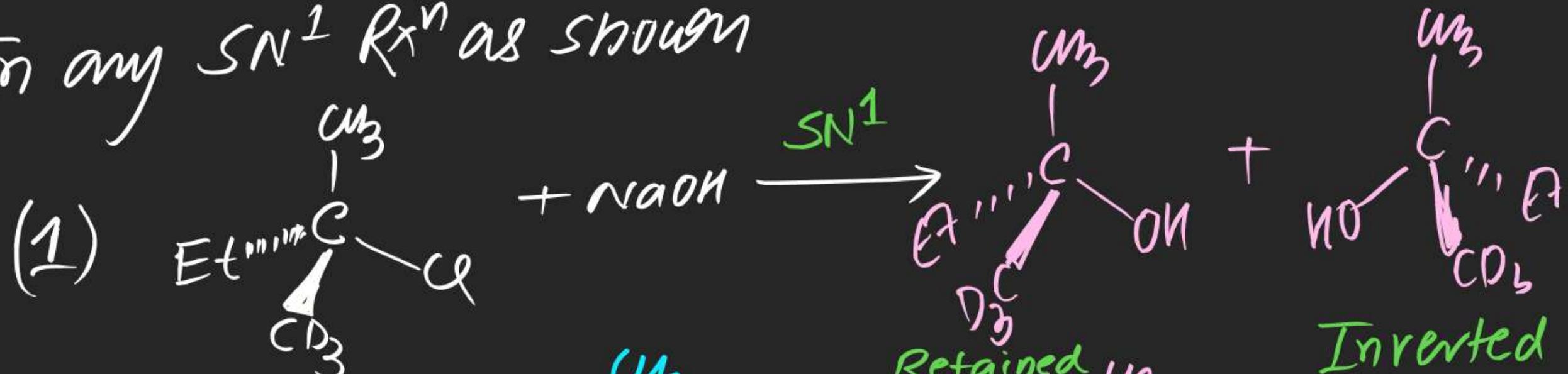
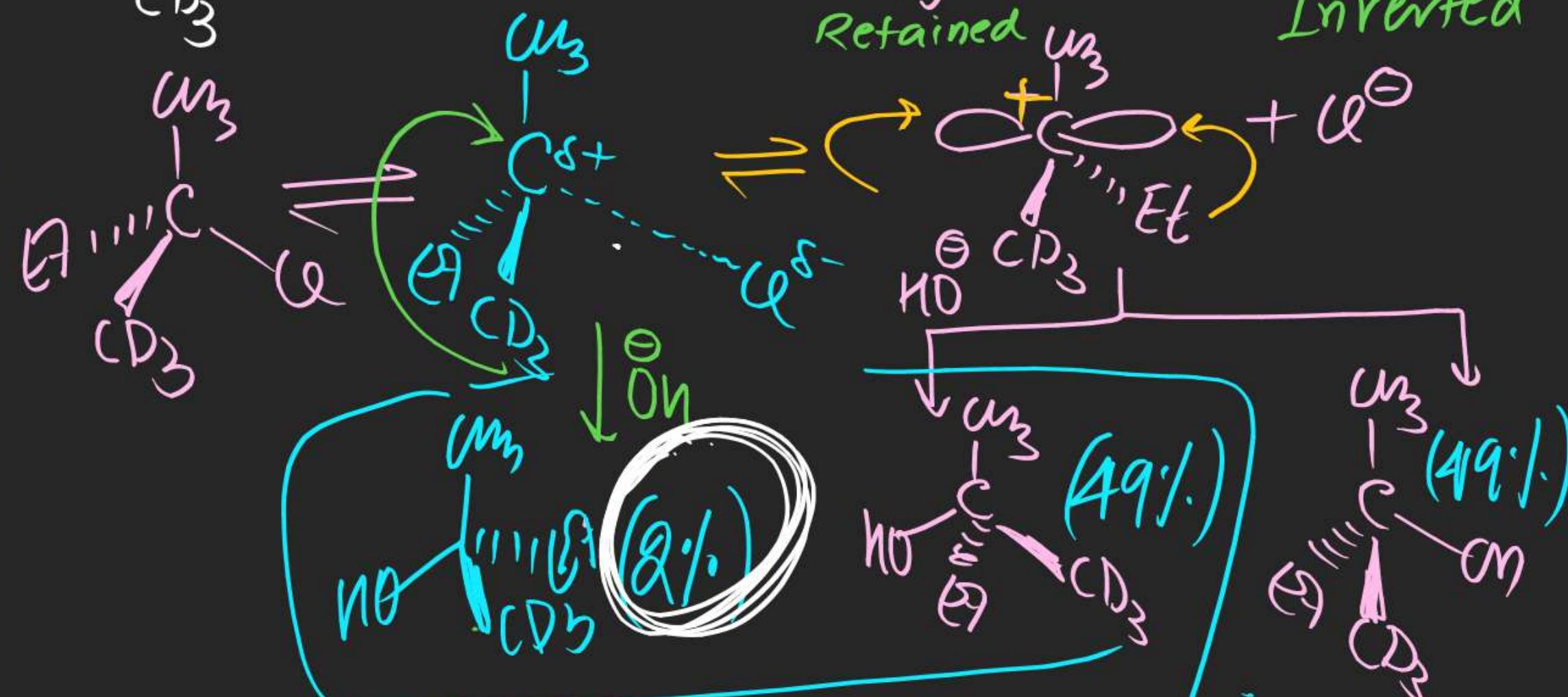


