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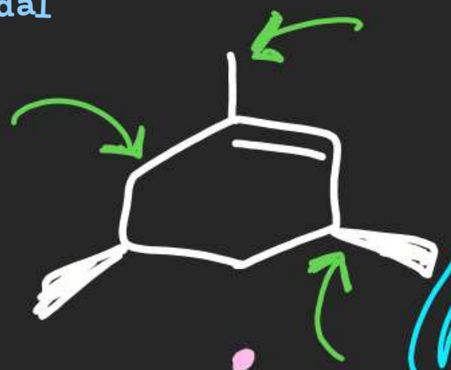
(13)  NBS →

Ex-stereo 4

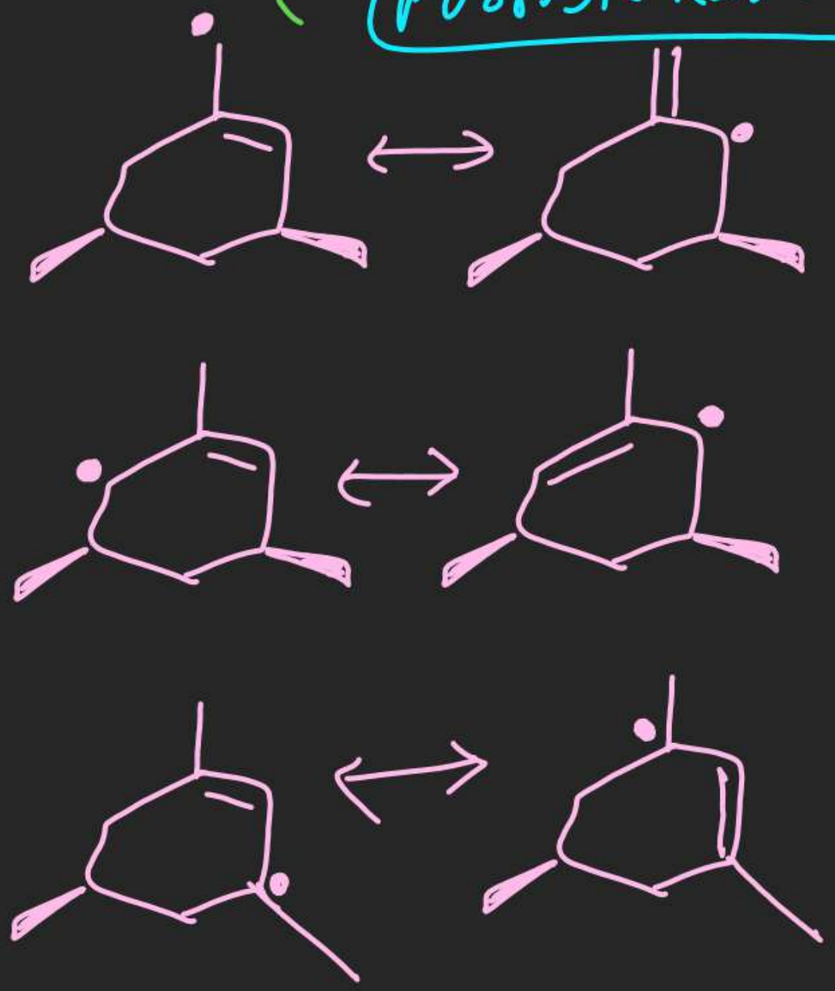
In stereo 11

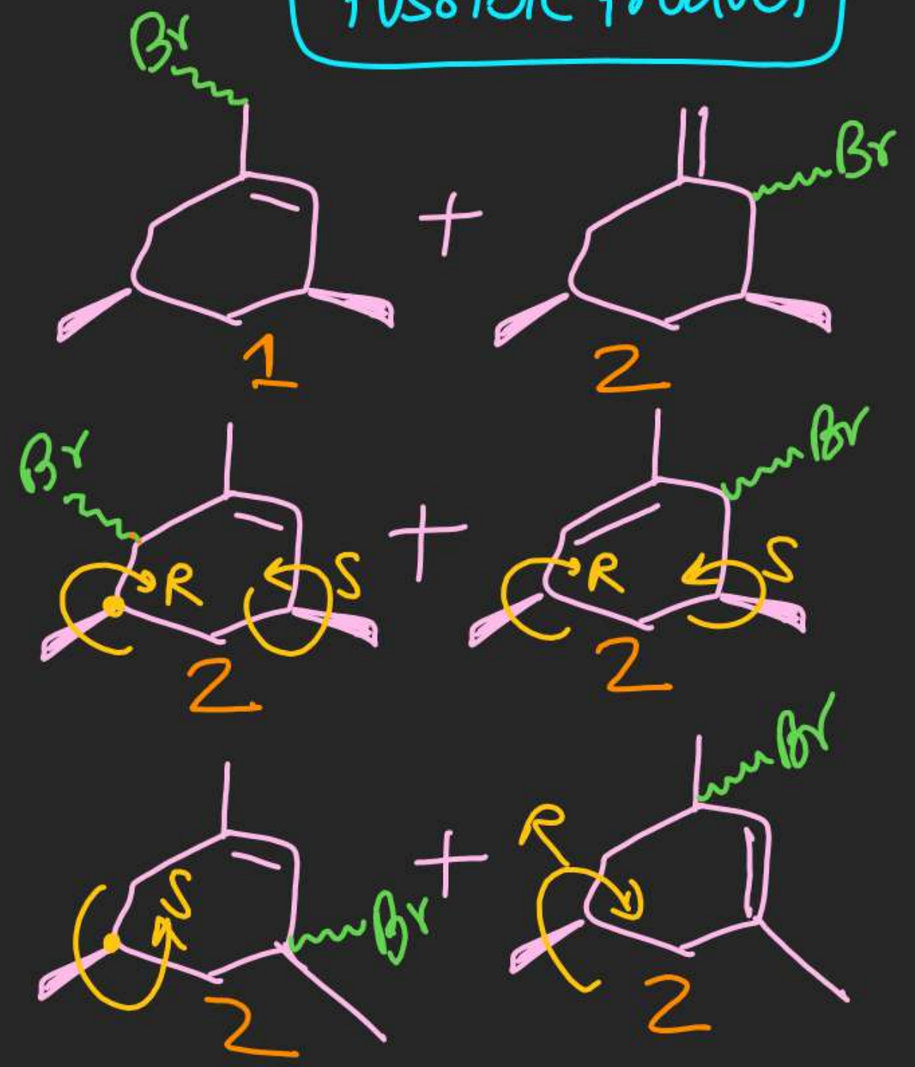
(4, 11)

Possible Radical

Possible Product

Soln:





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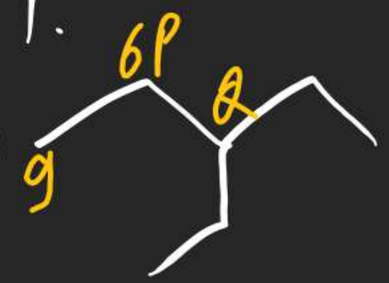
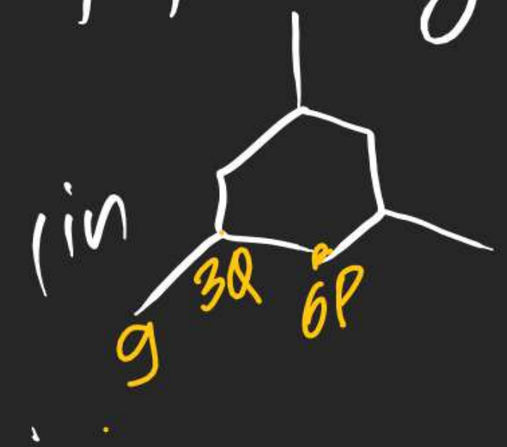
Ex-1: At Temp "T" on monochlorination of Propane, two products 1-chloro propane (46%) & 2-chloro propane (54%) is obtained & on monochlorination of iso Butane at same Temp two products 1-chloro-2-methyl Propane (66·5%) & 2-chloro 2-methyl propane (33·5%) is obtained. Calculate % yeild of products formed on monochlorination of following compounds at same Temp "T".

