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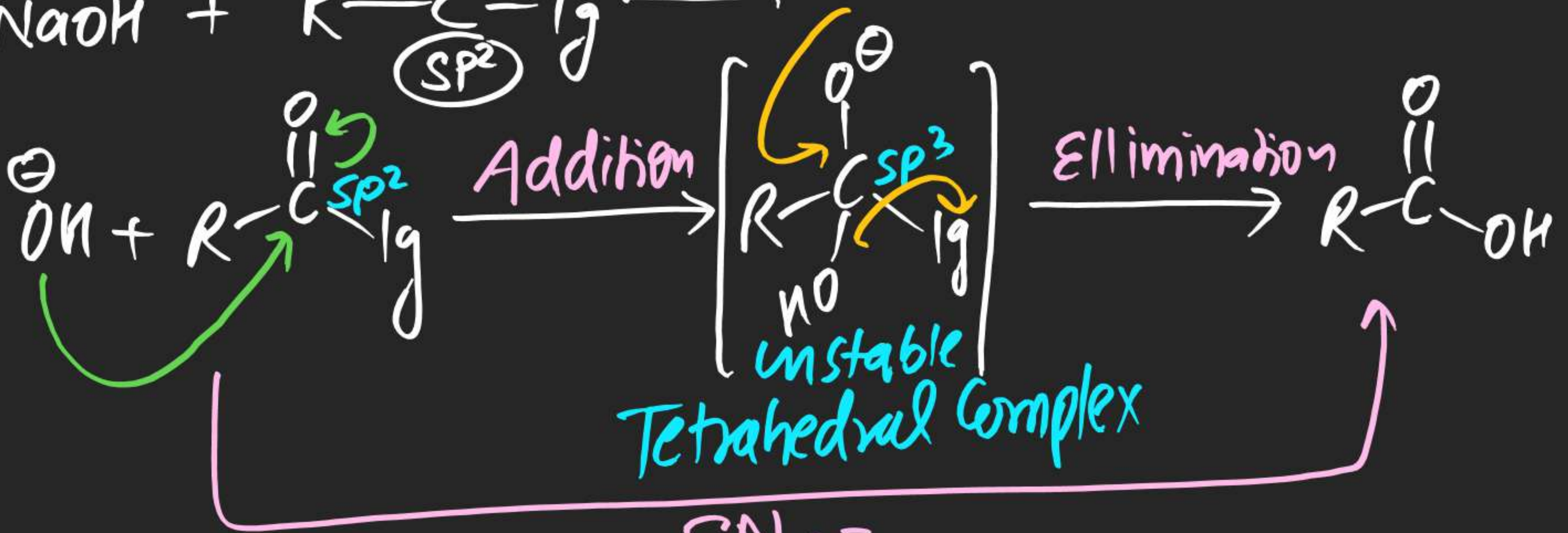
(#) SN_{AE} Mech^n:

AE: Ellimination / Addition

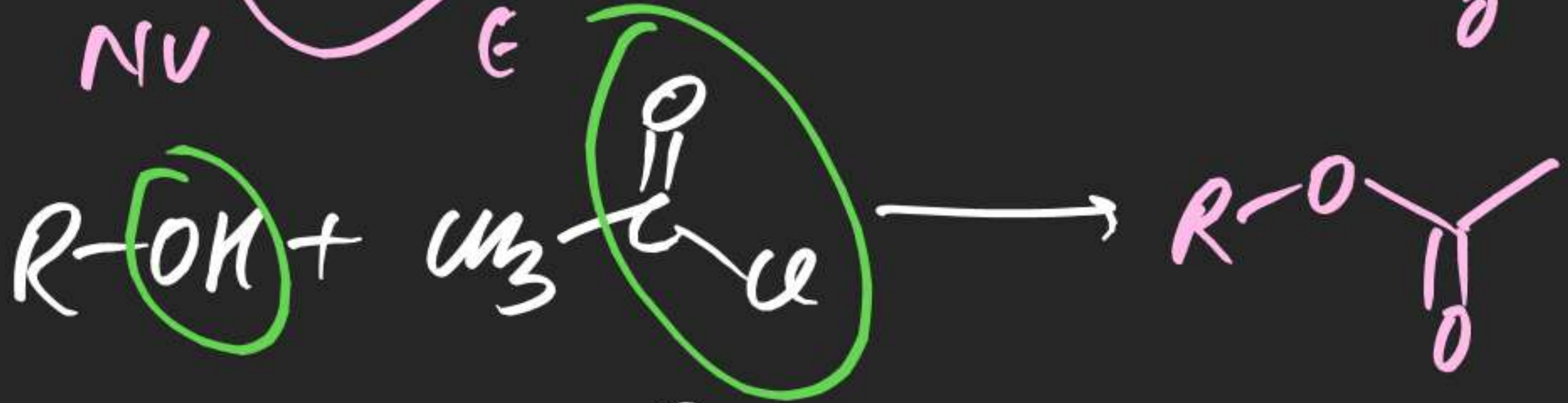
(1) $NaOH + R-\overset{\overset{O}{\|}}{\underset{sp^2}{C}}-lg \longrightarrow$

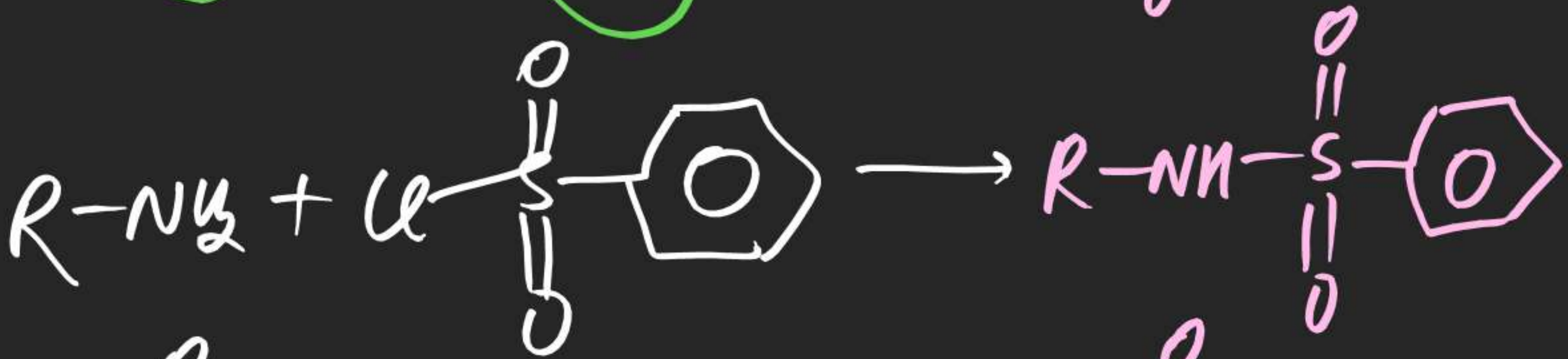
Mech^n:



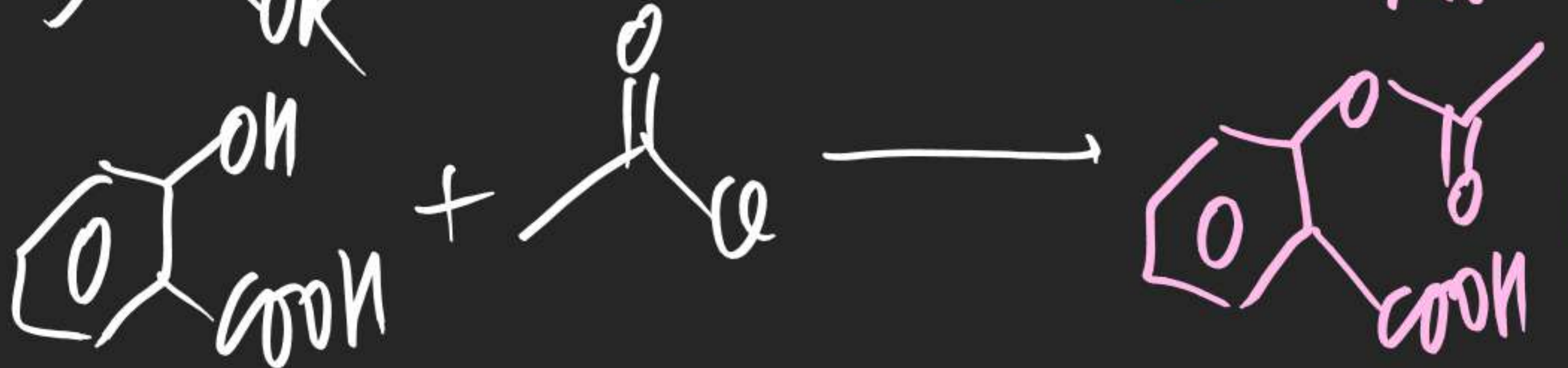
(2) $NaOR + CH_3-\underset{\underset{O}{\|}}{C}-Cl \xrightarrow{\;''\;}$ SN_{AE} $CH_3-\underset{\underset{O}{\|}}{C}-OR + NaCl$