(#) Stereochemistry of SN^1 mechanism:

In any SN^1 Rxn as shown



Mechn:



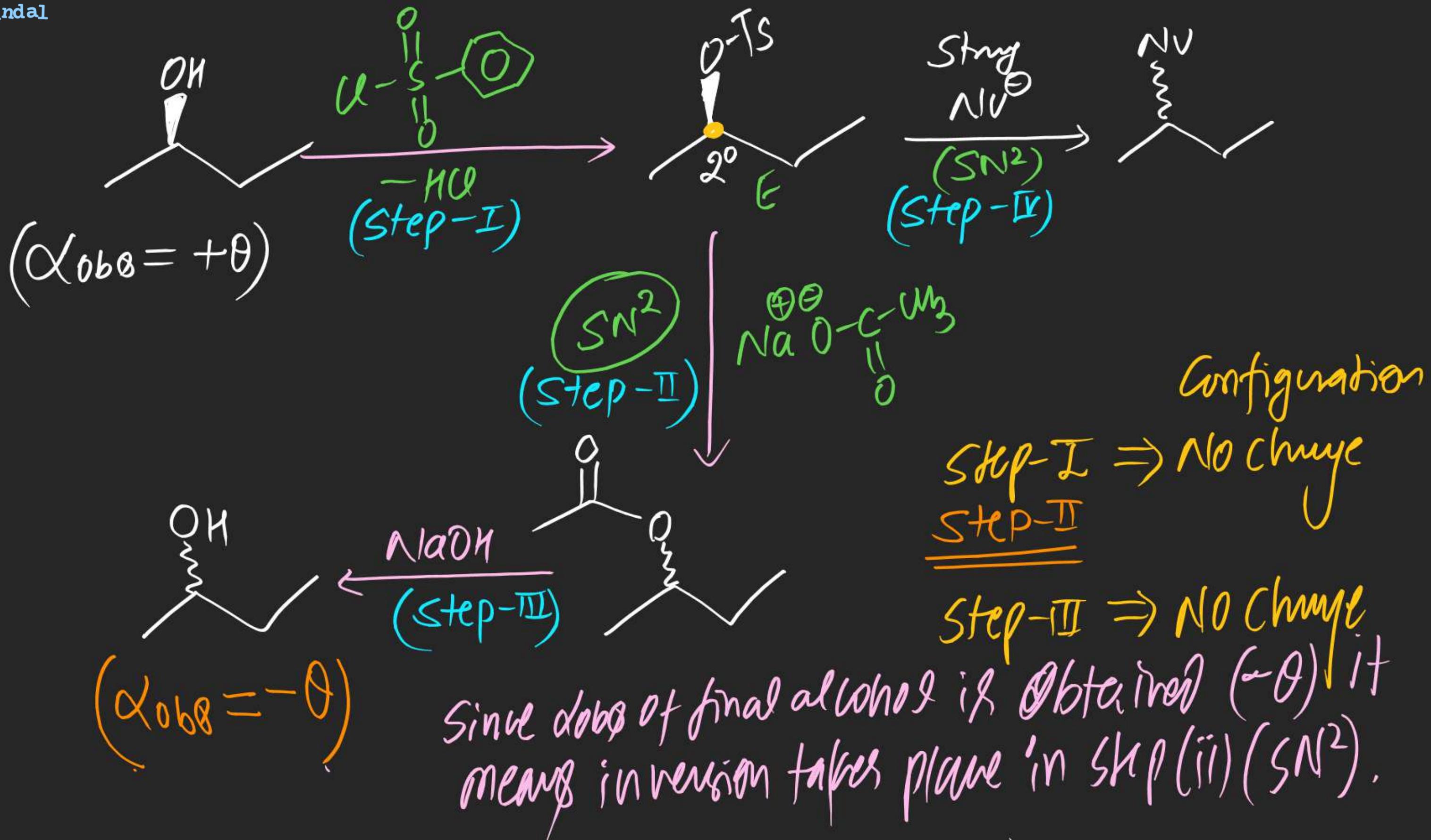
Note (Ques) During S_N^1 mechanism Partial Racemisation takes place.

