

CARBOCATION FREE RADICAL

20. The double bond which is most reactive towards electrophile :





(A) a (B) b (C) c (D) None

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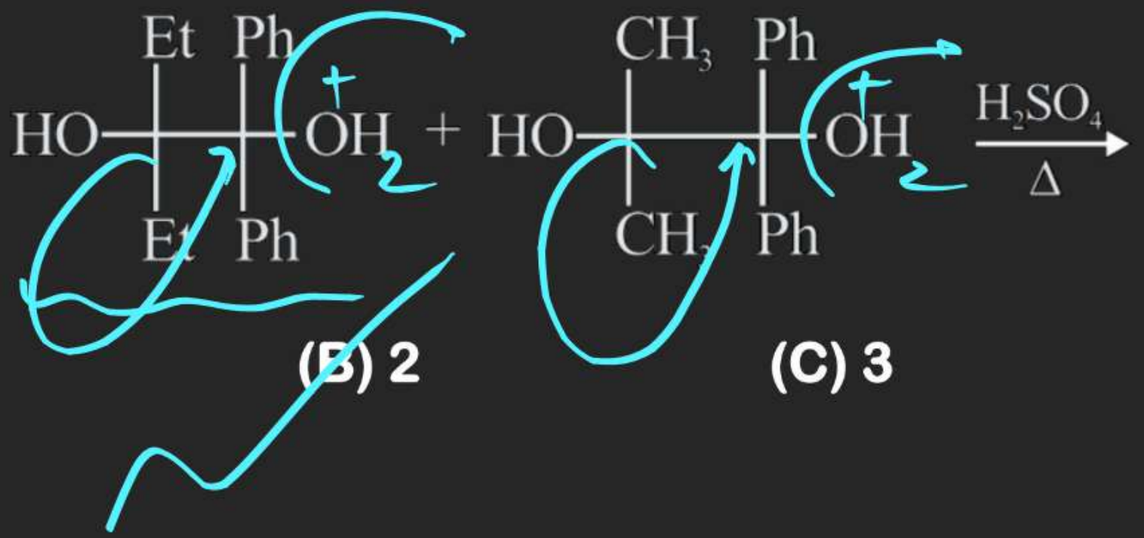
22. How many products are obtained in the given reaction :



(A) 1 (B) 2 (C) 3 (D) 4

CARBOCATION FREE RADICAL

27. Major product of the reaction is :

(A) 

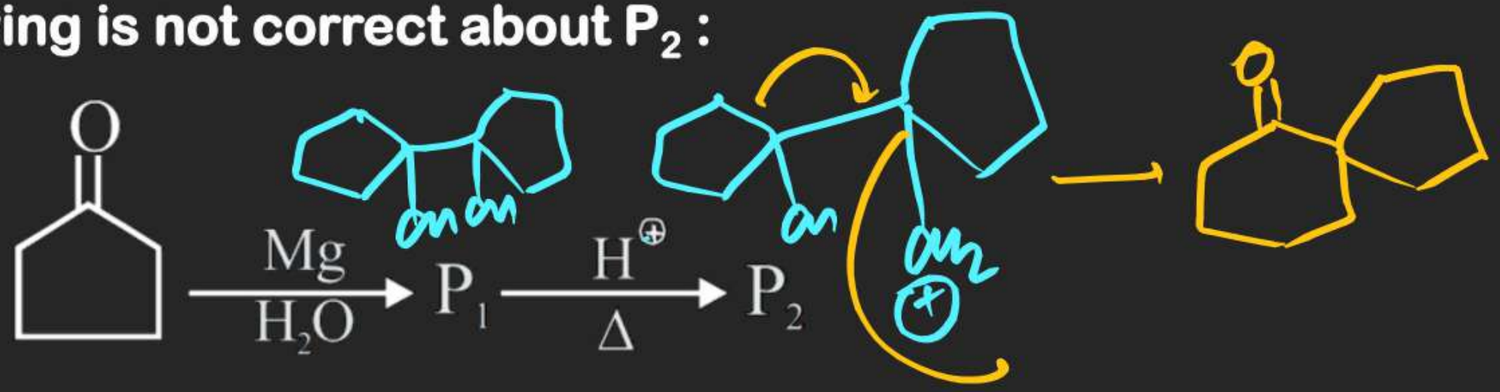
(B) 

