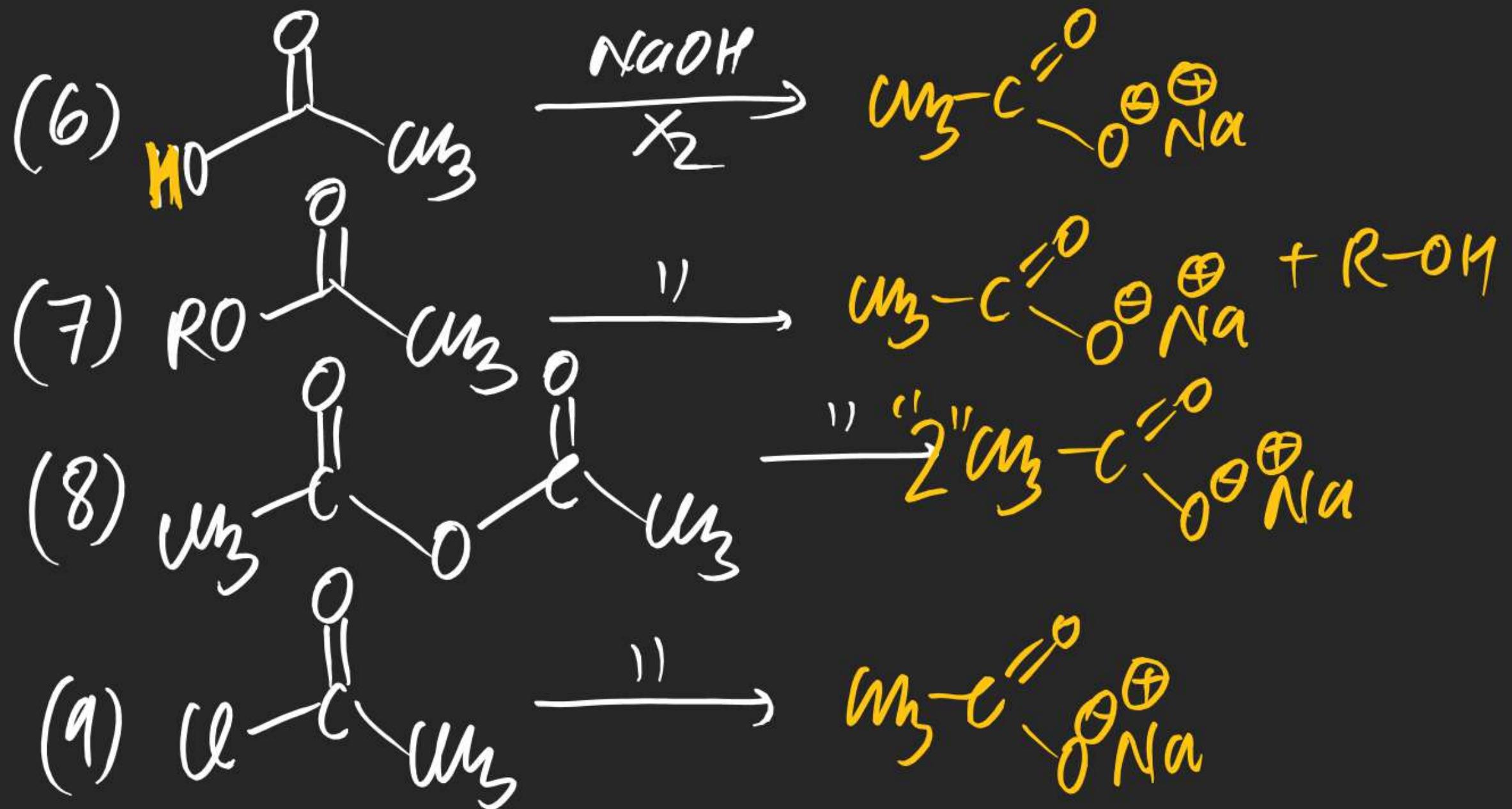
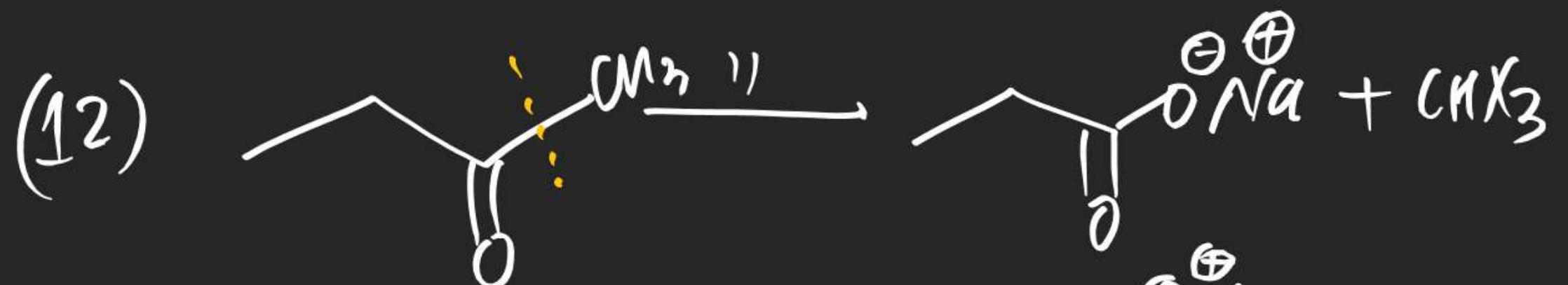
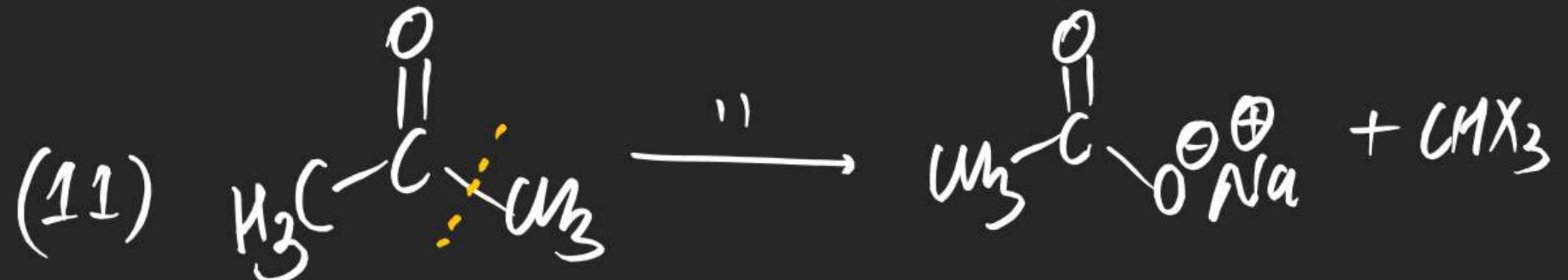


isolated in Basic condn.

