

Carboxylic acids :-

MOP

- 1) From 1° alcohols, aldehydes→ 2
- 2) From alkyl benzene→ 3
- 3) From Grignard's reagent→ 5
- 4) From cyanides & acid derivatives→ 5
- 5) From alkenes, alkynes→ 7

- 5) Decarboxylation→ 10
- 6) Kolbe's electrolysis→ 11
- 7) Red by LAH→ 11
- 8) EAS→ 12
- 9) HVZ→ 13
- 10) Heating effect :

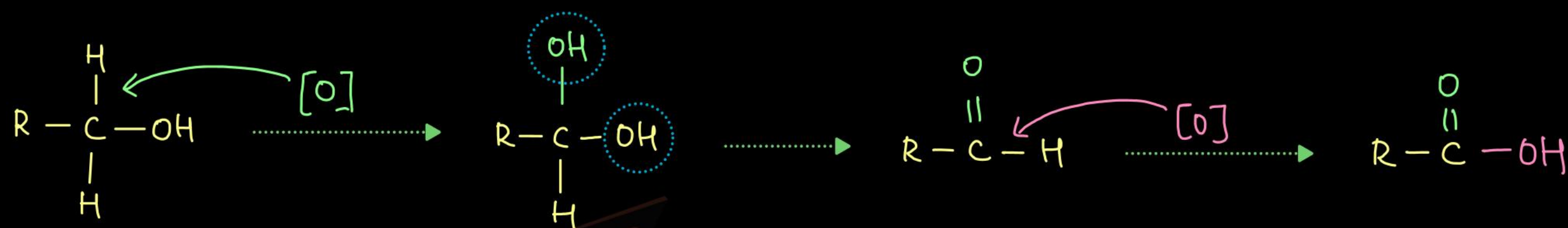
Properties

- 1) Acidic Strength→ 8
- 2) dehydration→ 9
- 3) Esterification→ 9
- 4) Rxn with PCl_5 , PCl_3 , $SOCl_2$ → 10

- i) β keto→ 15
- ii) Dicarboxylic→ 17
- iii) β , δ unsaturated→ 18
- iv) Hydroxy→ 19

MOP :

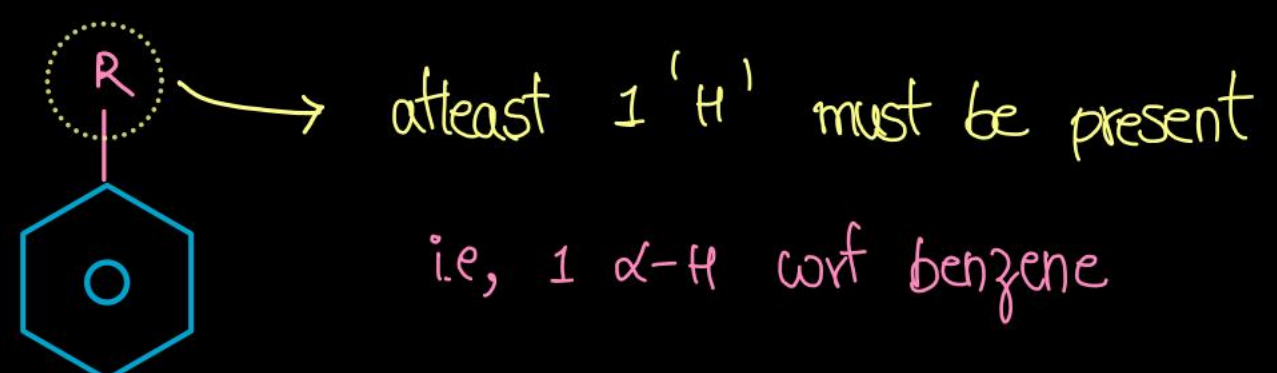
1) From 1° alcohols :



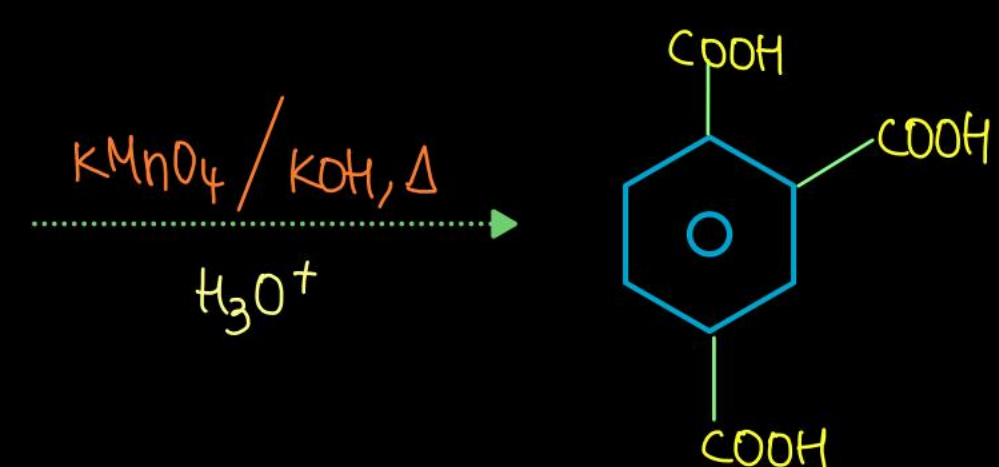
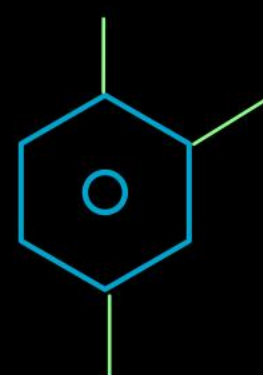
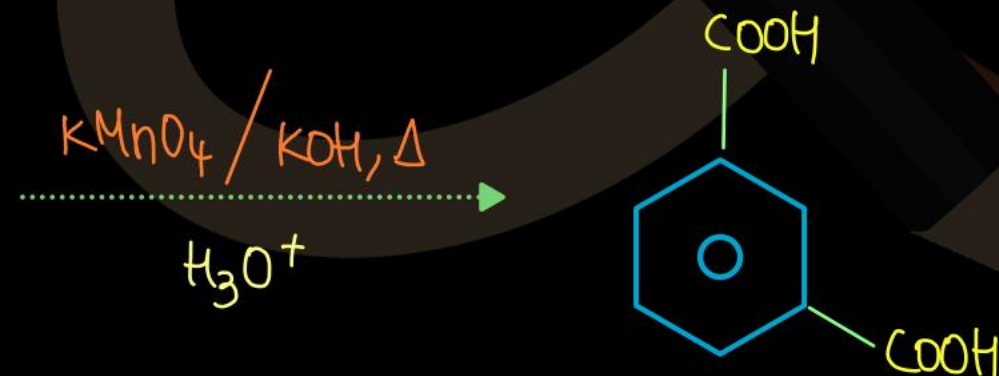
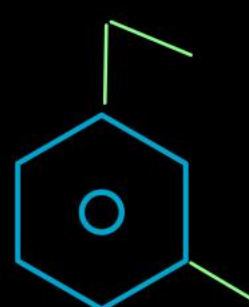
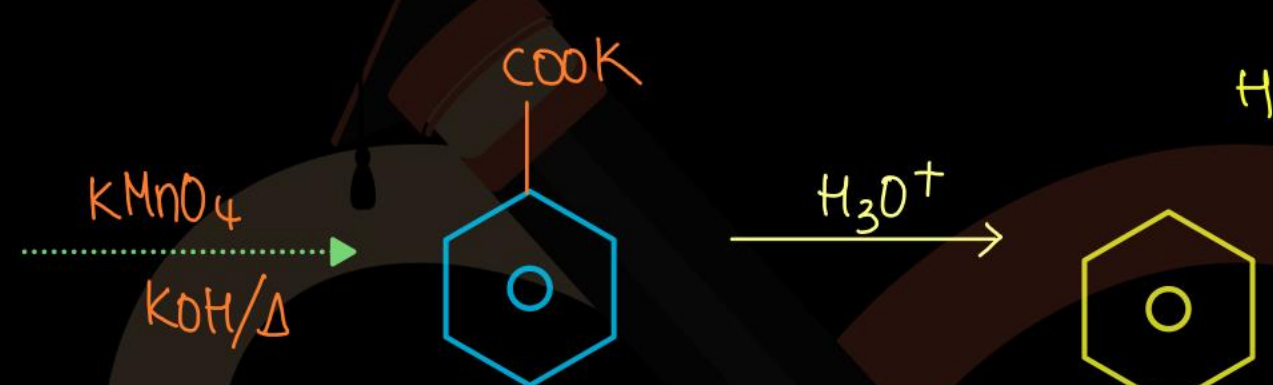
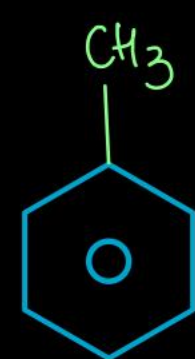
Strong Oxi agents

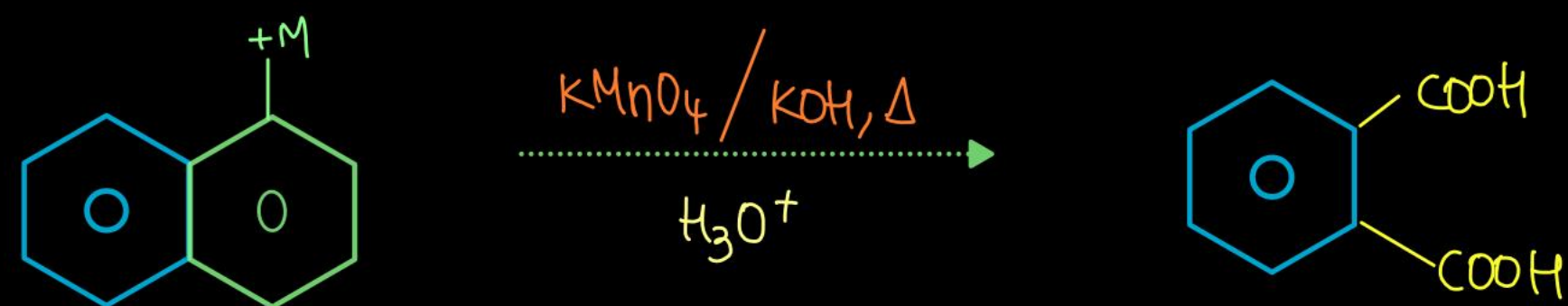
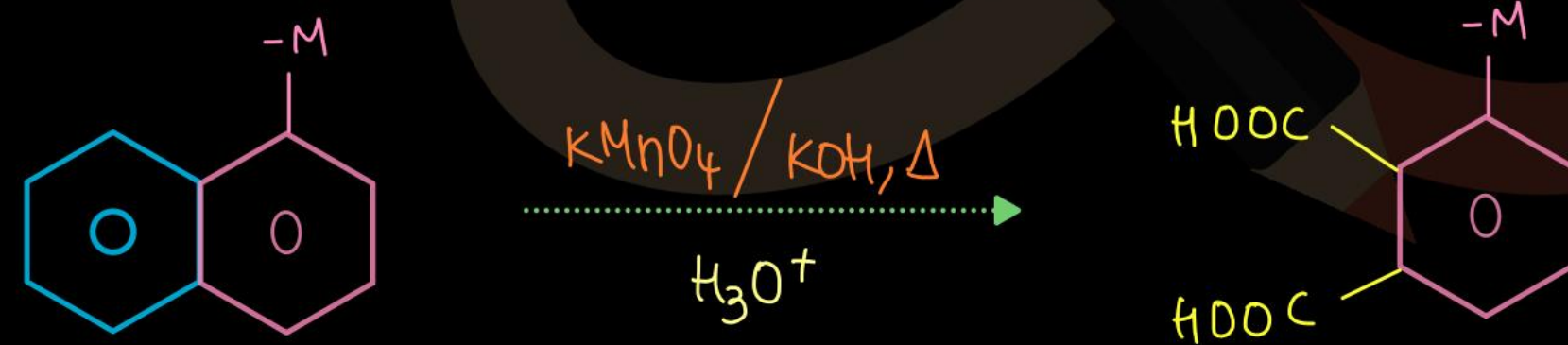
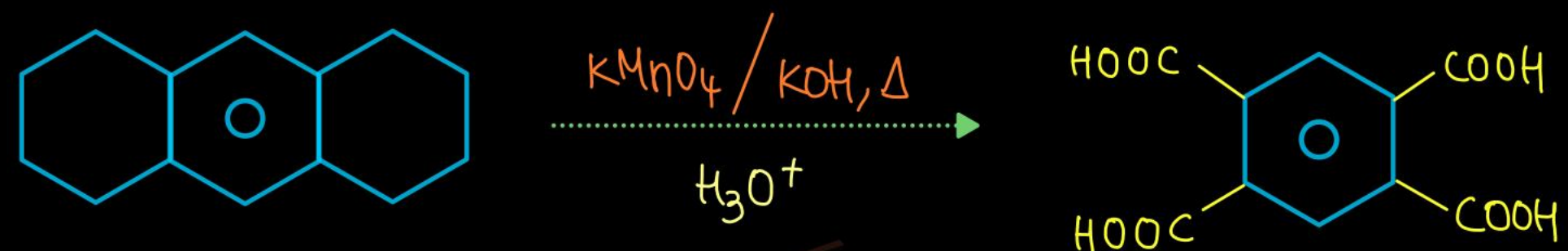
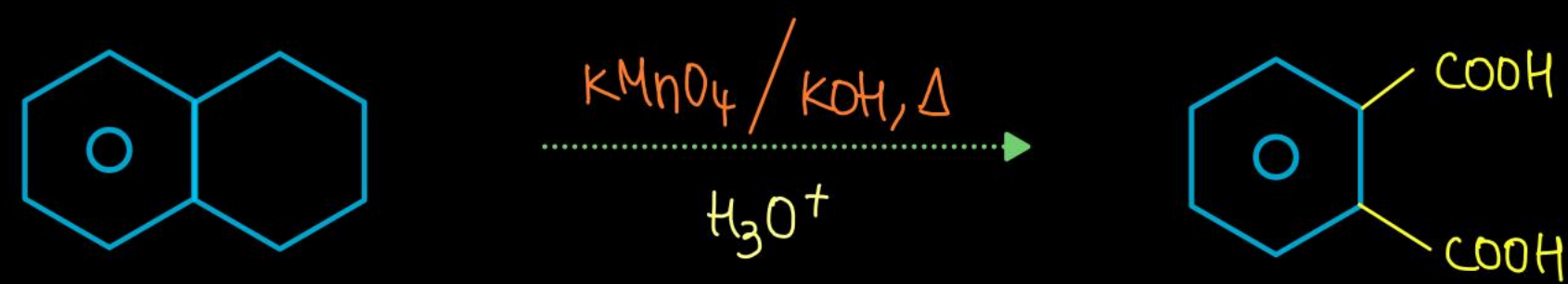
- 1) $\text{KMnO}_4 / \text{H}^+$ (or) KMnO_4 / Δ
- 2) $\text{K}_2\text{Cr}_2\text{O}_7 / \text{H}^+$ (or) Hot $\text{K}_2\text{Cr}_2\text{O}_7$
- 3) Conc. HNO_3 / Δ
- 4) $\text{CrO}_3 + \text{H}_2\text{SO}_4$ (Jones reagent)