(C) 

(D) 

CARBOCATION FREE RADICAL

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



(A) It is a spiro compound

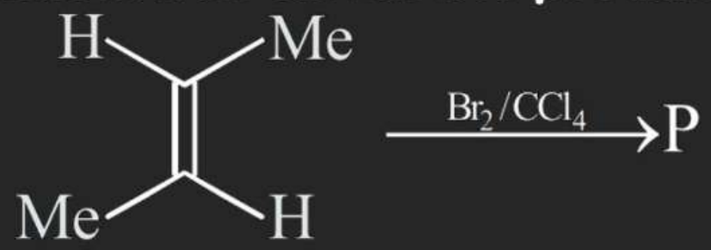
(B) It is a Ketone

(C) It can show tautomerism

(D) Its double bond equivalent is 4

CARBOCATION FREE RADICAL

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

meso + d + l.

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

(D) P can have four possible optical isomers.

0

CARBOCATION FREE RADICAL

3. Correct statement(s) for the monochlorinated products of following reaction.

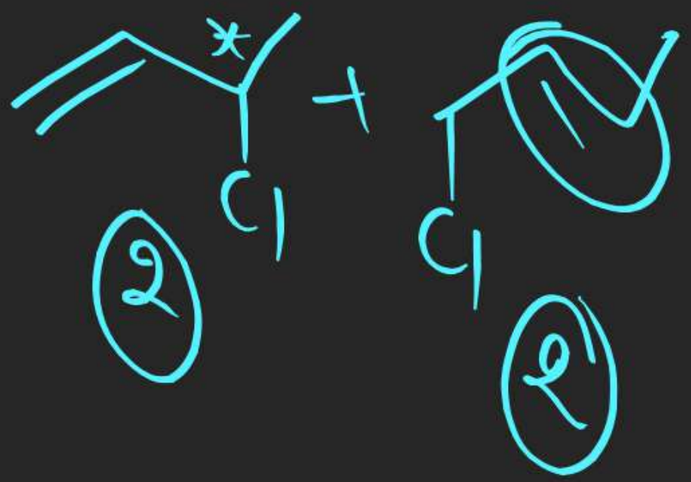
$$CH_2=CH-\dot{C}H_2-CH_3 \xrightarrow[Cl_2/500^0\,C]{}$$

(A) Four different products are formed

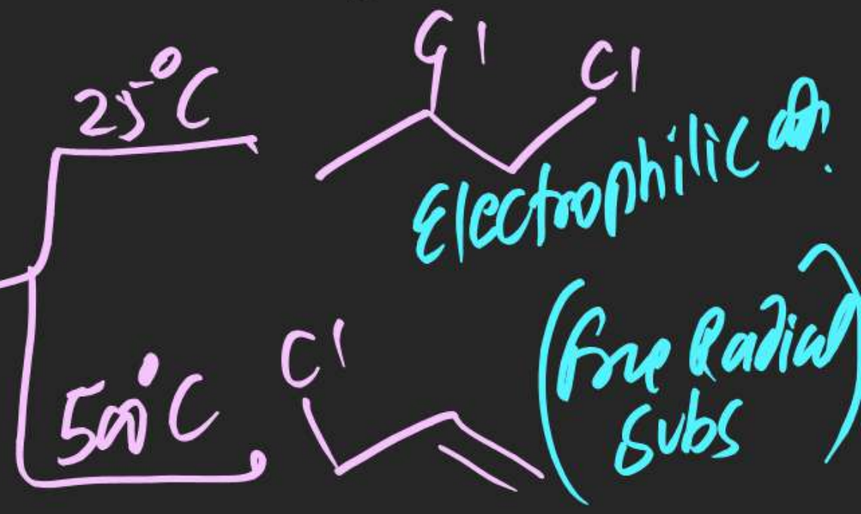
(B) Two optically active products are formed

(C) The optically active compound formed here can also be made by the reaction of HCl

(D) The reaction path is free radical substitution.