- (1) Slightly Inrated product dominates over Retained product
- (2) Extent of Racemisation \propto Stability of Carbocations
in S_N^1 mechⁿ \propto leaving Tendency of I_2
 $\propto \epsilon$ (dielectric constant) solvent
 $\propto \frac{1}{\text{optical purity}}$

(#) Stereochemistry of SN^2 mechanism:

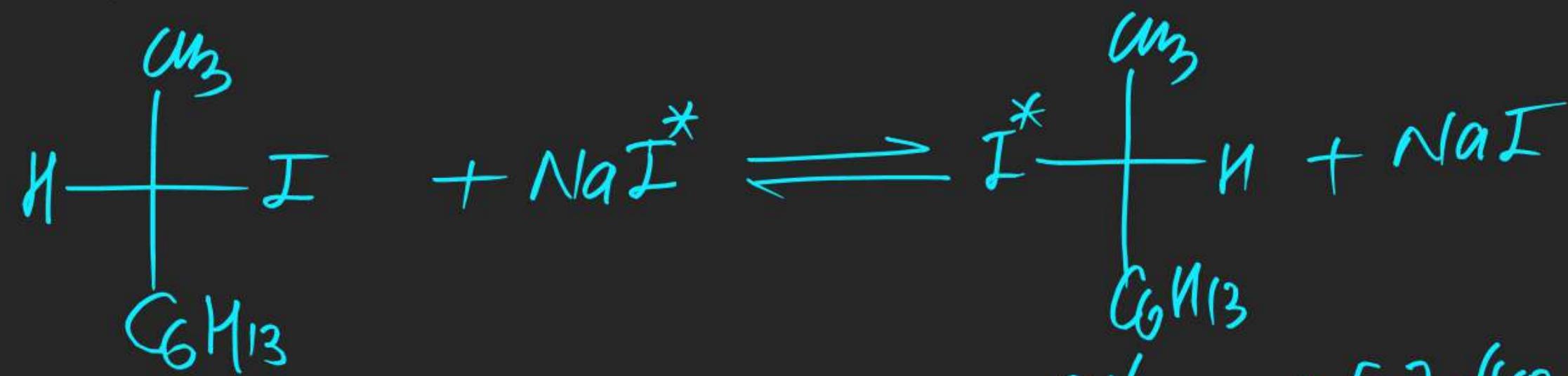
- ⇒ Inversion Takes place during SN^2 mechanism & Process is known as Weldon Inversion.
- ⇒ Configuration wd never change when Reaction doesn't take place at chiral centre
- ⇒ Configuration may or may not be change when Reaction takes place at chiral centre

Ex-1: In following Reaction sequence we are starting with a optically pure alcohol with known D_{20°



Ex-2:- (+)-2-Iodo octane gets slowly Racemised on Reaction with NaI^* (I^* Radioactive Iodine). Explain why?