(3) 

(4) 

(5) 

(6) 

(7) 

(Aspirine)

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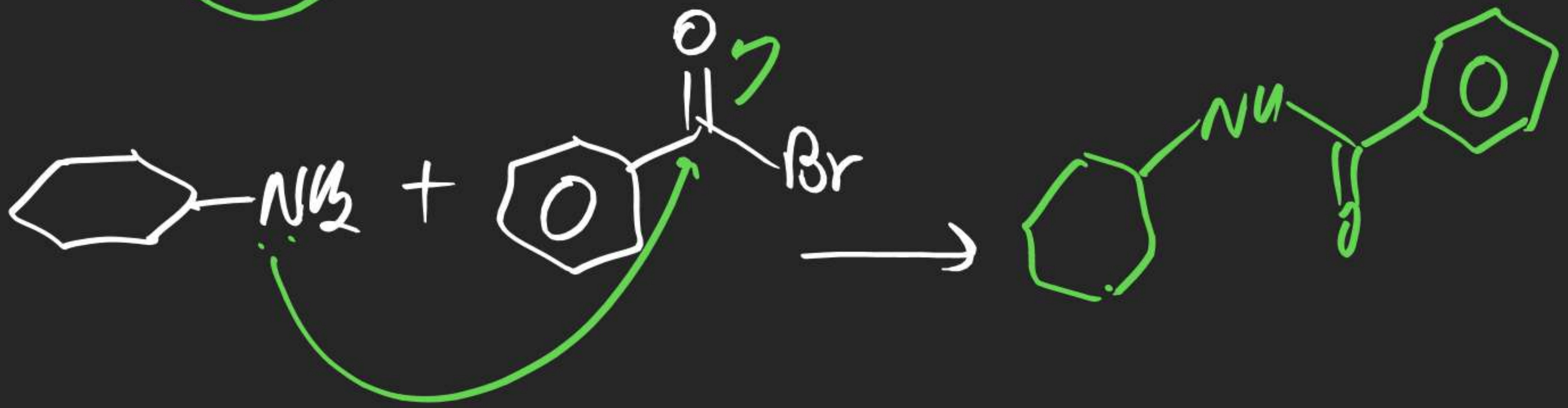
(8) $\overset{+}{Na}\overset{-}{O}H + CH_3-\overset{\overset{O}{\|}}{C}-OPh \longrightarrow CH_3-\overset{\overset{O}{\|}}{C}-ONa + Ph-ONa$

(9) $R_2NH + CH_3-\overset{\overset{O}{\|}}{C}-O-\overset{\overset{O}{\|}}{C}-CH_3 \longrightarrow CH_3-\overset{\overset{O}{\|}}{C}-NR_2 + CH_3-\overset{\overset{O}{\|}}{C}-OH$

(10)



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Ellimination Rx^n

⇒ When Two atom/groups are elliminated from any compound during a Reaction it is known as Ellimination Rx^n

Types of Ellimination Rx^n:

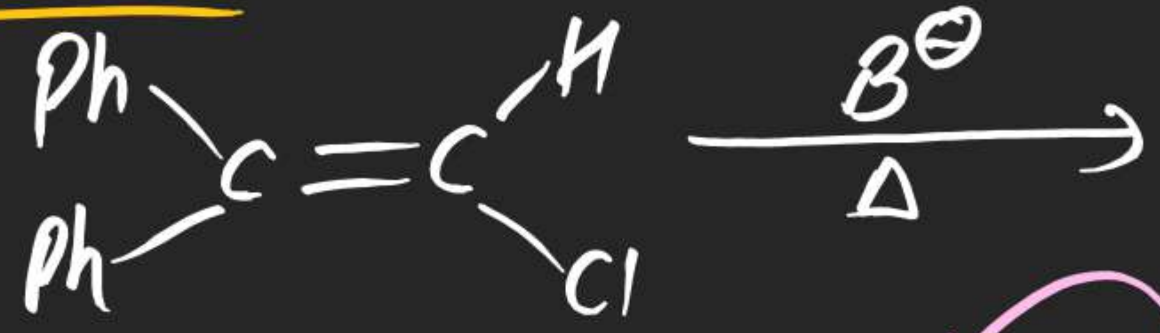
(i) α,α / α-Ellimination / 1,1-Ellimination

(i) α,β / β-Ellimination / 1,2-Ellimination

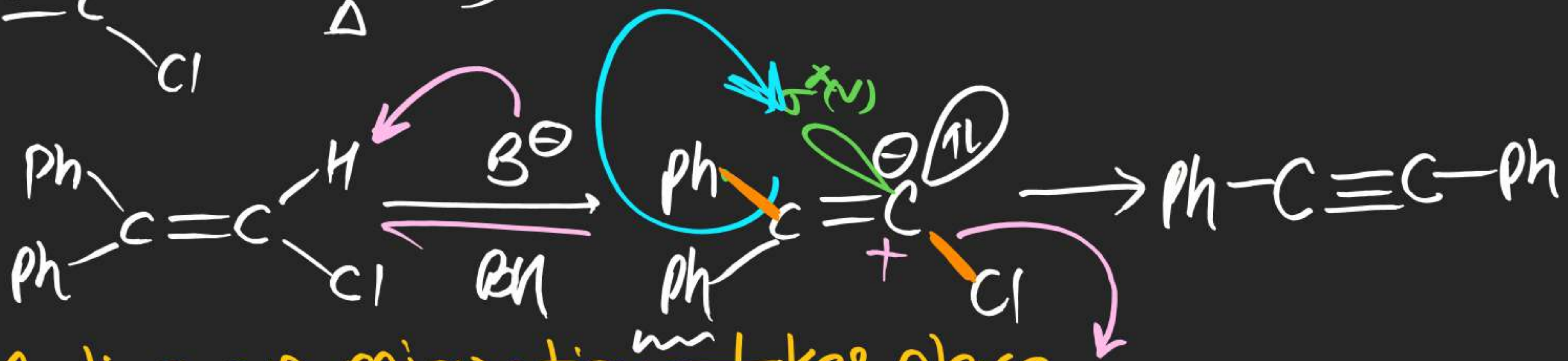
(i) α,γ / γ-Ellimination / 1,3-Ellimination

$\boxed{\alpha\text{-Ellimination}}$ when Both Elliminating atom/groups elliminates from same site, Ellimination is known as 1,1 Ellimination

Frist Rx^n :-

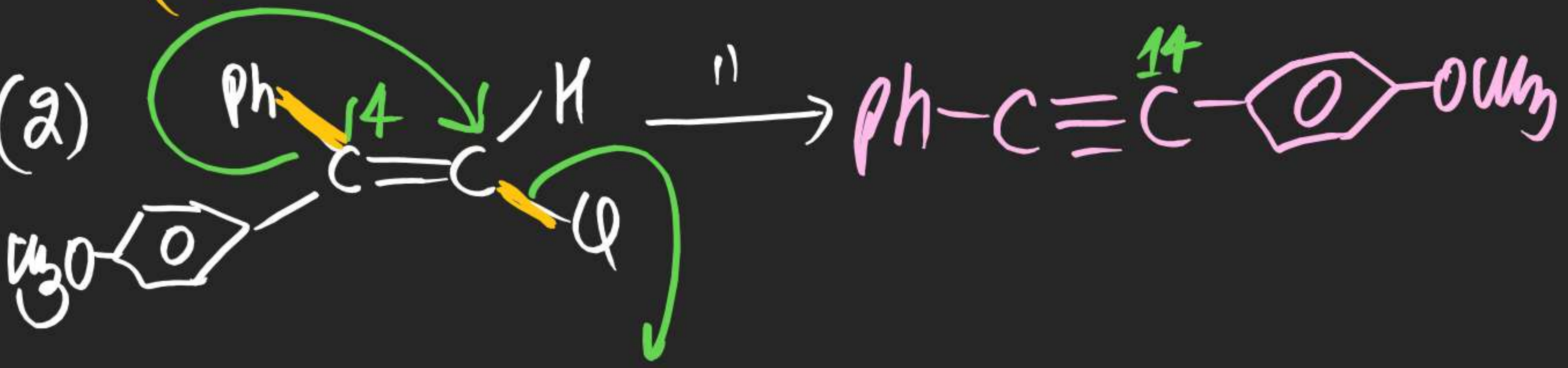
(1) 

$Mech^n$:-



Note (i) Anti group migration takes place

(ii) 1,1 Ellimination

(2) 