(i) 

(ii) 

(iii) 

(iv) 

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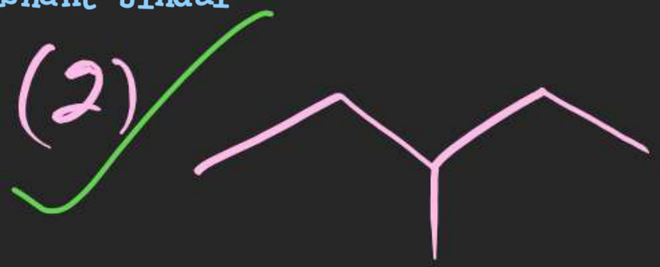
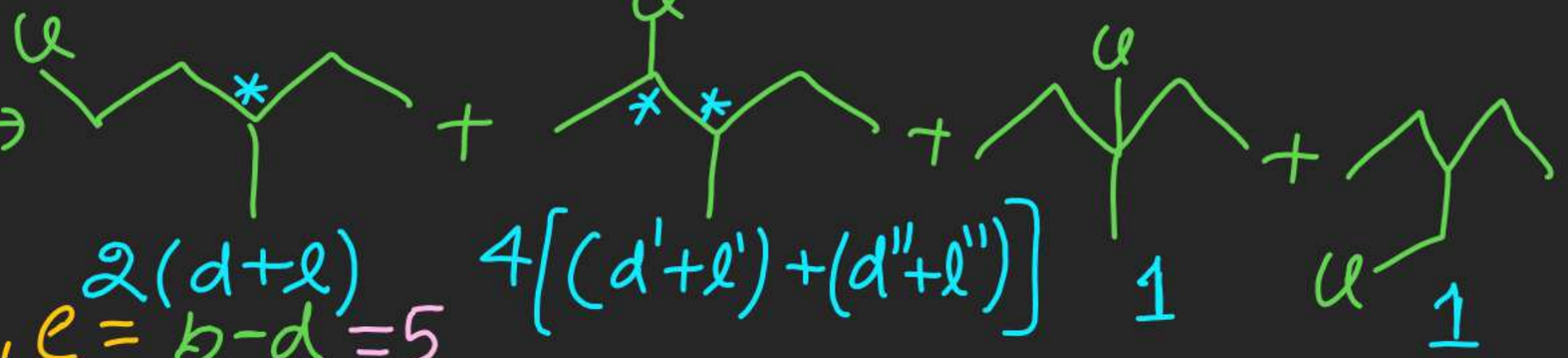
(2)



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

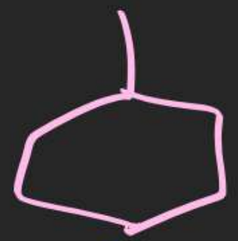


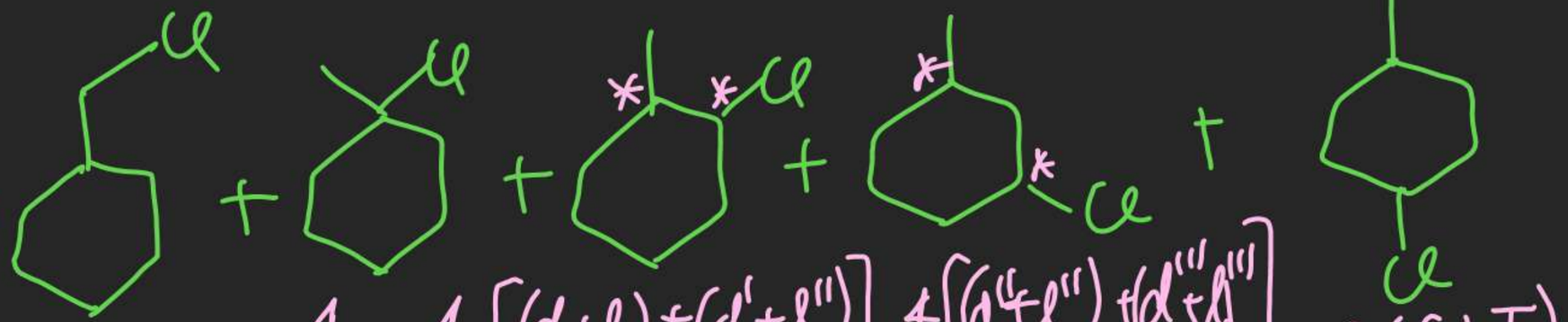
$a=4, b=8, c=6, d=3, e = \begin{matrix} 2(d+\ell) \\ b-d \end{matrix} = 5$

$4[(d'+\ell')+(d''+\ell'')]$ 1 1

(3)

(4)

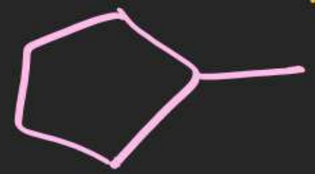


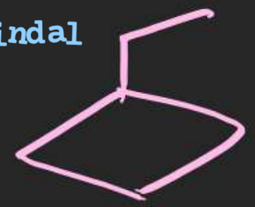


$a=5, b=12, c=8, \begin{matrix} 1 \\ d \end{matrix} =4, \begin{matrix} 1 \\ e \end{matrix} =8$

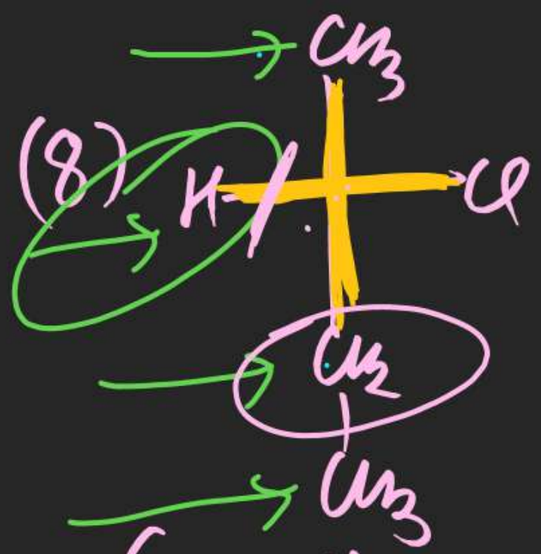
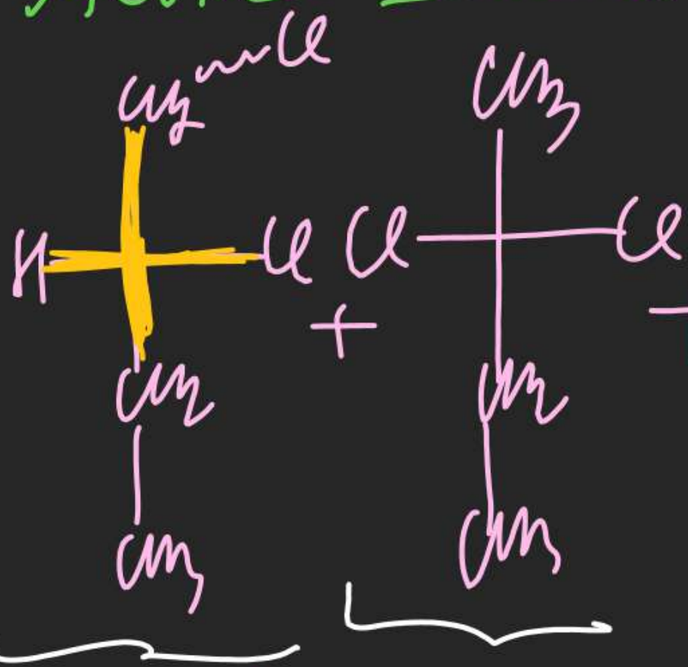
$4[(d+\ell)+(d'+\ell'')]$ $4[(d''+\ell''')+(d'''+\ell''')]$ $2(C+T)$

(5)



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

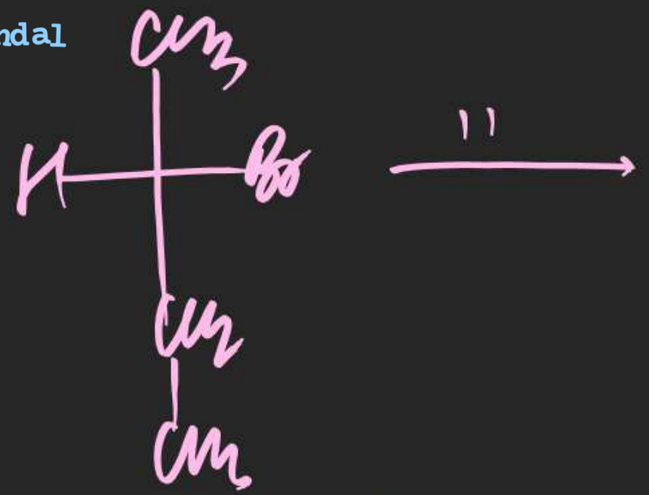
(7)  $\xrightarrow{\quad}$

(8)  $\xrightarrow{\quad}$ 

(Optically pure)