2) Side chain oxidation :

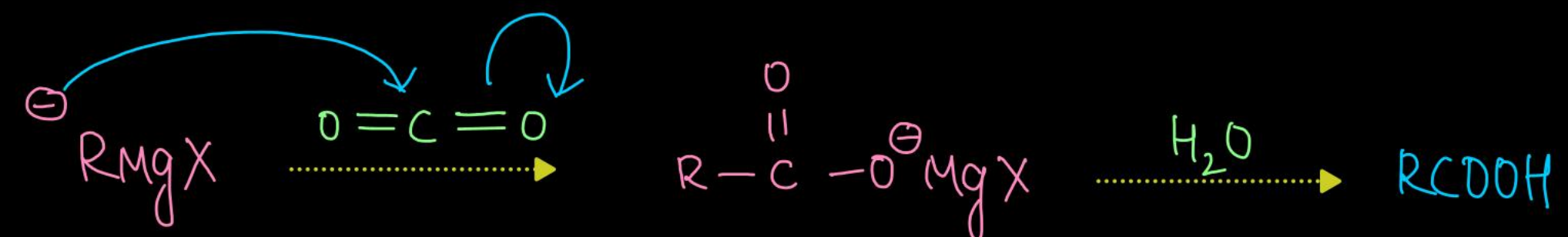


Ex:-

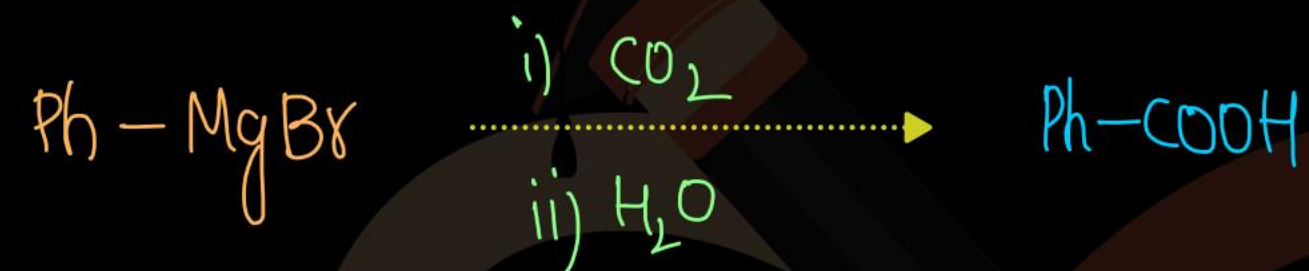




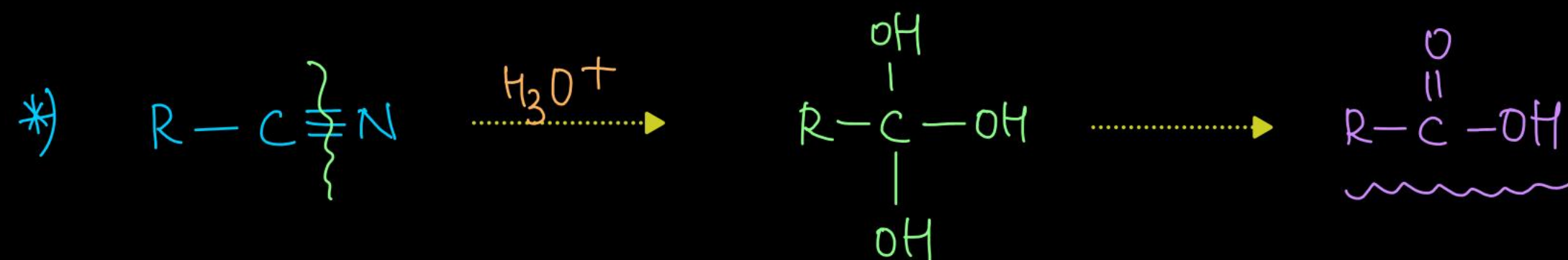
3) from Grignard reagent:

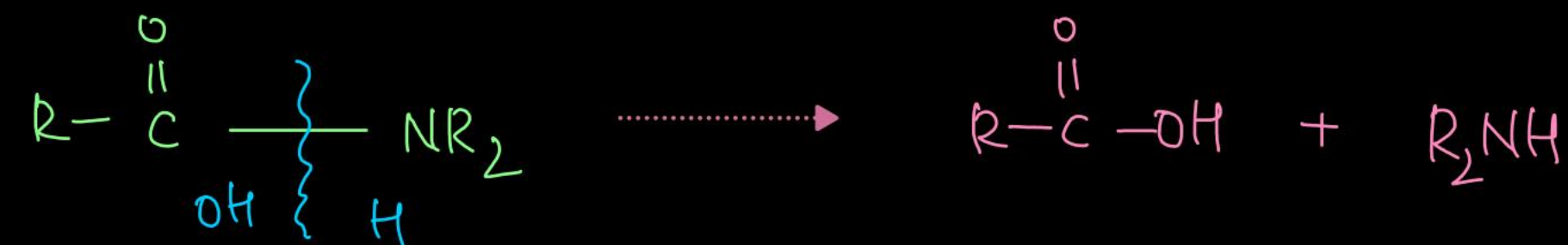
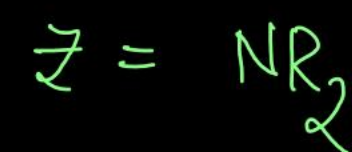
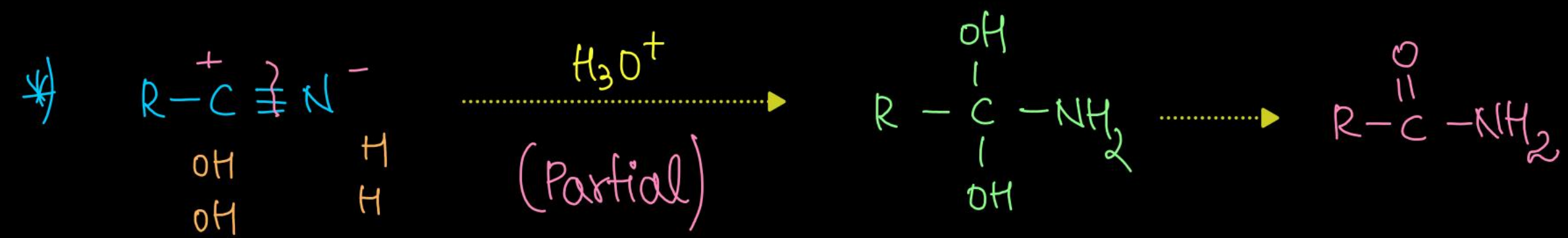


Ex:-



4) From hydrolysis of Cyanides & acid derivatives

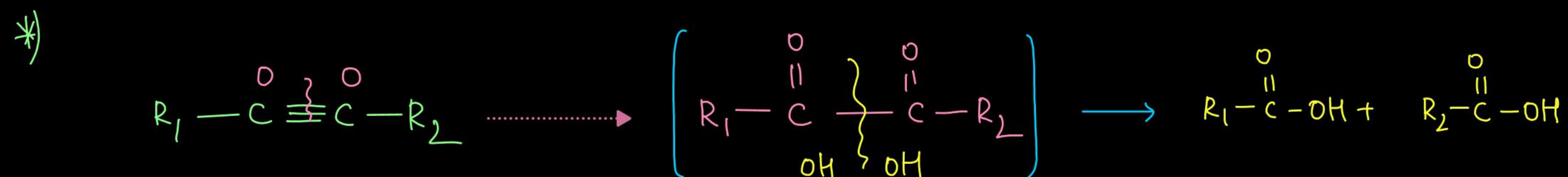
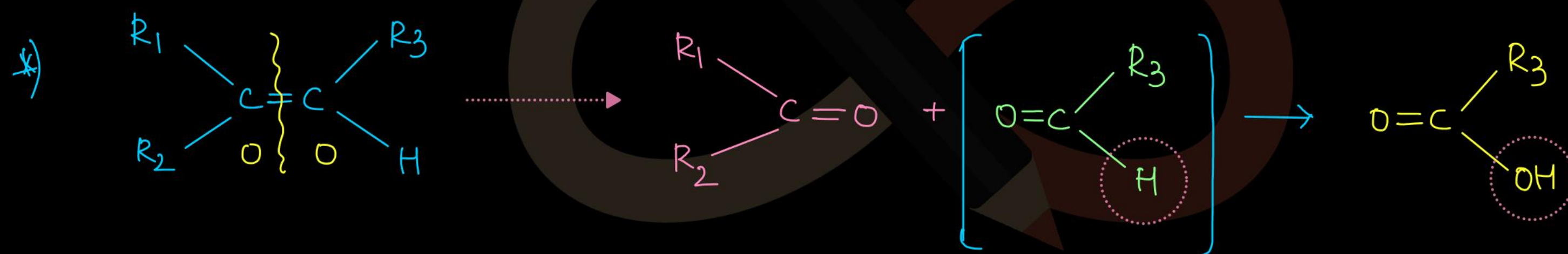




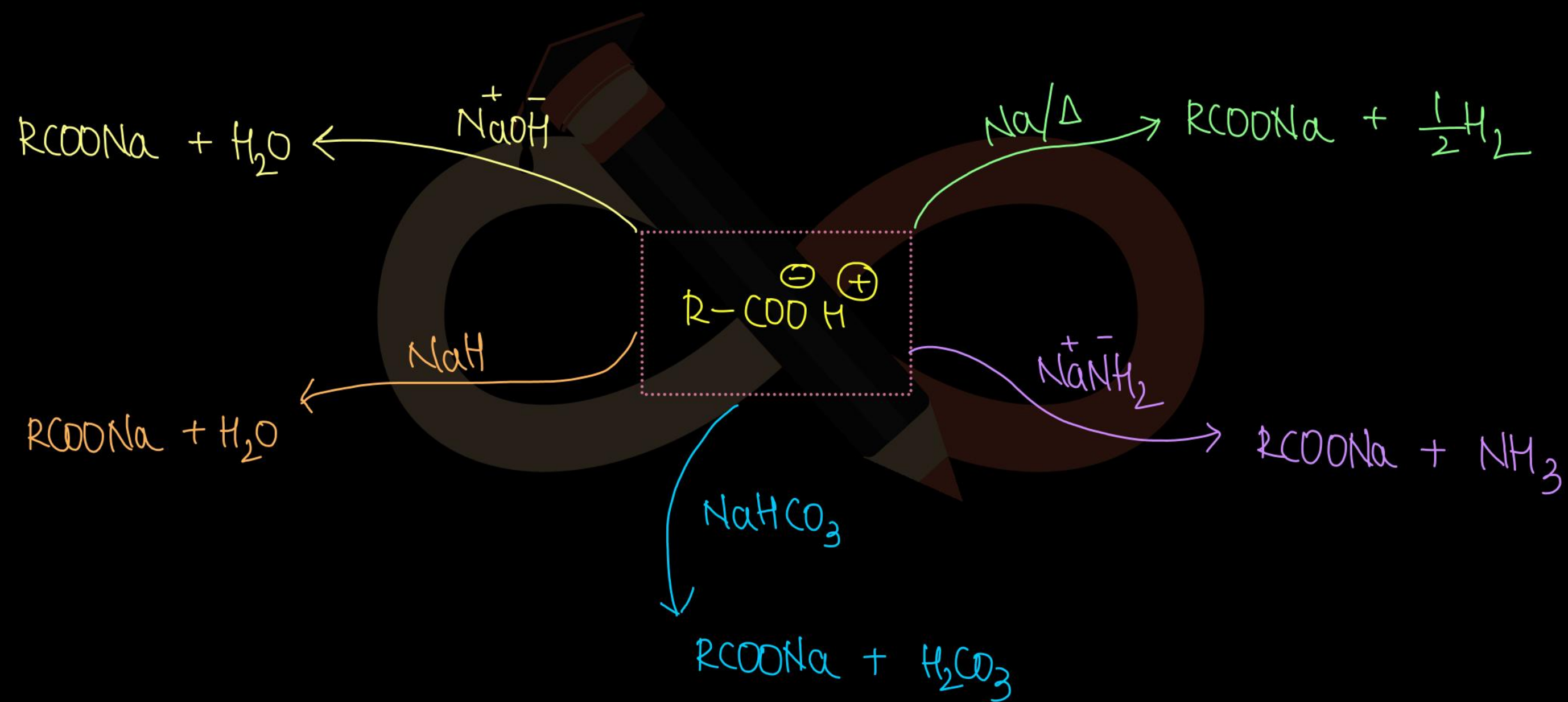
5) From Oxidative ozonolysis of alkenes, alkynes