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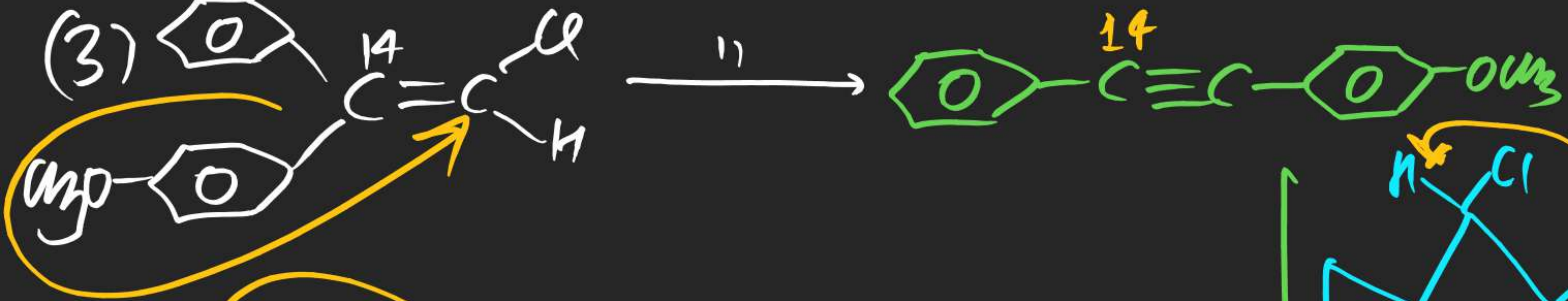
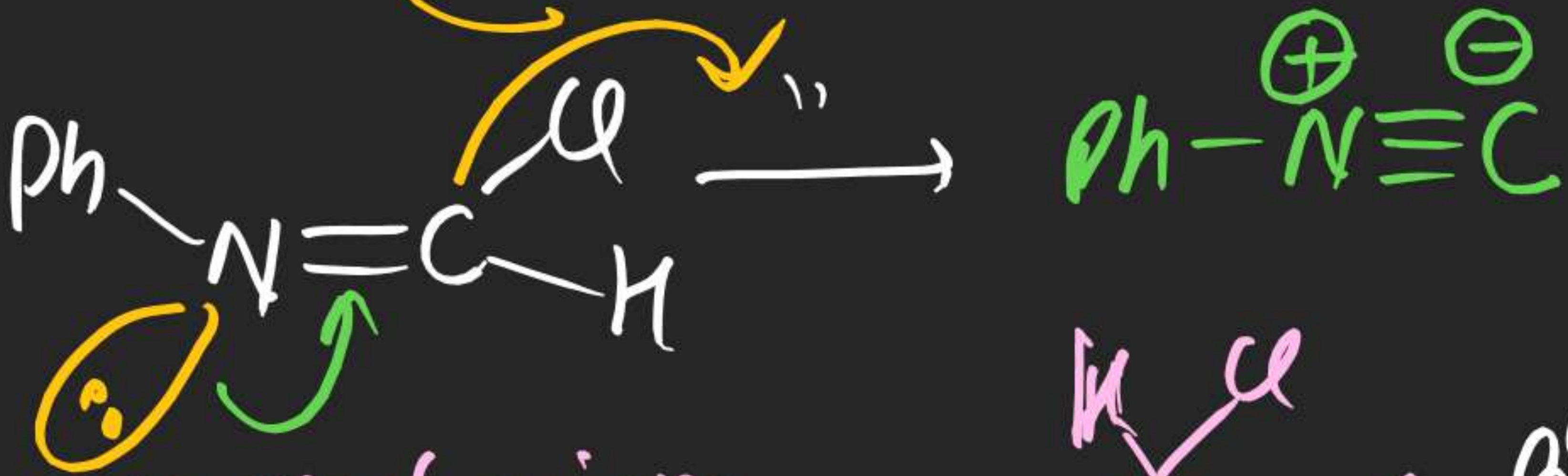
(3)

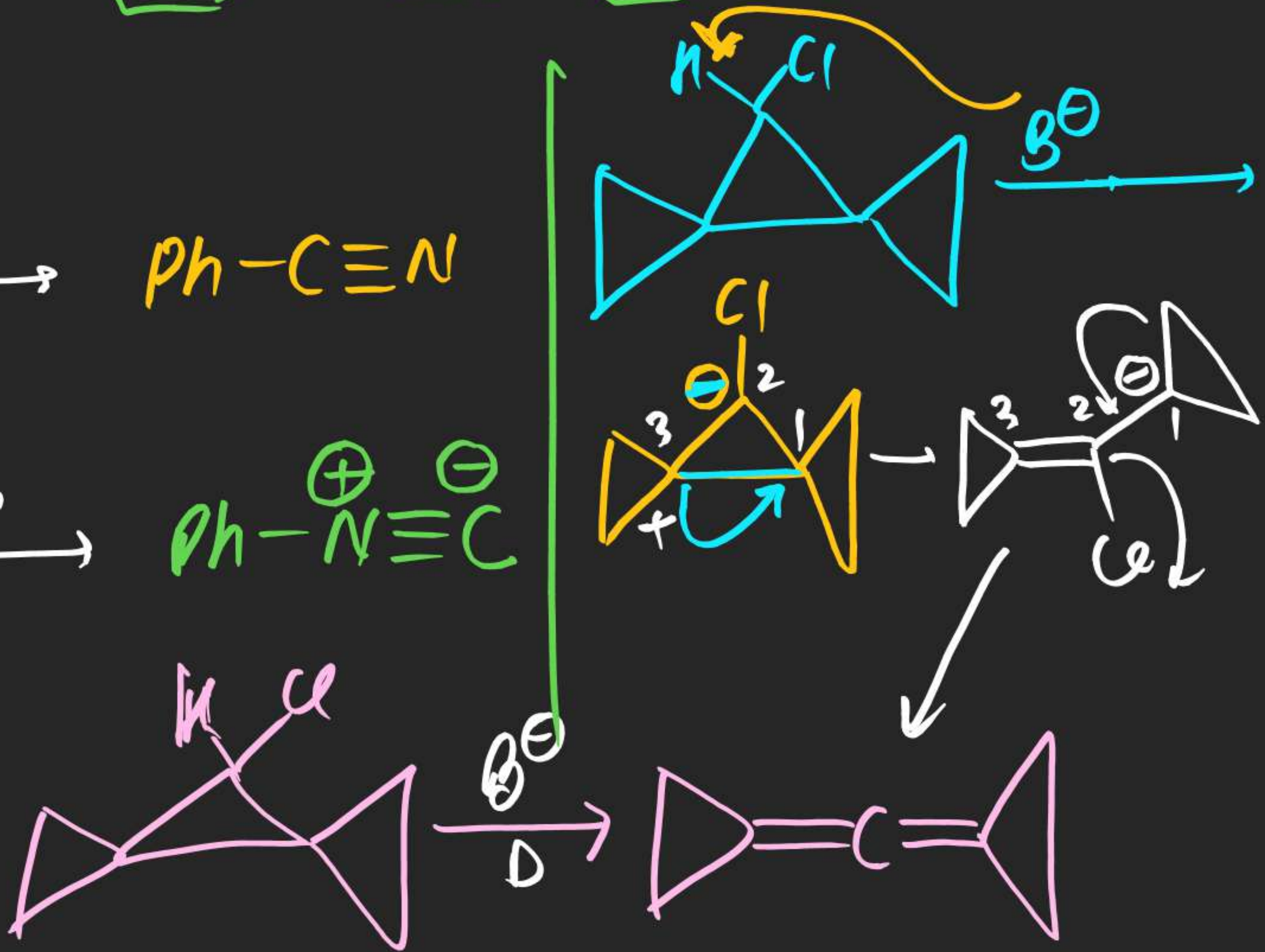


(4)

(5)



(6) Propose mechanism



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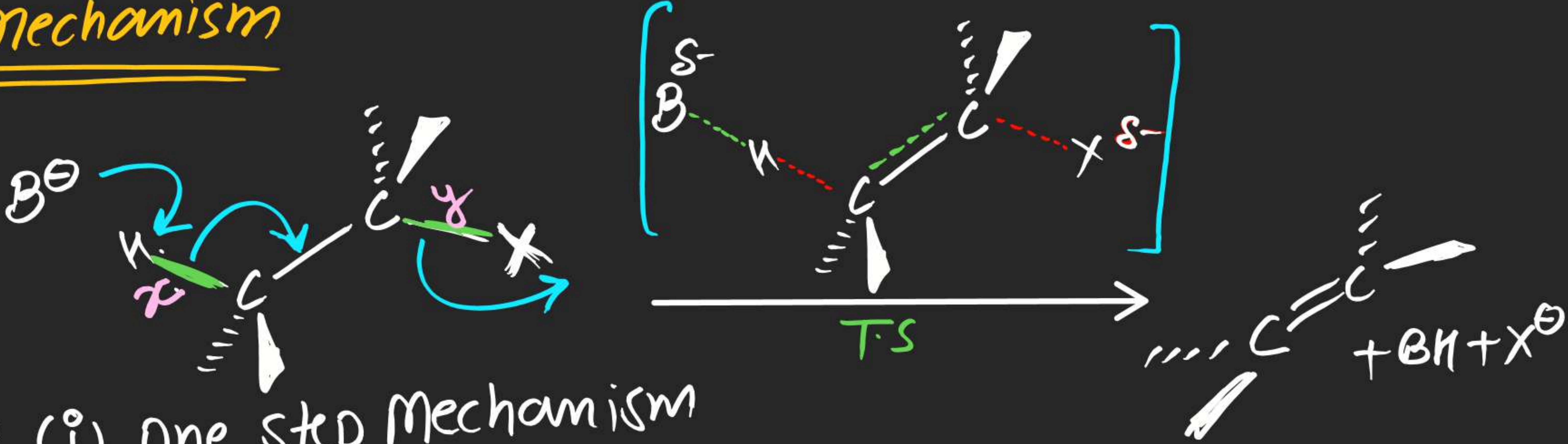
E^2 mechanism