Active (POS) Inactive Active (POS) Inactive Active

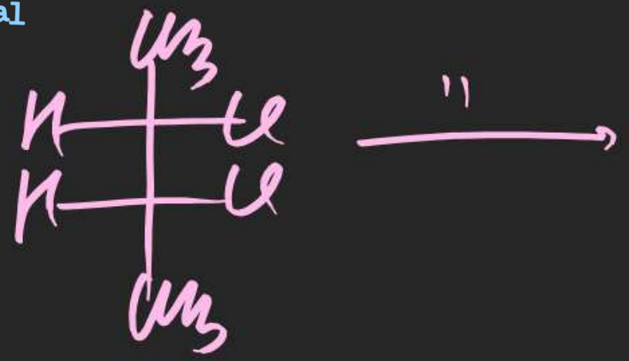
$a=4,\ b=5,\ c=3,\ d=0,\ e=5$

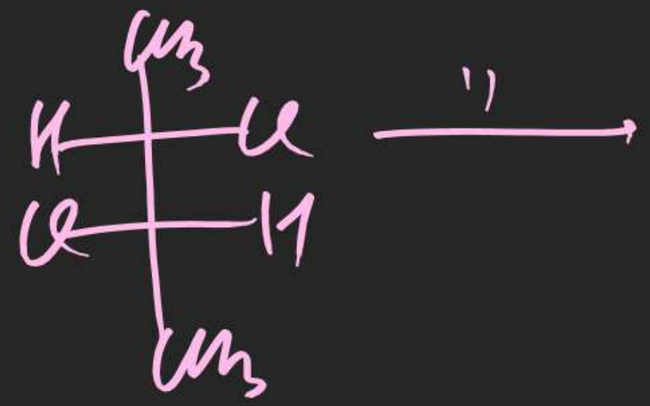
(9) 

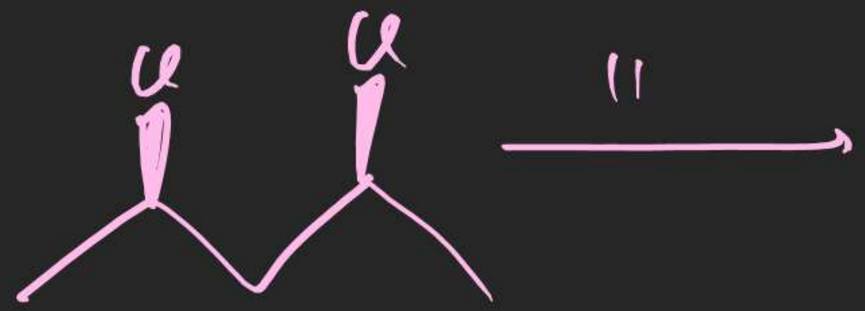
(optically pure)

(10) 

(11) 

(12) 

(13) 

(14) 

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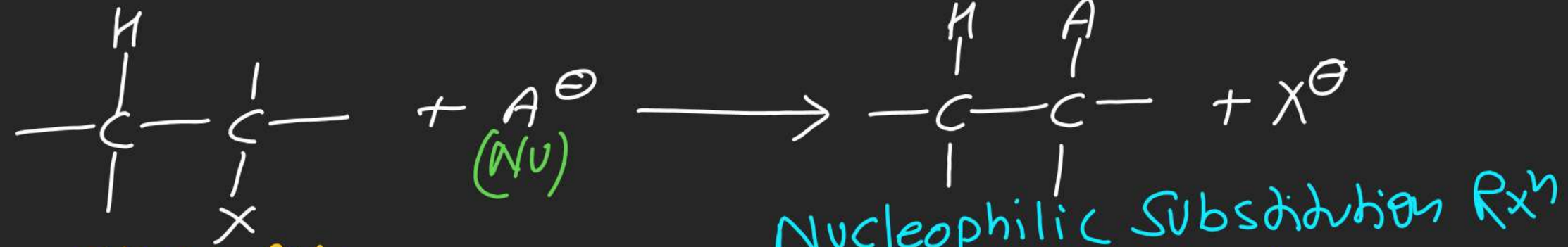
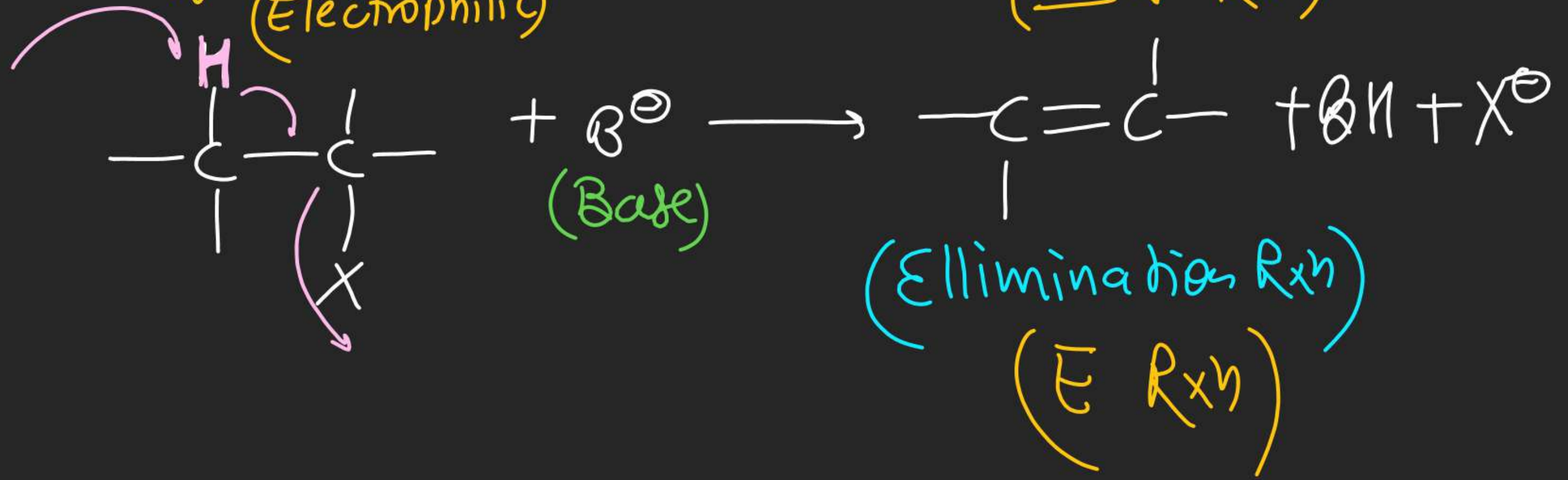
(#) Reactions shown By Alkyl Halide :-

(i) 

(ii) 

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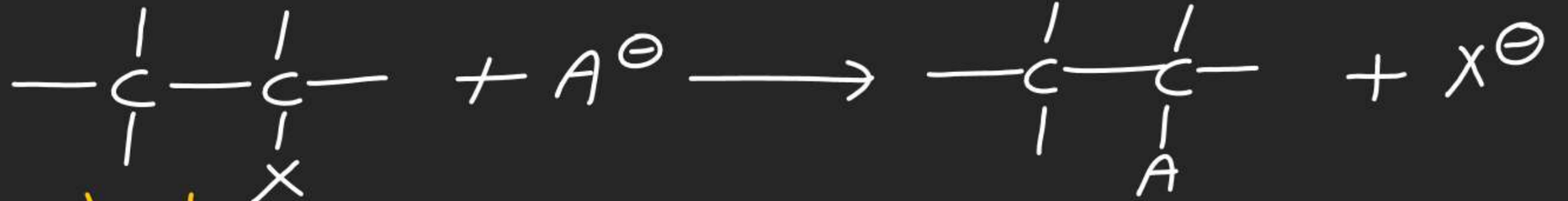
(#) Nucleophilic Substitution Reaction (SN Reaction)

⟹ When a Nucleophile substitutes another Nucleophile Rxn is known as Nucleophilic Substitution Rxn.