Reagents :-

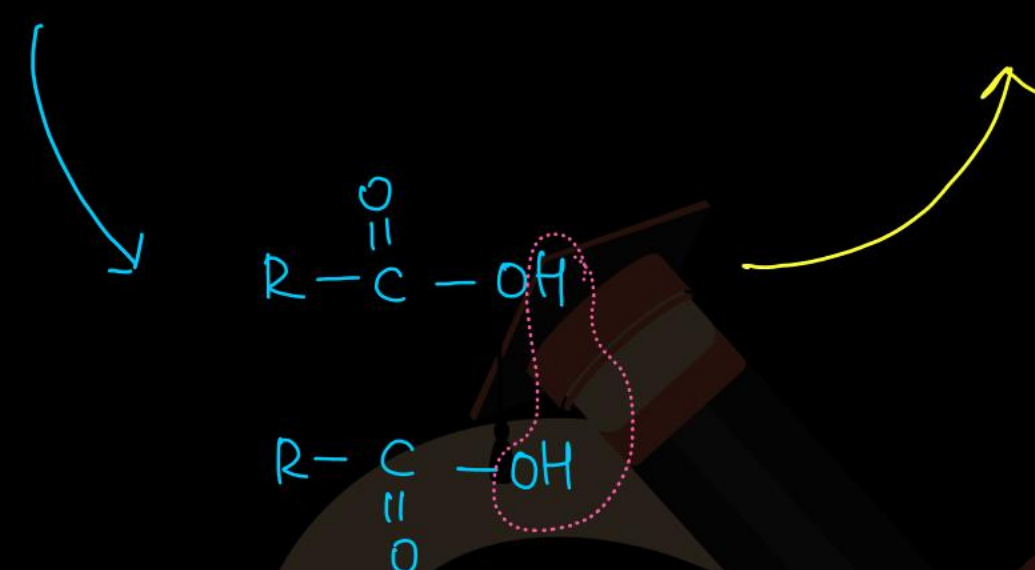
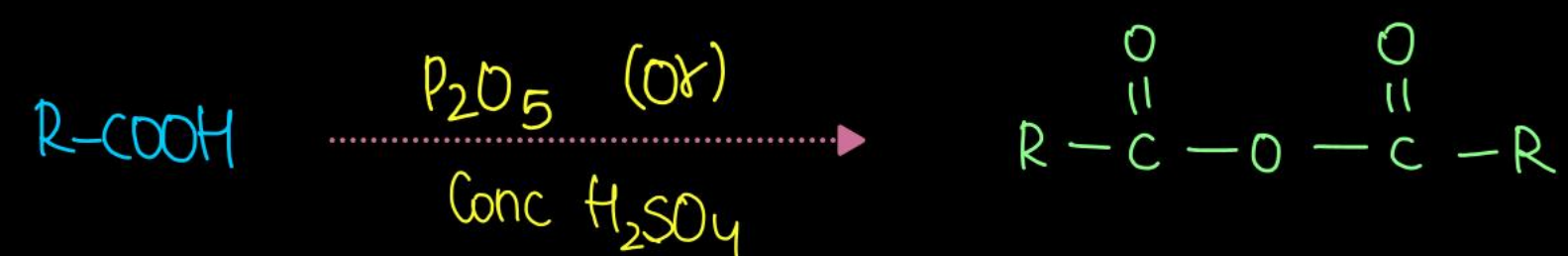
- 1) $O_3 + CCl_4 / H_2O$
- 2) $O_3 + CCl_4 / Ag_2O$
- 3) $KMnO_4 / H^+ (Hot)$
- 4) $K_2Cr_2O_7 / H^+ (Hot)$



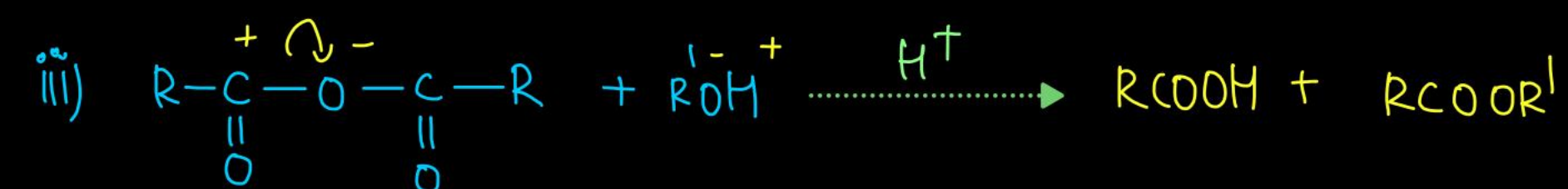
Properties :-



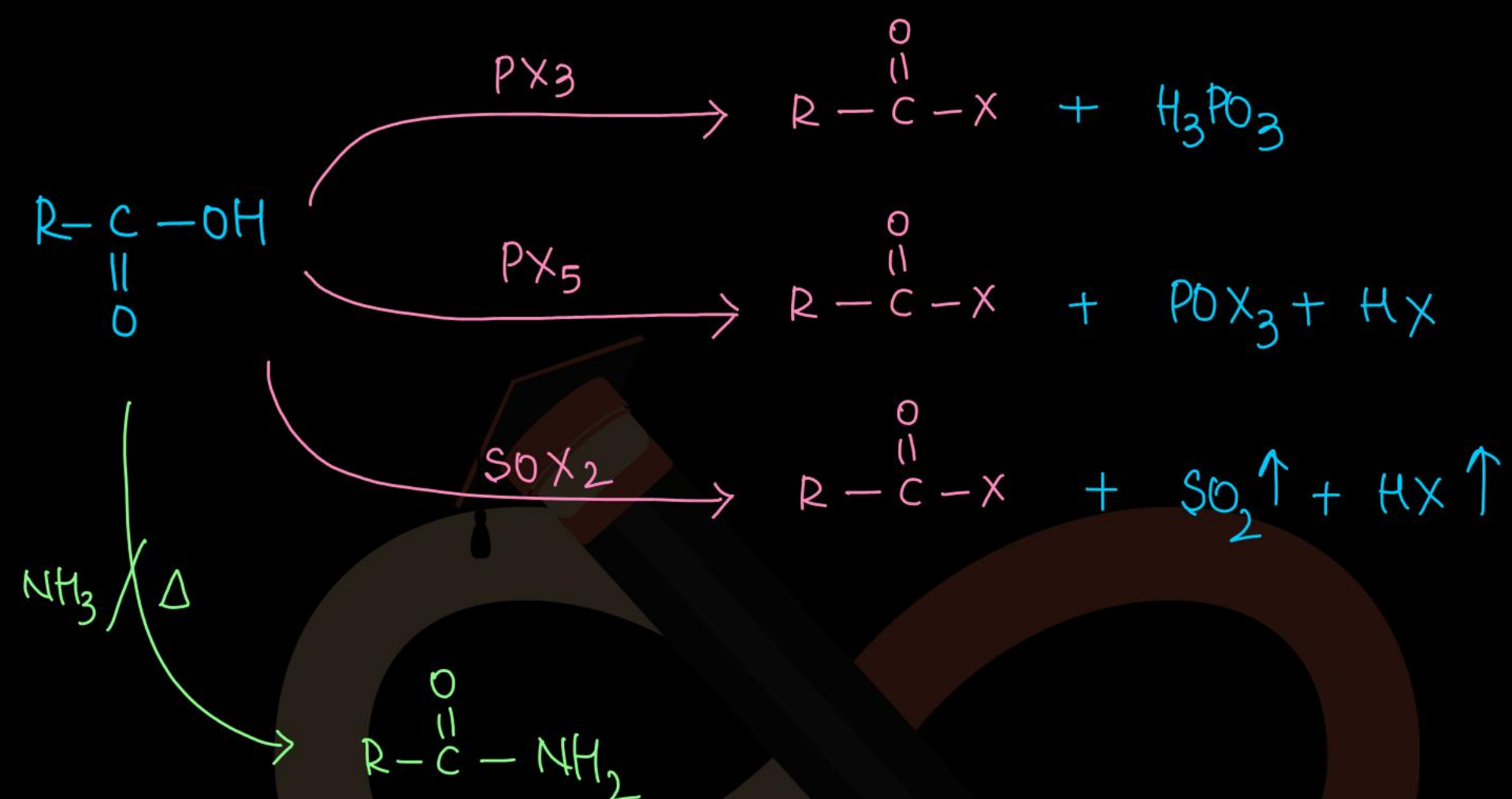
2) dehydration :-



3) Esterification :



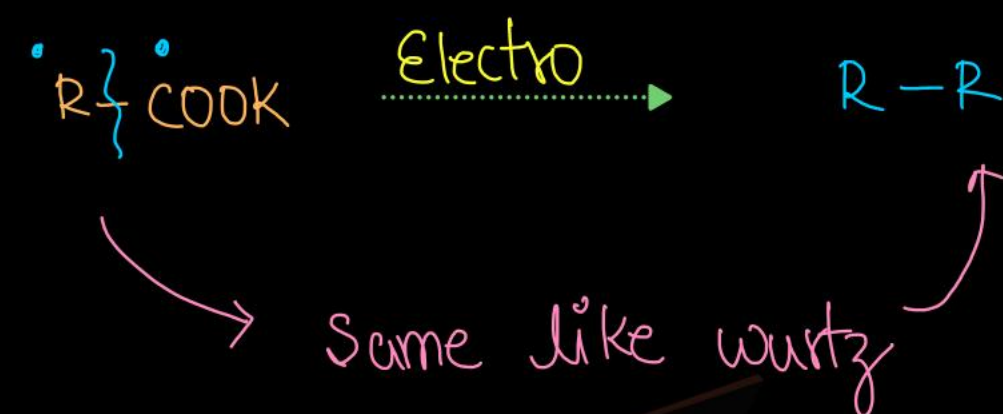
④ Rxn with PX₃, PX₅, SOX₂ and NH₃ :



⑤ de-carboxylation :