Note (i) One step Mechanism

(ii) No Carbocation intermidiate

(iii) No Rearrangement possible

(iv) rate exp $r_{E^2} = K_{E^2}[R-X][B^{\ominus}]$

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(v) Bi molecular Rx^n

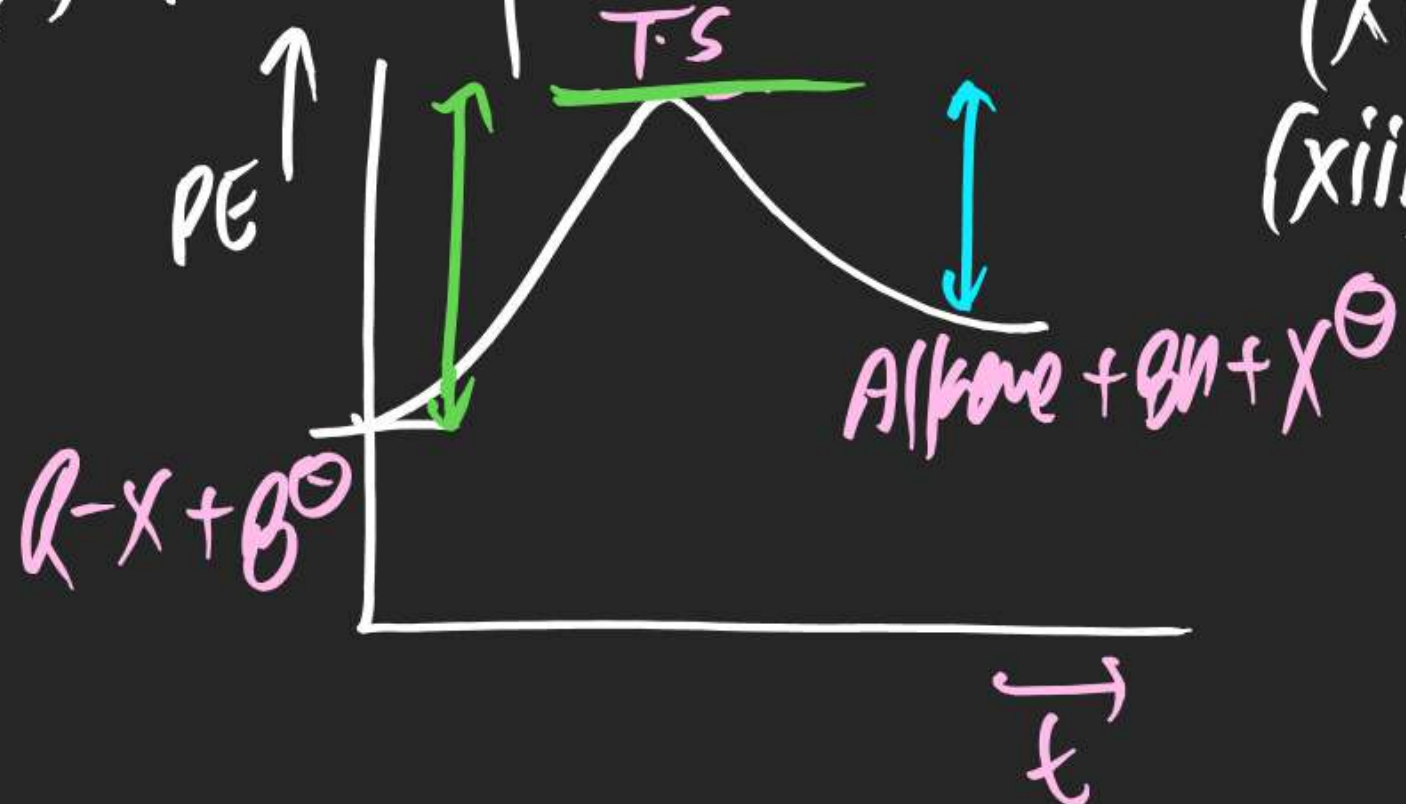
(vi) II-order Rx^n [I-order w.r.to [R–X] & I-order w.r.to $[B^{\ominus}]$]

(vii) E^2 $mech^n$

(viii) Anti Ellimination

(ix) Anti periplaner Transition State is involved

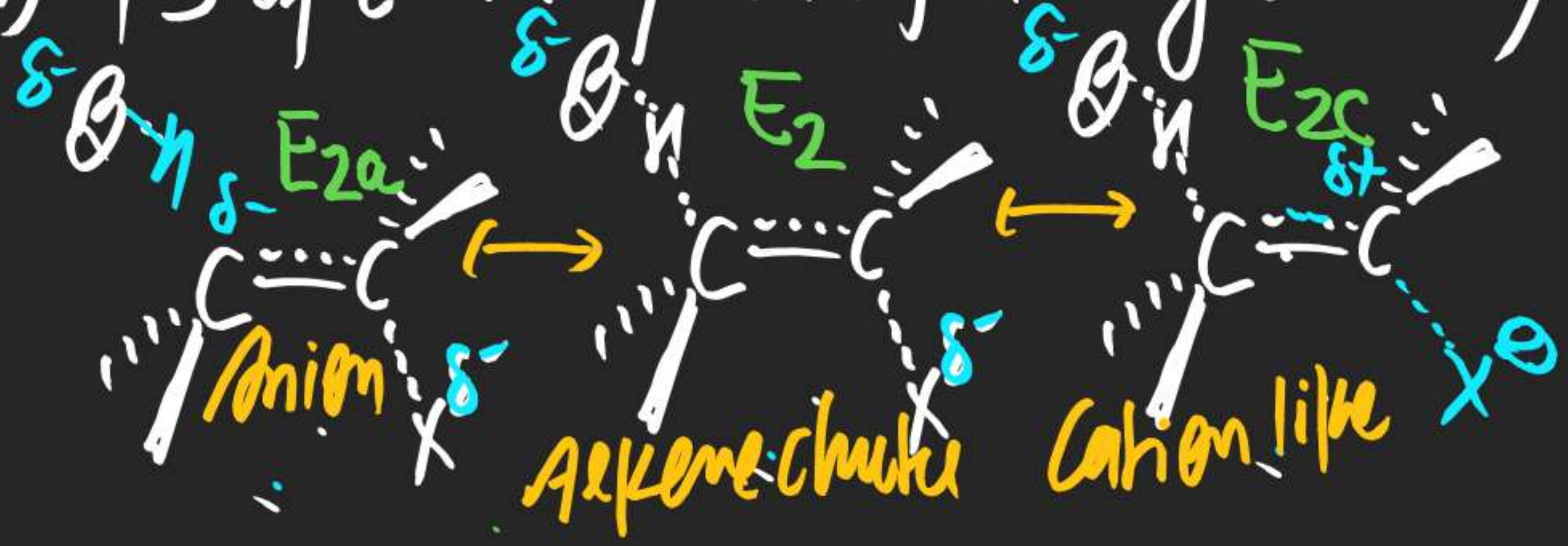
(x) P.E diagram



(xi) Endothermic Rx^n

(xii) TS Reflects properties of product.

(xiii) TS of E^2 may have following charactrs



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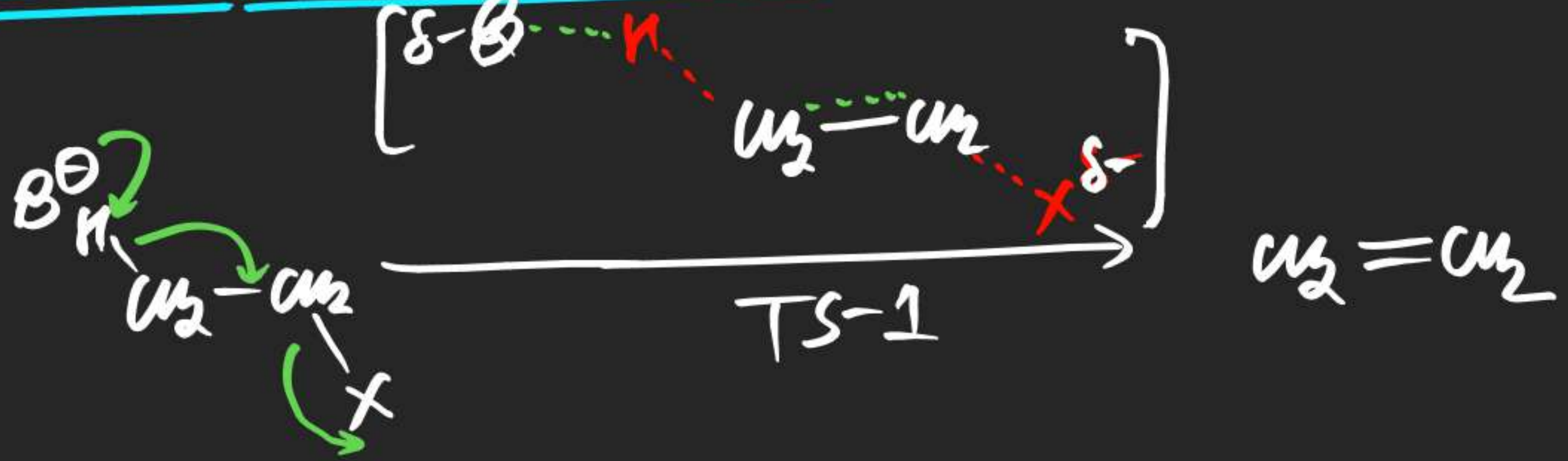
Factors affecting Ellimination mechanism:

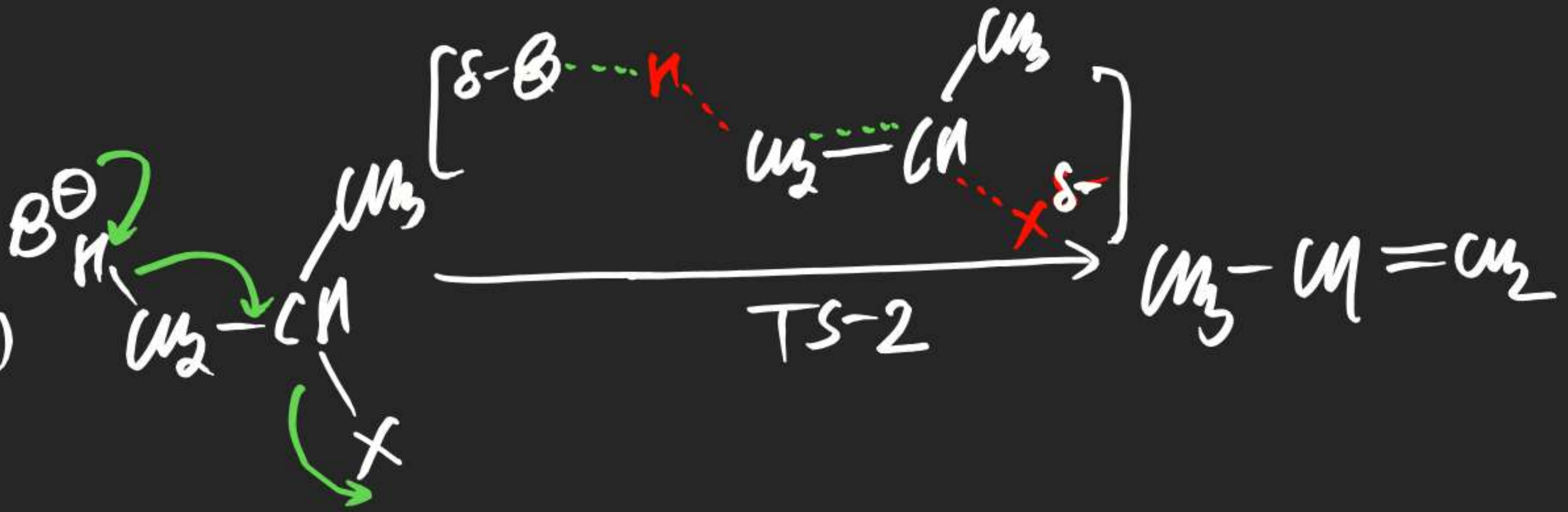
(1) Structure of Alkyl Halide:

For E^2

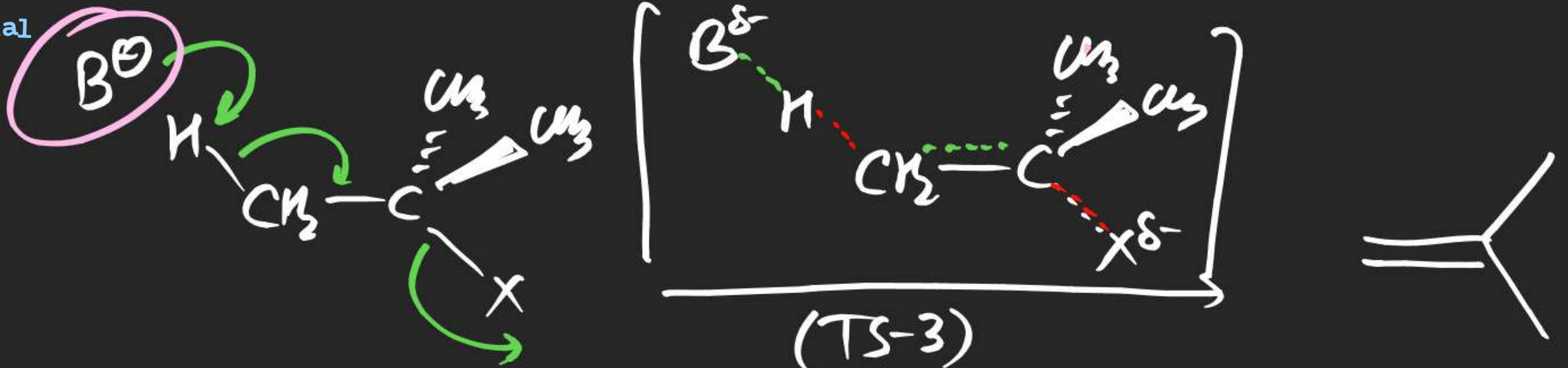
(a)



(b)



(C)



(TS-3)

$\Rightarrow$ Since T.S Reflects properties of product (Alkene), hence higher the stability of alkene, higher will be stability of T.S hence higher will be r_{E2}

Stability order of TS $\Rightarrow$ TS-3 > TS-2 > TS-1

(hence order of r_{E2} for R–X) $\boxed{3^\circ > 2^\circ > 1^\circ}$

For E^1:

(a) (b) (c)

Since higher the ease of dissociation of R–X / higher the stability of cation higher wd be r_{E^1}, hence

order of r_{E^1} for R–X $\boxed{3^\circ > 2^\circ > 1^\circ}$

For E^1CB:

β- Anion stablising EWG group.

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(#) Nature of leaving Group:

⇒ Since Breaking of $-\overset{|}{\underset{|}{C}}-X$ Bond is involved in r.d.s of Both E^1 & E^2 mechanism hence higher the leaving Tendency higher wd be r_{E^1} & r_{E^2}.

For r_{E^1} & r_{E^2}

$$\boxed{R-I > R-Br > R-Cl > R-F}$$

⇒ For E^1CB Bad leaving group is required like $-OH, -OR, -F, -\overset{\oplus}{N}R_3$ ......

(#) Nature Of Base:

(For E^1) Since No Base is involved in r.d.s of E^1 mechanism hence

No effect of Base (Conc./Basicity/Size) on r_{E1}

For E^2: Since Base is involved in r.d.s of E^2 mech^n hence on increasing Concentration & Basic strength r_{E^2} increases

$\Rightarrow$ **Few Bases for E^2:**

(i) Alcohlic NaOH

(ii) Alcoholic KOH (Alcoholic potash)

(iii) $NaNH_2$ (Sodamide)

(iv)  (t-BuOK) potassium t-Butoxide

(v) Et_3N

(vi) DBN
Di Azo Bi Cyclo Nonane

(vii) DBU
Di azo Bicyclo undecane

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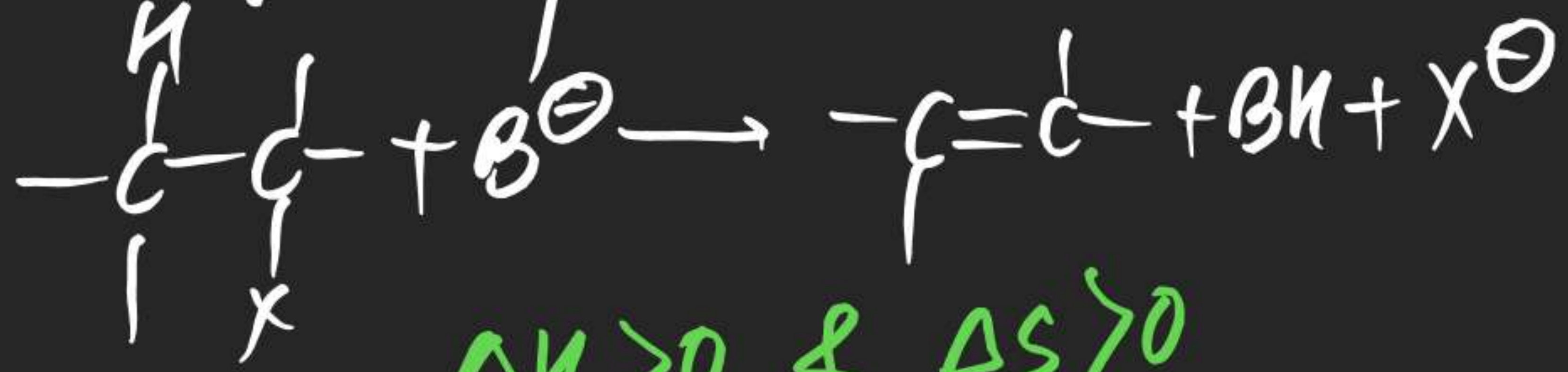
(#) effect of Solvent:-