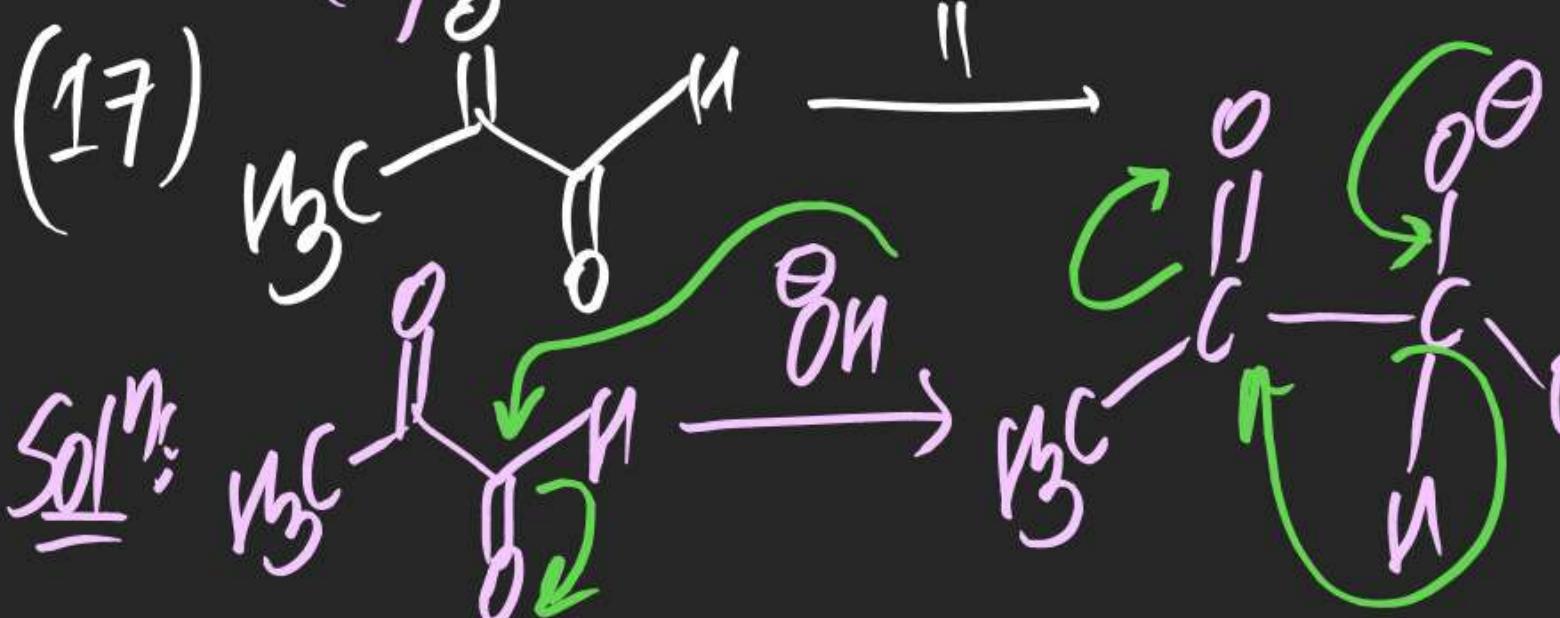
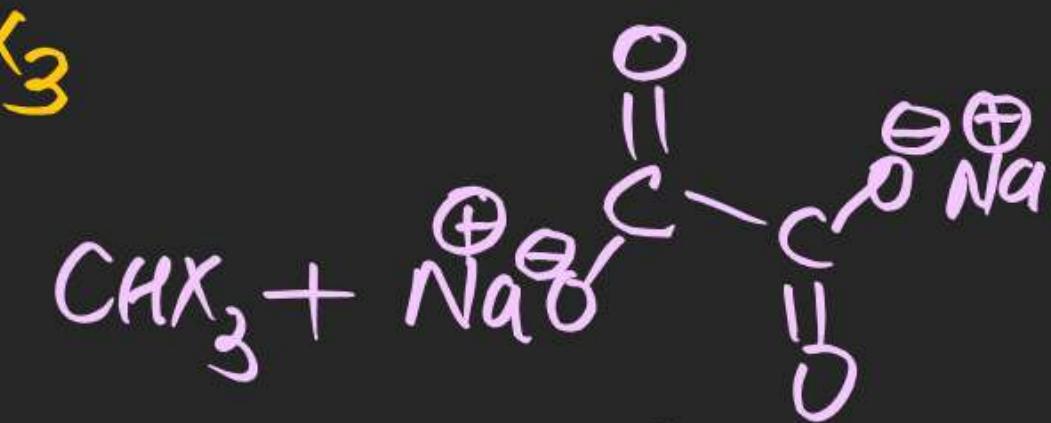
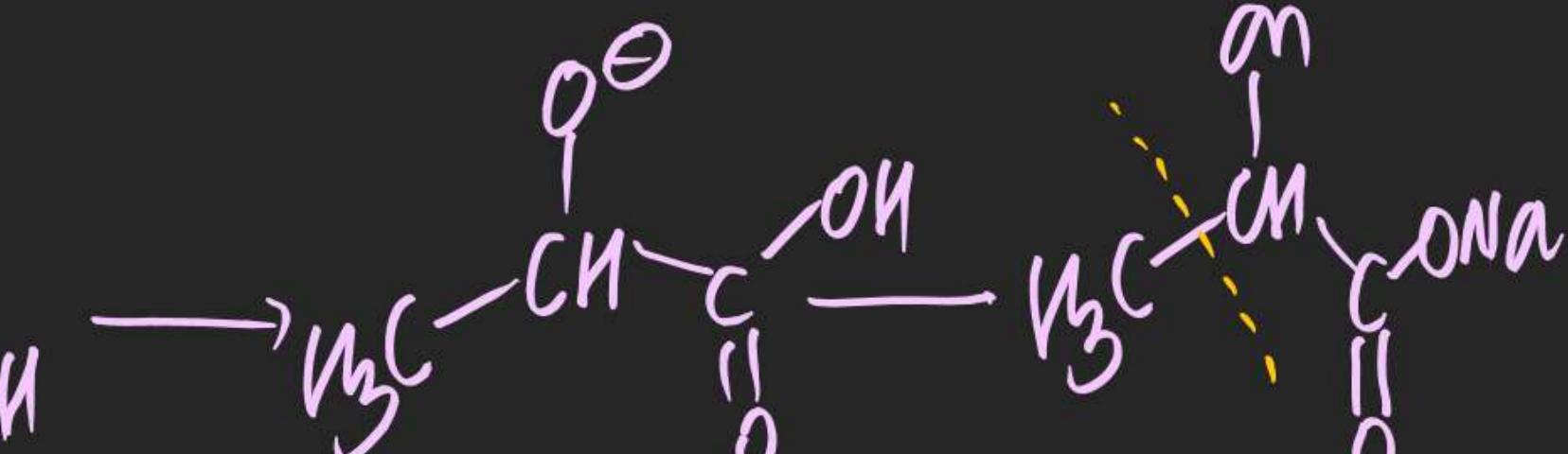


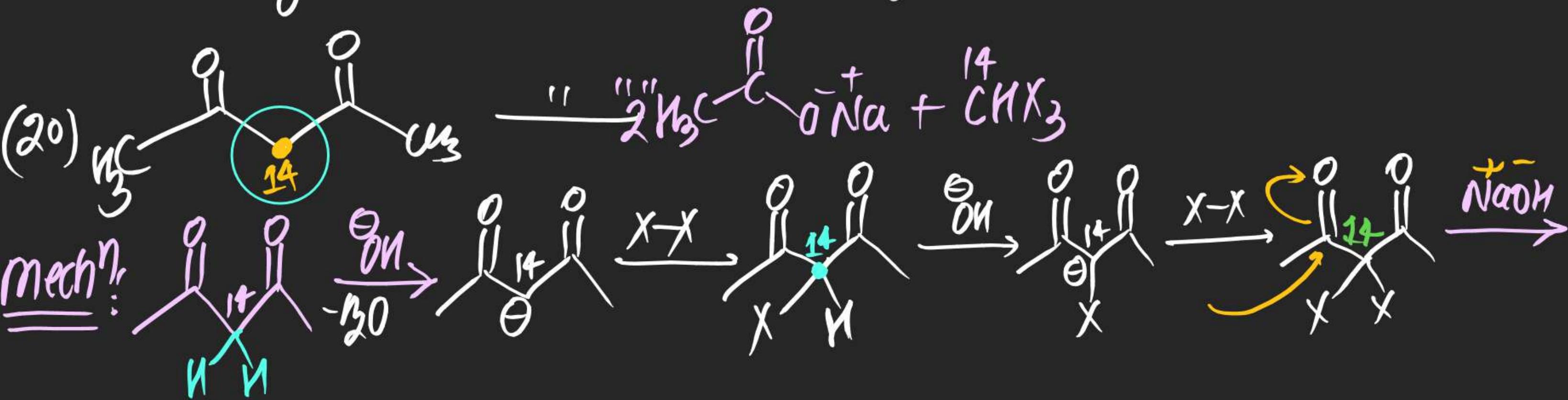
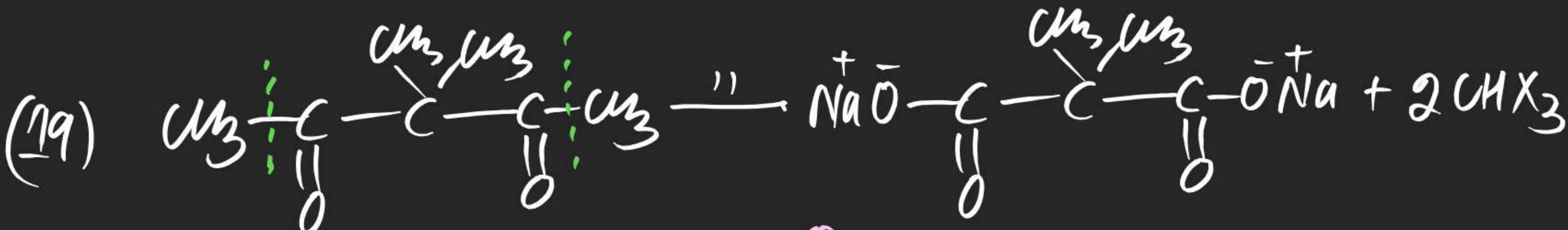