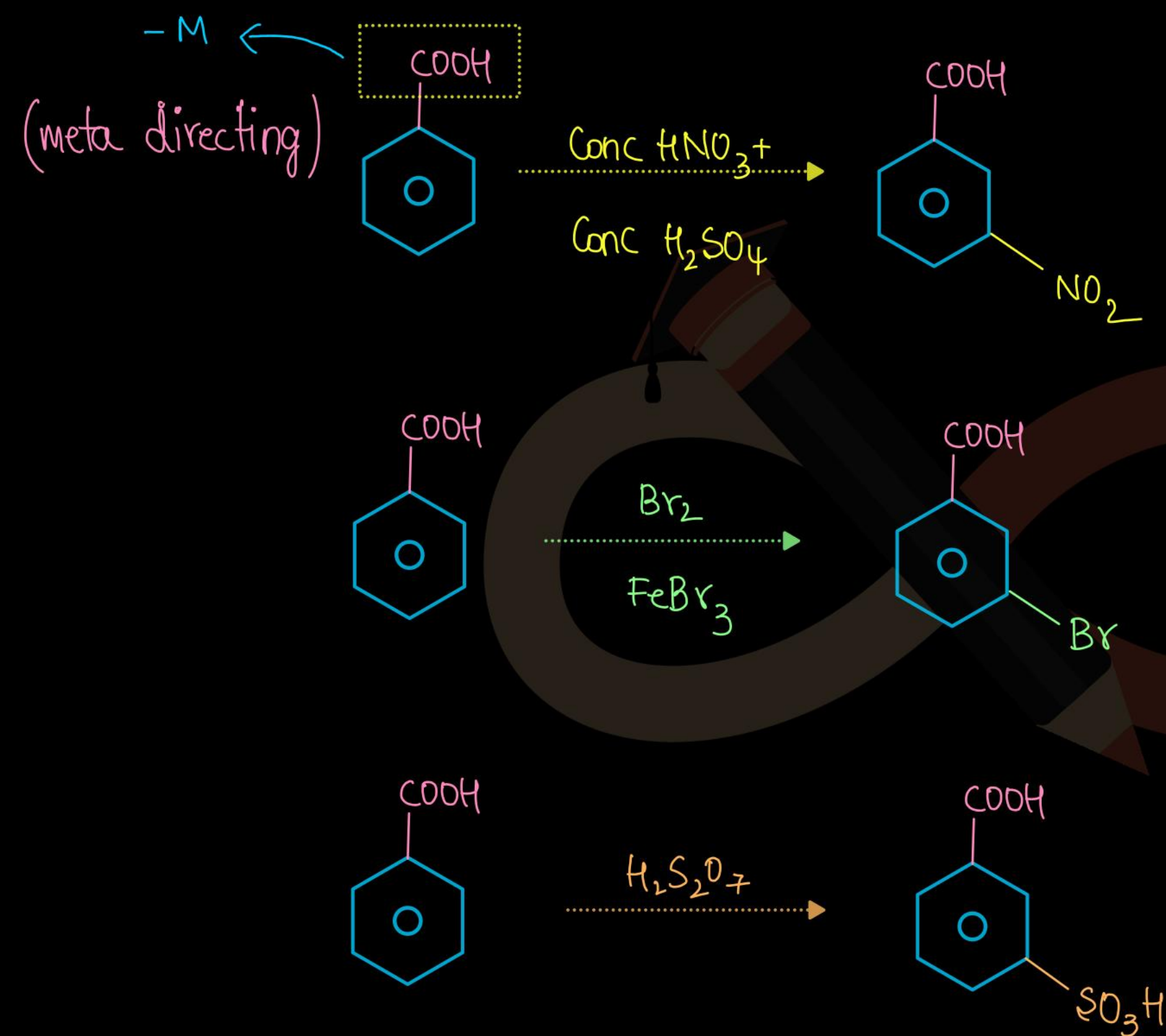
⑥ Kolbe's Electrolysis :-



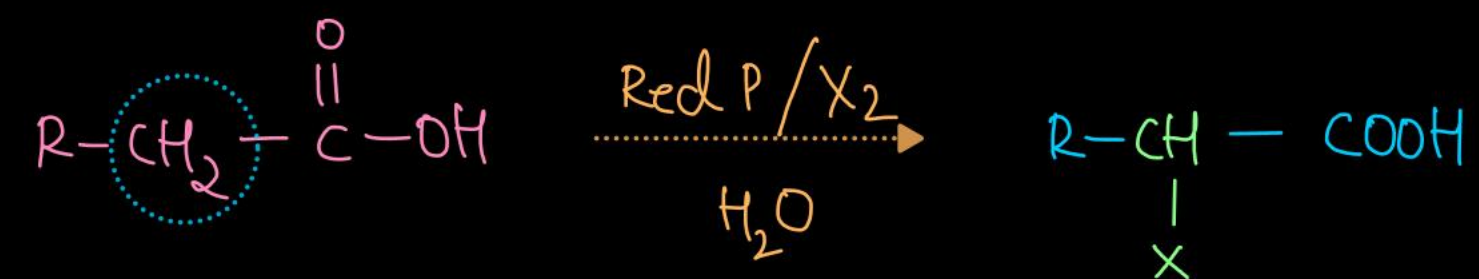
⑦ Red by LAH :-



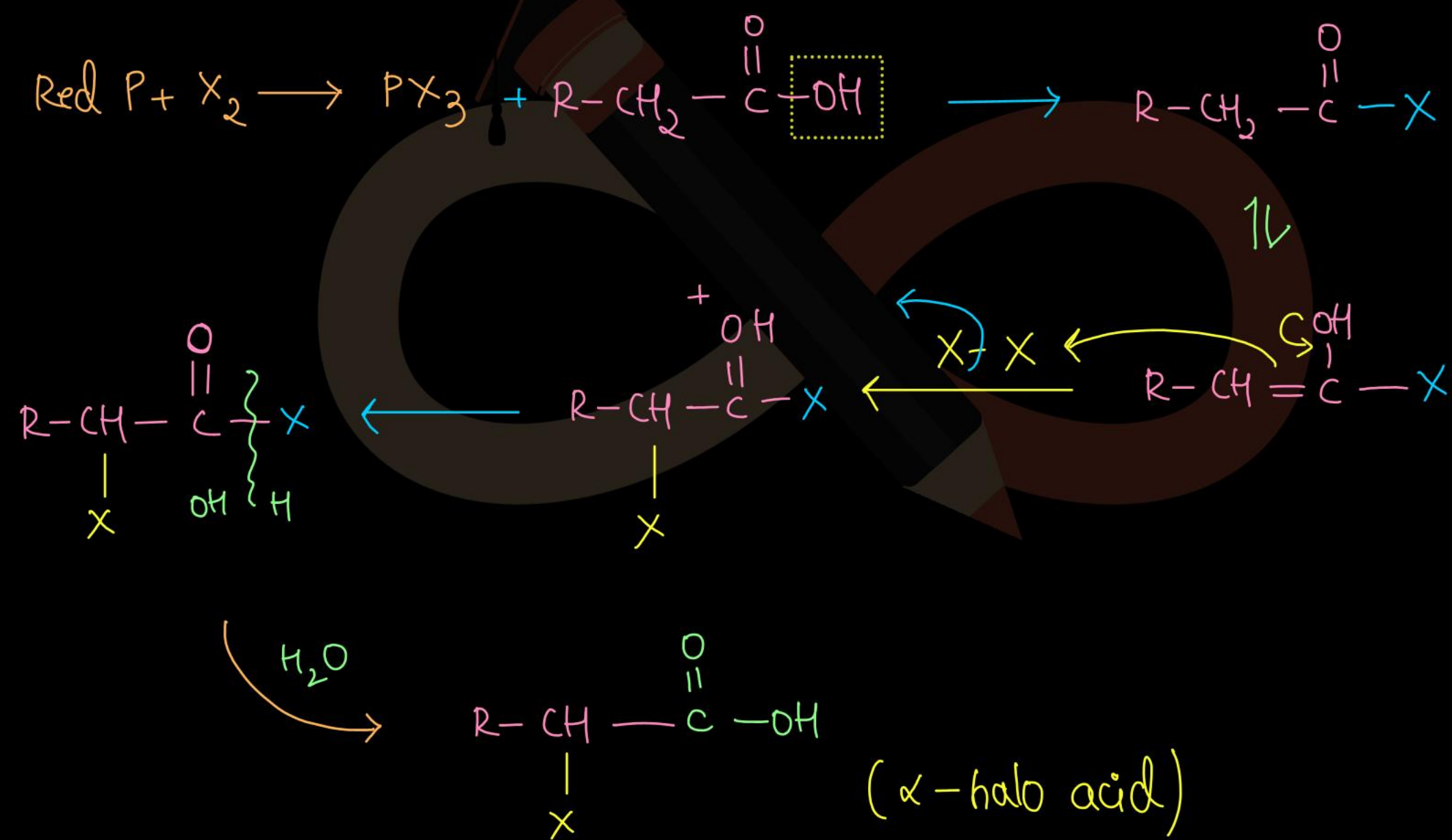
⑧ Electrophilic Aromatic substitution :

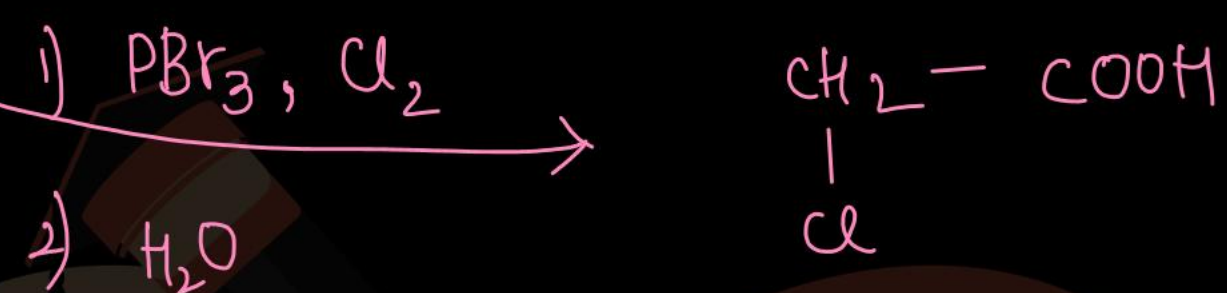
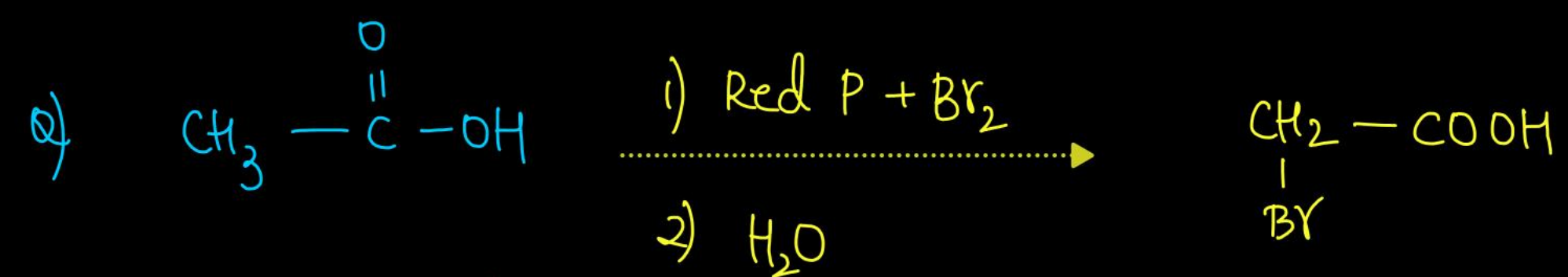


⑨ Hell - Volhard - Zelinsky rxn (HVZ)



Mech^o:-





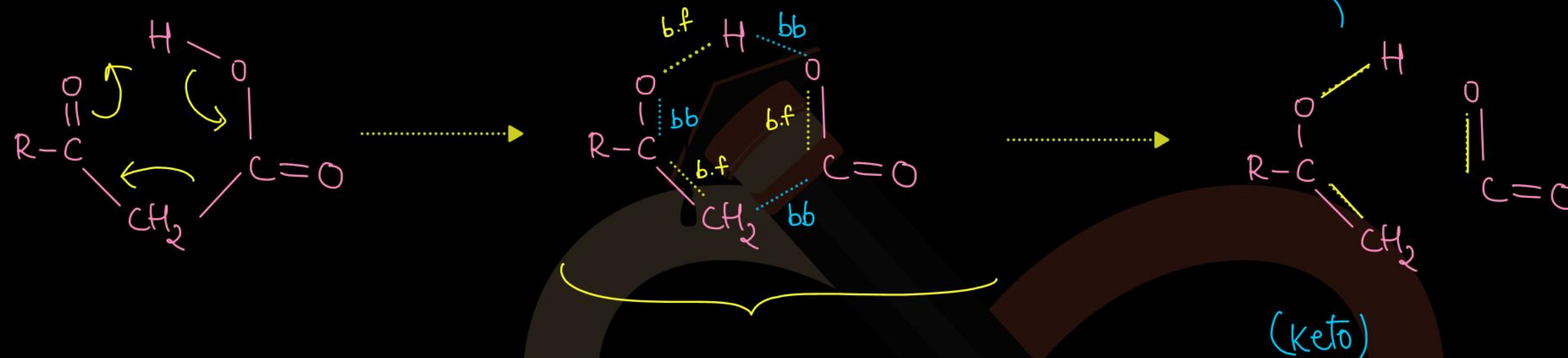
⑩ Heating effect :

i) β -keto acid :-



(end form)

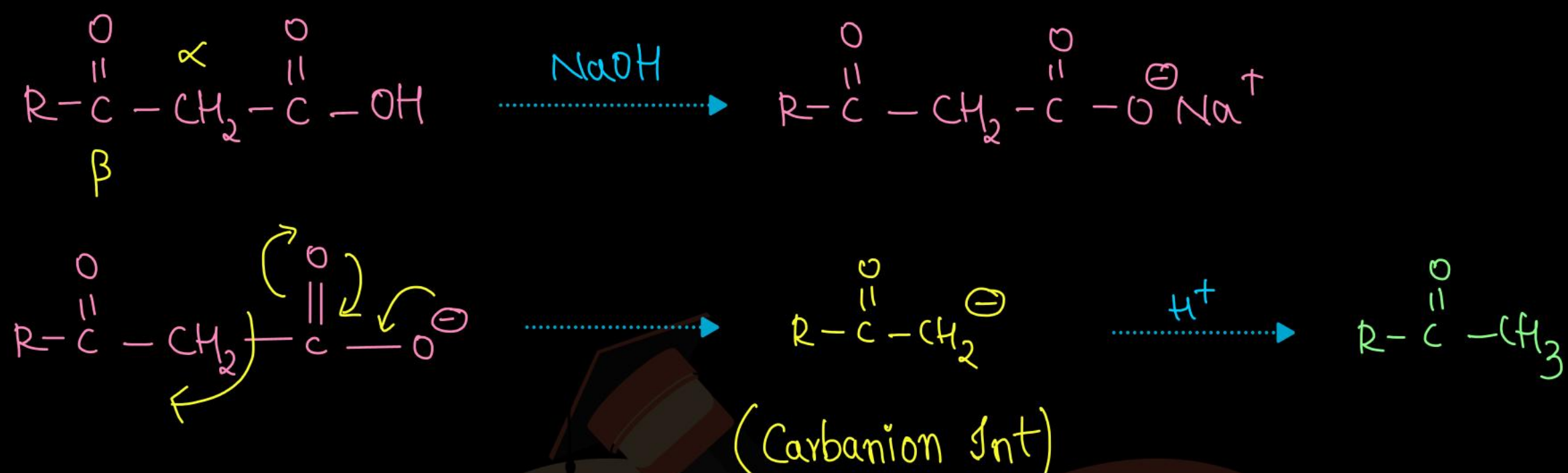
Mech-1^o :- (E_i)



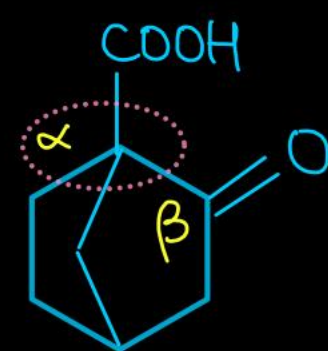
*) 6 Mem Cyclic Transition state

*) Pericyclic rxn.