Possible mechanism :-

(i) SN^2 mechanism [Bi Molecular Nucleophilic Subs. Rxn]
(ii) SN^1 mechanism [Uni ——]
(iii) SN^i mechanism [Intramolecular ——]
(iv) $SN^{2'}$ mechanism

(V) $SN^{1'}$ mechanism
(VI) $SN^{i'}$ mechanism
(VII) SN-NGP mechanism
(VIII) SN-AE mechanism
(VIII) SN-EA mechanism

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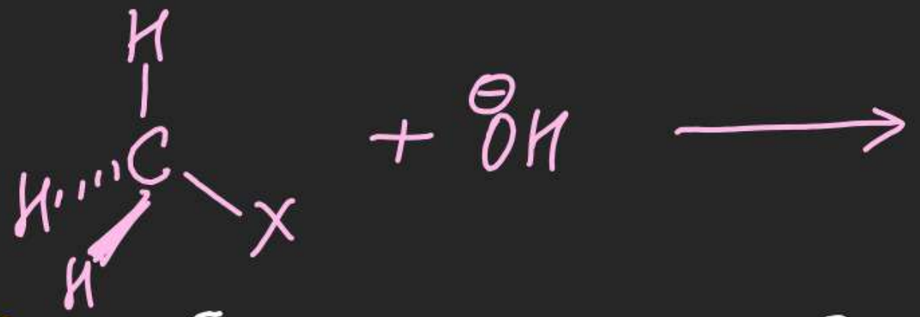
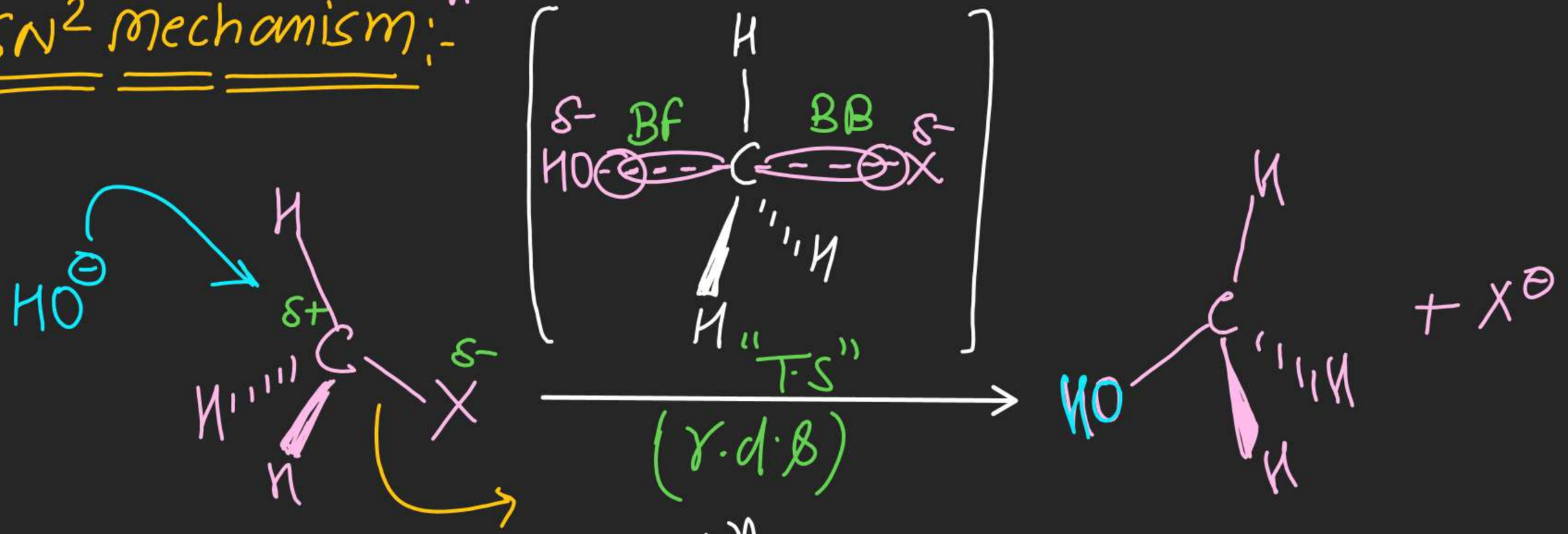
Ex-1



$+ \overset{\ominus}{O}H \longrightarrow$

SN^2 Mechanism :-



Note (i) One step mechⁿ

(ii) No Carbocation Intermidiate

(iii) No Rearrangement possible

(iv) T.S involved

(v) Backside attack of Nu^- takes place

(vi) Inversion takes place during Reaction

(vii) rate expression $\gamma_{SN2} = K_{SN2}[R-X]^1[Nu^-]^1$

(viii) Bimolecular Rxn

(ix) II - order

(x) No Kinetic isotopic effect

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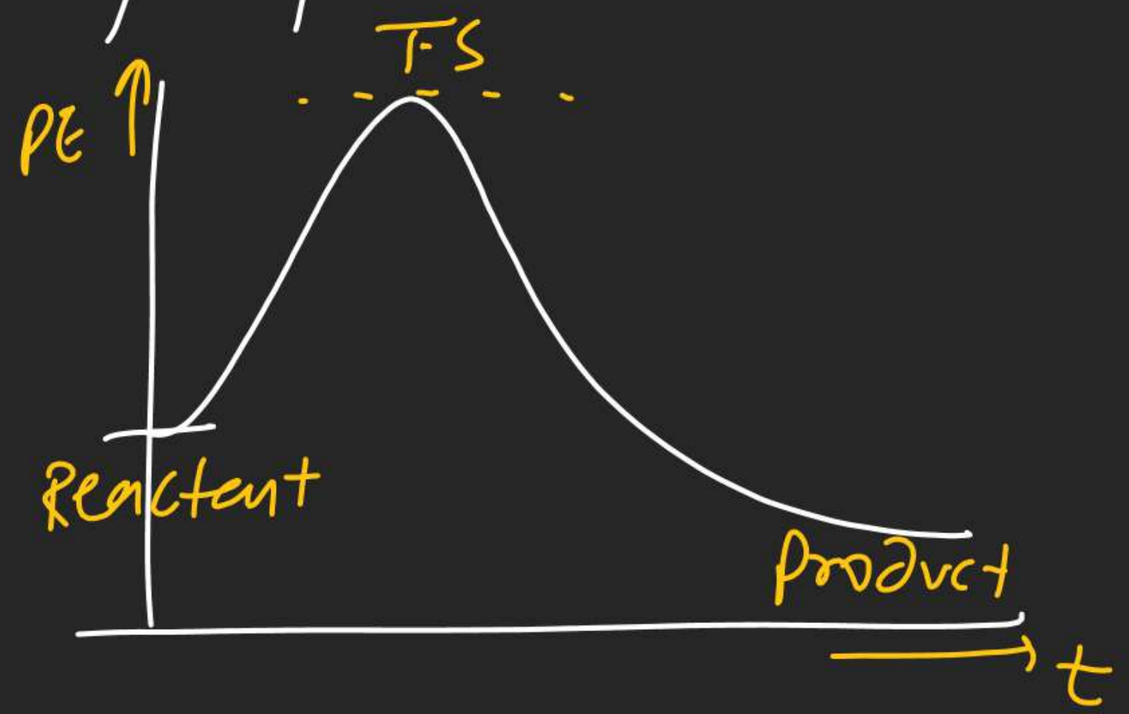
(xi) Potential Energy Diagram



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Carbocation sheet Ex-1 (31 - Complete)
Ex-2 Complete.

BB (isomerism) Ex-1 (41 - Complete)

2. Which carbocation is least likely to be formed as an intermediate ?

(A) $(C_6H_5)_3\overset{+}{C}$

(B) 

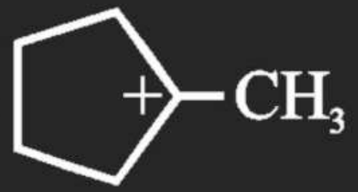
(C) 

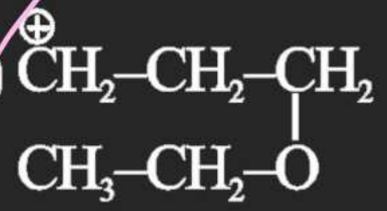
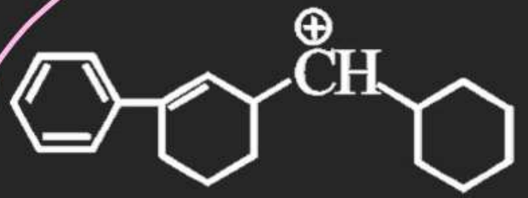
(D) $CH_3 - \overset{+}{C}H_2$

Real नहीं

5. How many following carbocation undergo re-arrangement?

(a) $CH_3CH_2CH_2^+$ (b) $(CH_3)_2CHCH^+HCH_3$ (c) $(CH_3)_3C\overset{\oplus}{C}HCH_3$

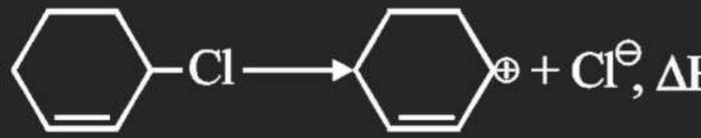
(d) $(CH_3CH_2)_3CCH_2^+$ (e)  (f) 

(g)  (h) 

(A) 5 (B) 8 (C) 6 (D) 7

6. For the reactions

(I)  $+ Cl^{\ominus}, \Delta H_1^{\circ}$

(II)  $+ Cl^{\ominus}, \Delta H_2^{\circ}$

(III)  $+ Cl^{\ominus}, \Delta H_3^{\circ}$

(IV)  $+ Cl^{\ominus}, \Delta H_4^{\circ}$

The correct decreasing order of enthalpies of reaction for producing carbocation is