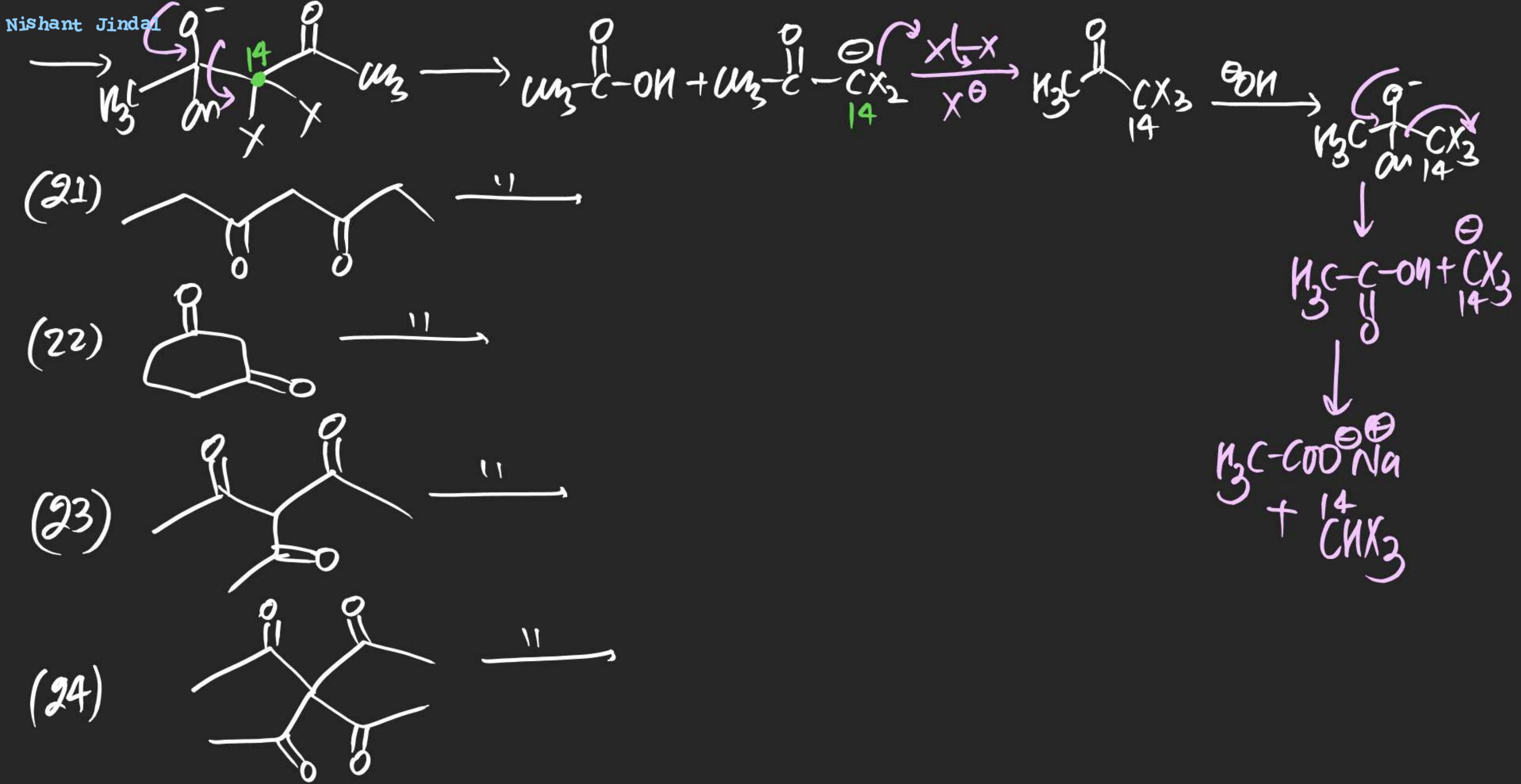
(14)

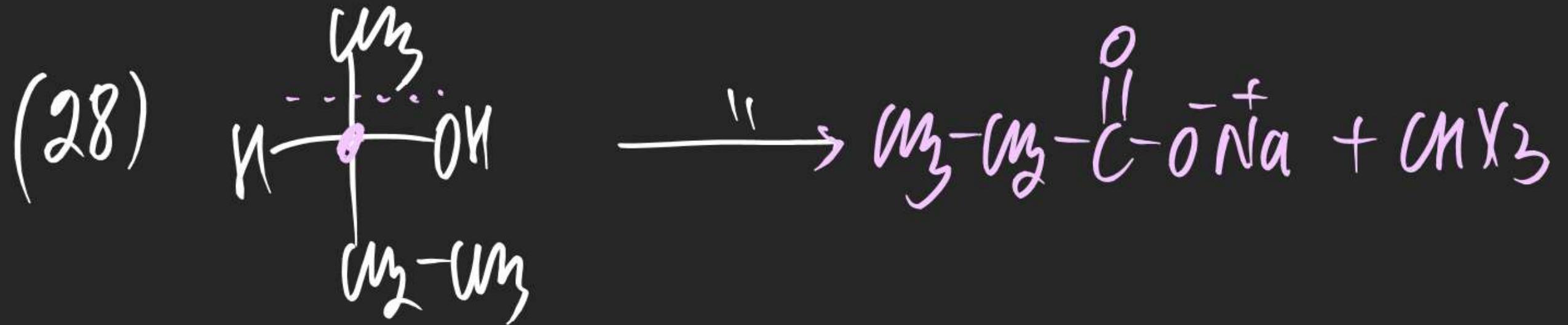
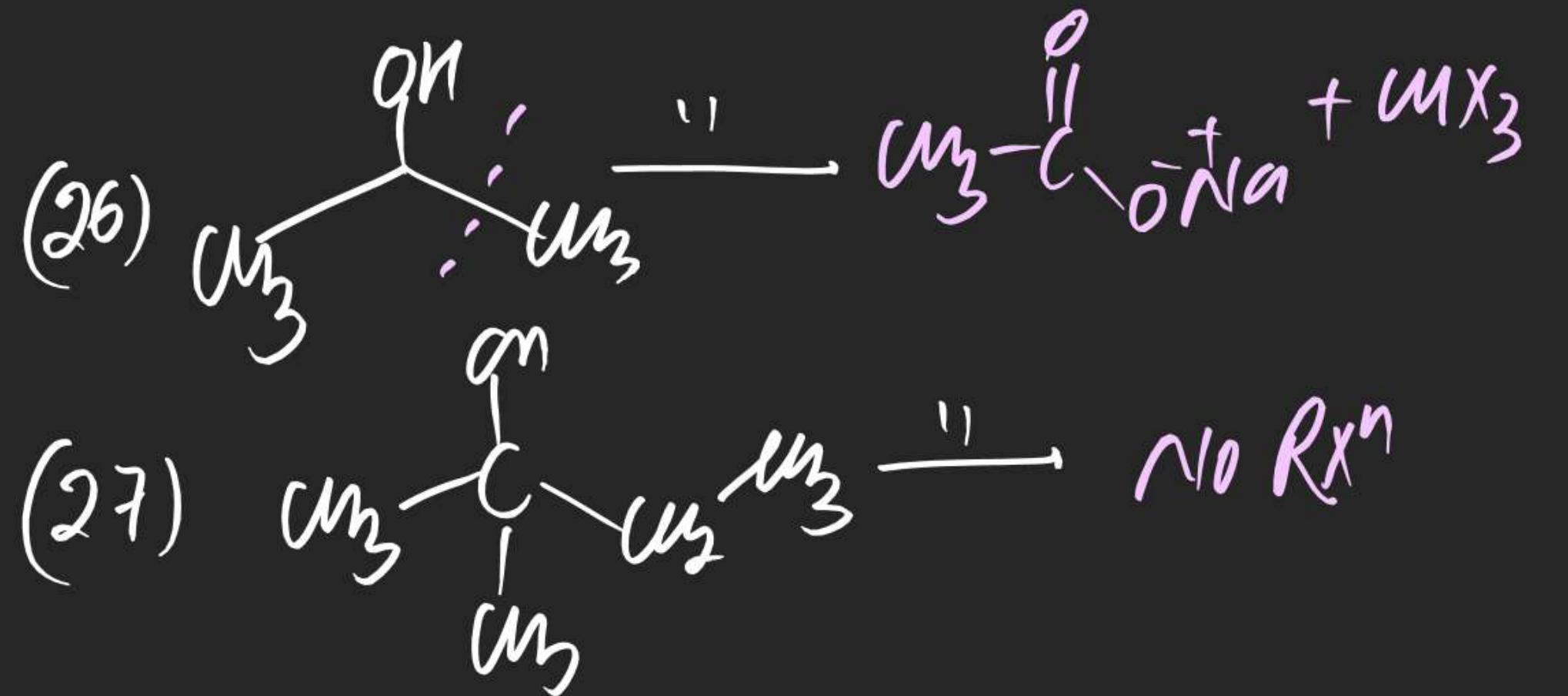


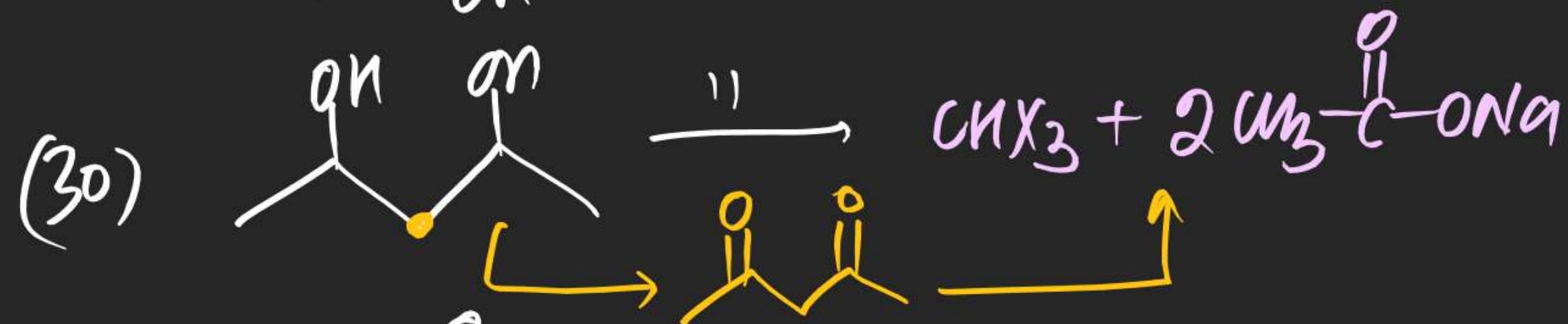
(15)