Soln:



$t=0$

100%

$(100-x)\%$

$t=t$

0%
 $x\%$

$$\left\{
 \begin{array}{l}
 [\text{+}] = (100-x)\%, \\
 [-] = x\%, \\
 \text{OP} = 100-2x\%,
 \end{array}
 \right.$$

Racemised part = $2x\%$

$t=eq$

50%

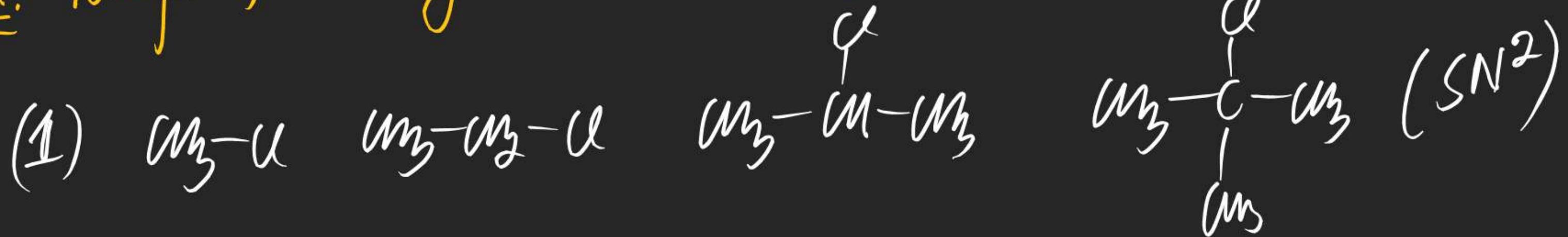
$$\left\{
 \begin{array}{l}
 K_{eq} = 1 \\
 \chi_{Dob} = 0
 \end{array}
 \right.$$

Slow Racemisation is possible when mirror image
Compound of Reactant is also present in mixture
which would certainly obtained by Inversion during S_N^2 mechanism.

(x)

$$\frac{\gamma_{\text{Racemisation}}}{\gamma_{\text{substitution}}} = \frac{2x}{x} = 2$$

Ex: Arrage following in ↓ order of rate of S_N mechanism



(3) $\text{Hg}-\text{CH}_2-\text{Cl}$ $\text{H}_3\text{C}-\overset{\text{O}}{\text{---}}\text{CH}_2-\text{H}$ (SN^2)