Mech-2



Note:-



Δ $\rightarrow$ ~~No rxn~~

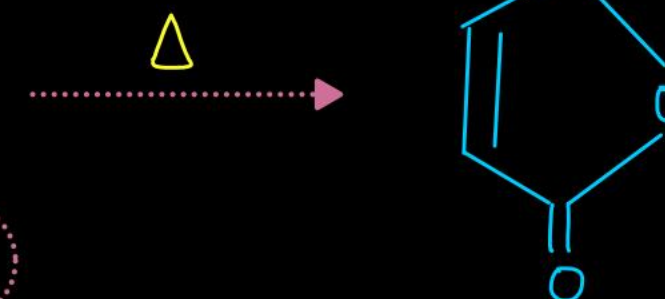
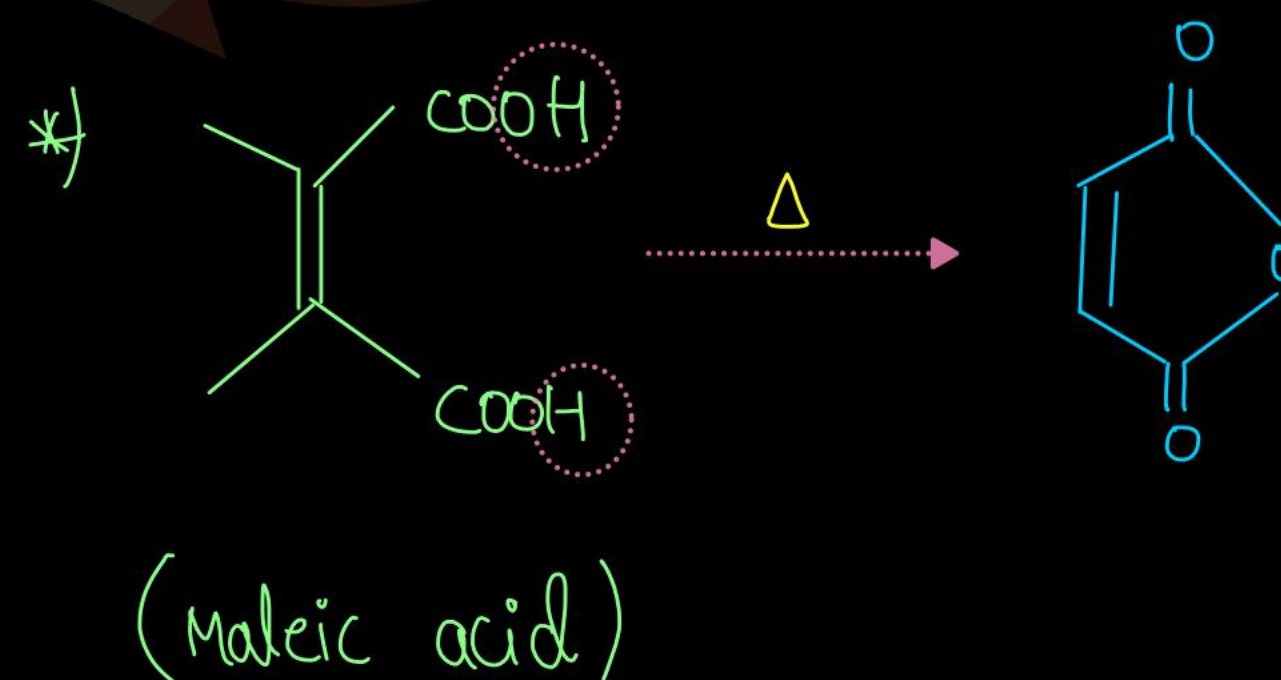
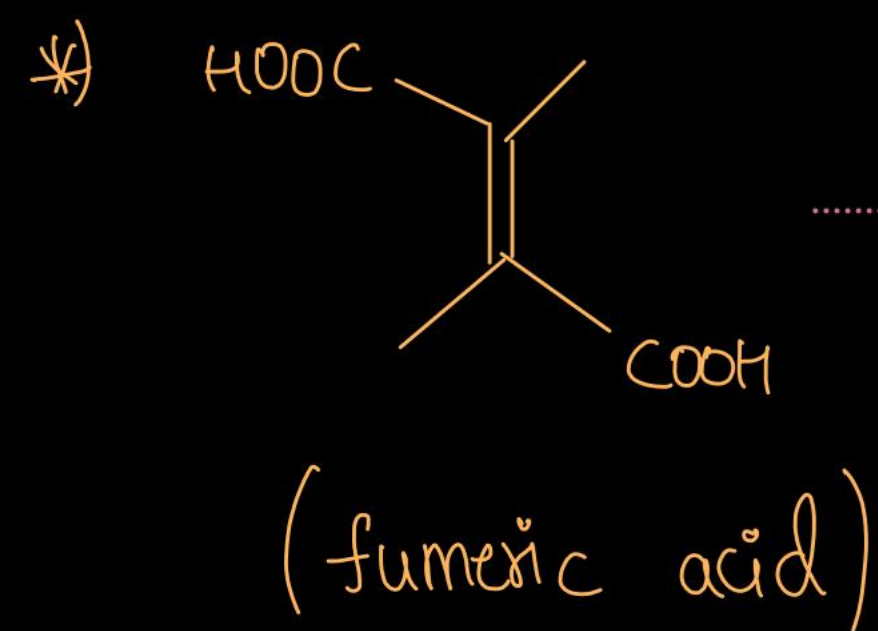
α -carbon should sp^2
during mech

$\times$ but it's not possible
due to bredt's rule

ii) Dicarboxylic acid :



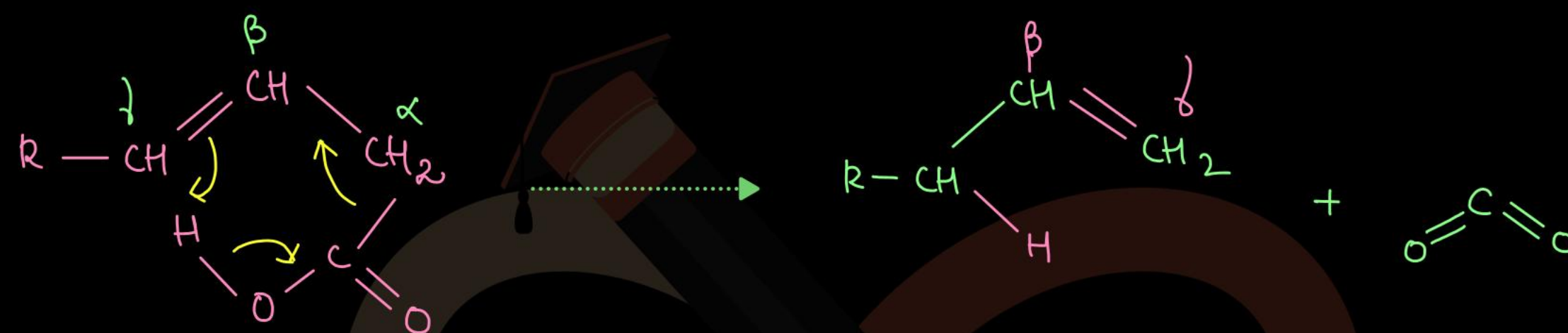
$n = 0$	1	2	3	4	5
0	M	S	G	A	P
oxalic	malonic	succinic	glutaric	adipic	palemic
$\xrightarrow{\Delta} CO + CO_2 + H_2O$	CO_2	H_2O	H_2O	$CO_2 + H_2O$	$CO_2 + H_2O$



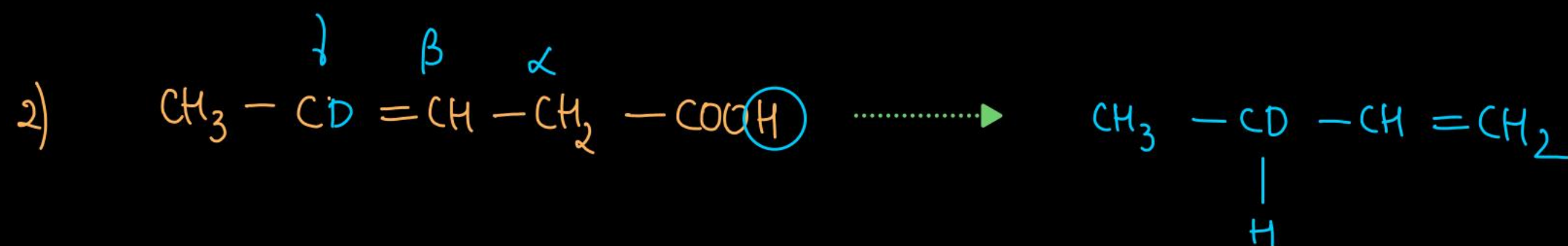
iii) β, γ unsaturated Carboxylic acid :-