$E^1 \Rightarrow$ Polar protic solvent

$E^2 \Rightarrow$ Polar Solvent

(#) $\boxed{\text{effect of Temp}}$

For any Ellimination Rx^n



$\Delta H > 0$ & $\Delta S > 0$

For Feasibility of Reaction

$\Rightarrow \Delta G < 0$

$\Rightarrow \underbrace{\Delta H}_{>0} - T\underbrace{\Delta S}_{>0} < 0$

possible only at high Temperature

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S_N2	S_N1	E1	E2
* $CH_3-X > 1° > 2° > 3°$ * $R-I > R-Br > R-Cl > R-F$ * Strong Nucleophile Aq. NaOH, NaI Aq. KOH, NaCN NaN_3 - - - - - - (*) PAS (DMSO, DMF - - - -)	* $3° > 2° > 1°$ * $R-I > R-Br > R-Cl > R-F$ (*) Weak Nucleophile H_2O, ROH, RCOOH - - - - (*) PPS (H_2O, ROH - - - -)	* $3° > 2° > 1°$ * $R-I > R-Br > R-Cl > R-F$ (*) Weak Base H_2O, R-OH, R-COOH - - - - (*) PPS (H_2O, ROH - - - -) (*) Δ (heating)	* $3° > 2° > 1°$ * $R-I > R-Br > R-Cl > R-F$ (*) Strong Base Alc. NaOH Alc. KOH t-BuOK - - - - - (*) Polar Solvent

Application of E^2 :-

(1) Dehydrohalogention:

⇒ Reaction in which hydrogen & halogen are elliminated

(1) $CH_3-CH_2-Cl \xrightarrow{Alc.\ NaOH}$

(2)  $\xrightarrow{\text{''}}$

(3)  $\xrightarrow{\text{''}}$

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(4)  $\xrightarrow{\;''\;}$

(5)  $\xrightarrow{\;''\;}$

(6) $D_3C-CD_2-Cl \xrightarrow{\;''\;}$

(7)  $\xrightarrow{\;''\;}$

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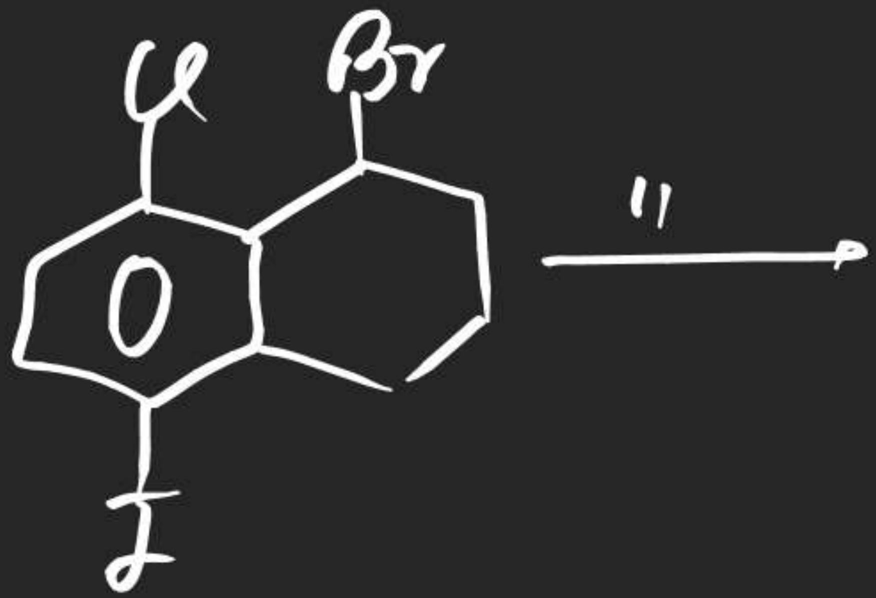
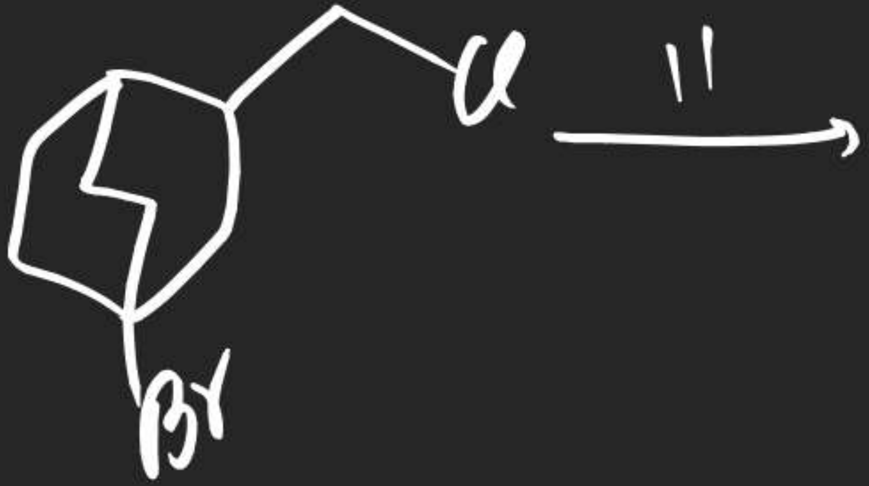
(8)

(9)

(10)



(11)



(12) 

(13) $\underset{Cl}{CH_2}-\underset{Cl}{CH_2} \xrightarrow[KOH]{Alc.} CH_2=\underset{Cl}{CH}$

Imp

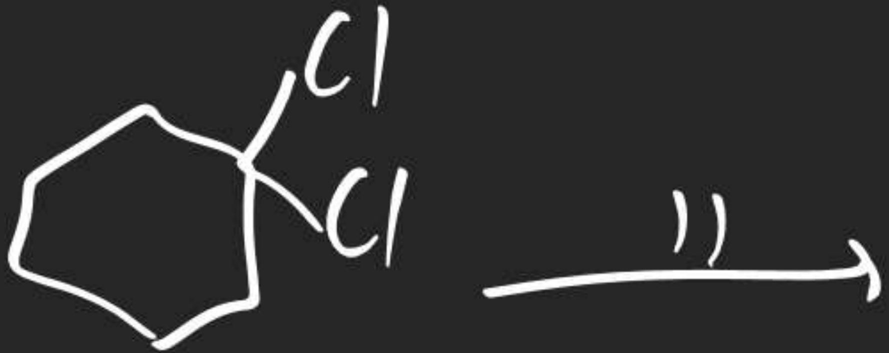
(14) $\underset{Cl}{CH_2}-\underset{Cl}{CH_2} \xrightarrow[(ii)\ NaNH_2]{(i)\ Alc.KOH} H-C\equiv C-H$

(15) Total No of moles of $NaNH_2$ can be consumed by 1 mole of 1,2-dichloro Ethane.

(16) $CH_3-CHCl_2 \xrightarrow[\text{(ii) } NaNH_2]{\text{(i) Alc. KOH}}$

(17) 

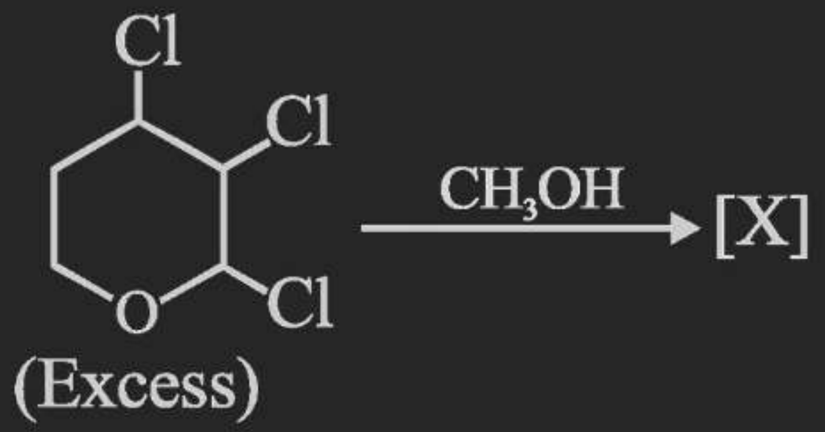
(18) 

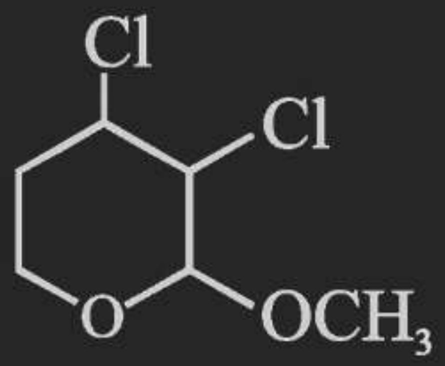
(19) 