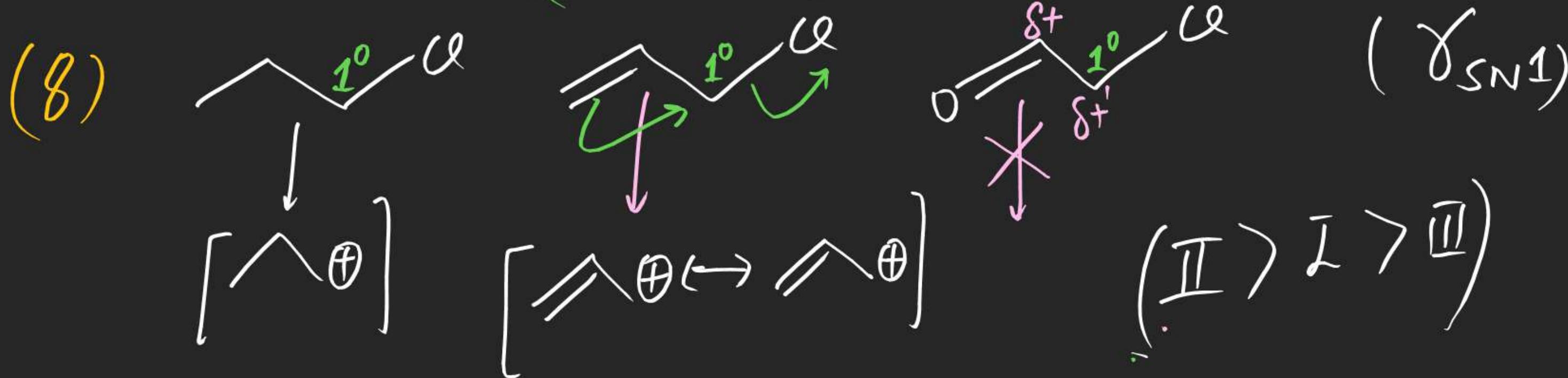
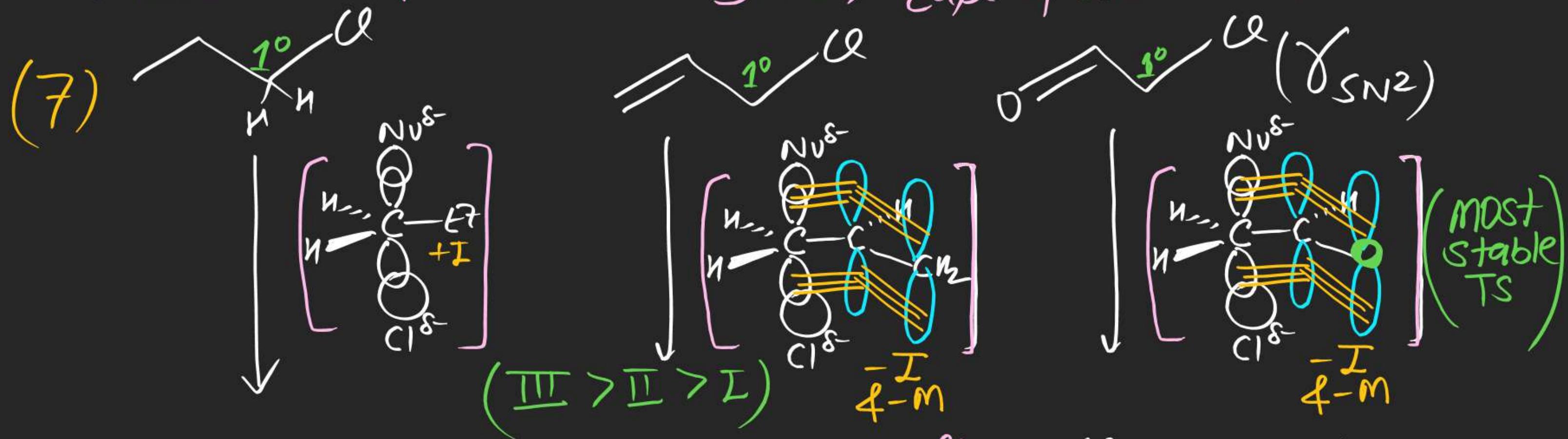
$$(4) \quad \underline{\hspace{1cm}} - \underline{\hspace{1cm}} - \underline{\hspace{1cm}} - \underline{\hspace{1cm}} \quad (\sin^1)$$