Mech :-

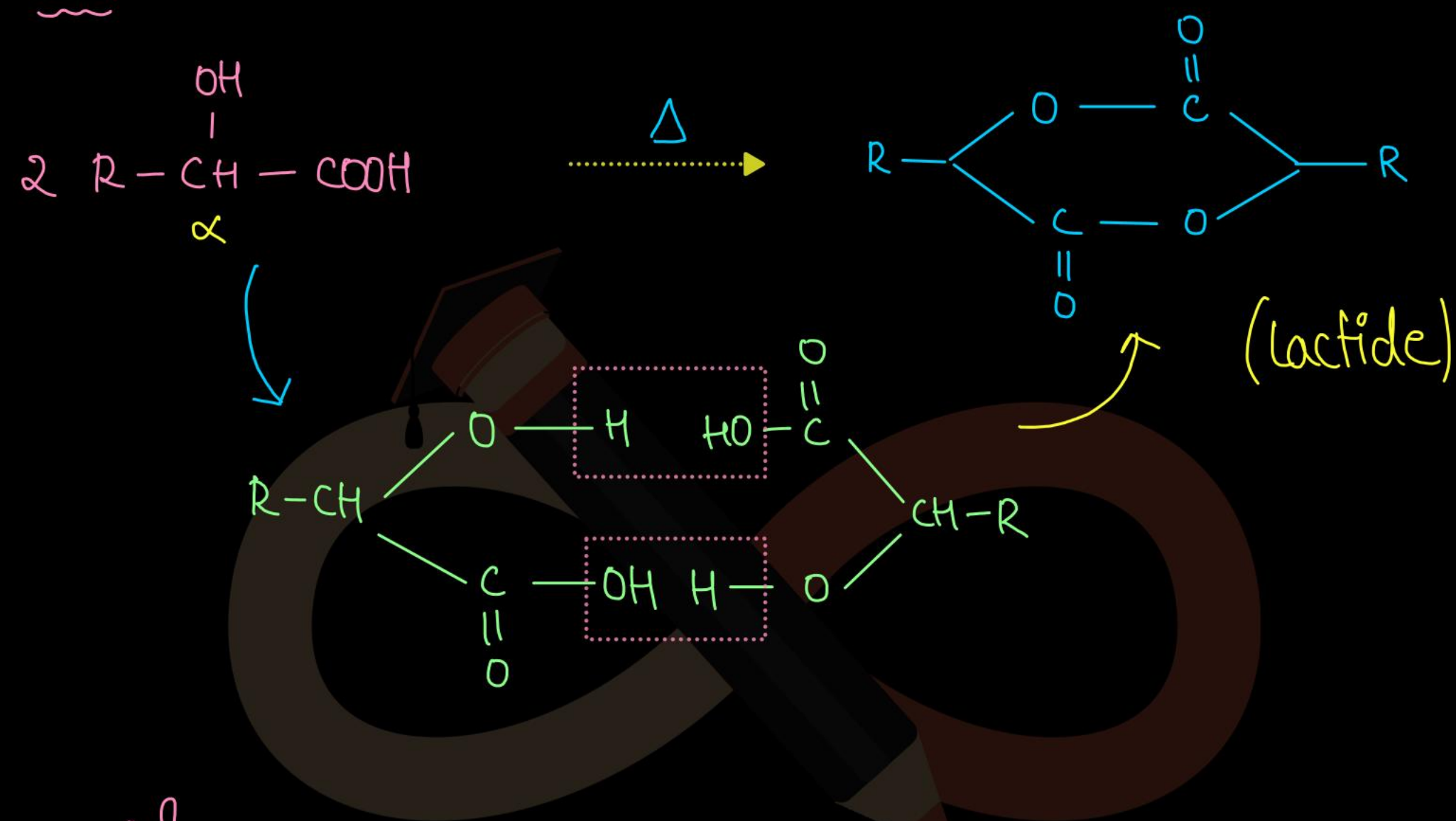


Ex:-

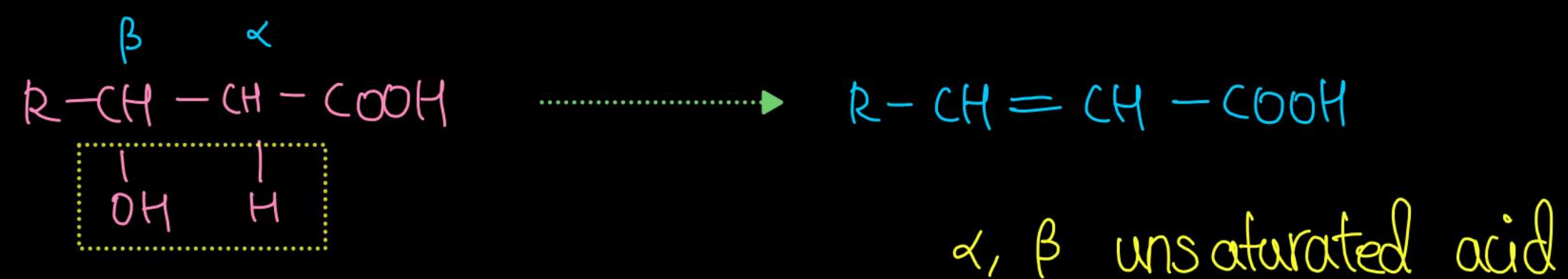


iv) Hydroxy acids :-

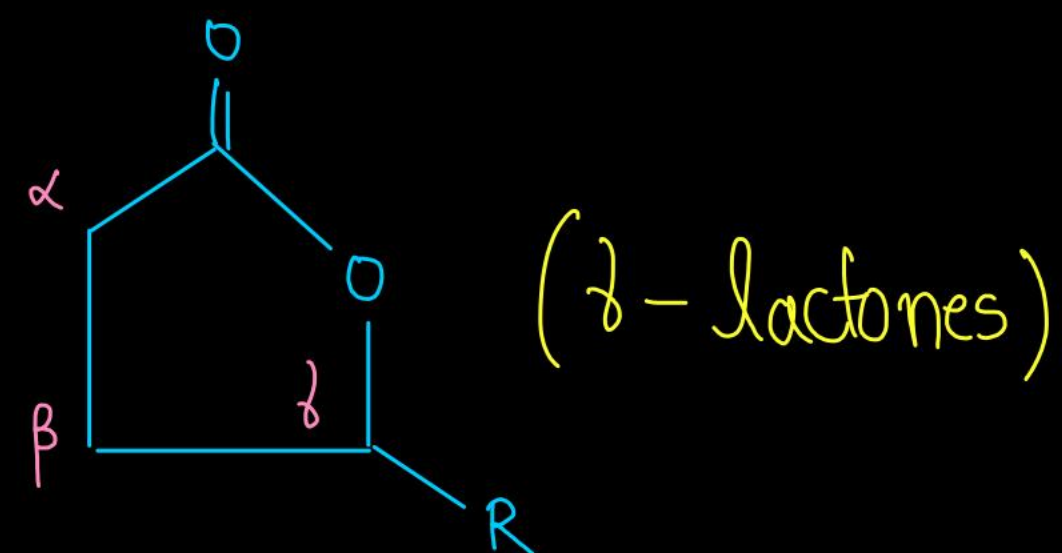
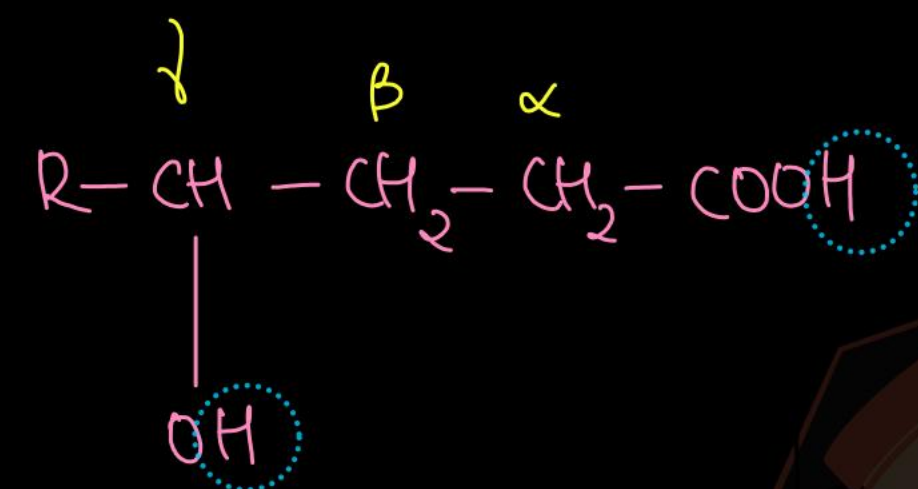
1) α -hydroxy acid



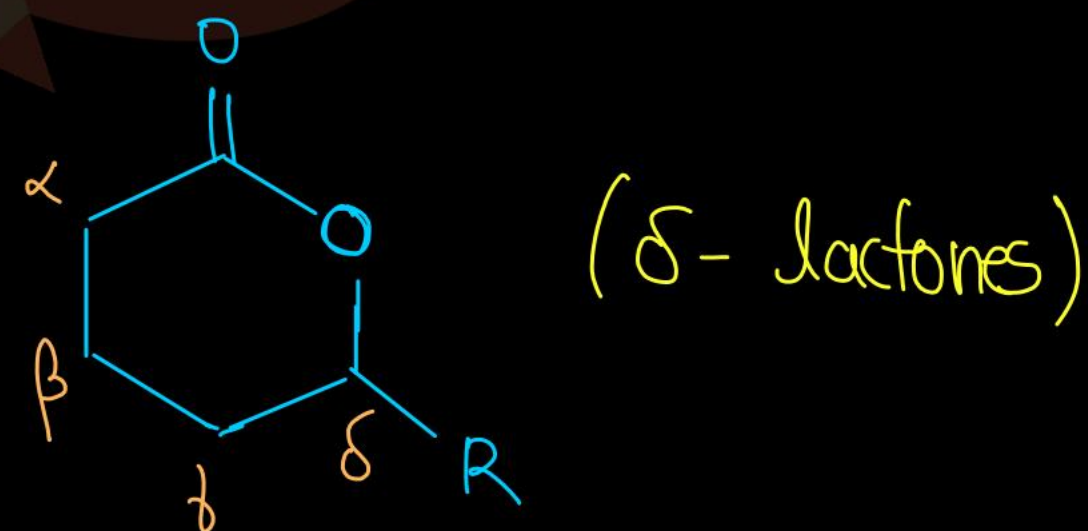
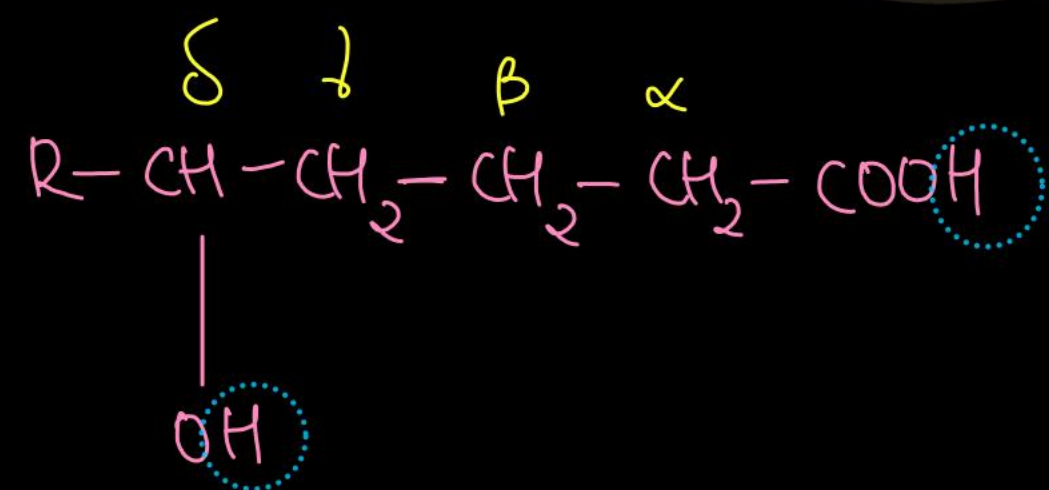
2) β -hydroxy acid :



3) γ -Hydroxy acid :-

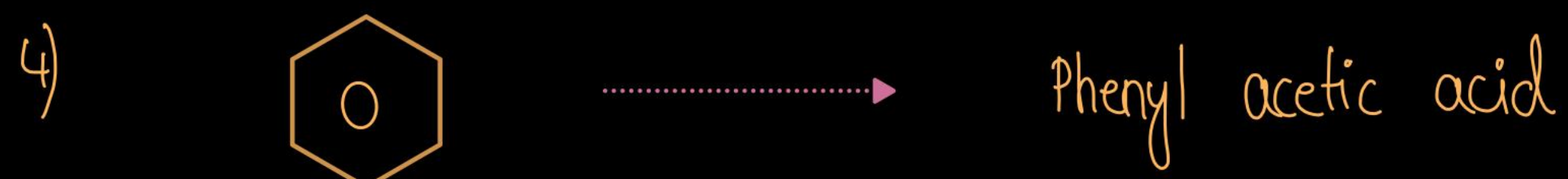


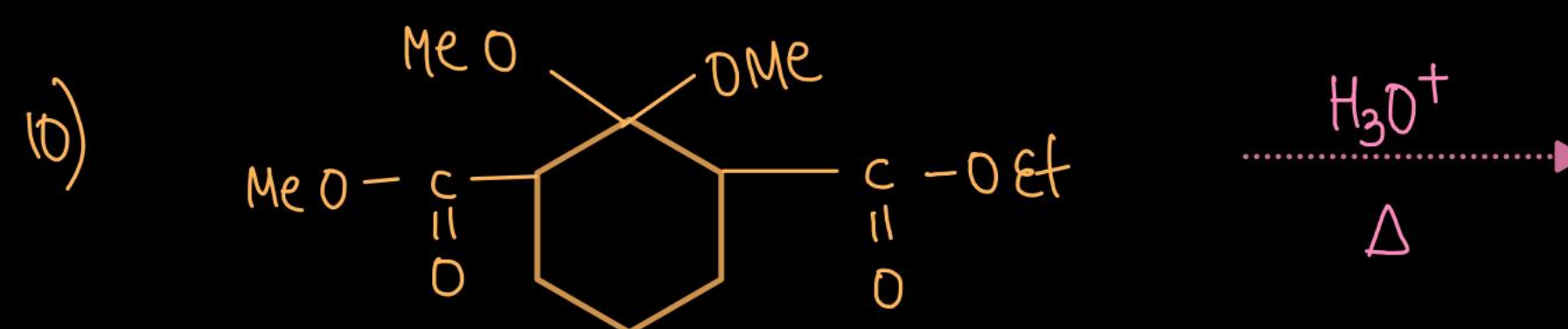
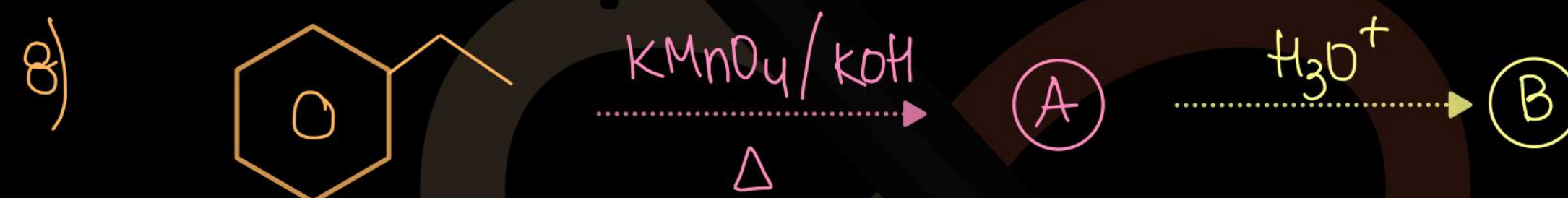
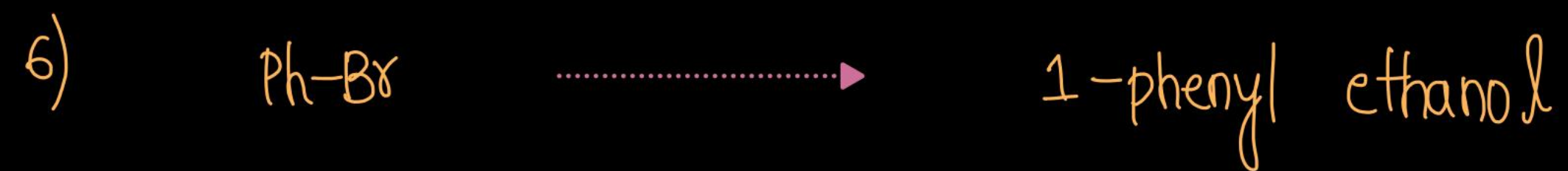
4) δ -hydroxy acid