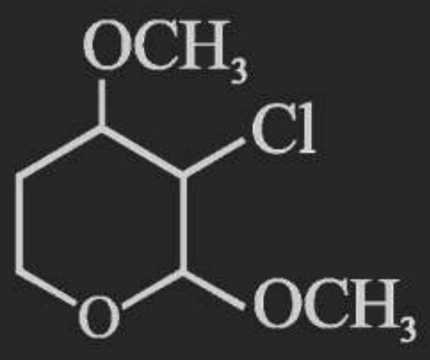
(20) 

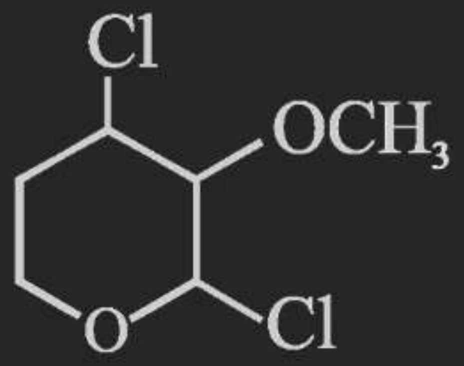
EXERCISE - I (MAINS ORIENTED) PPT-1

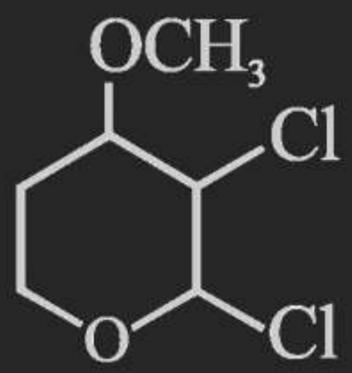
1. Major product of following reaction is:



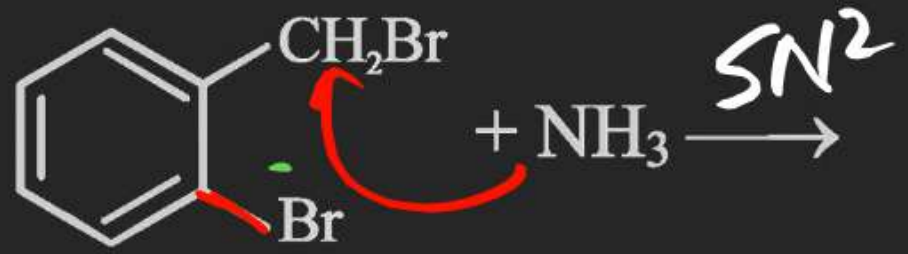
(A) 

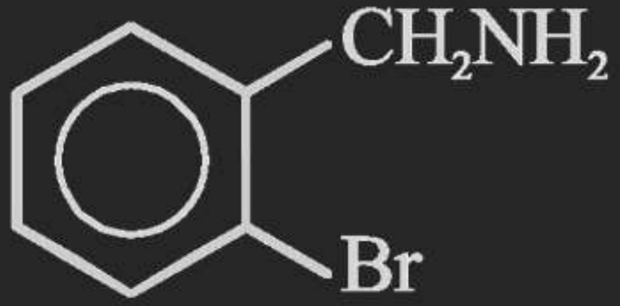
(B) 

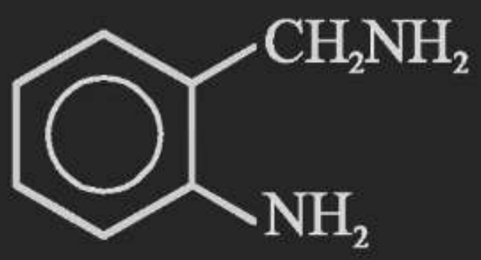
(C) 

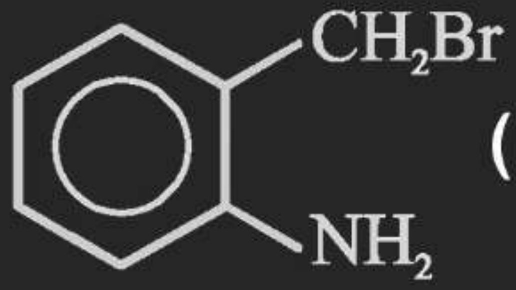
(D) 

24. The major product in the given reaction is:



(A) 

(B) 

(C) 

(D) All of these

26. Which will give white ppt. with $AgNO_3$?

(A) 

AgCl

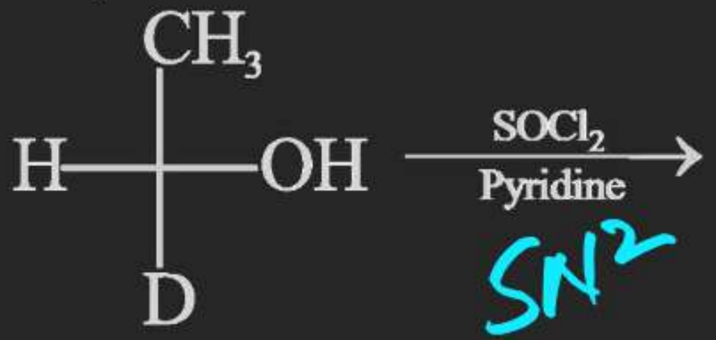
(B) 

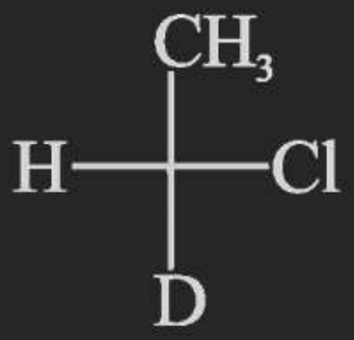
(C) 

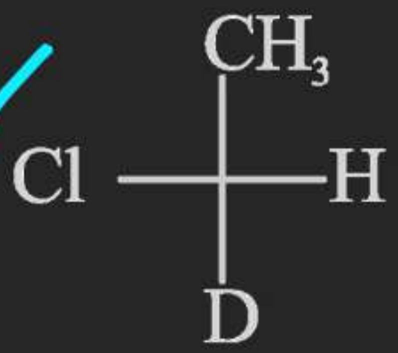
AgCl

(D) Both (A) and (C)

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



(A) 

(B) 

(C) $H_2C = CH_2$

(D) $H_2C = C\begin{smallmatrix} H \\ D \end{smallmatrix}$

33. The reaction of $SOCl_2$ on alkanols to form alkyl chlorides gives good yields because

(A) Alkyl chlorides are immiscible with $SOCl_2$

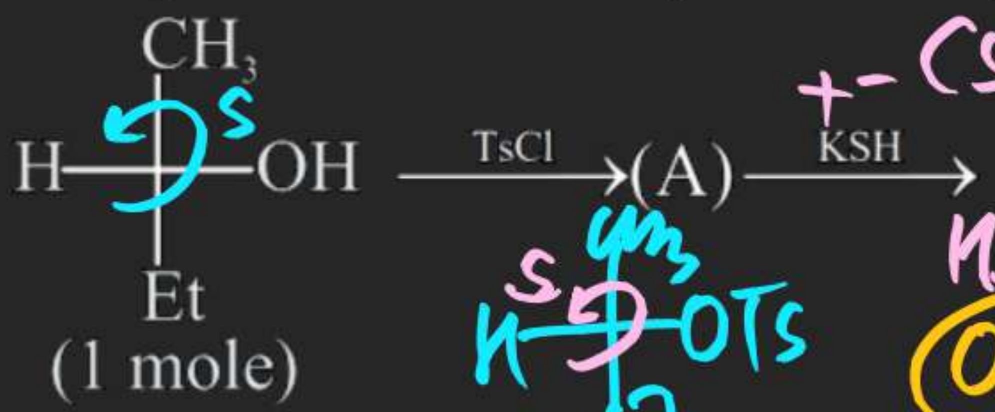
(B) The other products of the reaction are gaseous and escape out