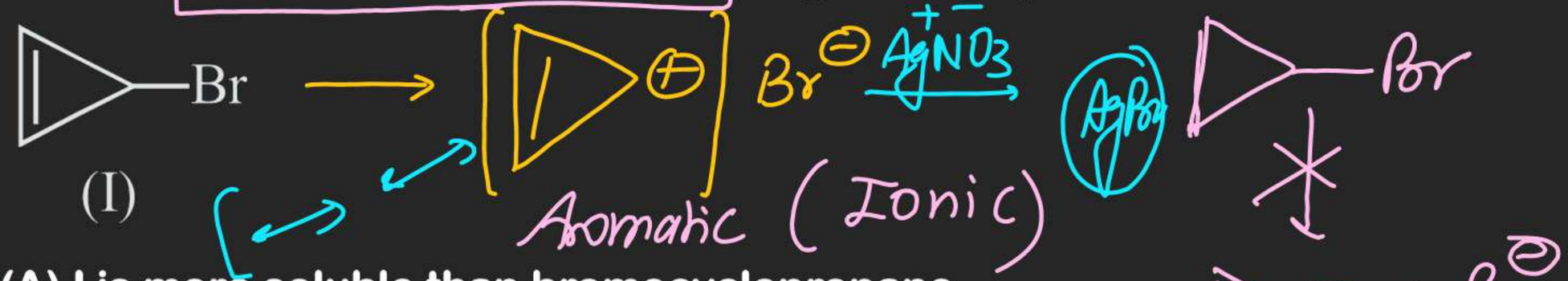
(A) $\Delta H_1^0 > \Delta H_2^0 > \Delta H_3^0 > \Delta H_4^0$

(B) $\Delta H_4^0 > \Delta H_1^0 > \Delta H_2^0 > \Delta H_3^0$

(C) $\Delta H_3^0 > \Delta H_2^0 > \Delta H_1^0 > \Delta H_4^0$

(D) $\Delta H_2^0 > \Delta H_1^0 > \Delta H_4^0 > \Delta H_3^0$

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



(A) I is more soluble than bromocyclopropane

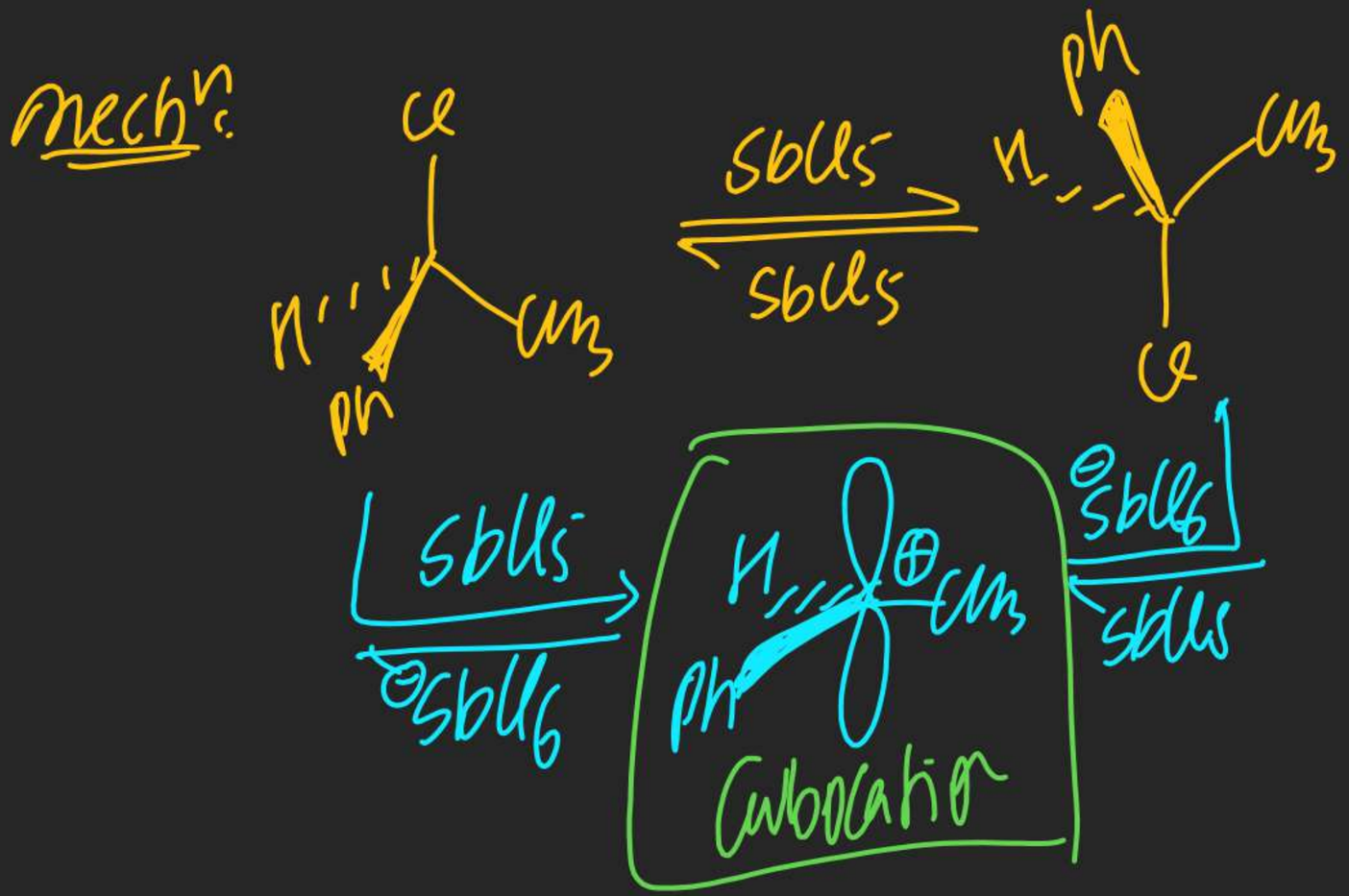
(B) I gives pale yellow ppt. on addition with $AgNO_3$

(C) I has lower dipole moment than bromocyclopropane

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

8. A solution of $(-)-1$-chloro-1-phenylethane in toluene racemises slowly in the presence of a small amount of $SbCl_5$, due to the formation of :

(A) carbanion (B) carbene (C) carbocation (D) free radical



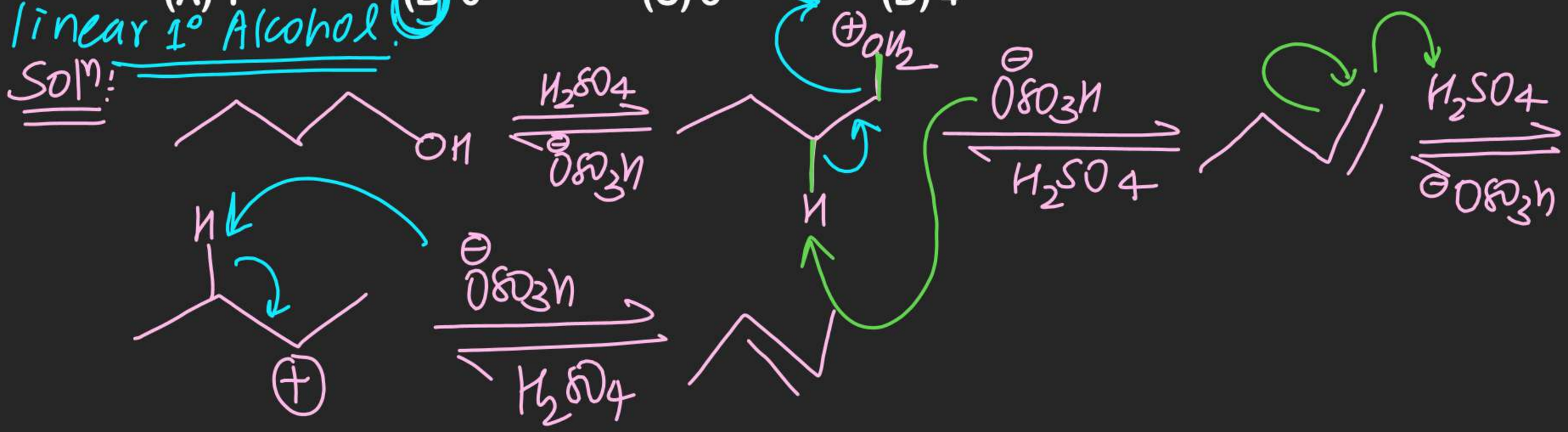
of Carbocation

9. How many 1, 2-Shifts are involved during the course of following reaction:

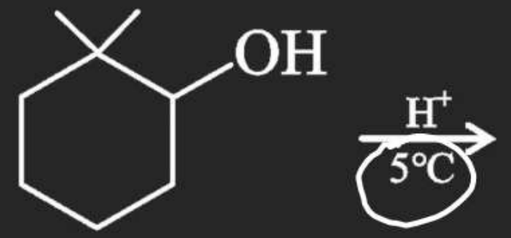
(A) 1 (B) 0 (C) 3 (D) 4

linear 1° Alcohol!