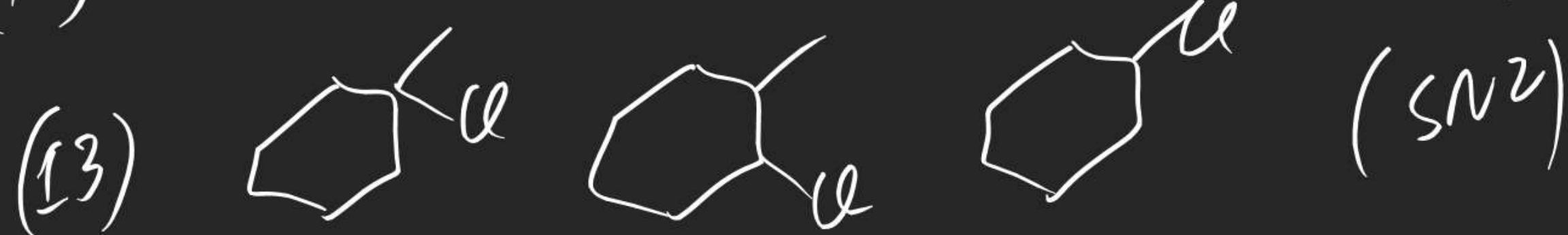
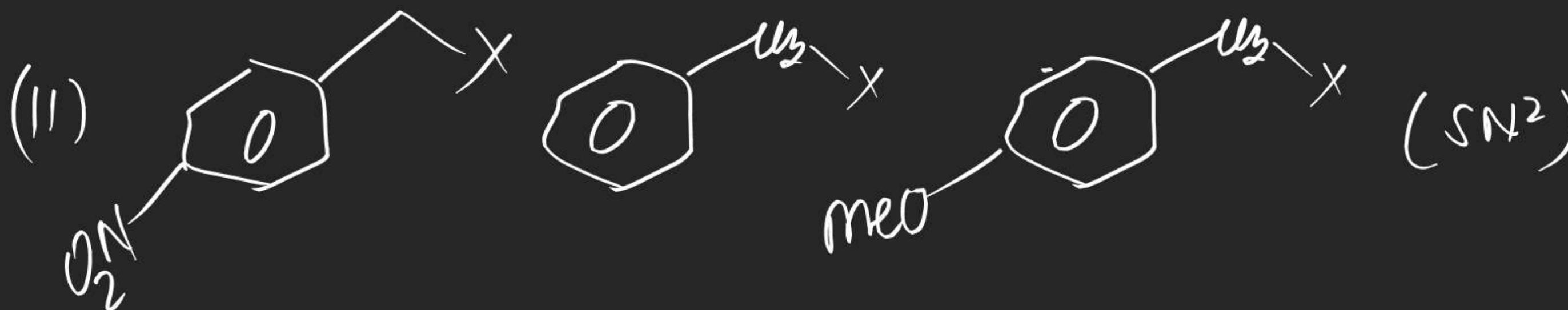
(5)  (SN^2) ($\text{III} > \text{II} > \text{I}$)

$$(6) \quad - - - - - \quad (SN^+) \quad (I > II > III)$$

If Substrate degree is same

$SN^2 \Rightarrow TS$ Stability (EWG)
 $SN^1 \Rightarrow$ Ease of dissociation





$$(14) \quad - - - - \overbrace{\hspace{10em}} \quad - - (\sin^{-1})$$

(25) H_3C-CH_2 D_3C-CH_2 (SN^2)

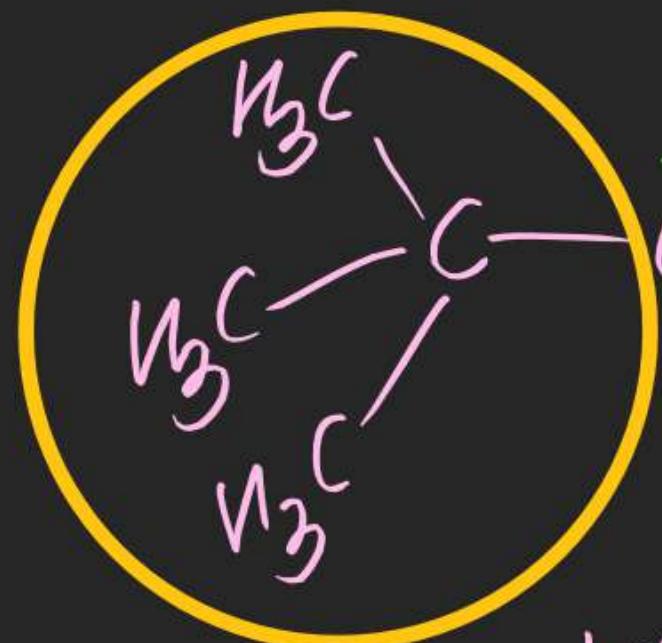
$$(16) \quad \begin{array}{c} M_3 \\ M_2 \\ M_1 \end{array} \rightarrow \begin{array}{c} D_3 \\ D_2 \\ D_1 \\ \emptyset \end{array} \cup \quad (SN^1)$$

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(17) 

	SN^1	SN^2
Arly halide	X	X
Vinyl halide	X	X
Bridge head halide	X	X

(ii)

neopentyl halide

SN^1 ✓ SN^2 X
 (slow)