(16)  $\text{HC}\equiv\text{C}-\text{C}(=\text{O})-\text{COOH}$   
*(Pyrvic Acid)*Sol'n:









(a)  $t=0 \quad \begin{matrix} 1 \\ 1 \end{matrix} \quad \begin{matrix} 1 \\ 1 \end{matrix}$   
 $t=60\text{m} \quad \left(1 - \frac{1}{3}\right) = \frac{2}{3} \quad \left(1 - 3\left(\frac{1}{3}\right)\right) = 0$



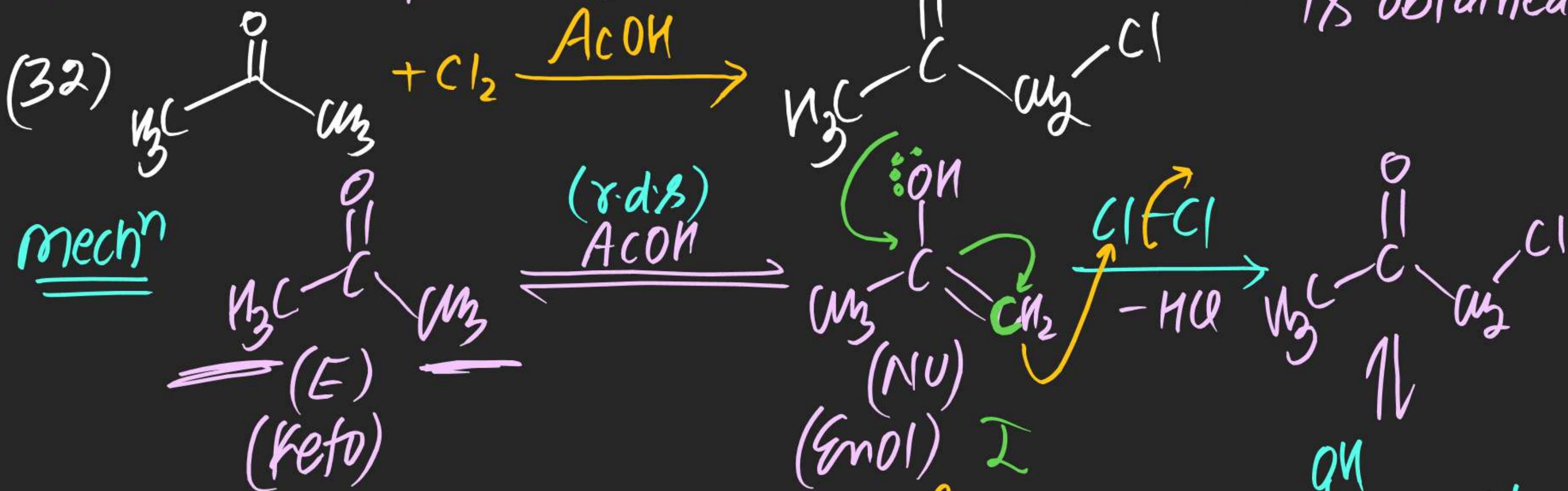
(b)  $\frac{1}{1/3} : \frac{2}{0}$



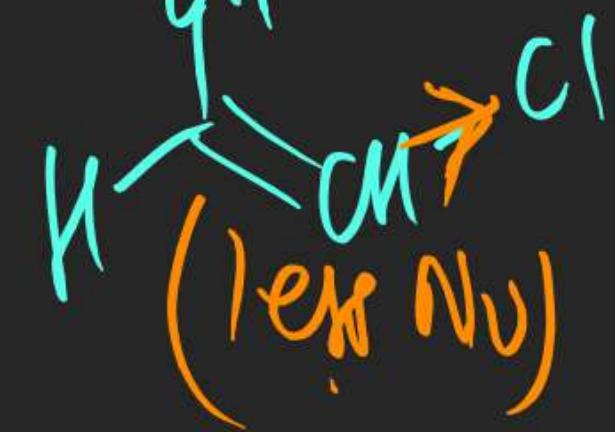
(c)  $\frac{1}{0} : \frac{3}{0}$



Nishant Jindal  
 (#) Acid Catalysed Halogenation : (e.g. M·M·Imp)  
 ⇒ on Acid Catalysed halogenation mono / di / Tri halogenated product is obtained.



Note (i) Rxn gets slow down as proceeds  
 (ii) step-I (Keto to Enol) is r.d.s

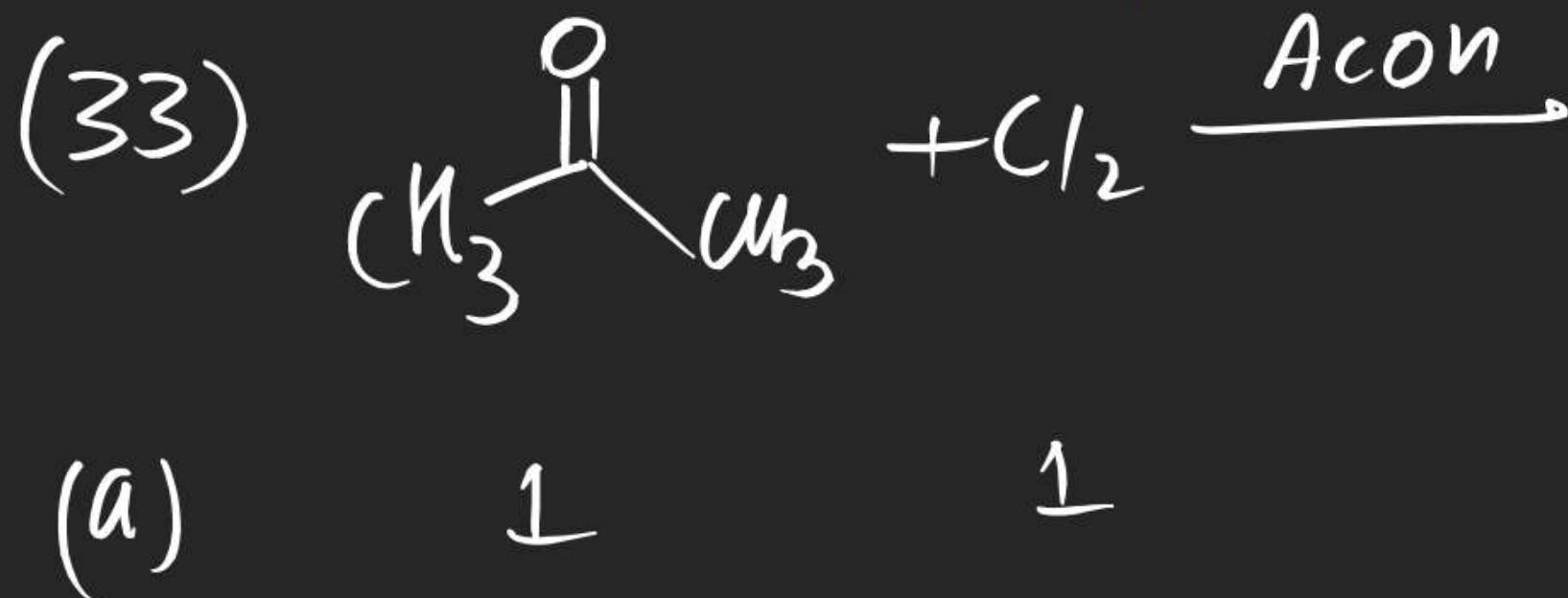


(iii) Rate exp.