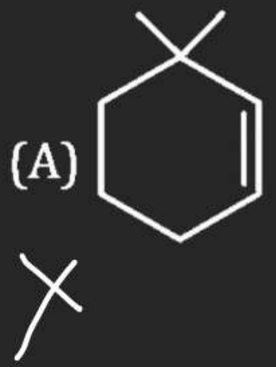
Soln:



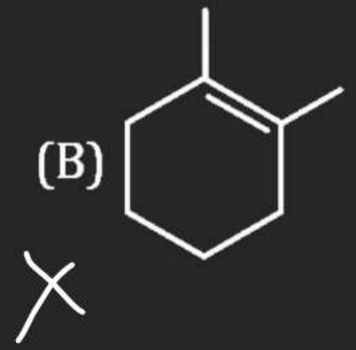
11. Major product of following reaction is :



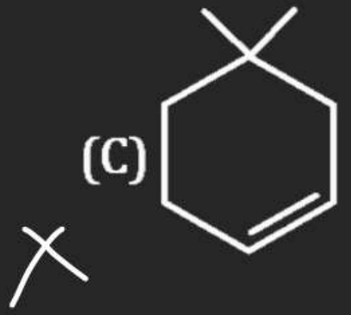
(A)



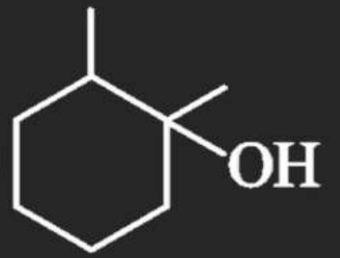
(B)

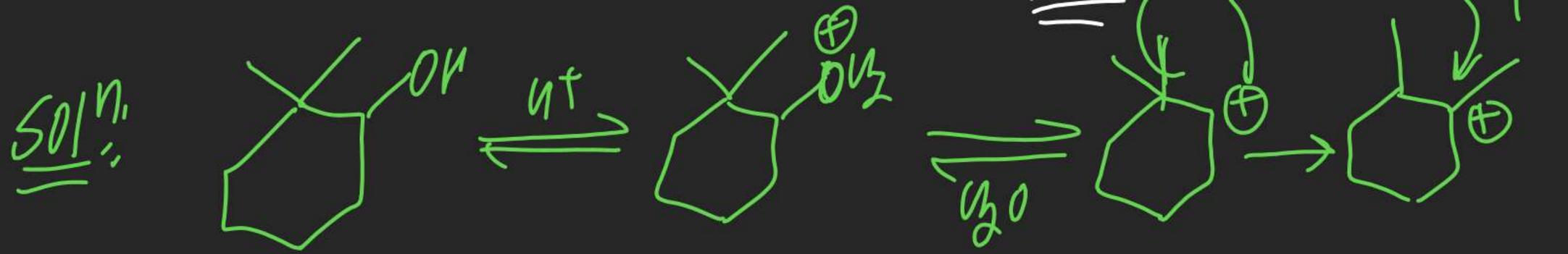


(C)



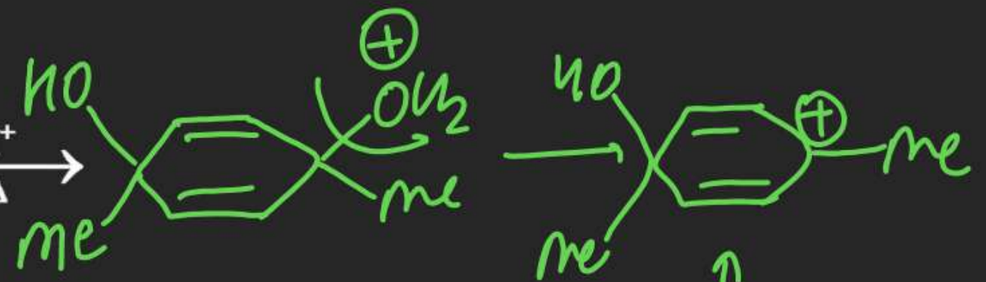
(D)





13. Major product of following reaction is :

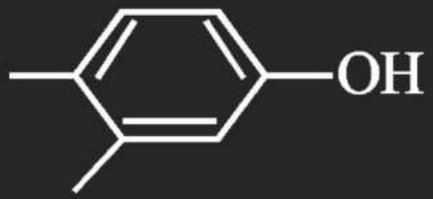
$\xrightarrow[\Delta]{H^+}$



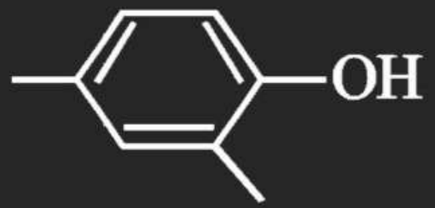
(A)

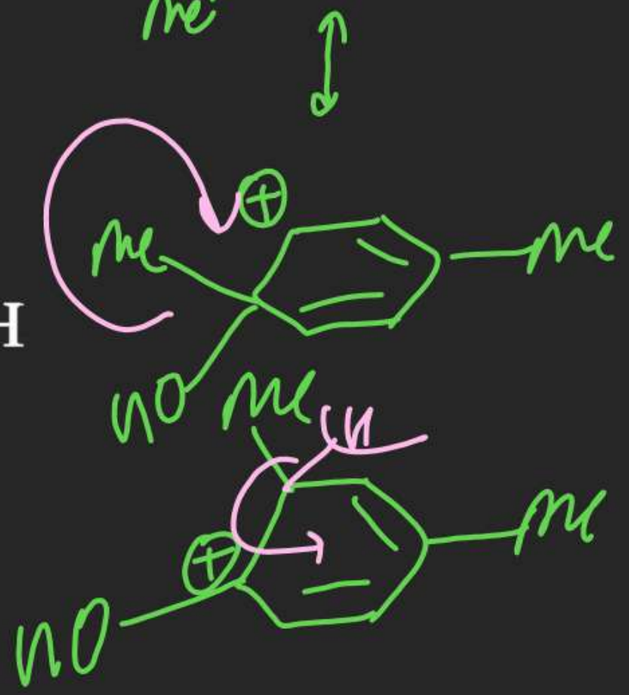
(B)

(C)

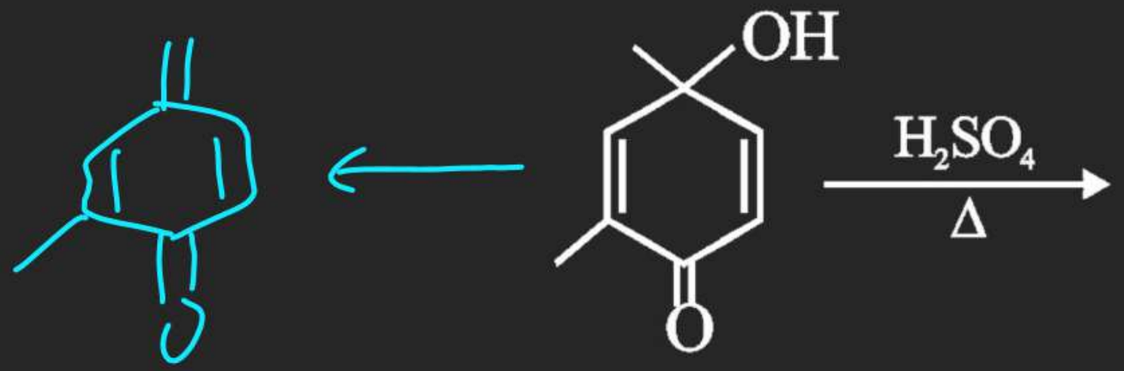


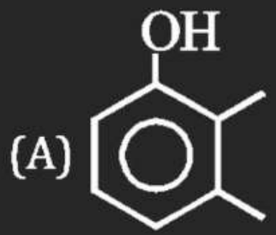
(D)