$CH_2=CH-CH_3 + Cl_2$



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CARBOCATION FREE RADICAL

6. Products formed when HCl adds to 2,4 -hexadiene is :

(A) 4-chloro-2-hexene

(B) 2-chloro-3-hexene

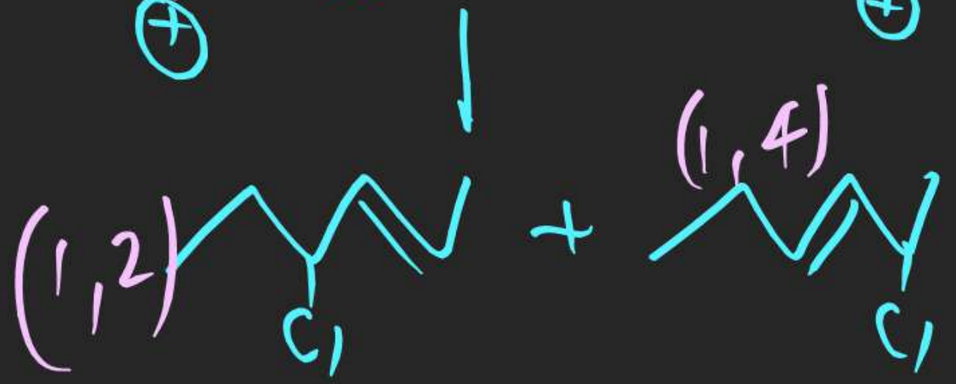
(C) 2-chloro-4-hexene

(D) 1-chloro-2-hexene

KCP & TCP

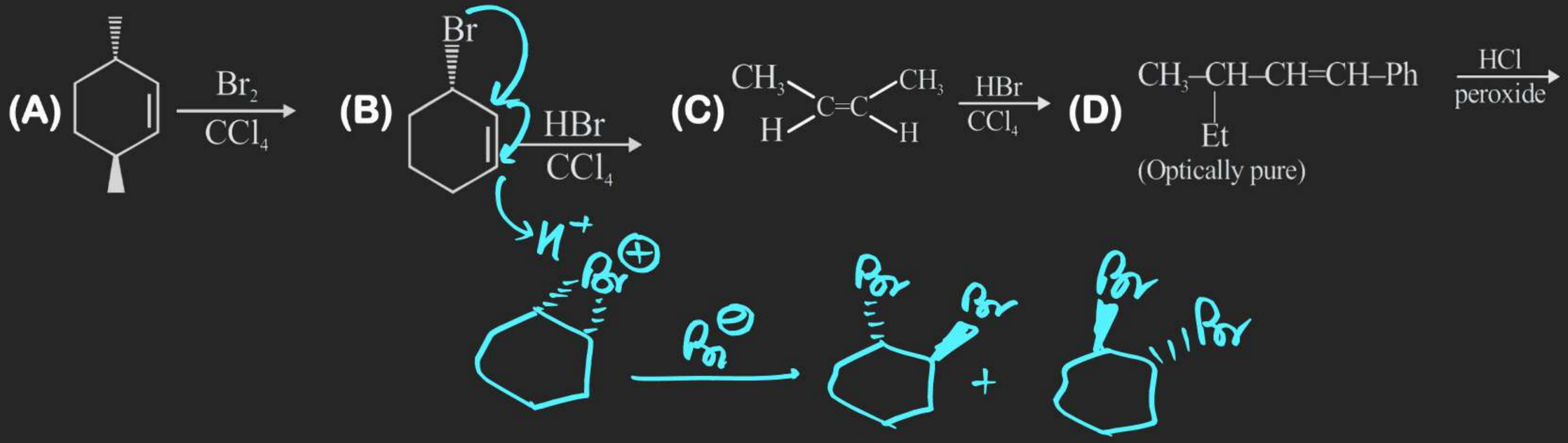
(1,2) (major at low T)

most stable (major at high T)



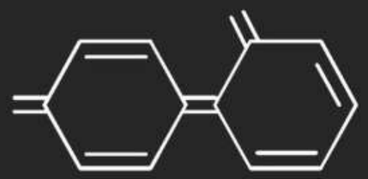
CARBOCATION FREE RADICAL

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

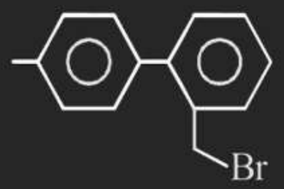


CARBOCATION FREE RADICAL

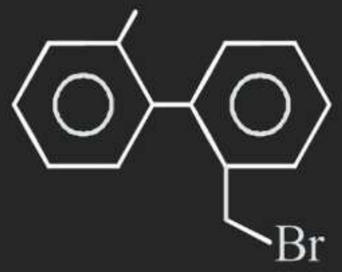
10. Which of ~~following reaction products are diastereomer~~ of each other:



Major Product

(A) 

(B) 

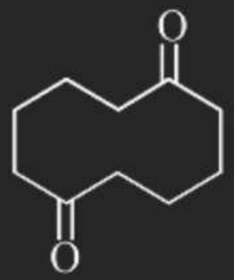
(C) 

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

(Optically pure)

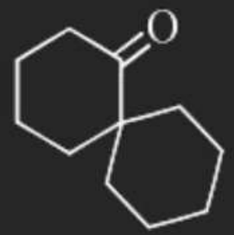
CARBOCATION FREE RADICAL

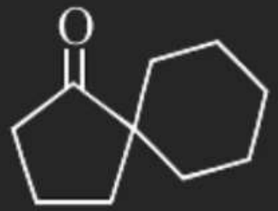
14. Major product (Q) of following reaction is :

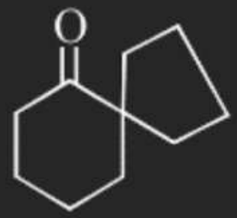


(i) Mg-Hg
(ii) H_2O

P $\xrightarrow[\Delta]{H^+}$ Q

(A) 

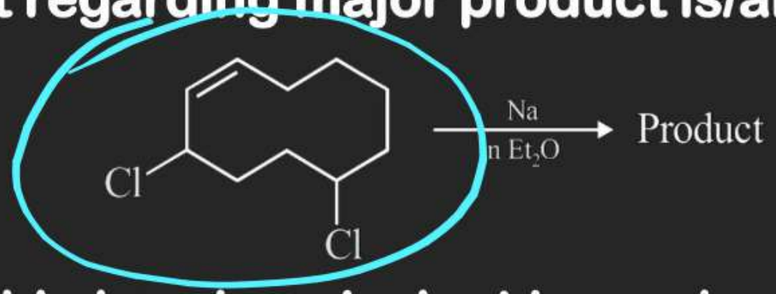
(B) 

(C) 

(D) 

CARBOCATION FREE RADICAL

17. Correct statement regarding major product is/are :



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

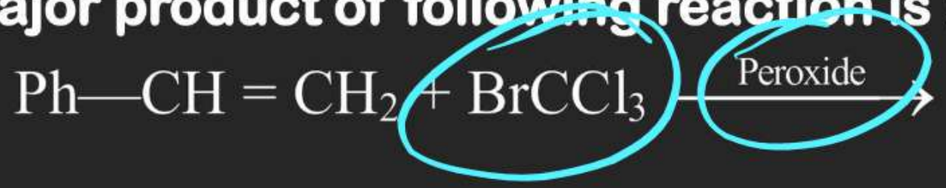
(B) product is bicyclic compound

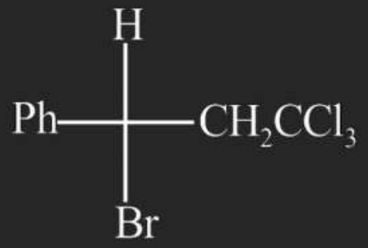
(C) product can show geometrical isomerism

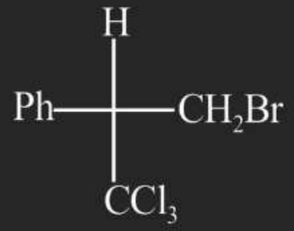
(D) reaction involve carbocation as intermediate

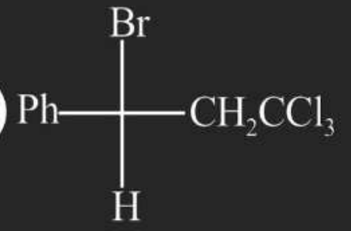
CARBOCATION FREE RADICAL

18. Major product of following reaction is :



(A) 

(B) 

(C) 

(D)