$$\gamma = K \left[ \text{Cyclohexanone} \right]^1 [x_2]^0$$

$$\Rightarrow \gamma = K[\text{Acetone}]$$

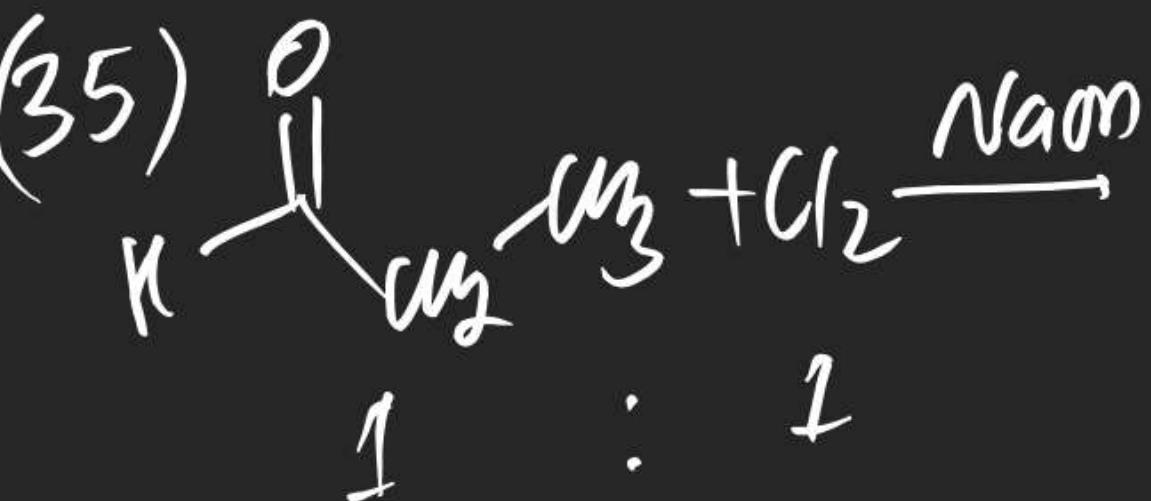
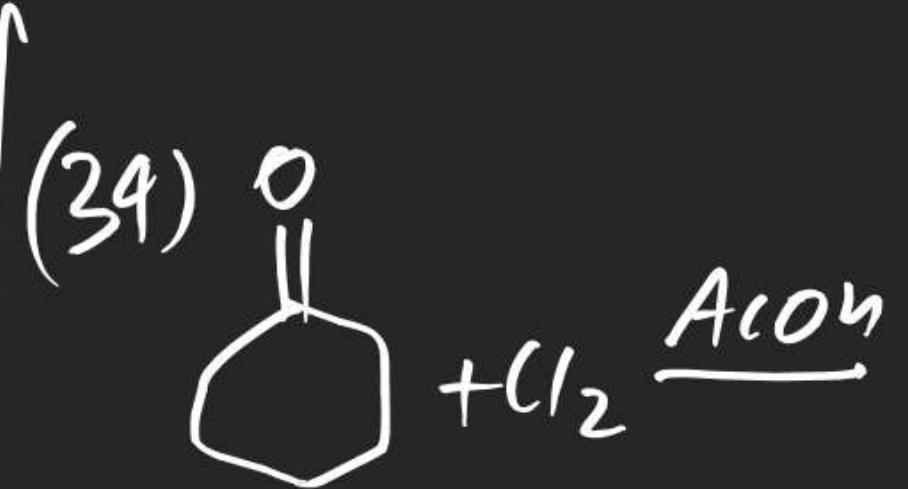
(iv) rate of halogenation



(a)

(b)

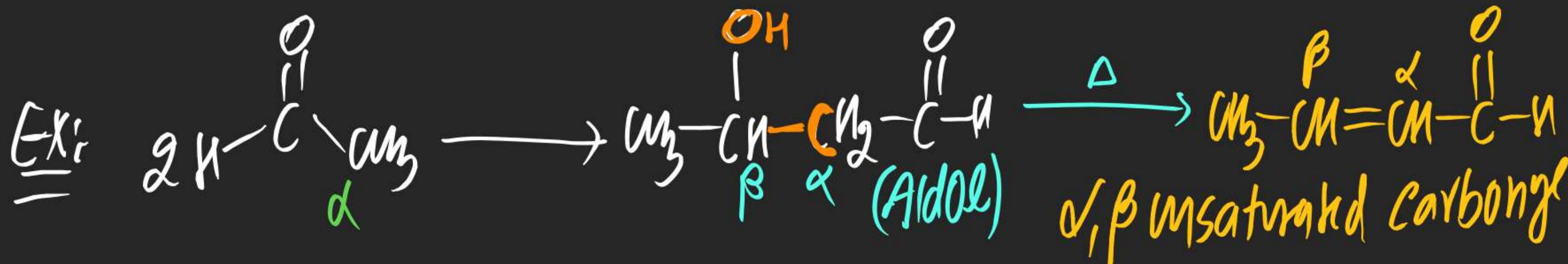
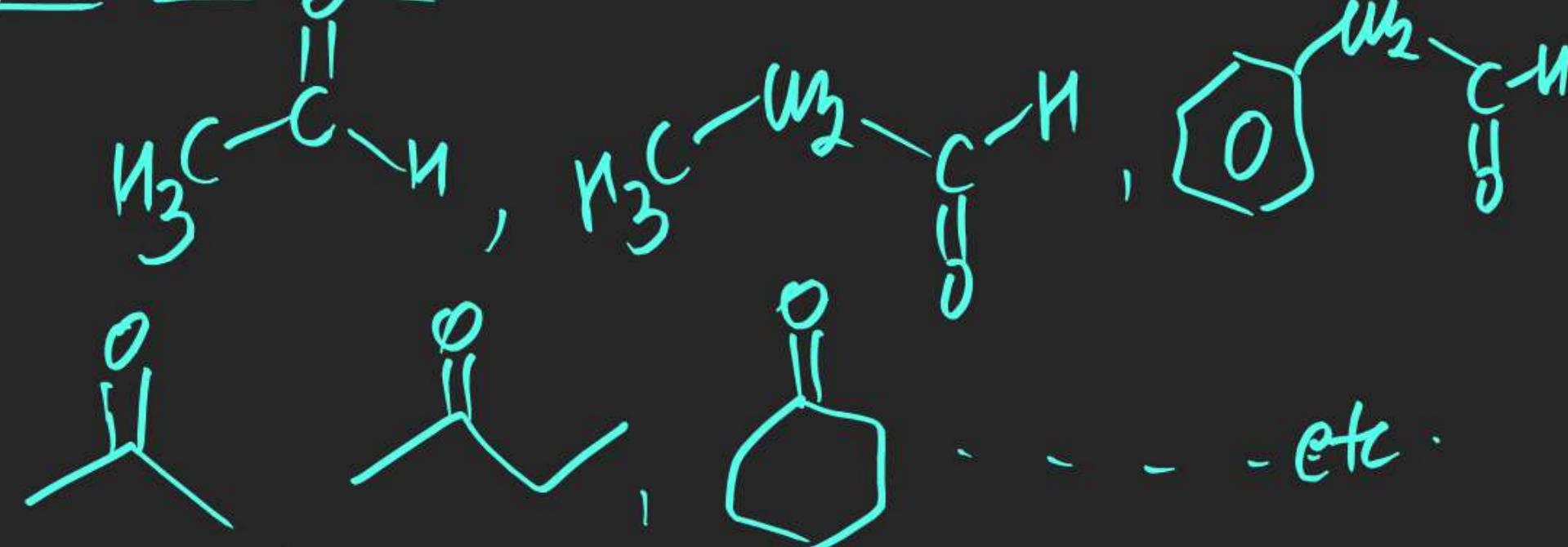
2



## Aldol Reaction / Aldol Condensation

→ Carbonyl compound containing " $\alpha$ " H atom gets dimerised to give  $\beta$ -hydroxy carbonyl compound (Aldol) as a product.

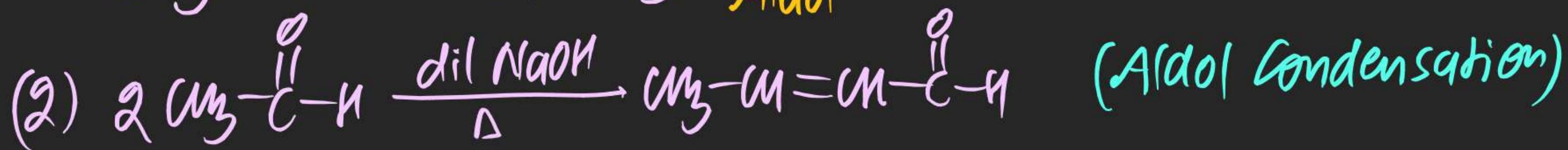
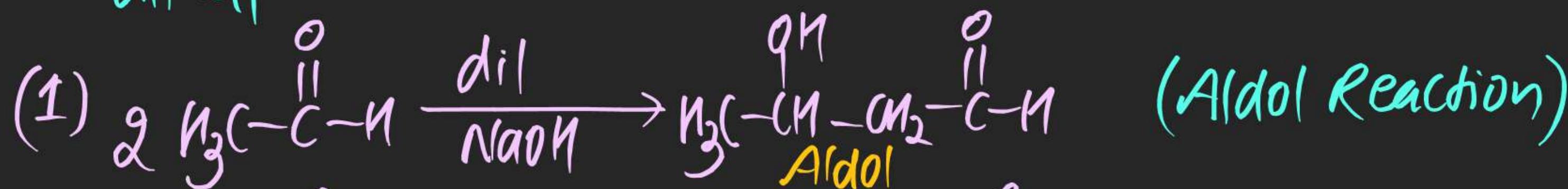
Ex: Carbonyl compound with " $\alpha$ " H



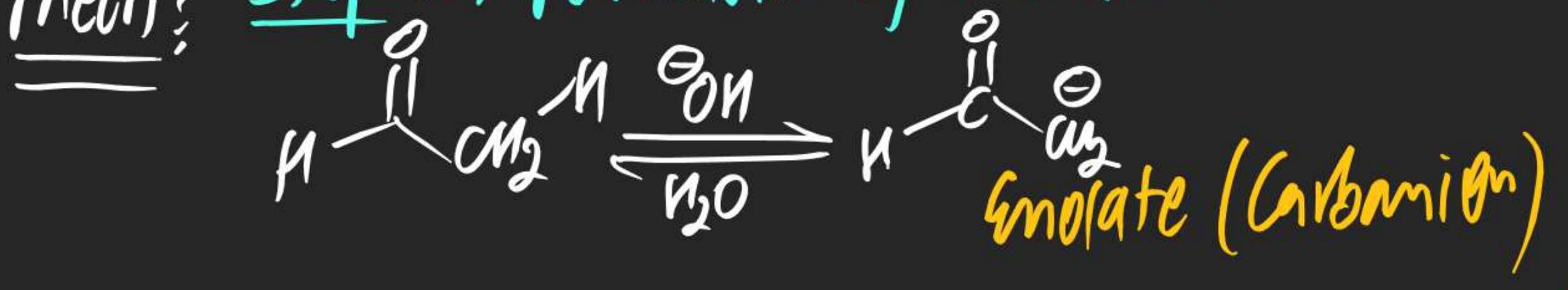
$\Rightarrow$  Aldol Rxn Can be Catalysed Both By Acid & Base