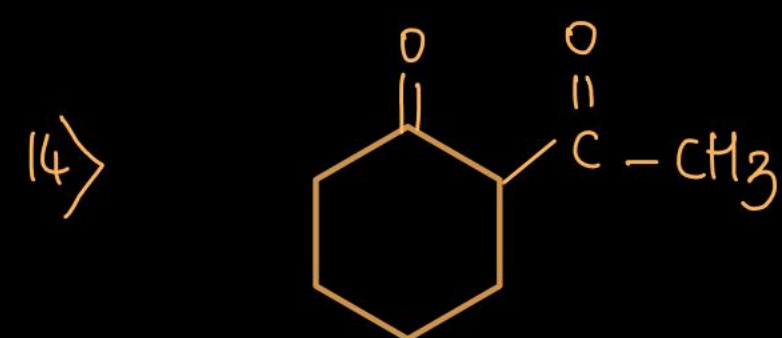
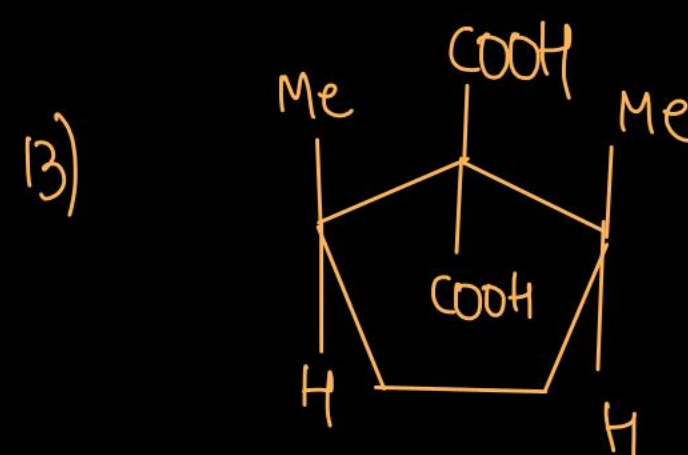
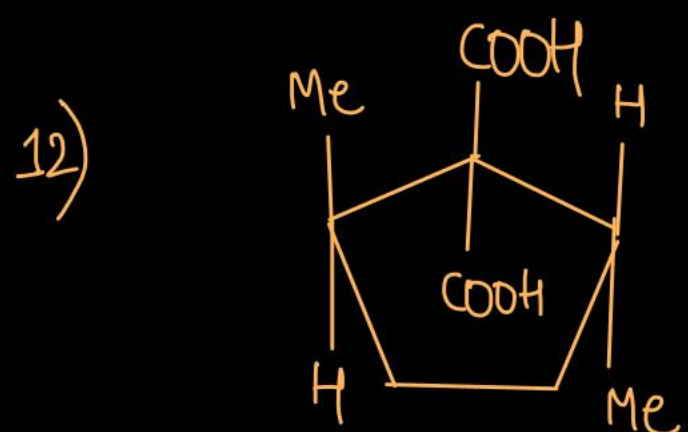
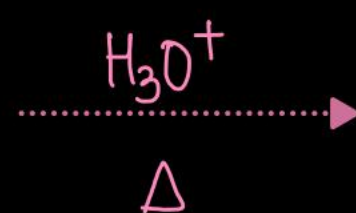
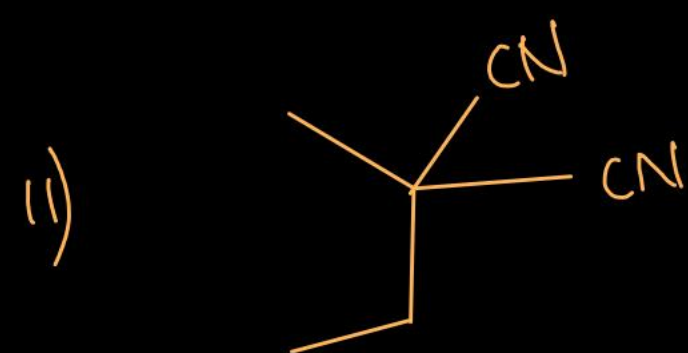


Practice :-

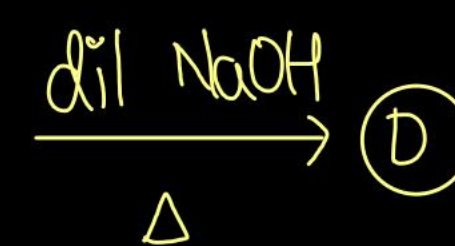
Q) Convert



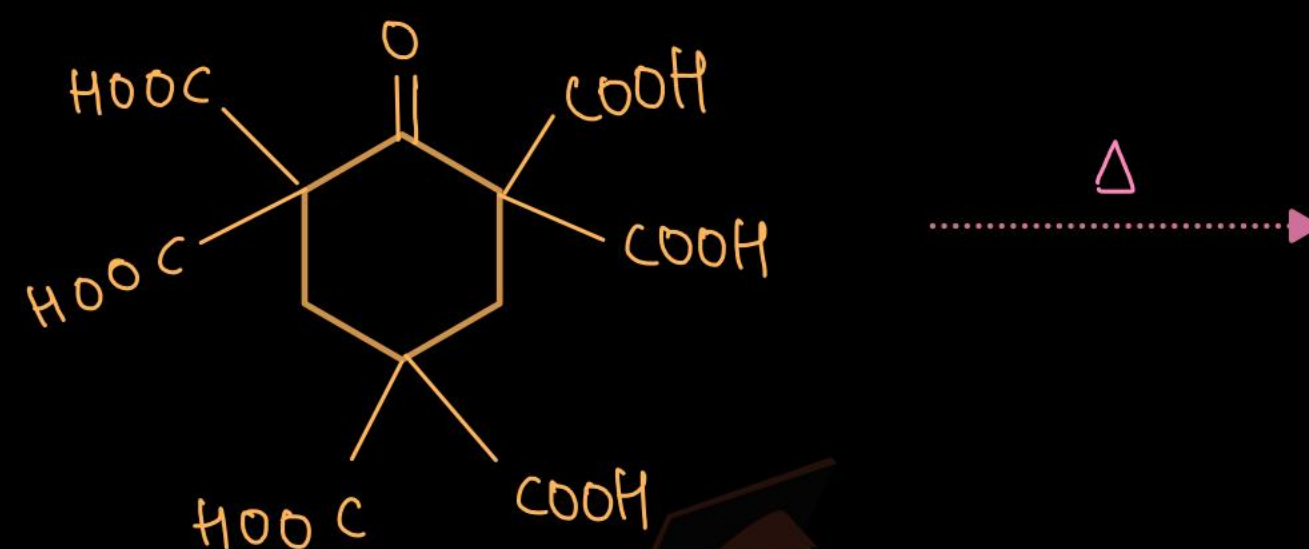




+



15)



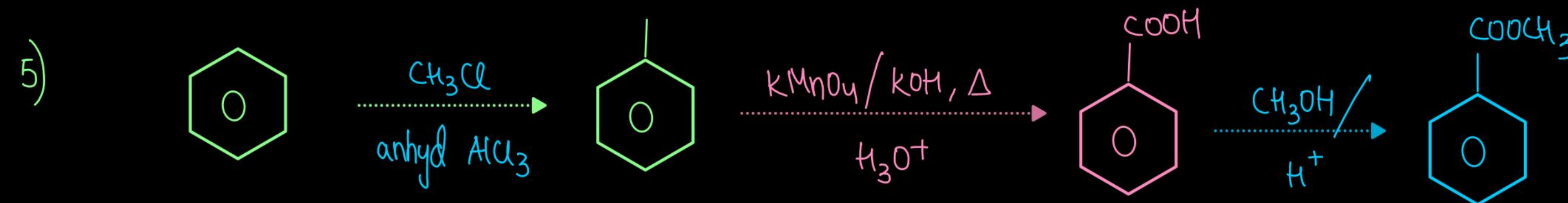
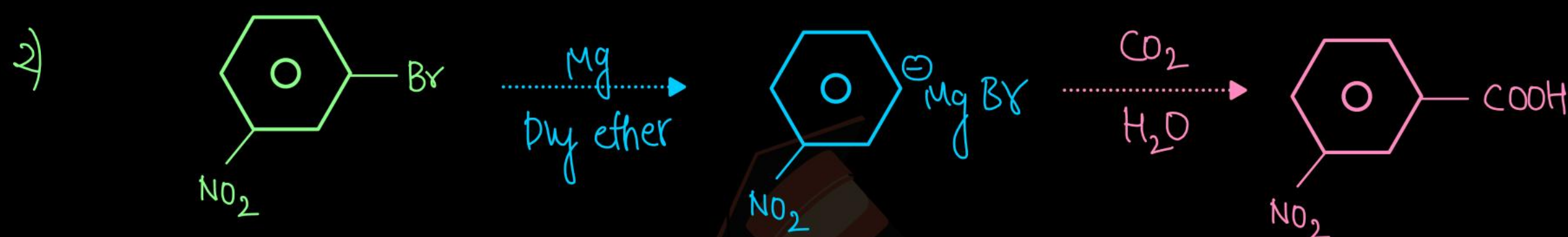
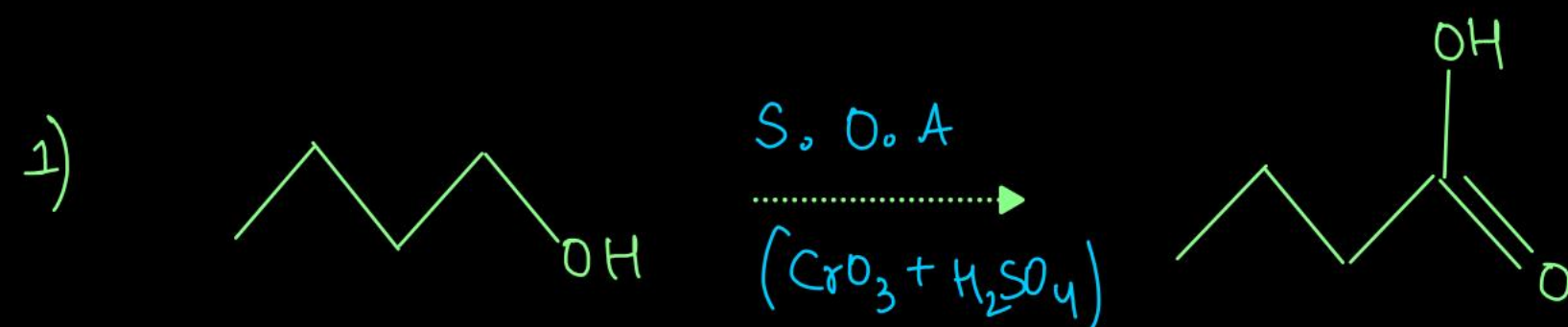
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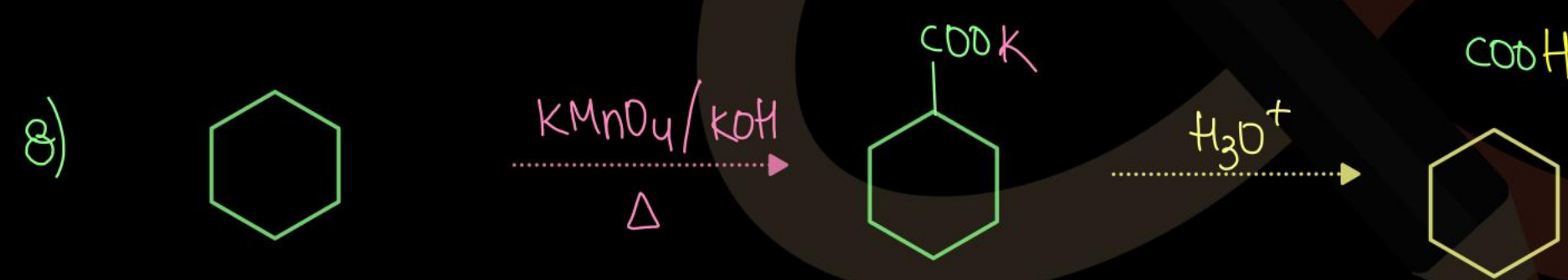
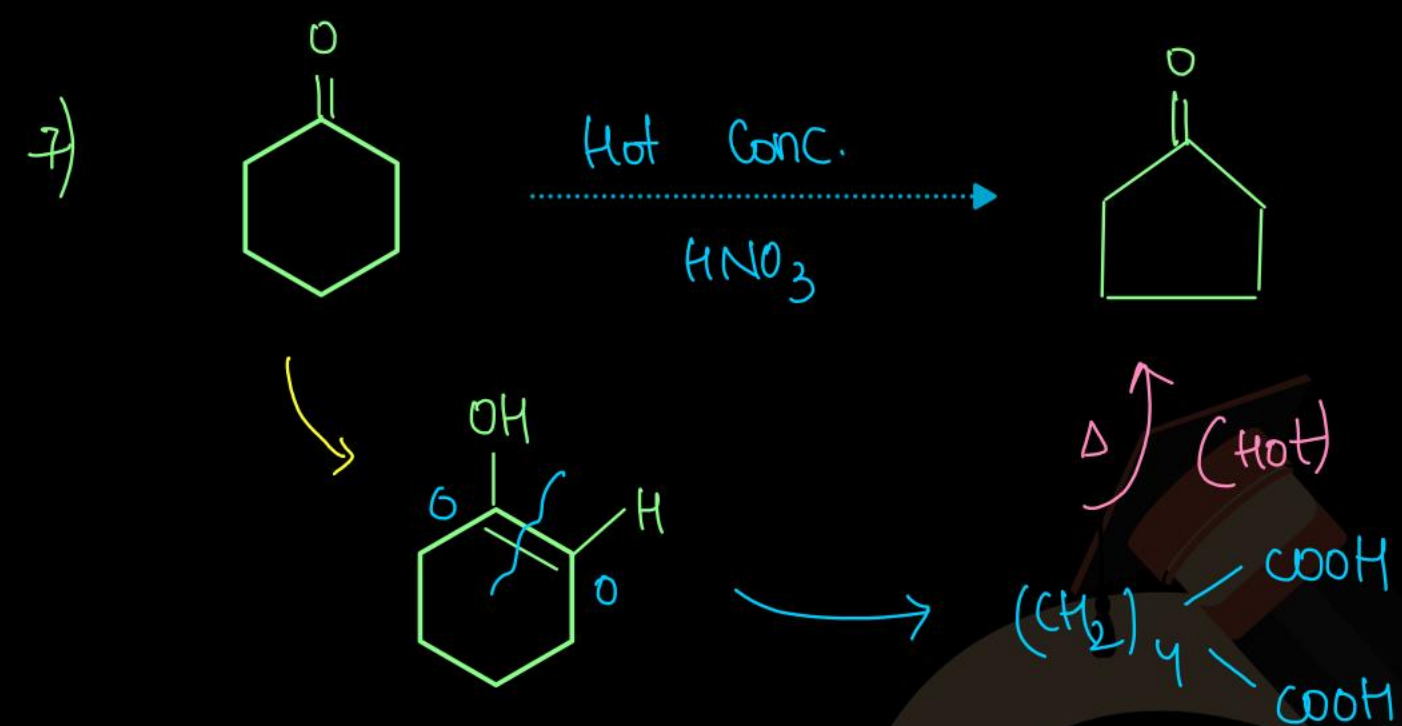
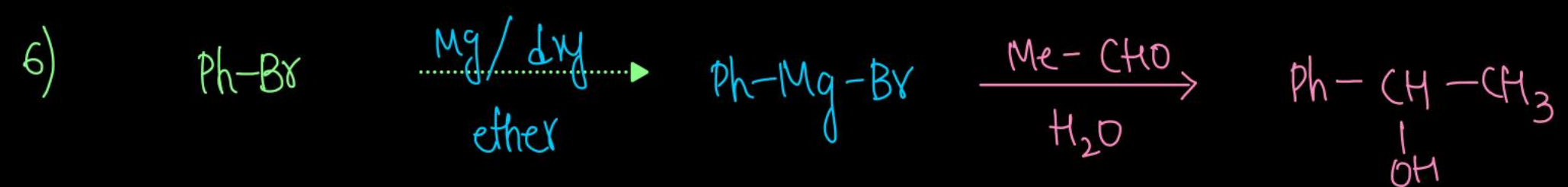