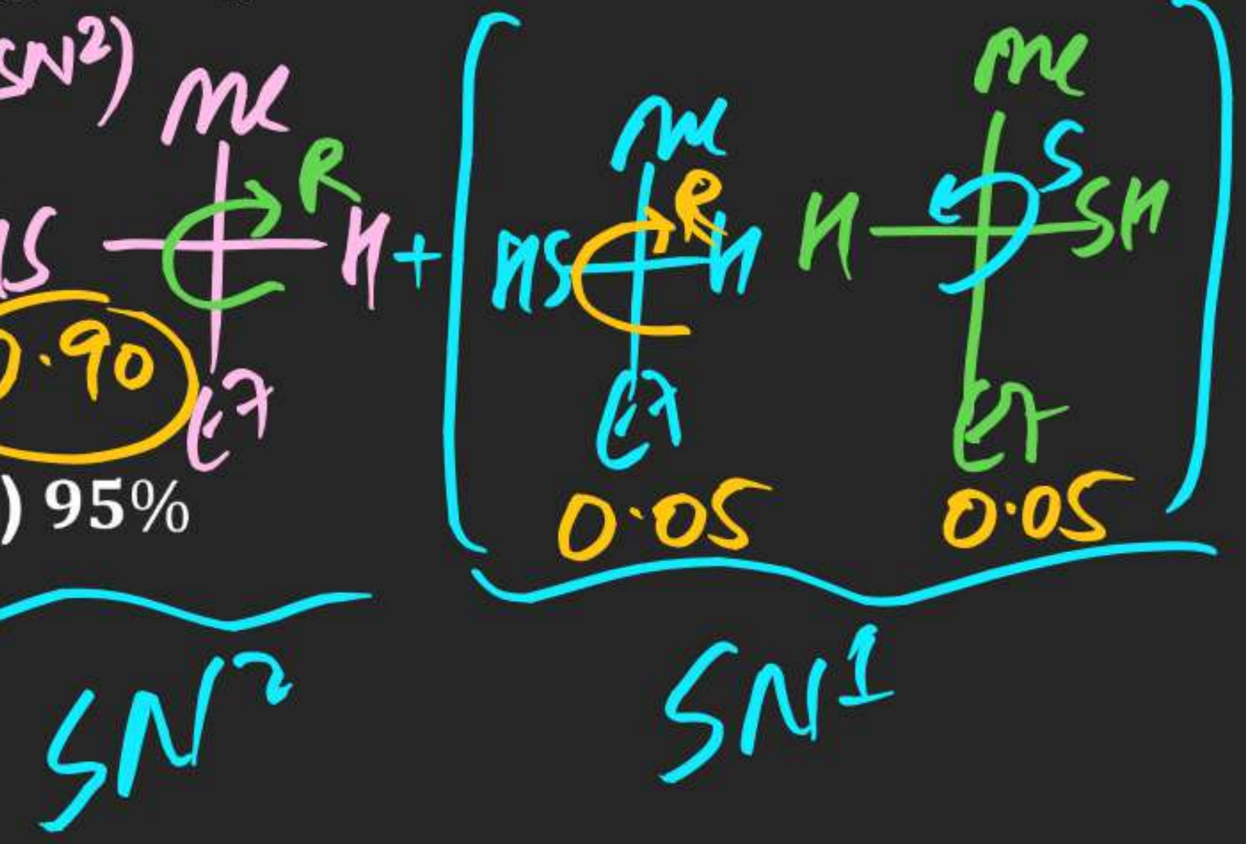
(C) Alcohol and $SOCl_2$ are soluble in water

(D) The reaction does not occur via intermediate formation of an alkyl chloro sulphite

32. Assuming all the substrate convert into substitution products containing 0.05 mole of Configuration, calculate the percentage of S_N2 mechanism.

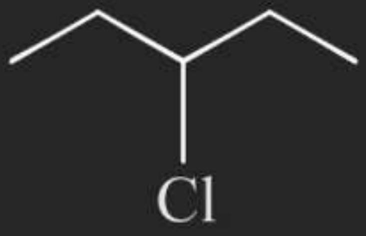
"S"

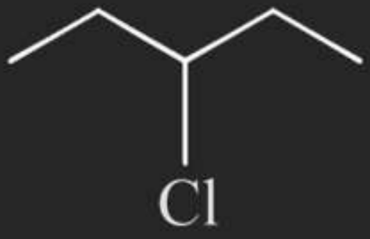


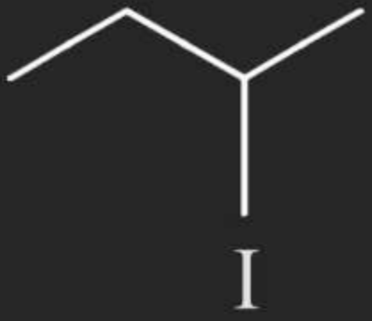
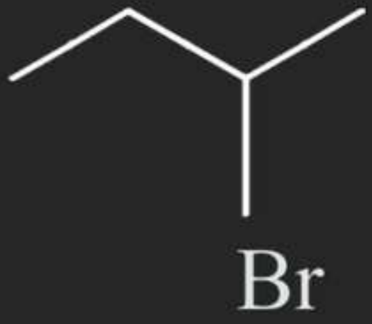


(A) 90% (B) 80% (C) 70% (D) 95%

35. In the given pairs, which pair represent correct order of rate dehydrohalogenation reaction.

(A)  < 

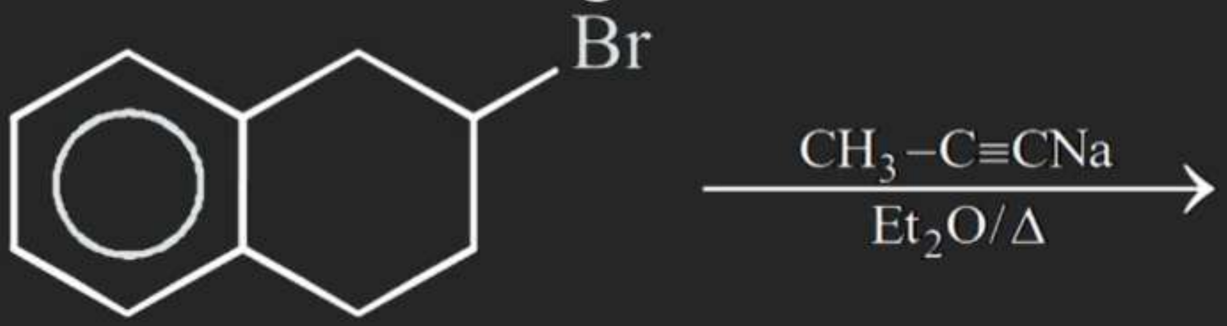
(B)  < 

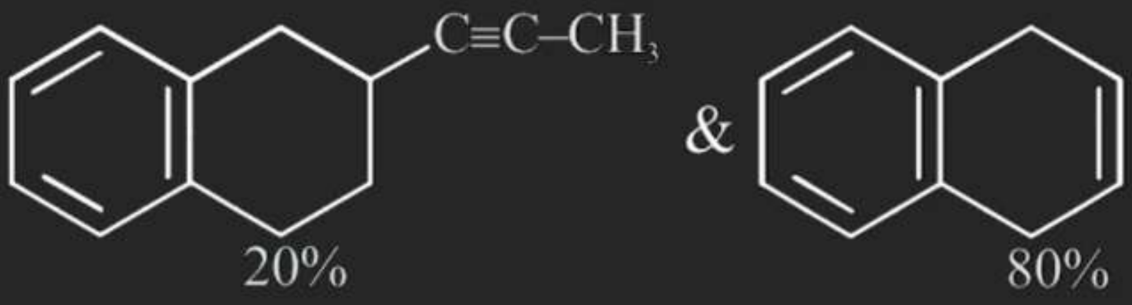
(C)  < 

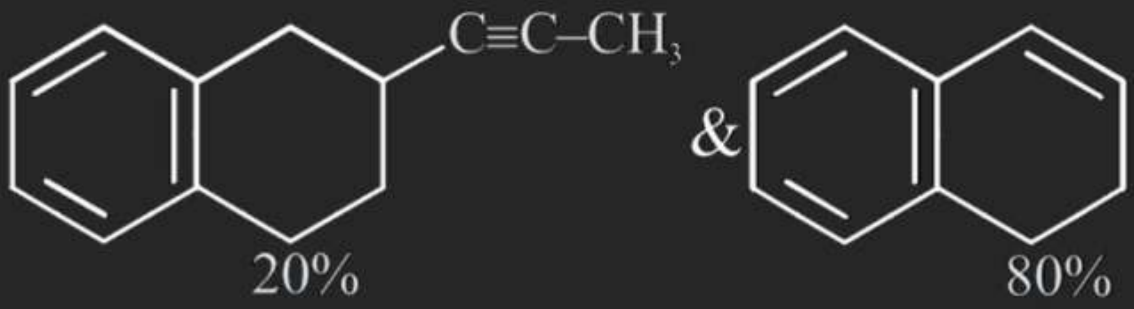
(D) $CH_3-CH_2-Cl < CD_3-CD_2-Cl$

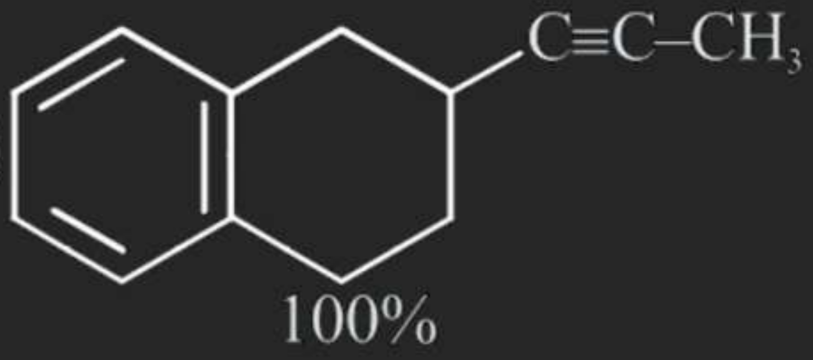
Next 50 Questions

41. Major product of following reaction is:



(A) 

(B) 

(C) 

(D)