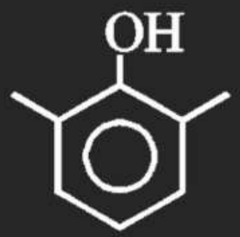


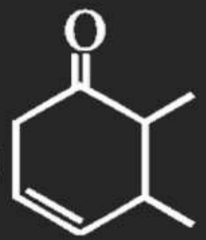


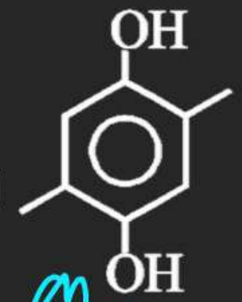
15. One of the major product of following reaction is :

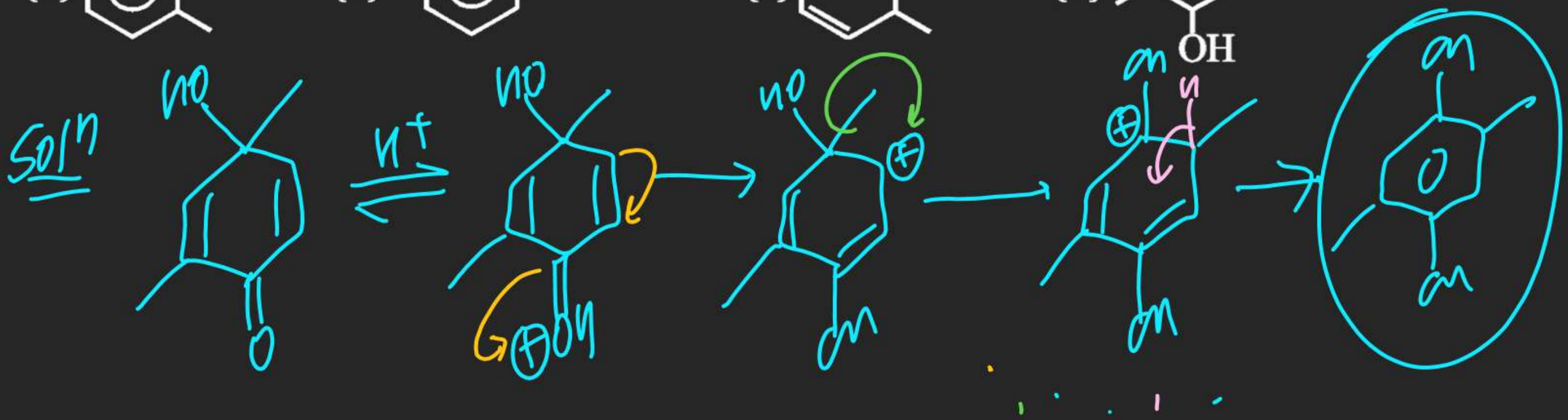


(A) 

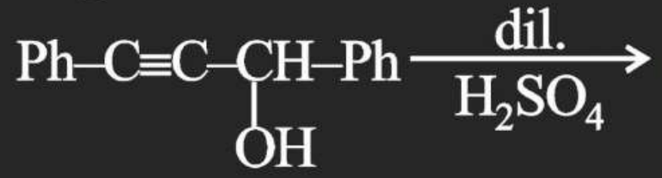
(B) 

(C) 

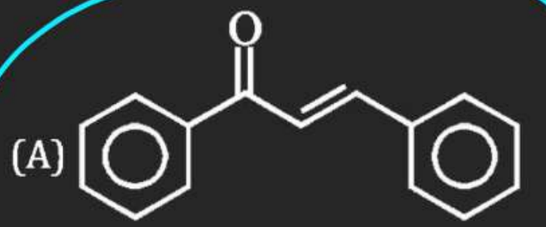
(D) 



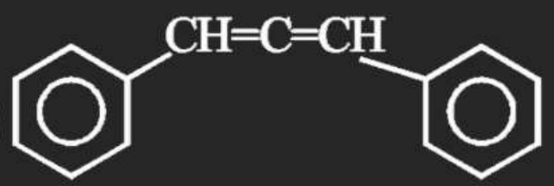
17. Major product of following reaction is :



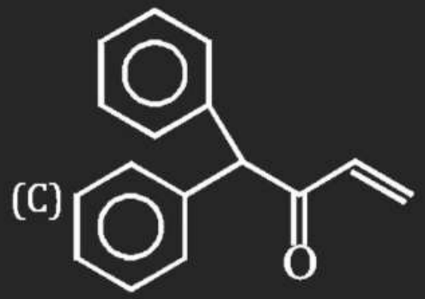
(A)



(B)



(C)



(D)

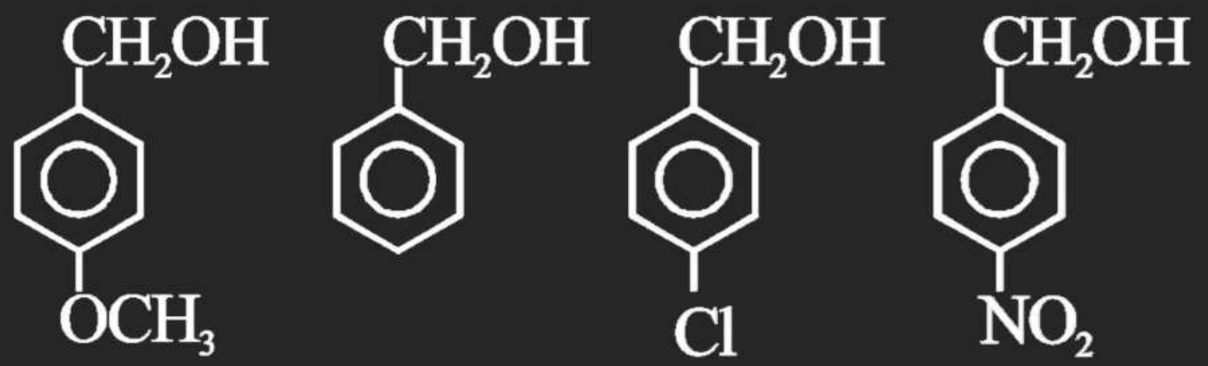
Ph–C≡C–CH–Ph → Ph–C≡C–CH–Ph (⊕ on OH$_2$) → Ph–C≡C–$\overset{\oplus}{C}$H–Ph (−H$_2$O)

Ph–C≡C–$\overset{\oplus}{C}$H–Ph ⇕ Ph–$\overset{\oplus}{C}$=C=CH–Ph

Ph–$\overset{\oplus}{C}$=C=CH–Ph → (H$_2$O, −H$^+$) → Ph–C(=O)–CH=CH–Ph ⇌ Ph–C(OH)=C=CH–Ph

18. What is the decreasing order of rate of reaction with HBr for the following benzyl alcohol and its derivative:

Rate $\propto$ Cation stability



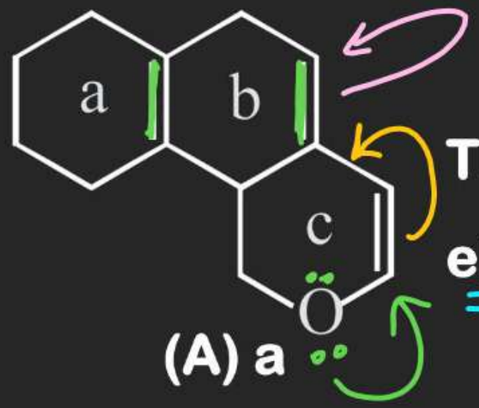
(A) (B) (C) (D)

(A) A > C > D > B

(B) A > B > D > C

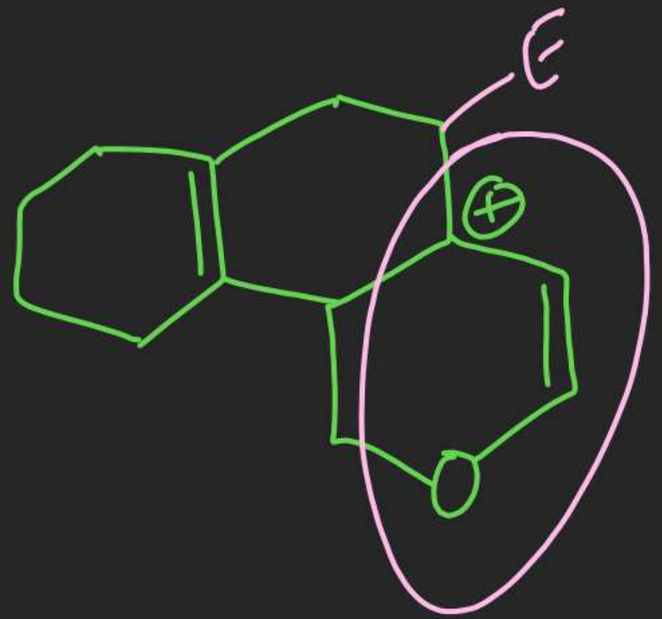
(C) D > C > B > A

(D) A > B > C > D

20. 