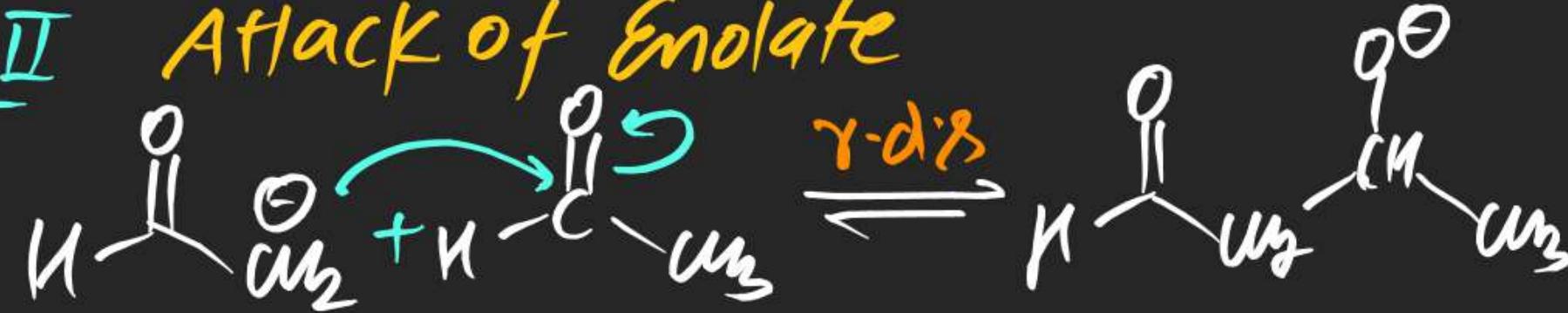
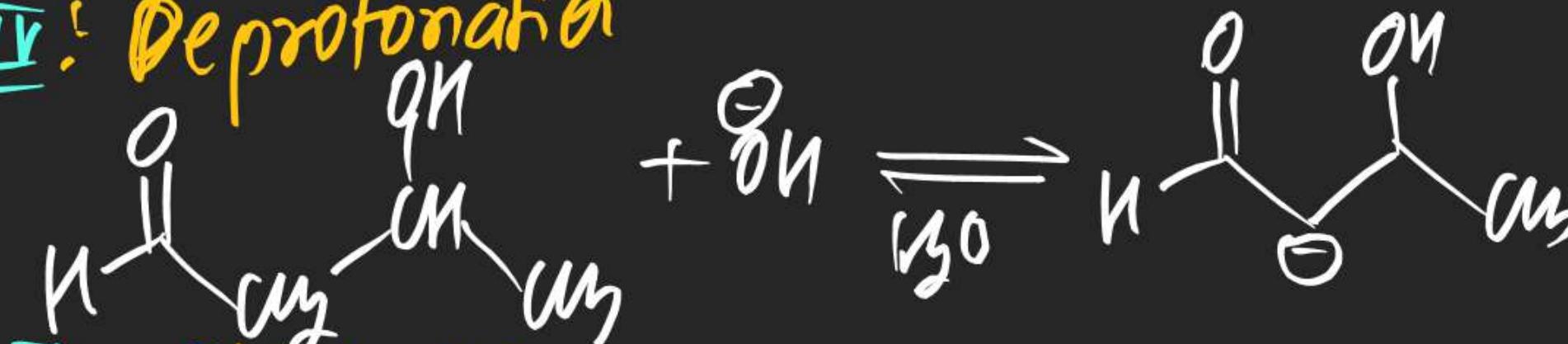
### Base Catalysed Aldol :-

$\Rightarrow$  whenever Carbonyl Compound with " $\alpha$ " H is treated with dil alkali Aldol is obtained as a product



mech<sup>n</sup>: Step-I: formation of Enolate ion



Step-II Attack of EnolateStep-III ProtonationStep-IV: DeprotonationStep-V Elimination

Note (i) Carbamion (Enolate) Intermediate

(ii) Step-II (Attack of enolate) is  $\text{r} \cdot \mathcal{J}$

(iii) Alkali oftenly used in Aldol Rxn

dil NaOH

dil KOH

\*\*  $\text{Ba(OH)}_2$

Aq.  $\text{K}_2\text{CO}_3$

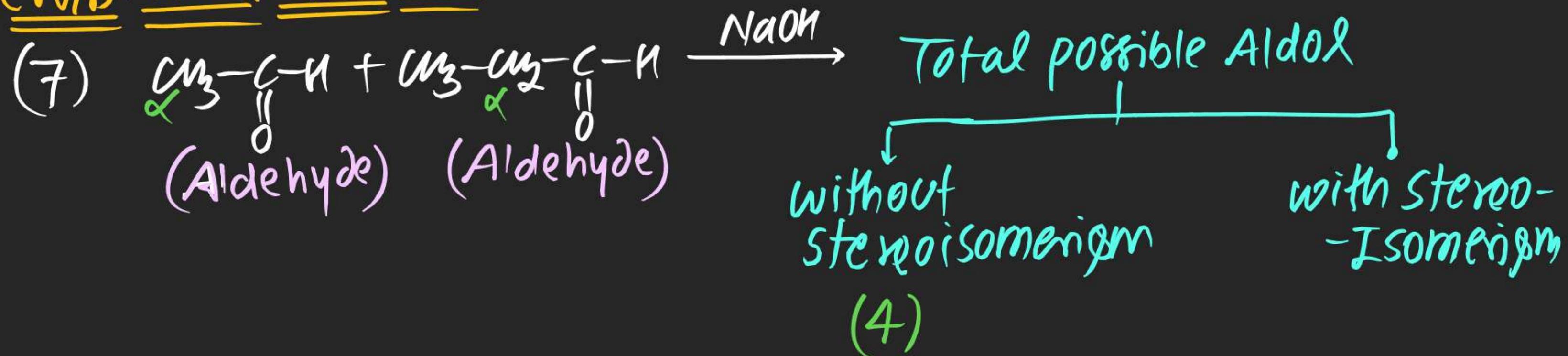
Aq.  $\text{Na}_2\text{CO}_3$

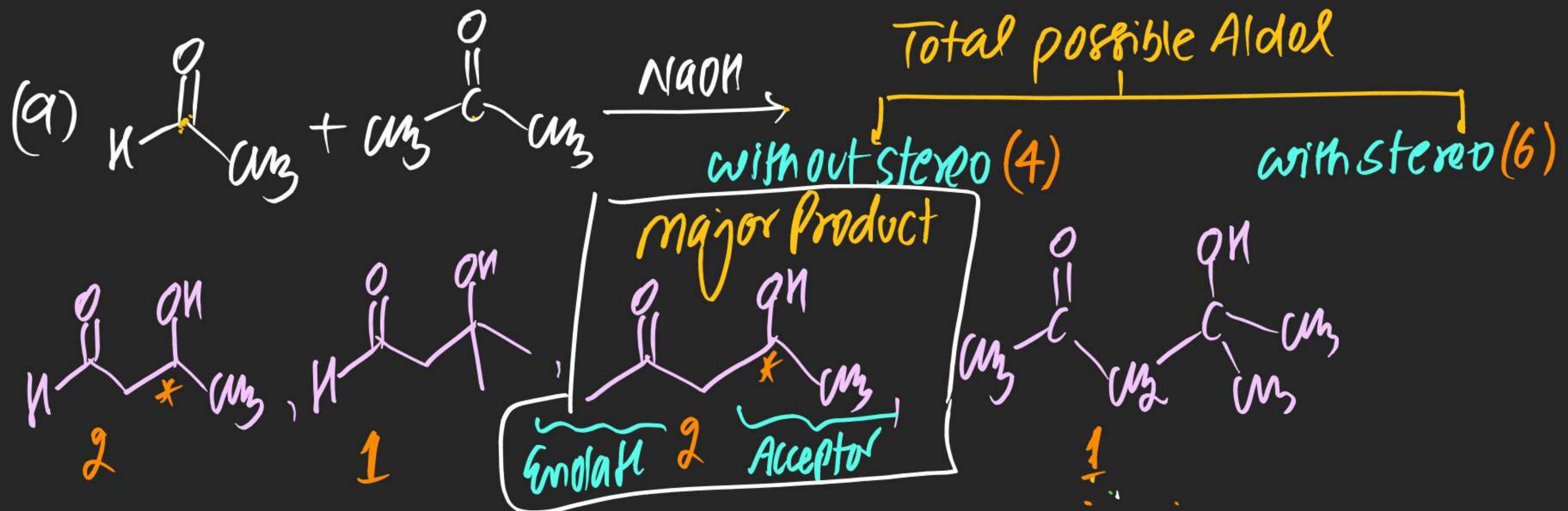
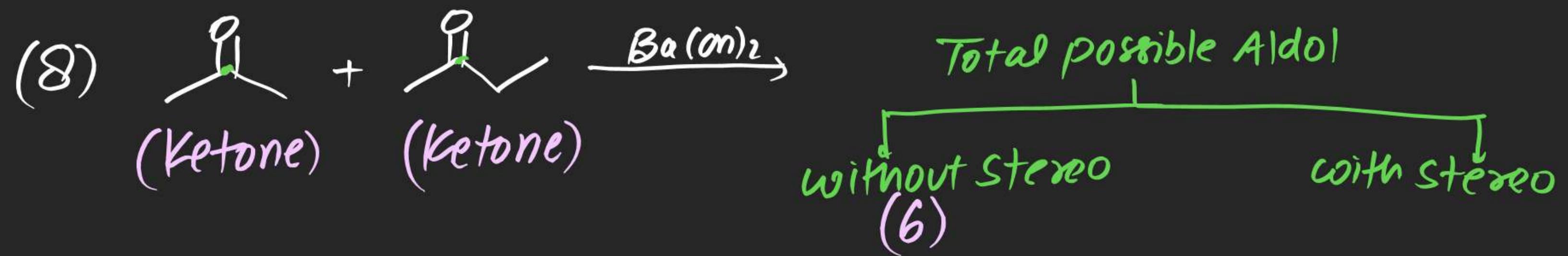
(iv) Aldol of ketone is highly reversible & usually removed in  $\text{Ba(OH)}_2$ , which helps in separation of Aldol of ketone.