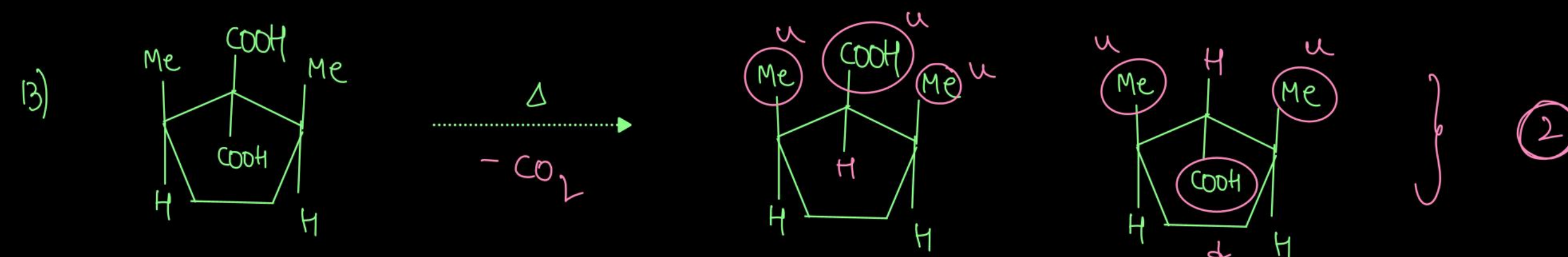
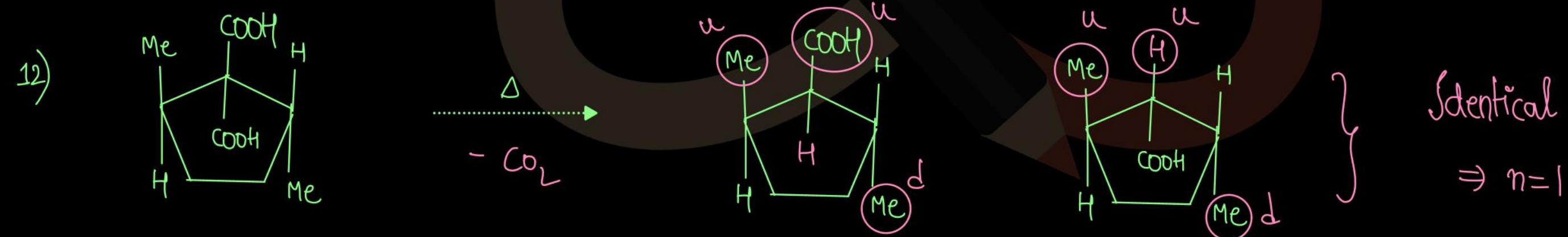
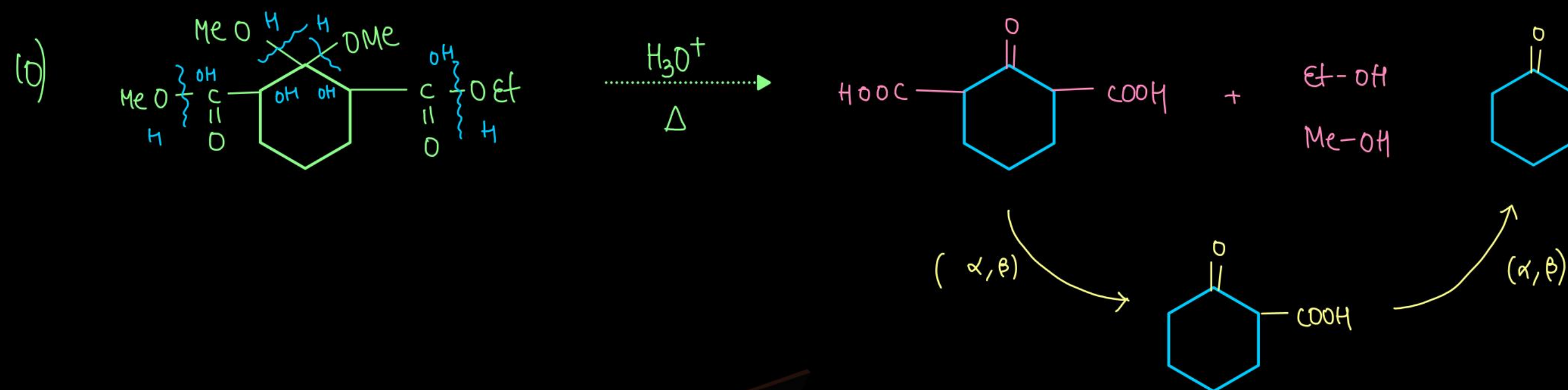
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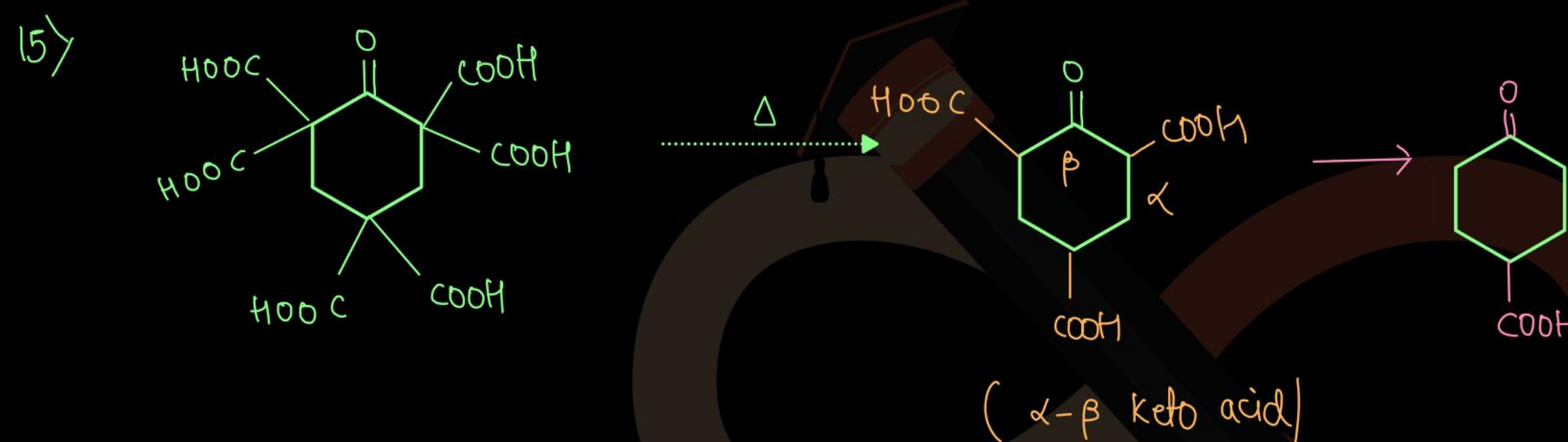
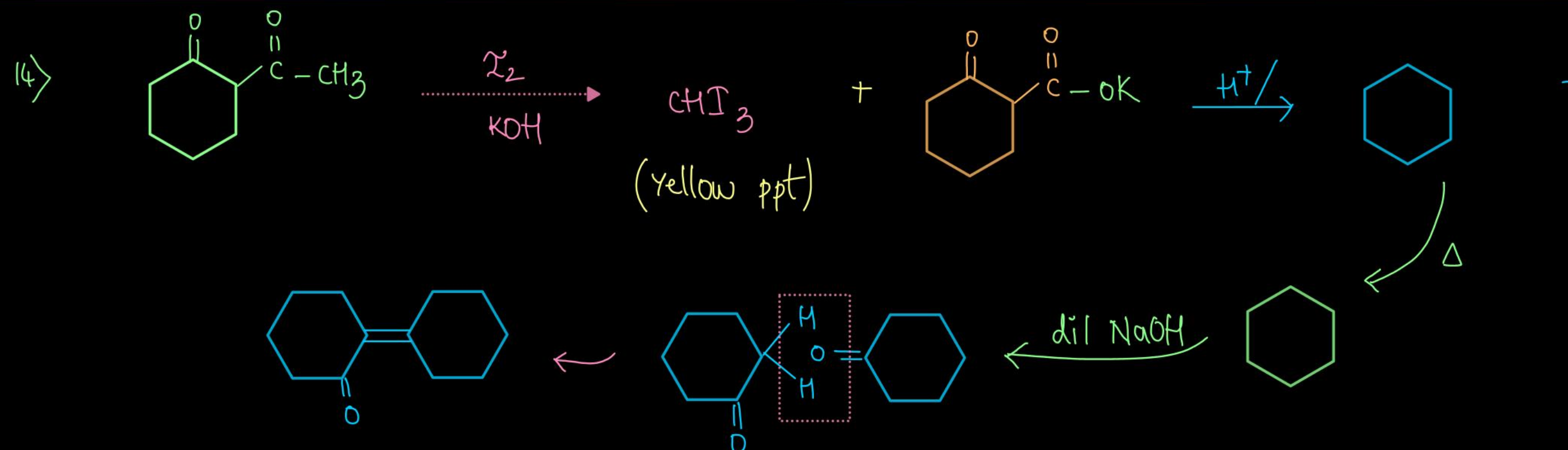


Solutions









Q)

Ethane