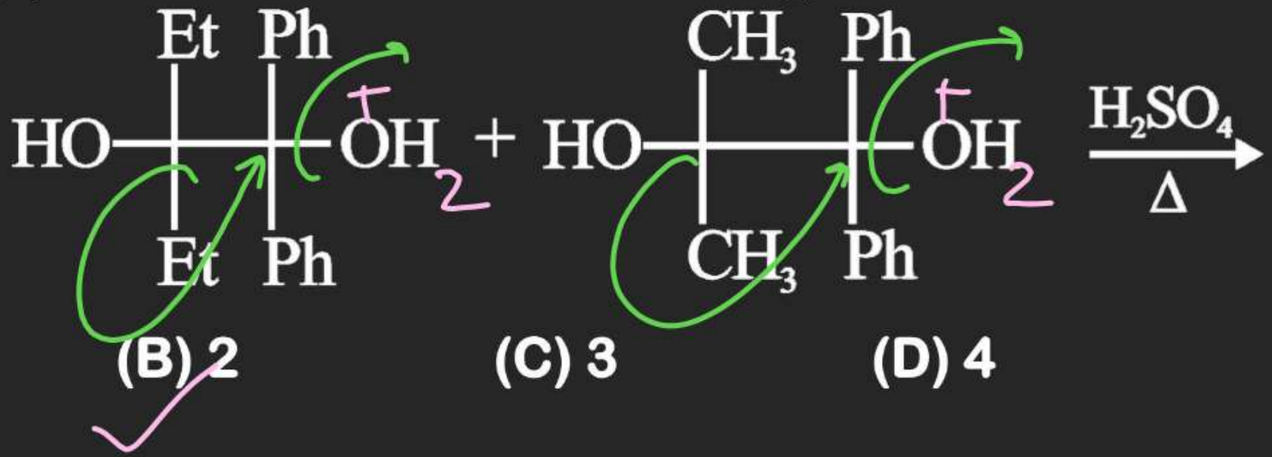
The double bond which is most reactive towards electrophile :

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



most stable Cation

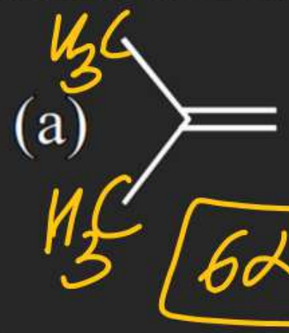
22. How many products are obtained in the given reaction :

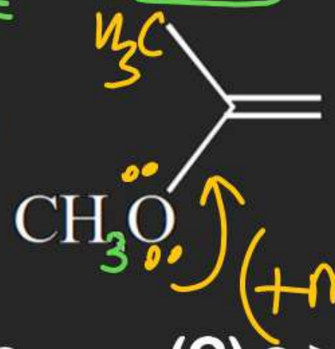


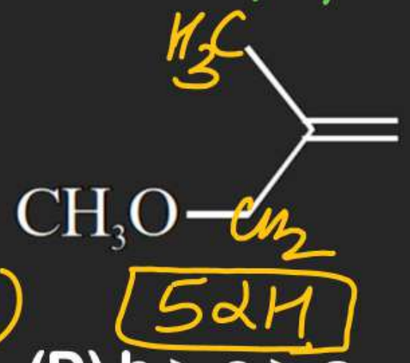
(A) 1 (B) 2 (C) 3 (D) 4

Rate with Electrophile & Nucleophilicity & Stability of Carbocation.

25. What is the order of reactivity with HBr :

(a) 

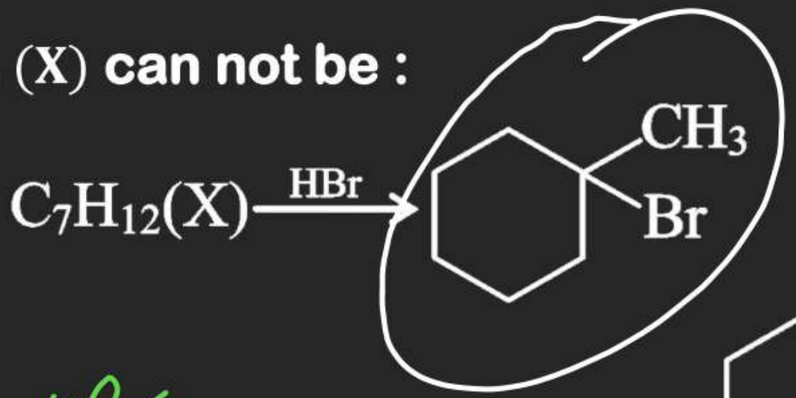
(b) 

(c) 

(A) a > b > c (B) b > a > c (C) c > b > a (D) b > c > a

Ans

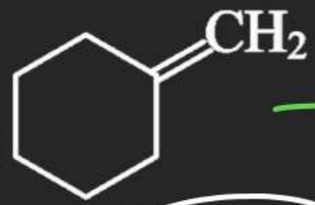
26. In the given reaction, (X) can not be :



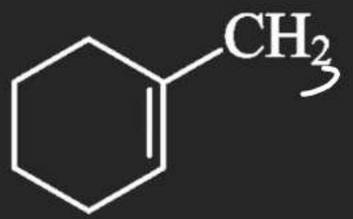
7C

(A) 

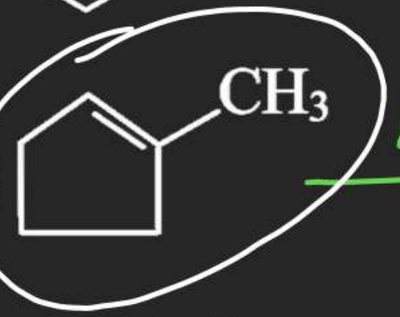
HBr

(B) 

HBr

(C) 

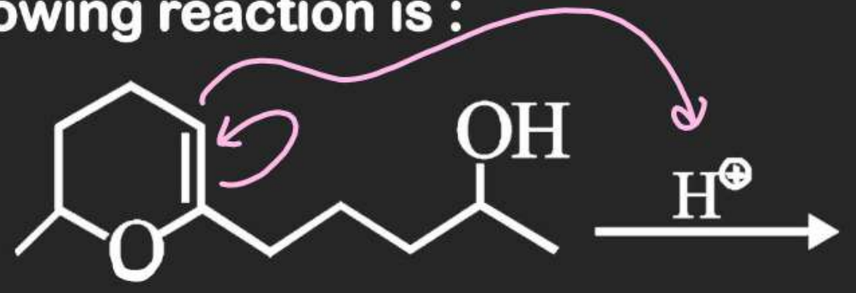
HBr

(D) 

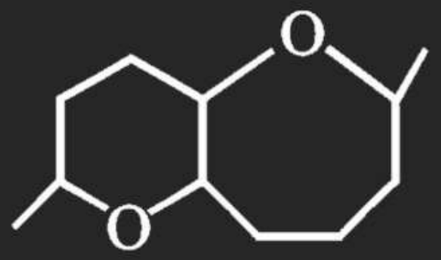
HBr

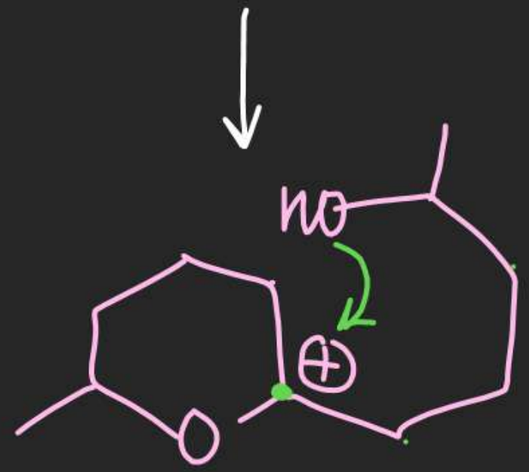
6C

28. Major product of following reaction is :

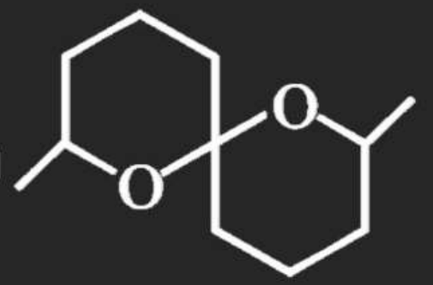


(A)



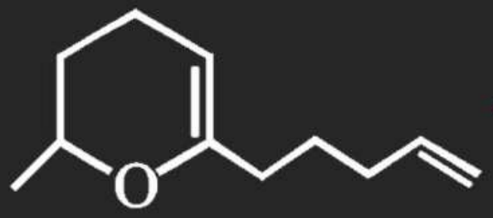


(B)



$-H^+$

(C)



(D)