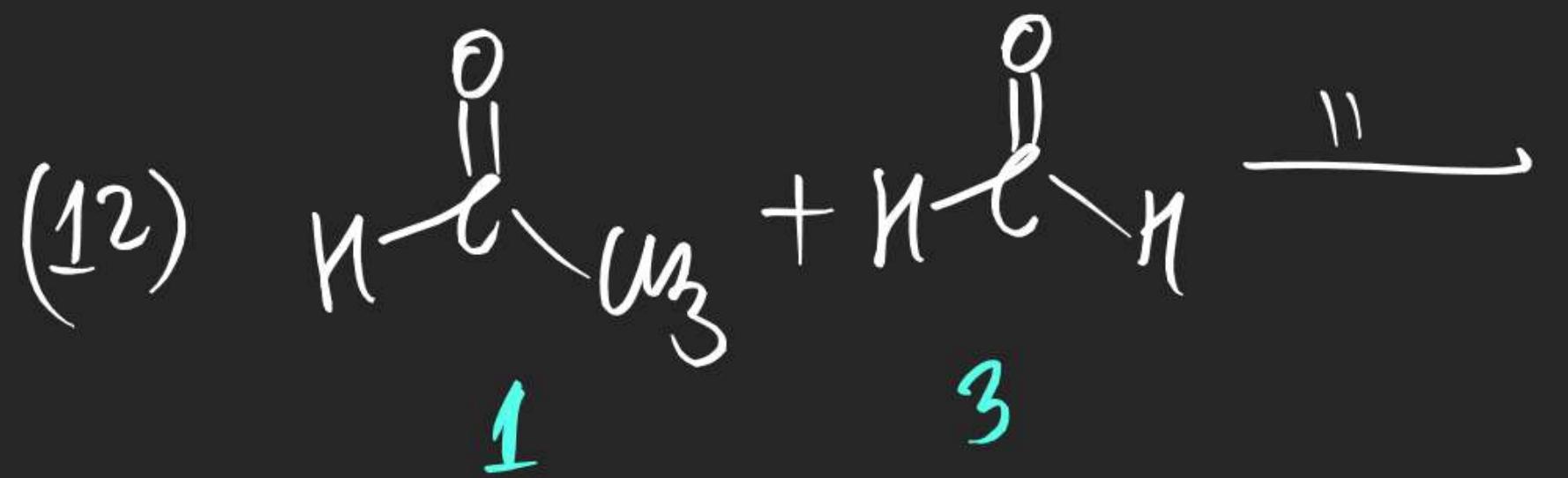
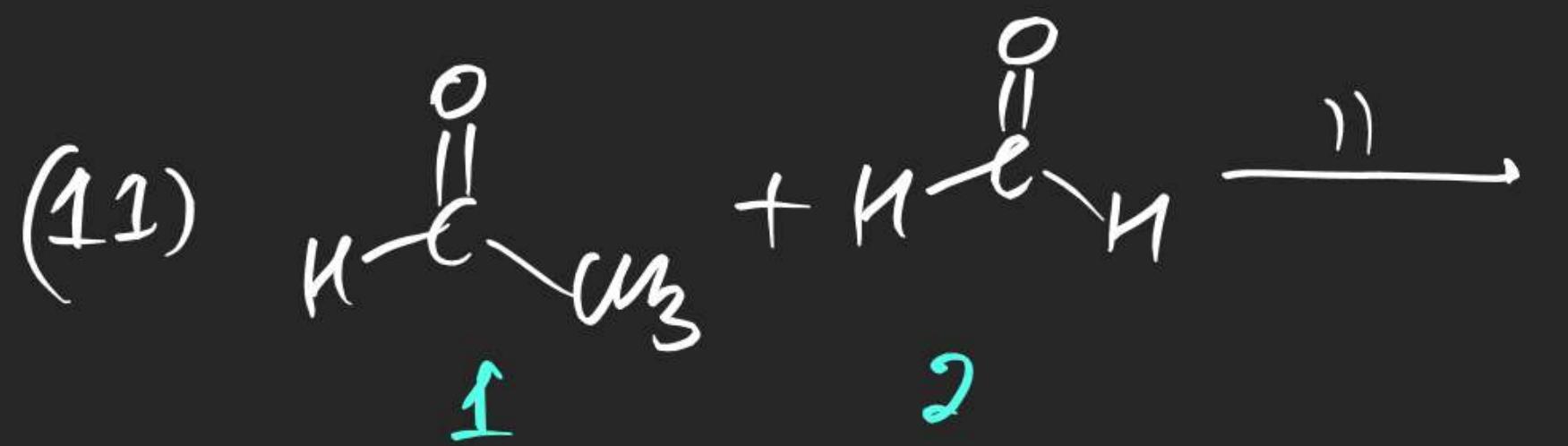




### Cross Aldol Reaction:

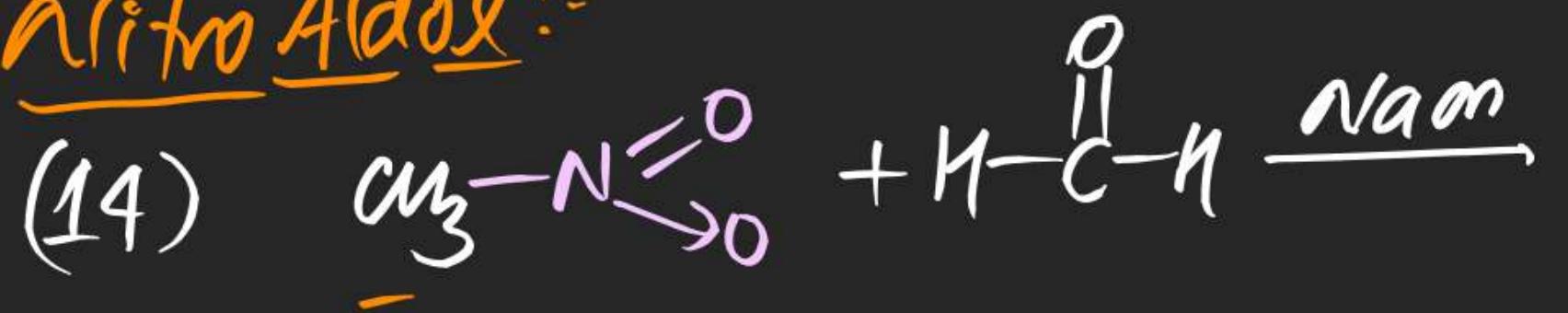








Nitro Aldol:



Cyno Aldol

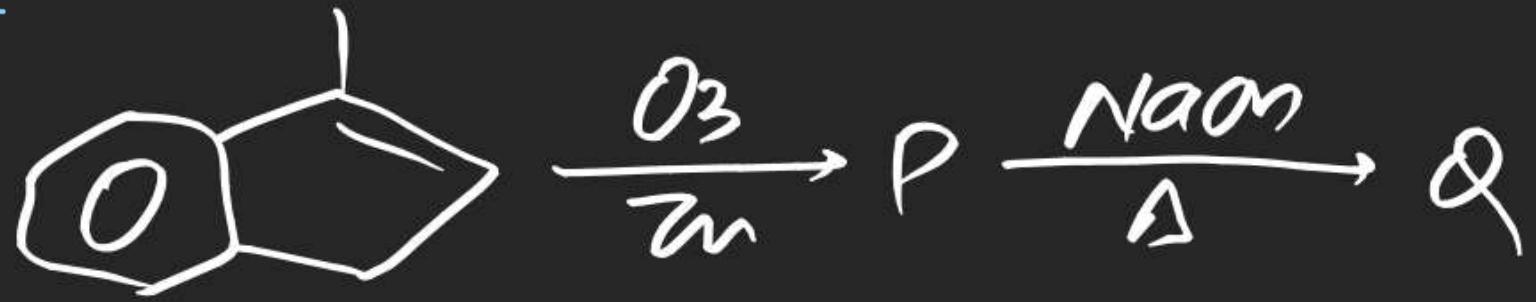


## Intramolecular Aldol:

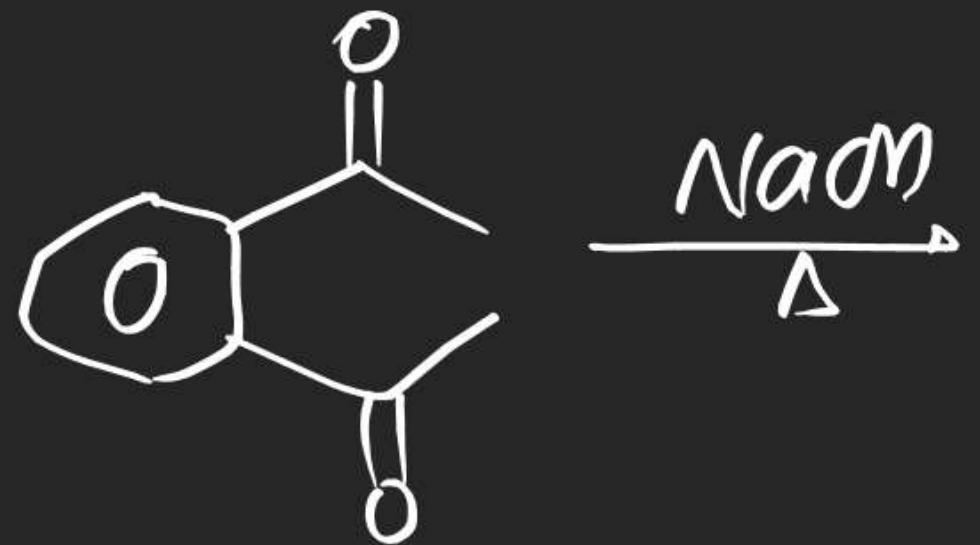
⇒ di Carbonyl Compound may undergo Intramolecular Aldol only when 5 or 6 membered Ring is formed



(18)

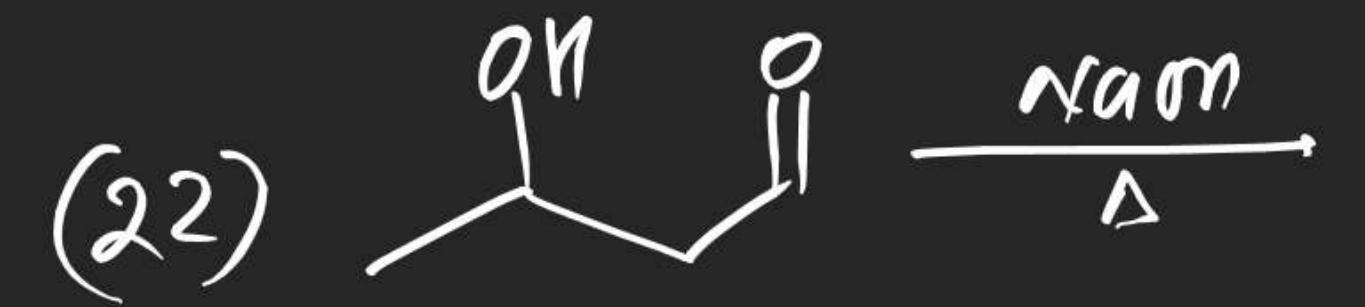
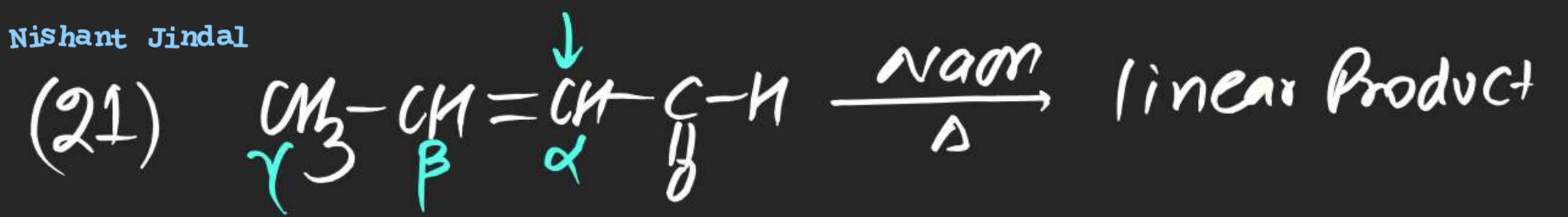


(19)



(20)

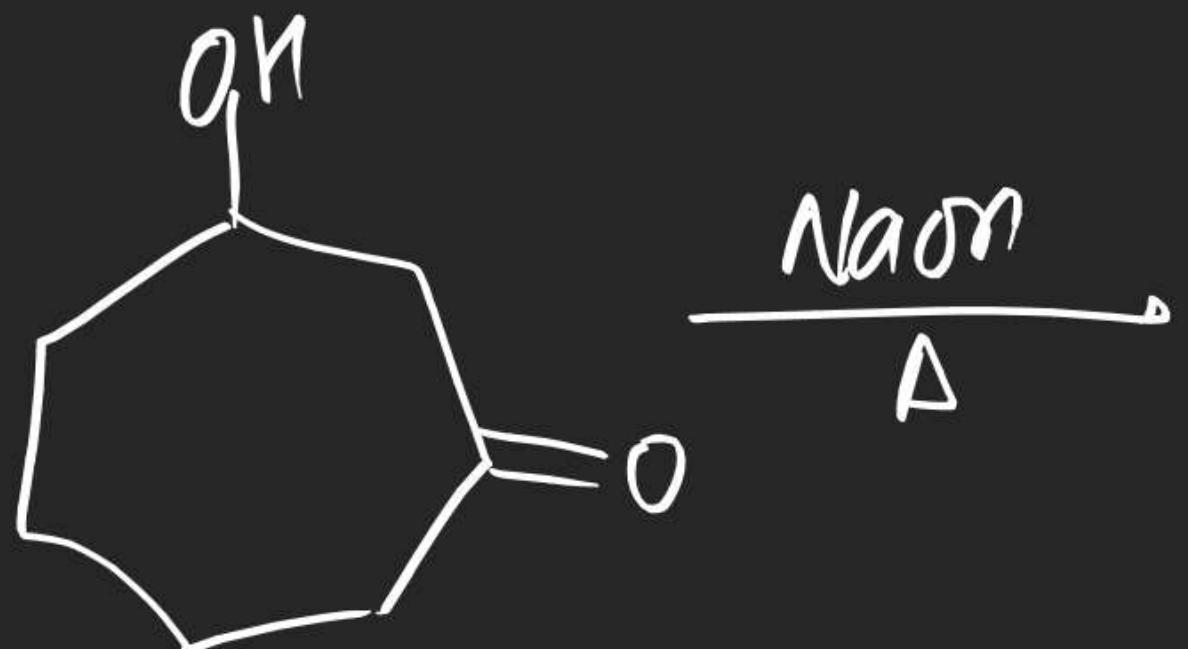




(24)

 $\xrightarrow[\Delta]{\text{NaOM}}$ 

(25)

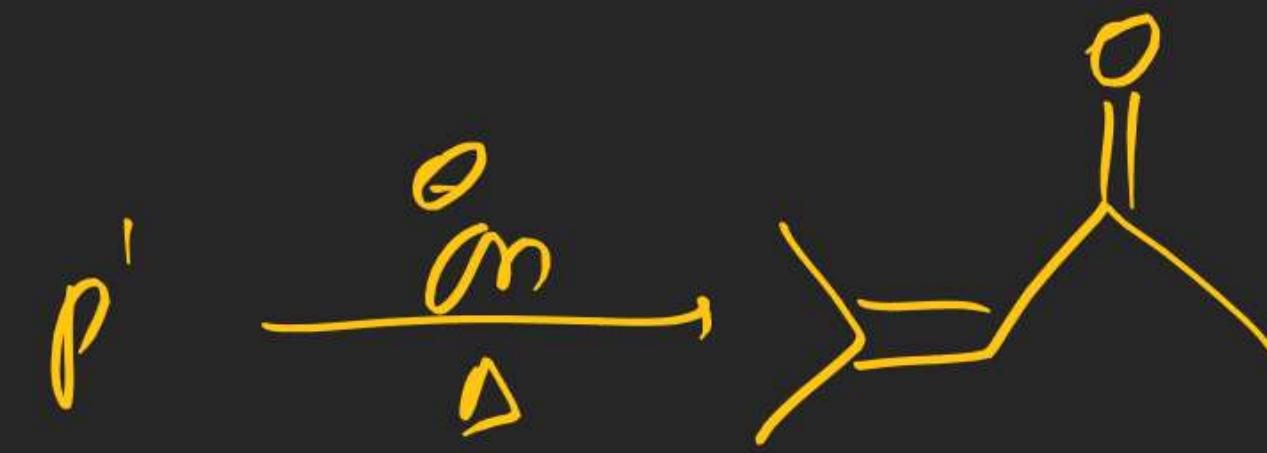
 $\xrightarrow[\Delta]{\text{NaOM}}$

(27) Retro Aldol:

(26)



(27)



## (#) Acid-Catalysed Aldol: