

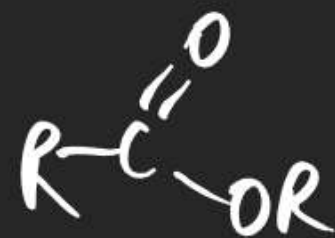
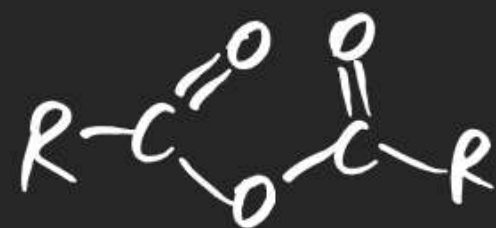
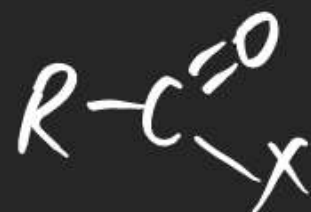
Carboxylic Acid & Derivatives

⇒ Carboxylic Acid



↑ Hydrolysis

⇒ Carboxylic Acid derivatives



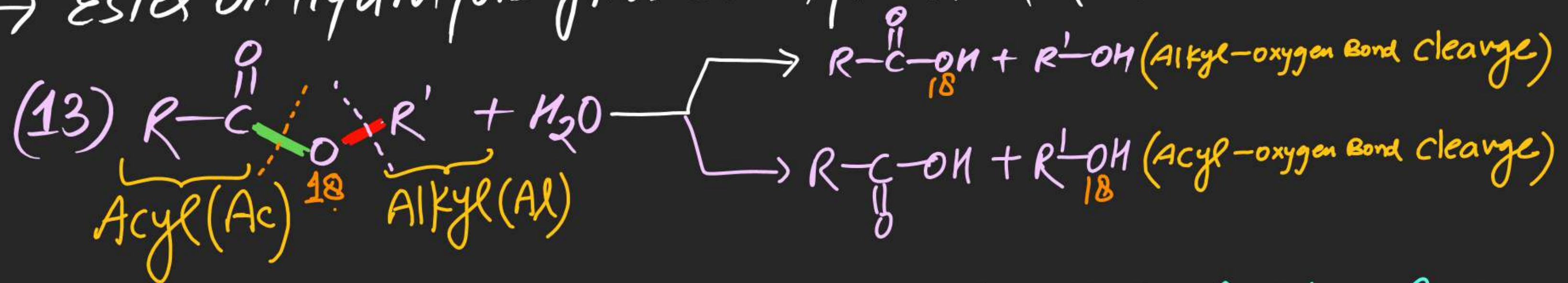
Method of Preparation:

(1) By Reaction of PCl_5 , $SOCl_2$ with $R-COOH$



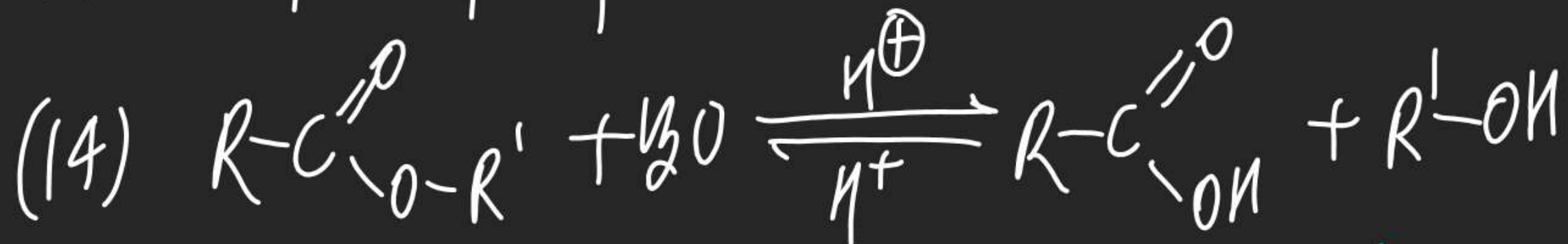
(6) Hydrolysis of Ester:

⇒ Ester on Hydrolysis gives Carboxylic Acid & Alcohol as a Product.



Note: (i) Hydrolysis of ester can be catalysed both by Acid & Base

(ii) Acid Catalysed hydrolysis of Ester is reversible in nature.



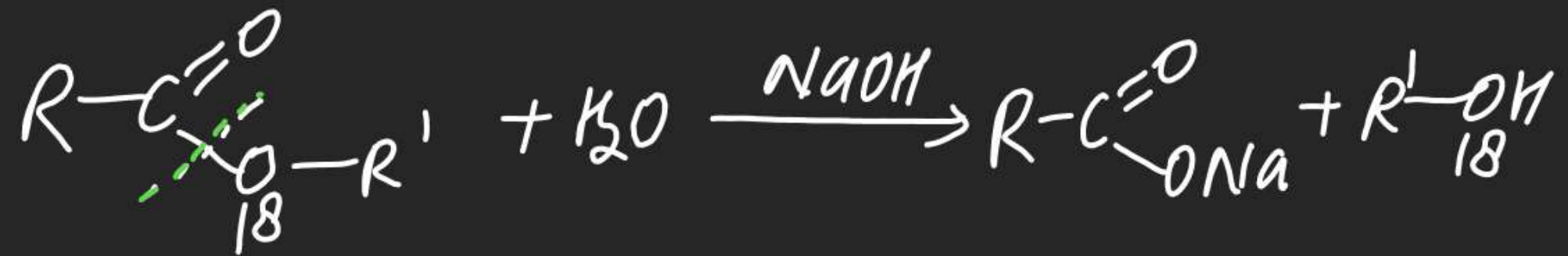
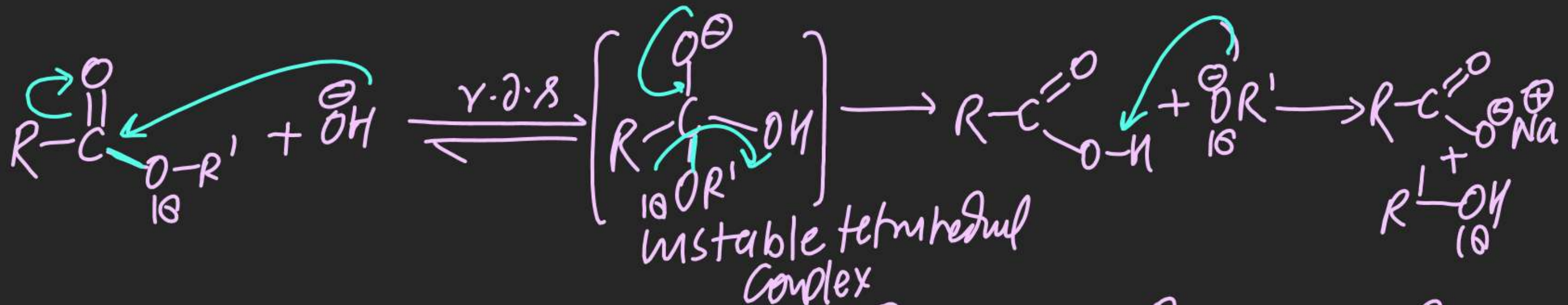
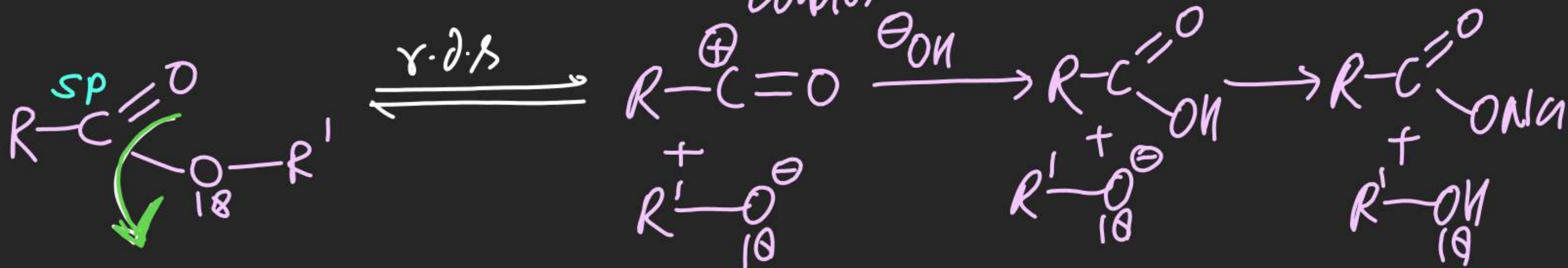
(iii) Base Catalysed Hydrolysis of Ester is irreversible in nature & known as saponification.

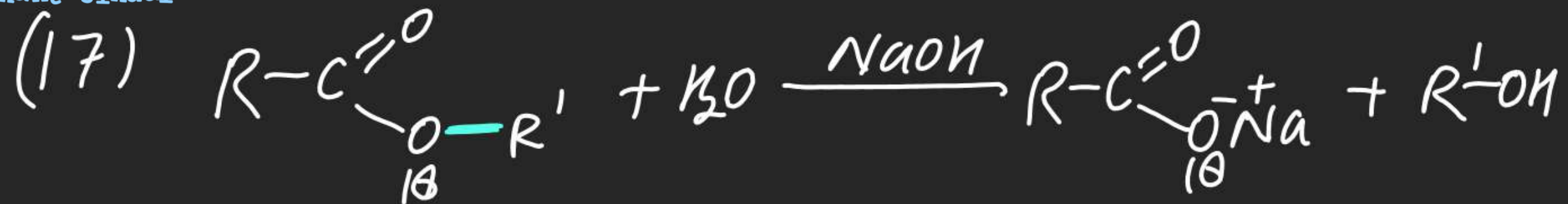


(iv) Possible mechanism

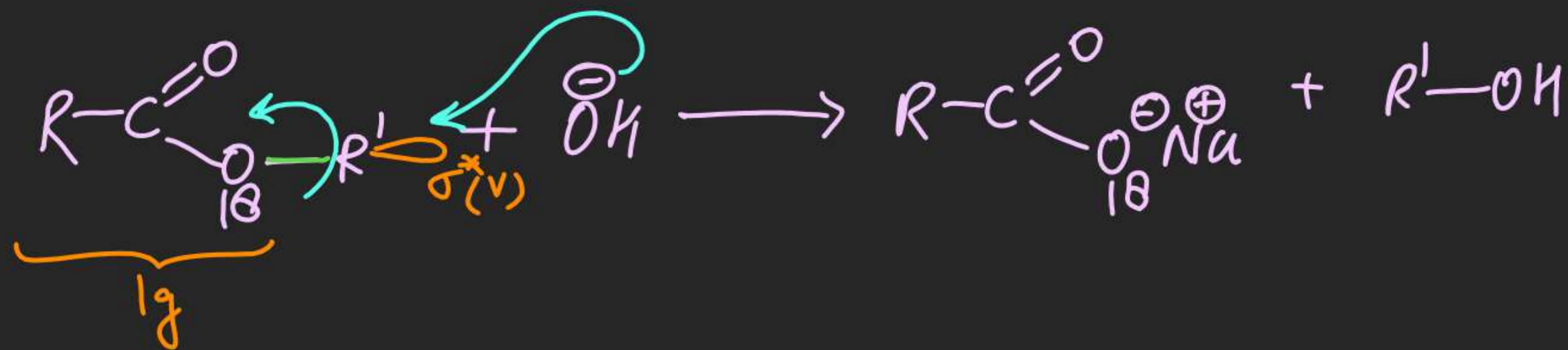
- (a) BAC^2 [Bimolecular Base Catalysed Acyl-oxygen Bond Cleavage mechanism]
- (b) BAC^1 [Unimolecular _____]
- (c) BAI^2 [Bimolecular _____ Acyl _____]
- (d) BAI^1 [Uni _____]
- (e) AAC^2 [Bi _____ Acid _____ Acyl _____]
- (f) AAC^1
- (g) AAI^2
- (h) AAI^1

(16)

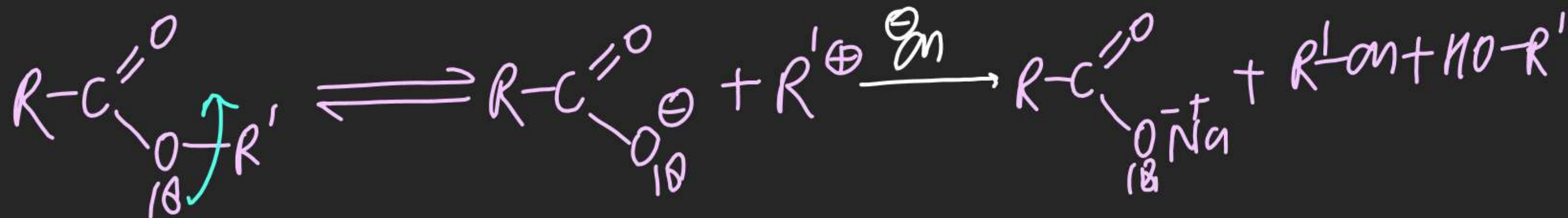
BAC²BAC¹

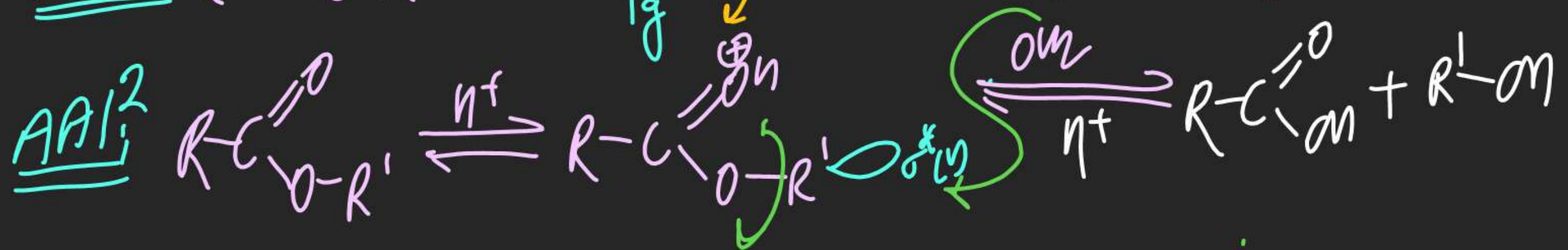
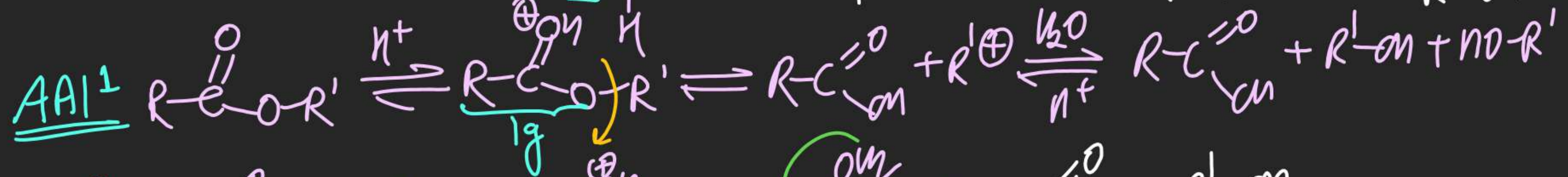
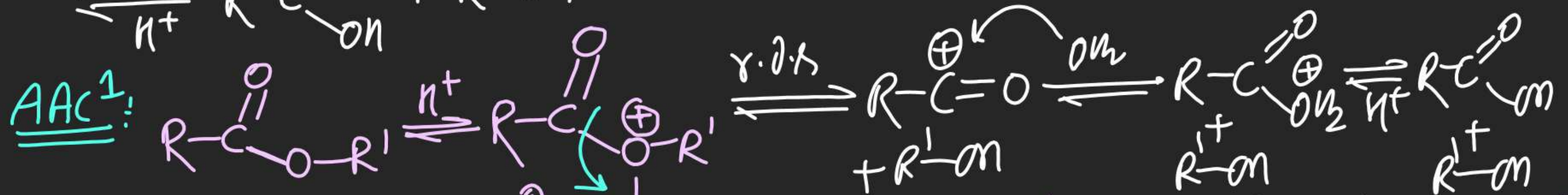
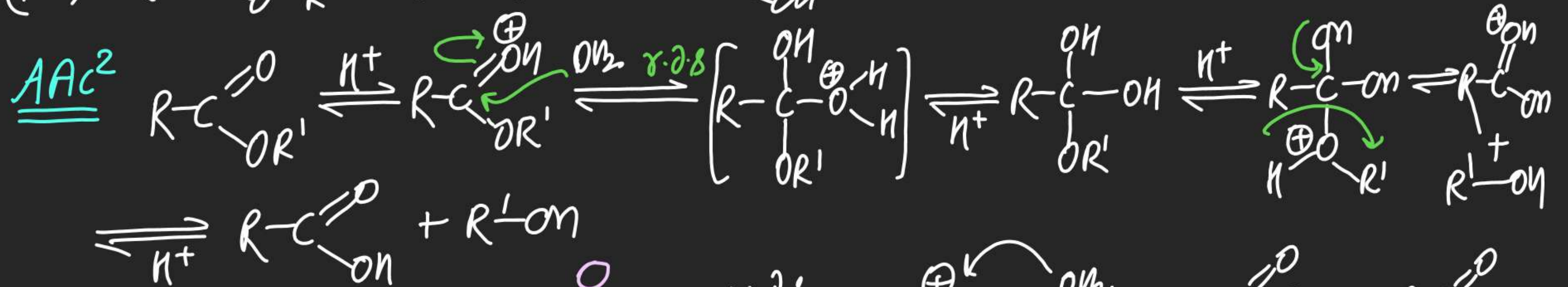
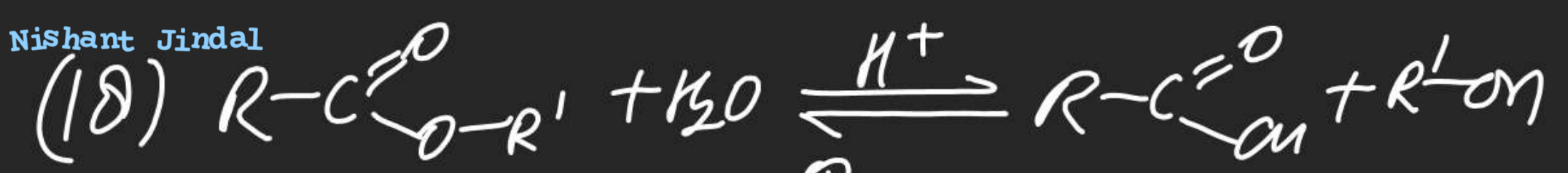


BAI²:



BAI¹

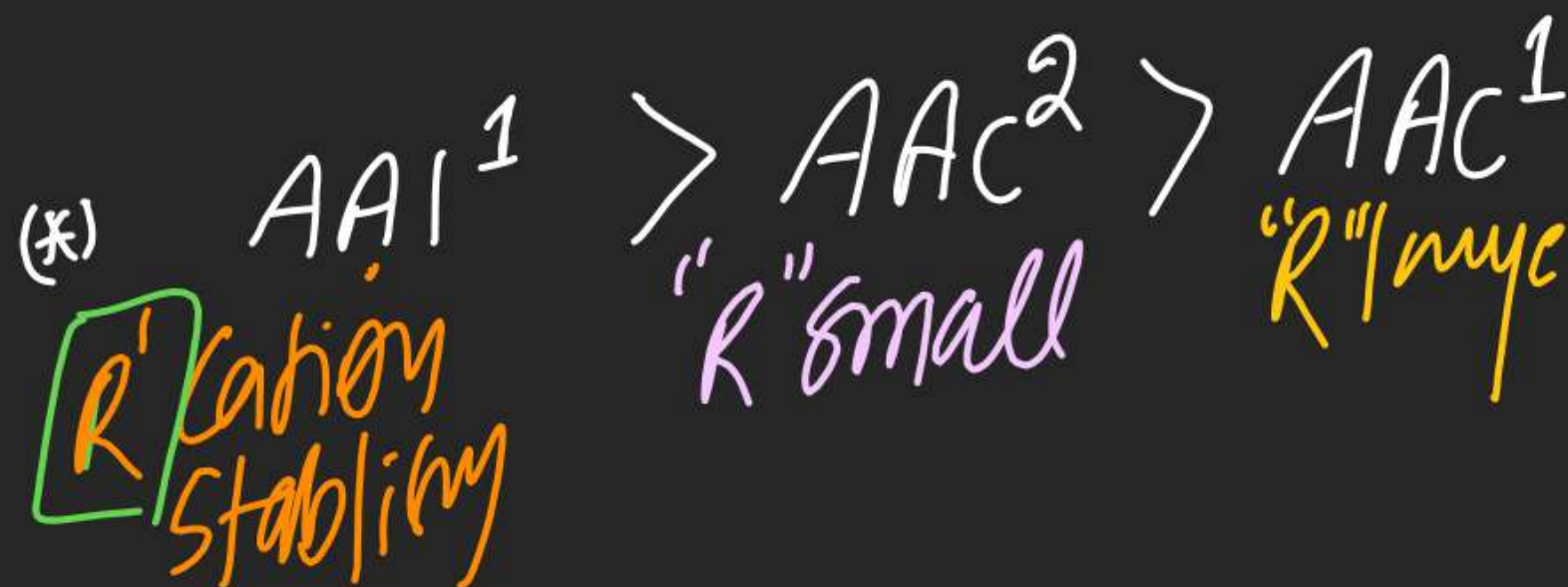
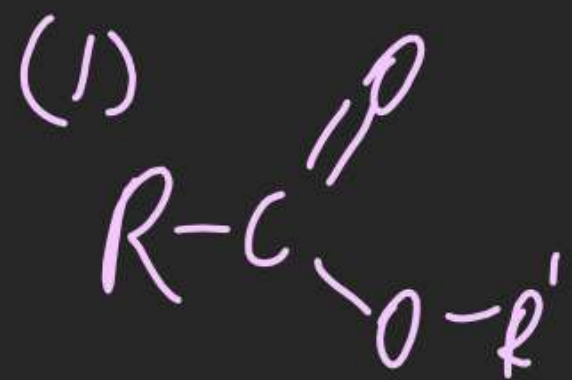
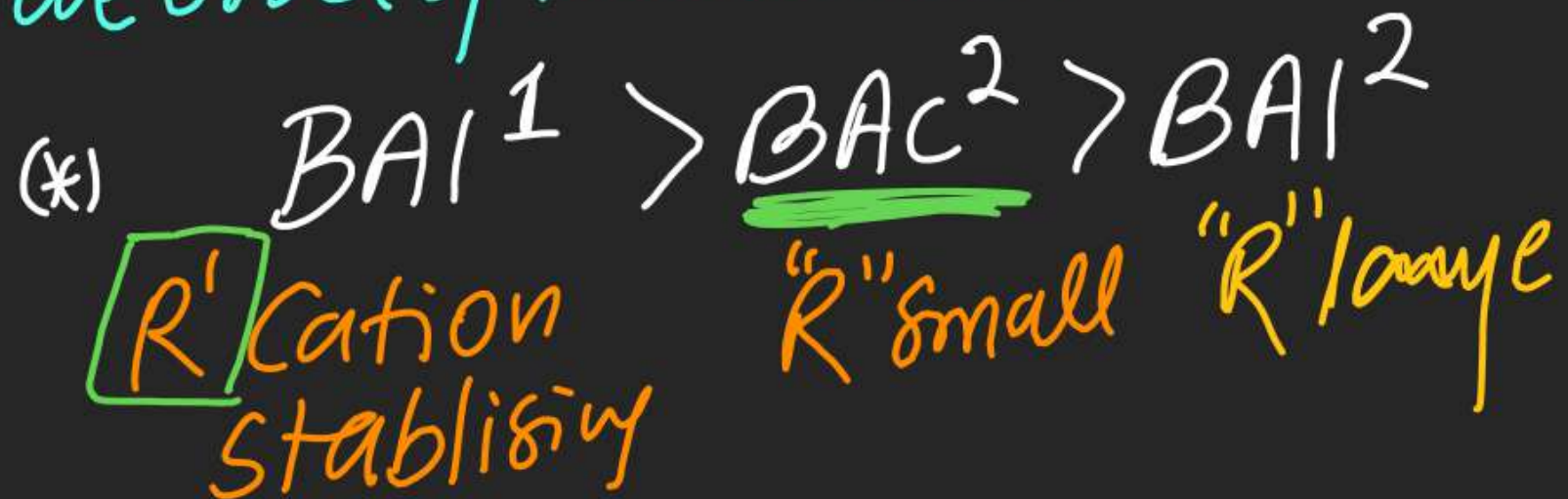


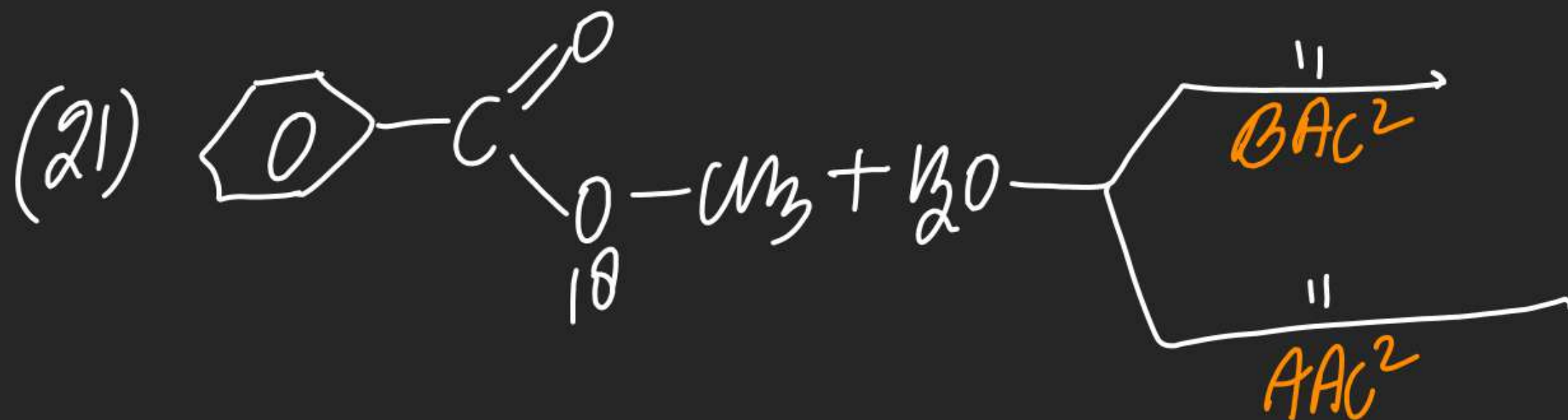
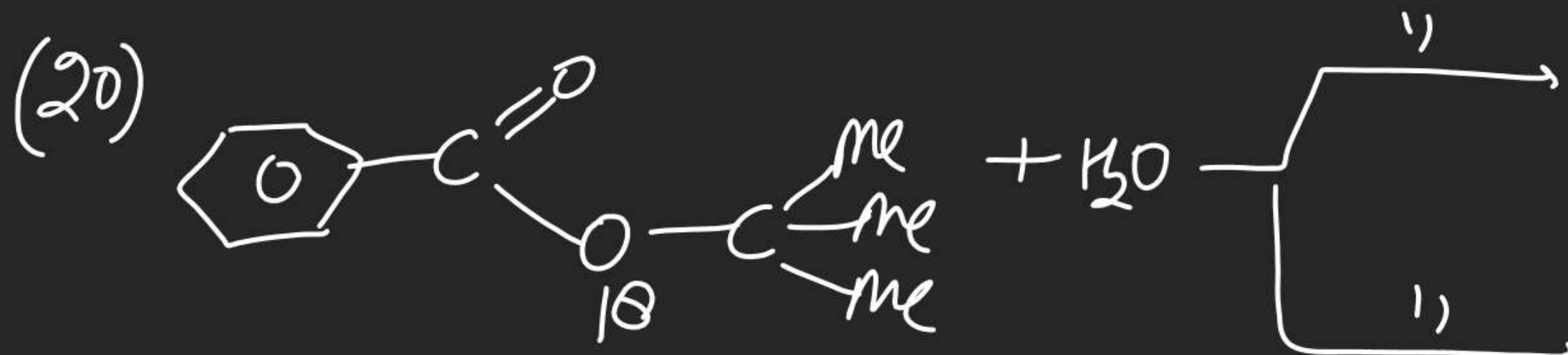
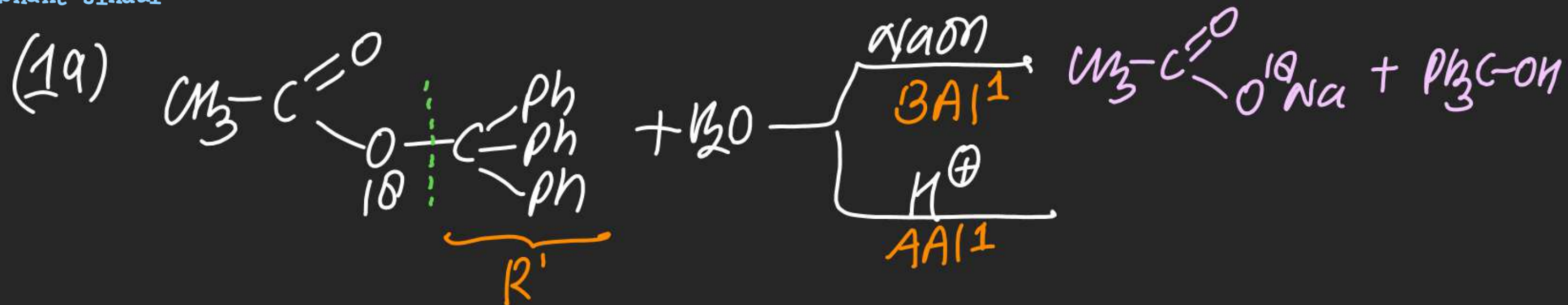


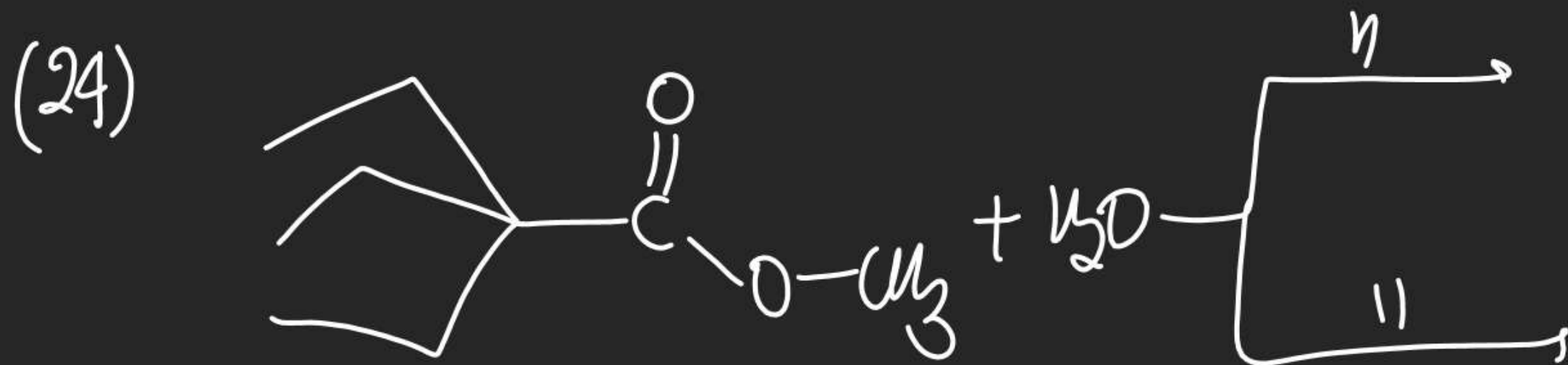
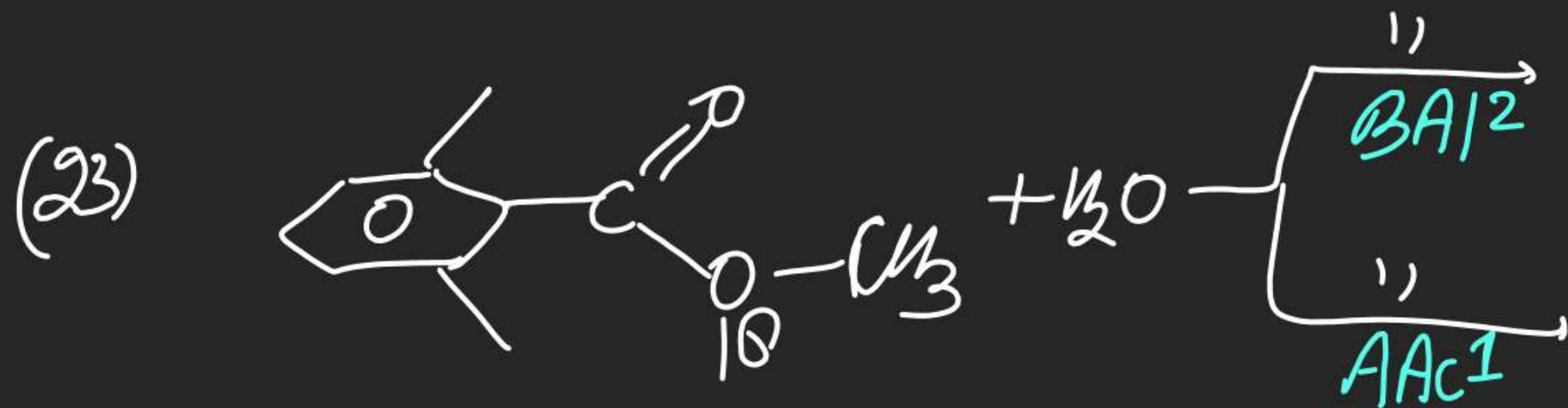
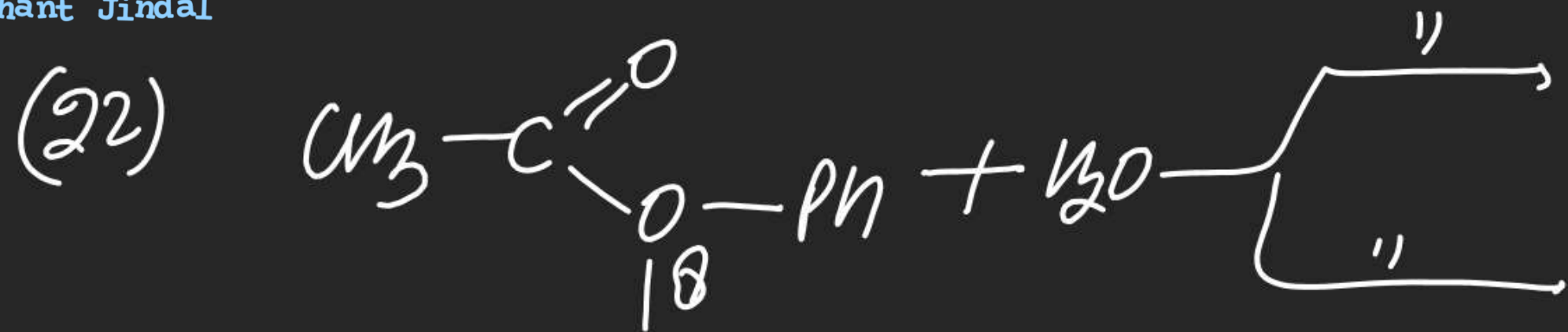
Note (i) There is no any ester found till now which gets hydrolysed

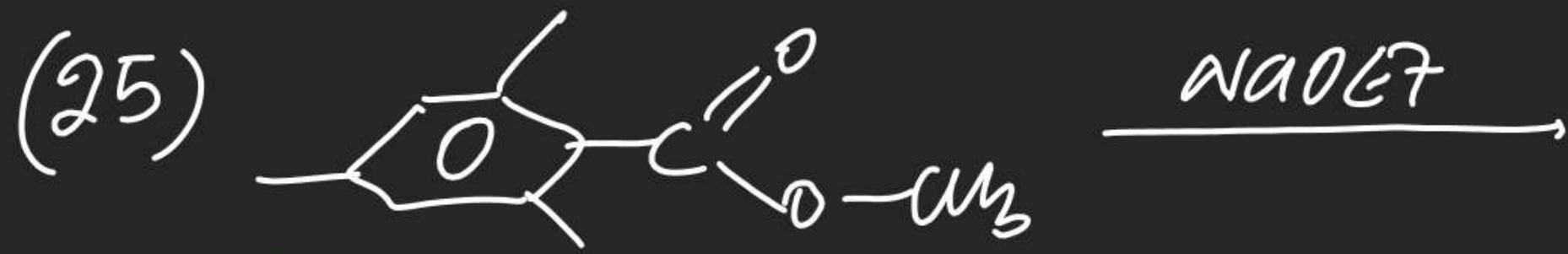
By BAC^1 & AAI^2

(ii) Preference order of mechanism



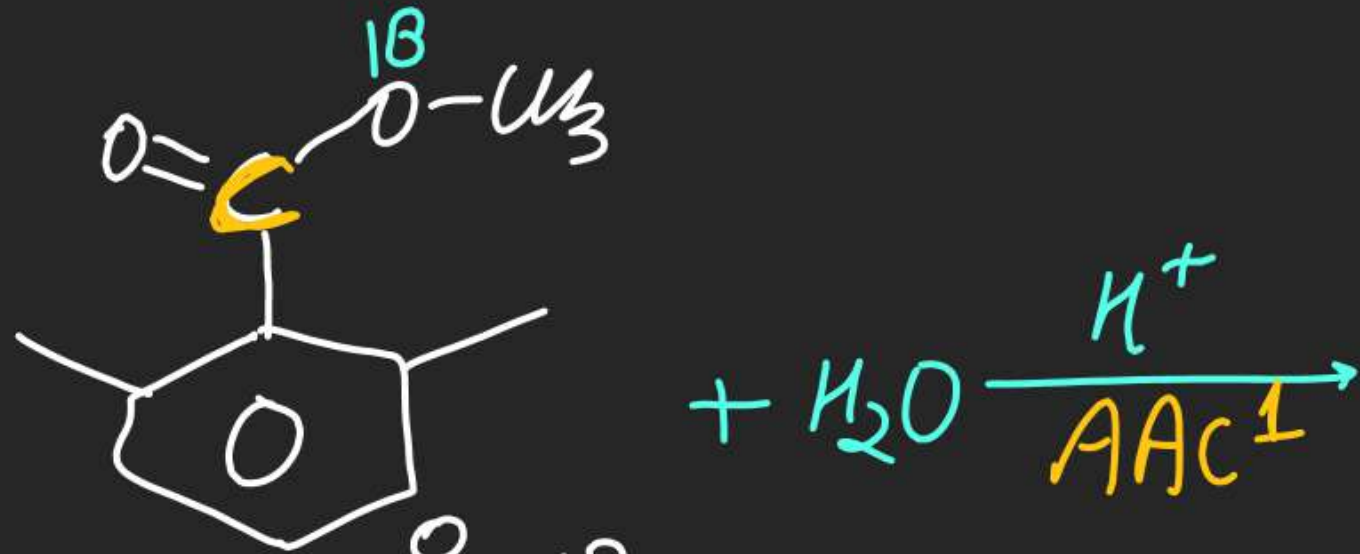






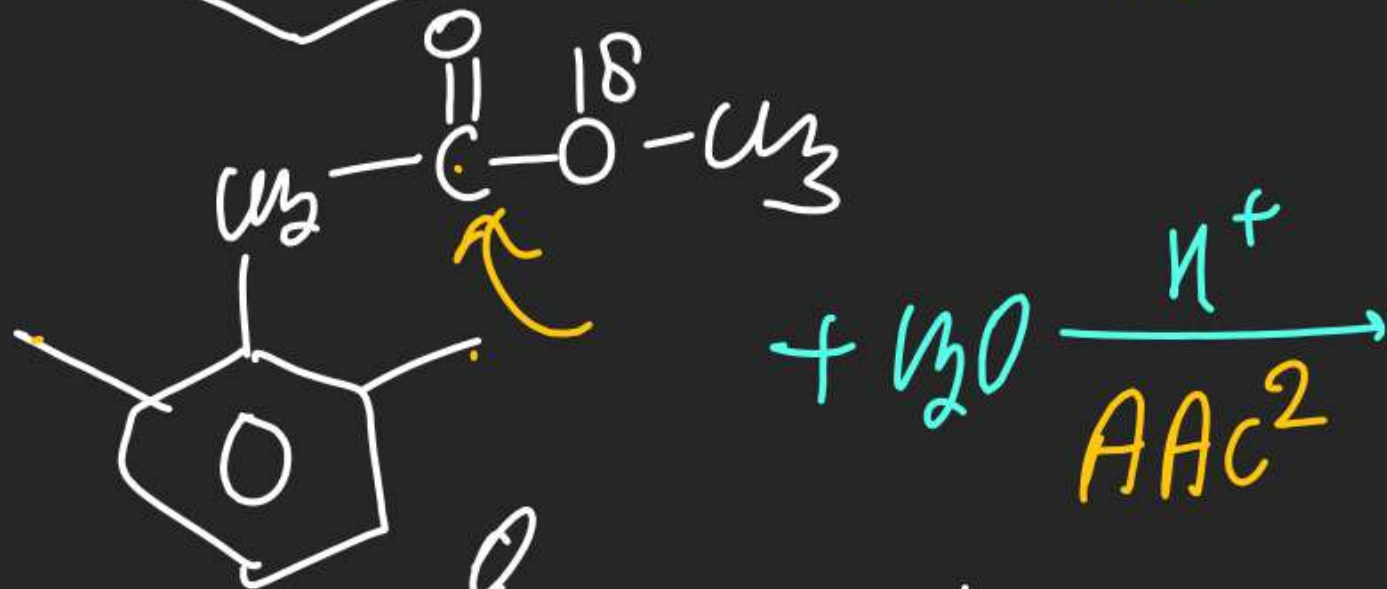
m.f.w

(26)

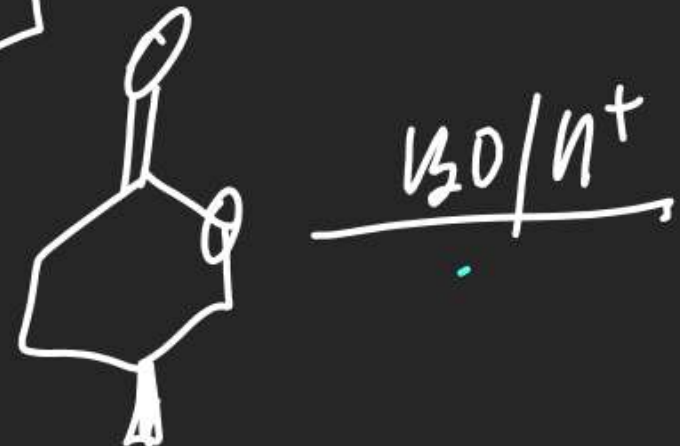


m.f.w

(27)

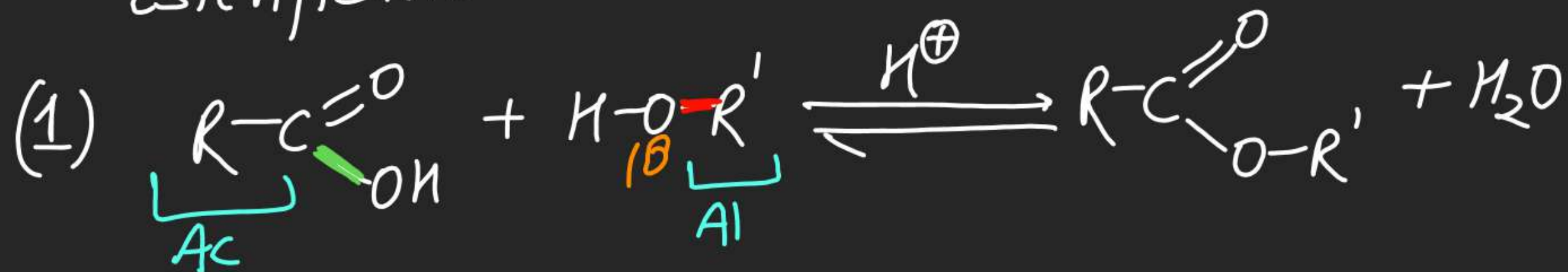


(28)



(#) Esterification:

⇒ Formation of Ester By Reaction of Acid & Alcohol are known as Esterification.



Note (i) Reversible Rxn
(ii) Can be Catalysed only by Acid
(iii) mechanism possible

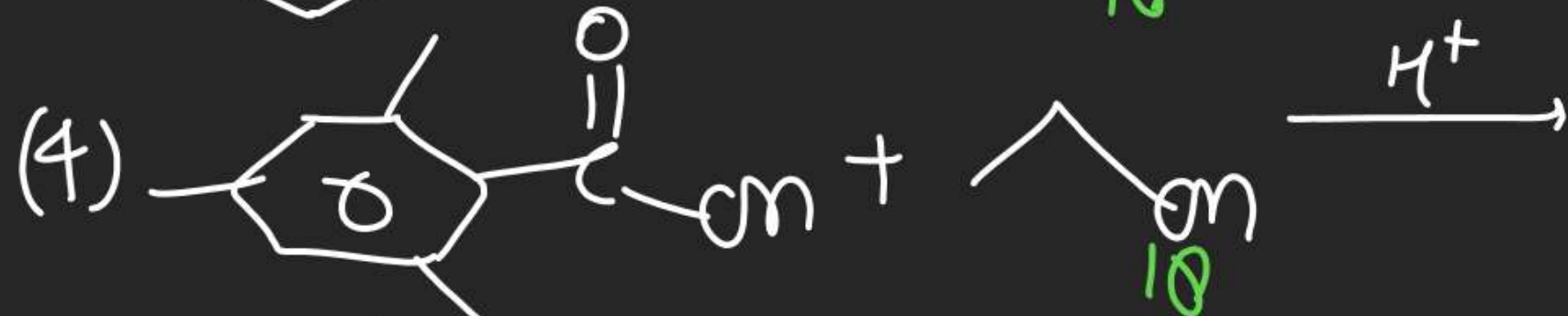
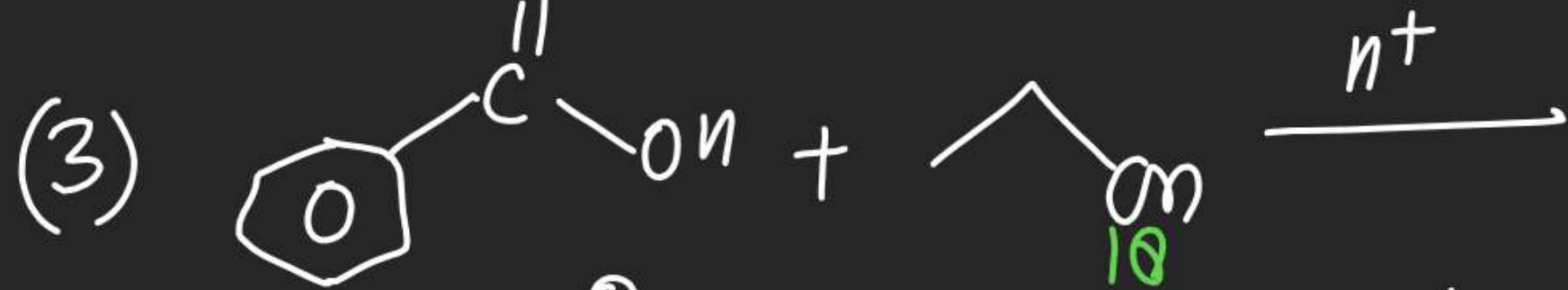
(*) AAC²

(*) AAC¹

(*) AAl²

(*) AAl¹

(iv) mechanism of Fischer esterification

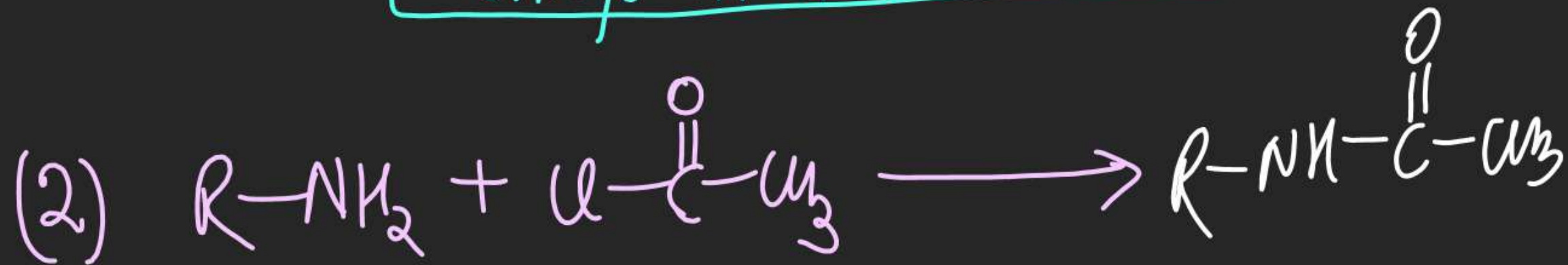
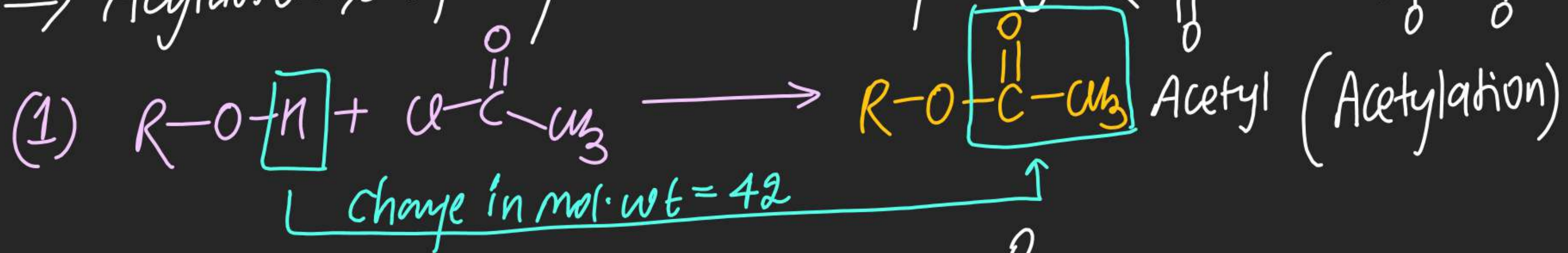


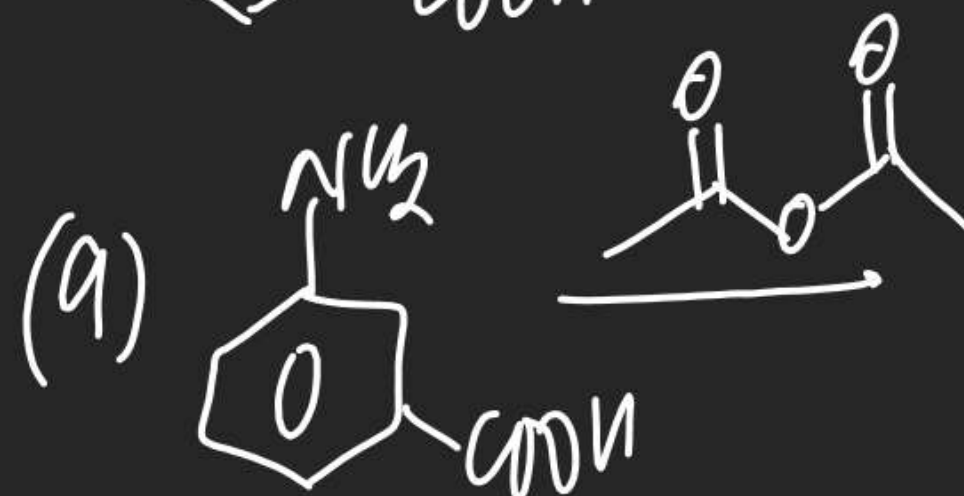
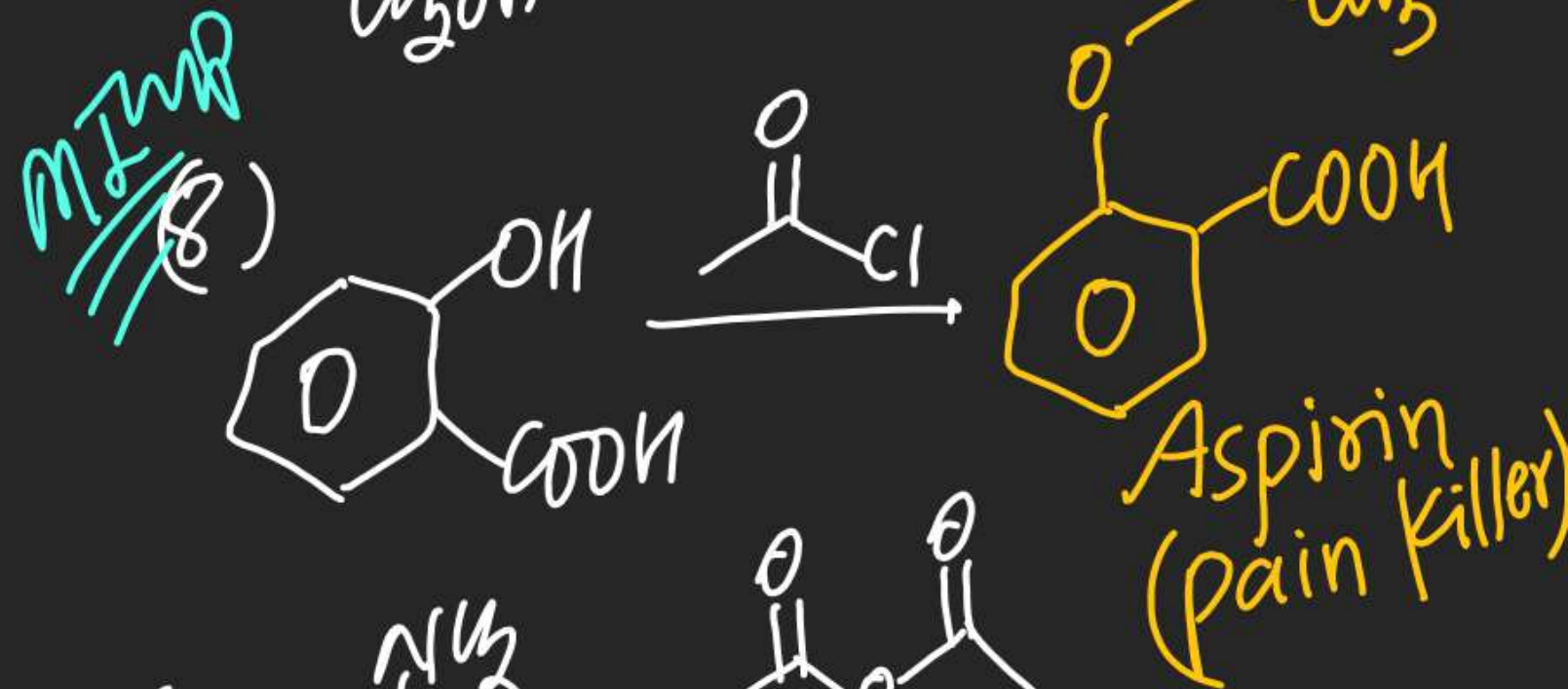
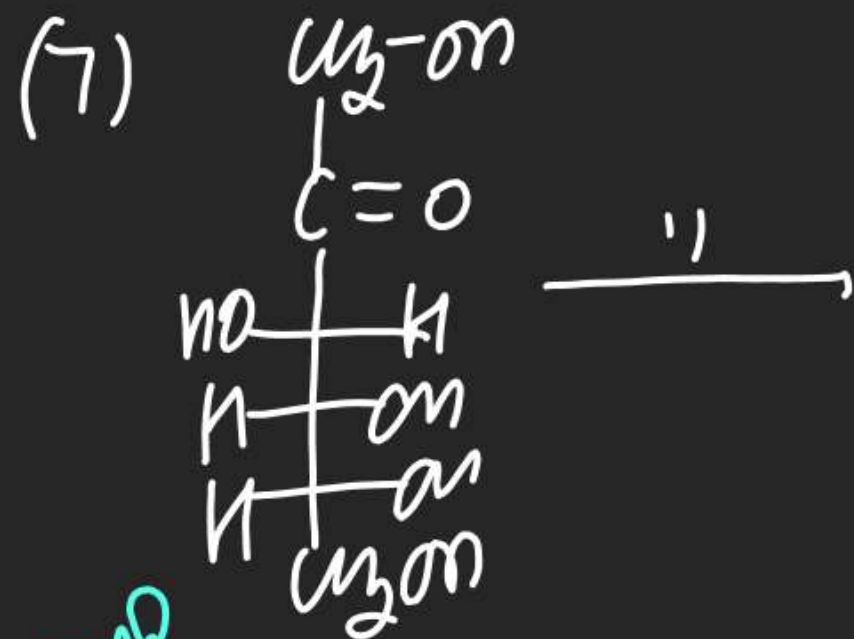
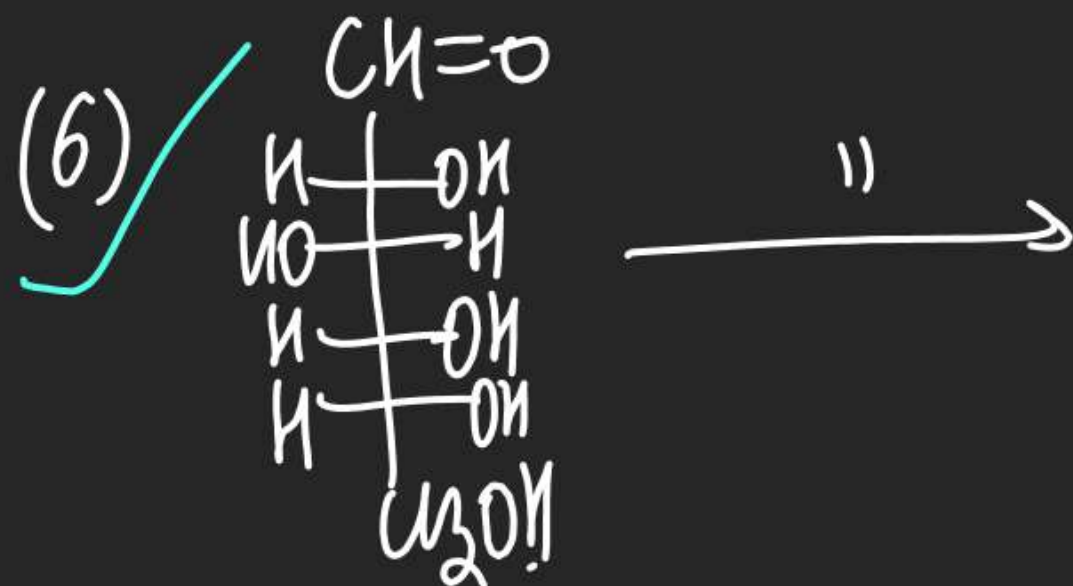
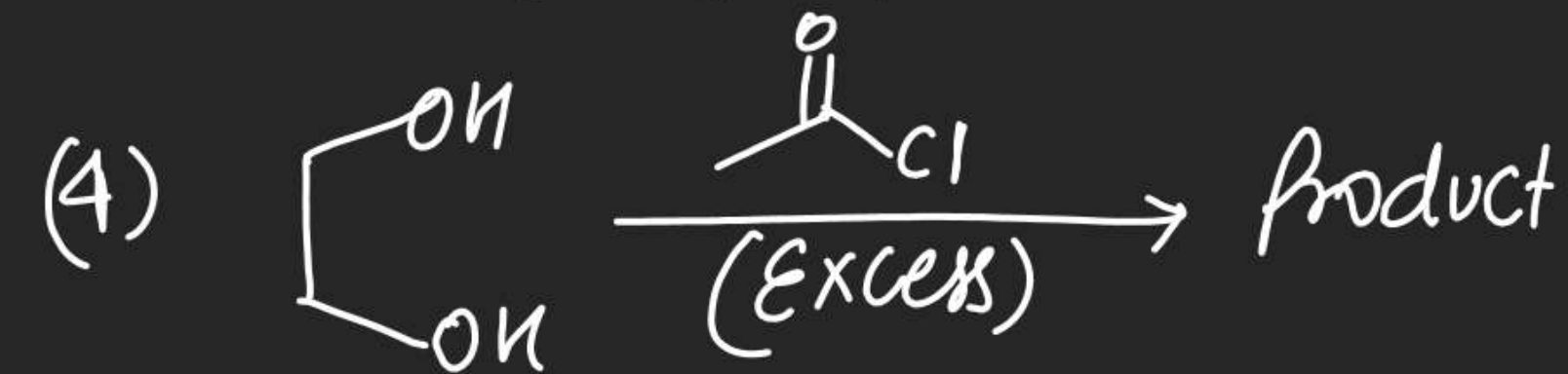
(#) Acylation:-

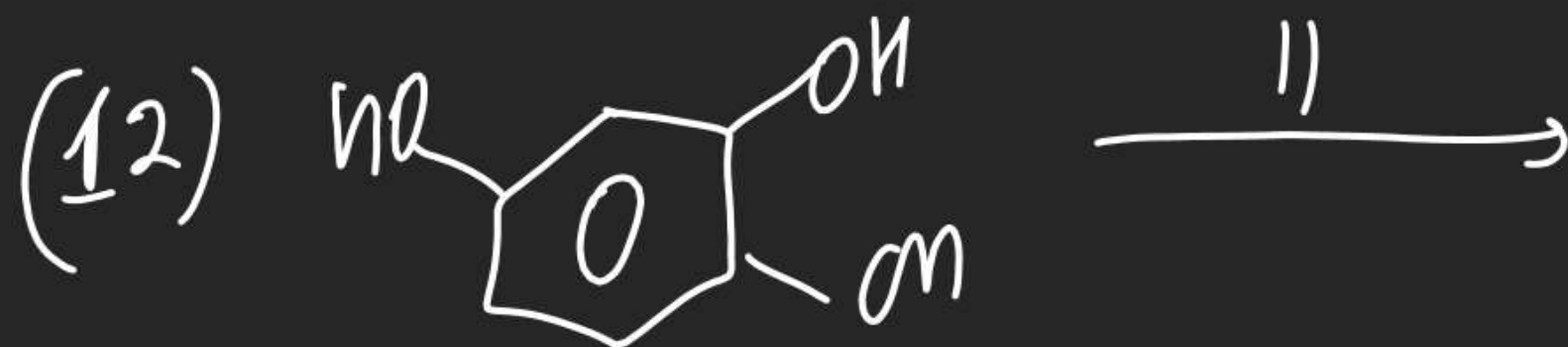
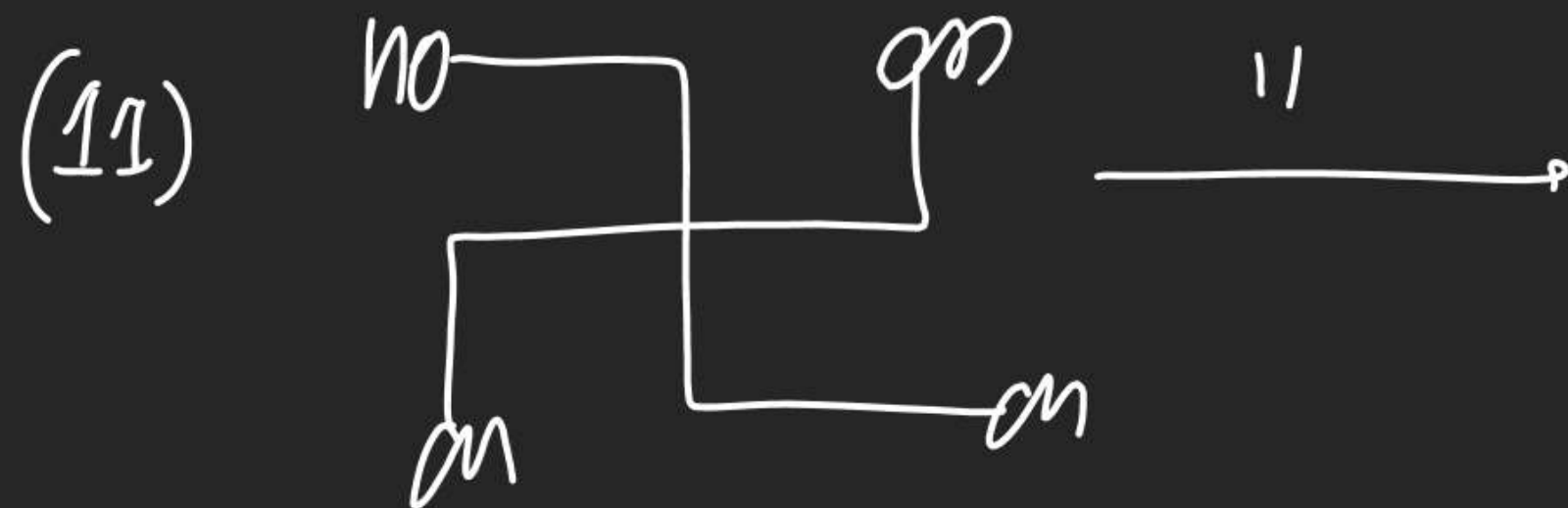
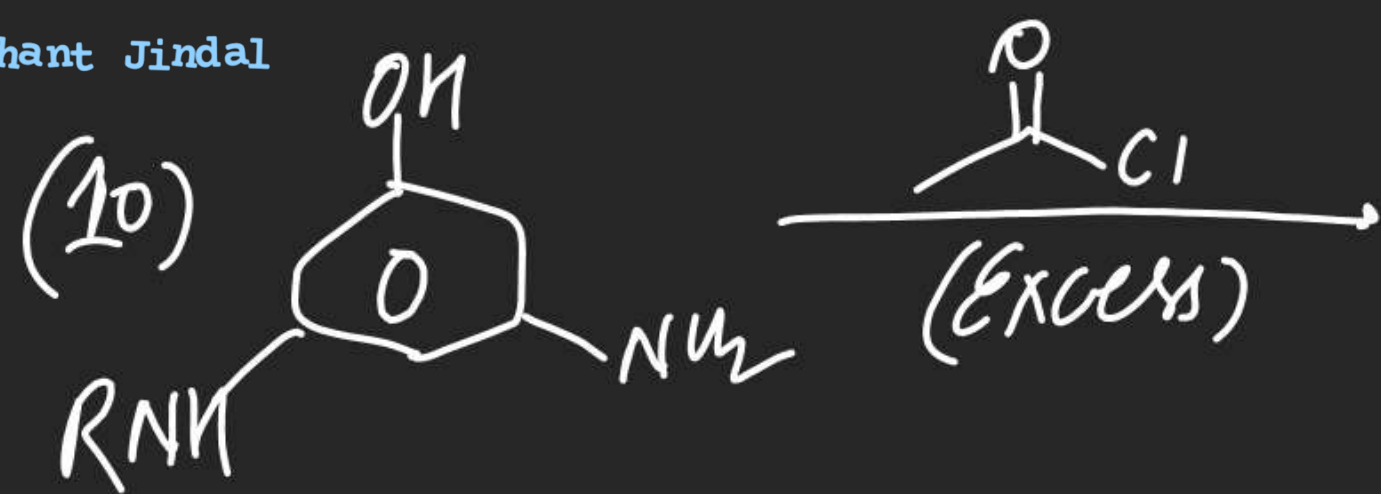
⇒ Insertion of $-\overset{\overset{\text{O}}{\parallel}}{\text{C}}-\text{R}$ group is known as Acylation



⇒ Acylation is oftenly carried out By using $\text{R}-\overset{\overset{\text{O}}{\parallel}}{\text{C}}-\text{X}$ or $\text{R}-\overset{\overset{\text{O}}{\parallel}}{\text{C}}-\text{O}-\overset{\overset{\text{O}}{\parallel}}{\text{C}}-\text{R}$





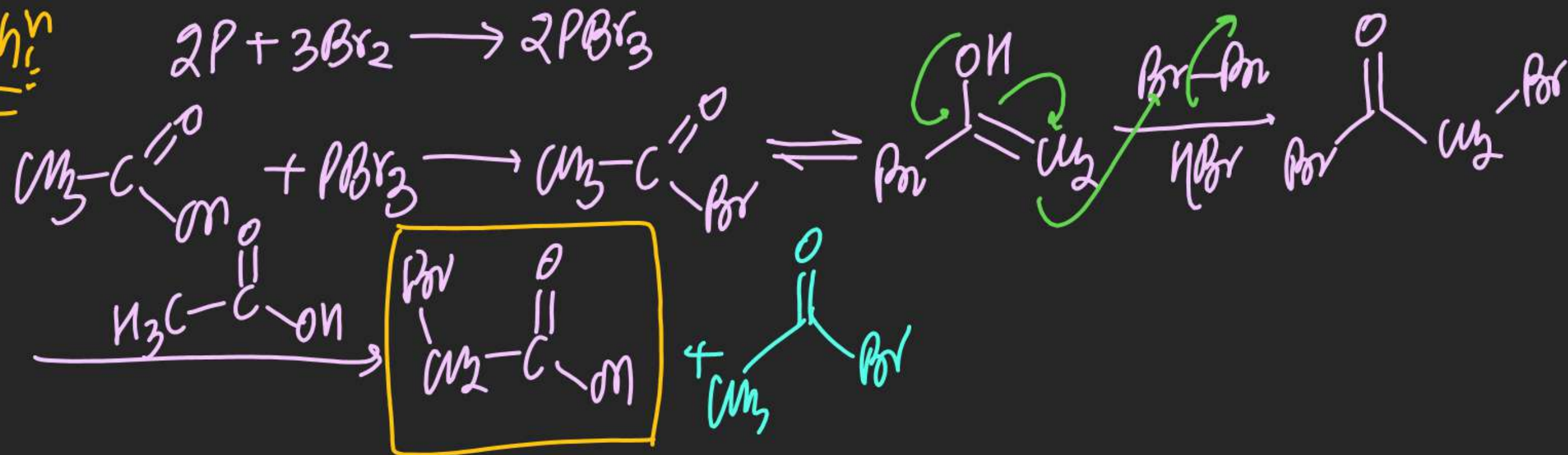


(#) Hell Volhard Zelinsky Reaction (HVZ Reaction)

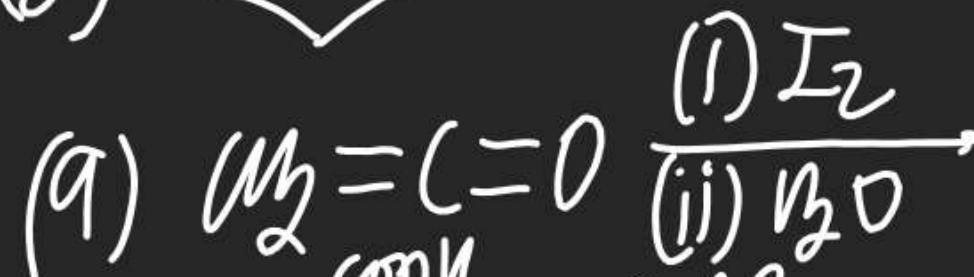
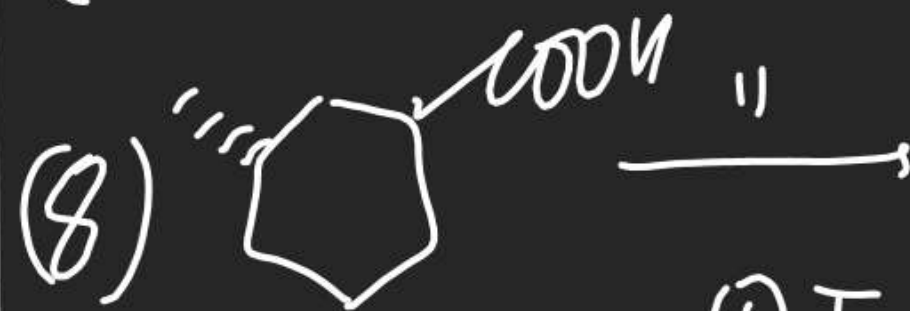
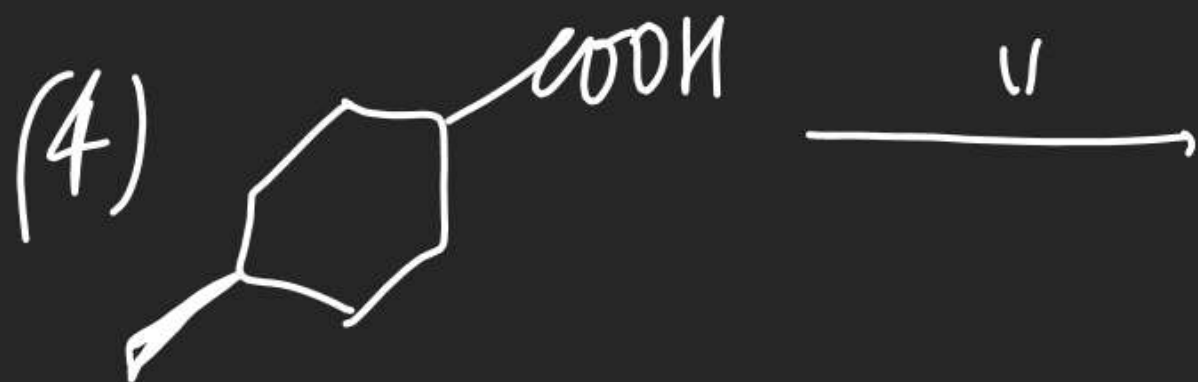
⇒ In this Reaction Carboxylic Acid is treated with $\text{Red P}/\text{Br}_2$ so that α -Bromo Acid is obtained as a Product.



mechⁿ

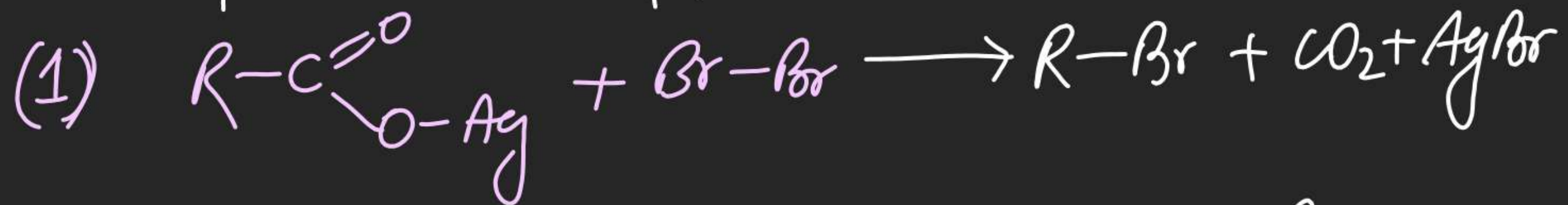


- Note
- (i) Oxidⁿ Rxⁿ
 - (ii) Electrophilic substitution Rxⁿ
 - (iii) Iodine can't be substituted by H₂O

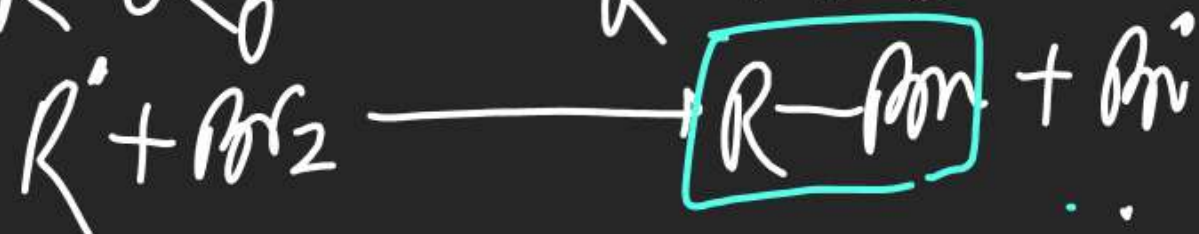
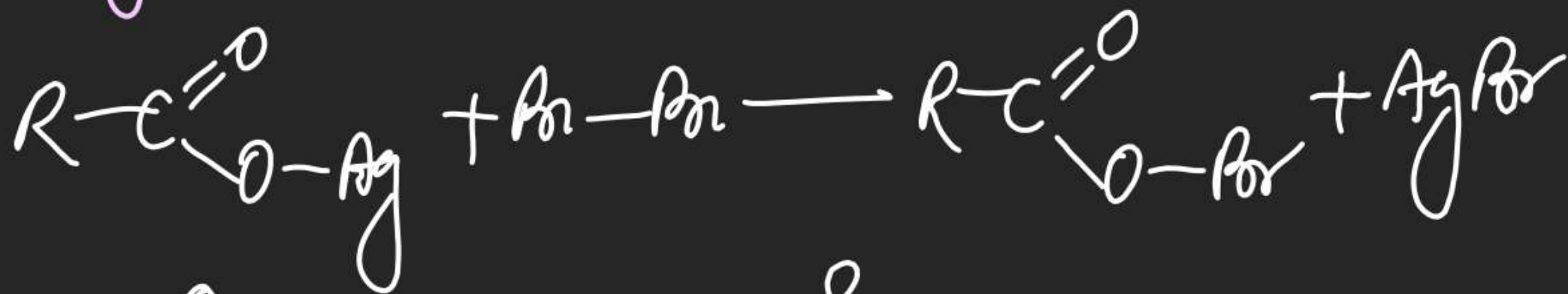


(#) Borodine Hunsdiecker Rxⁿ:-

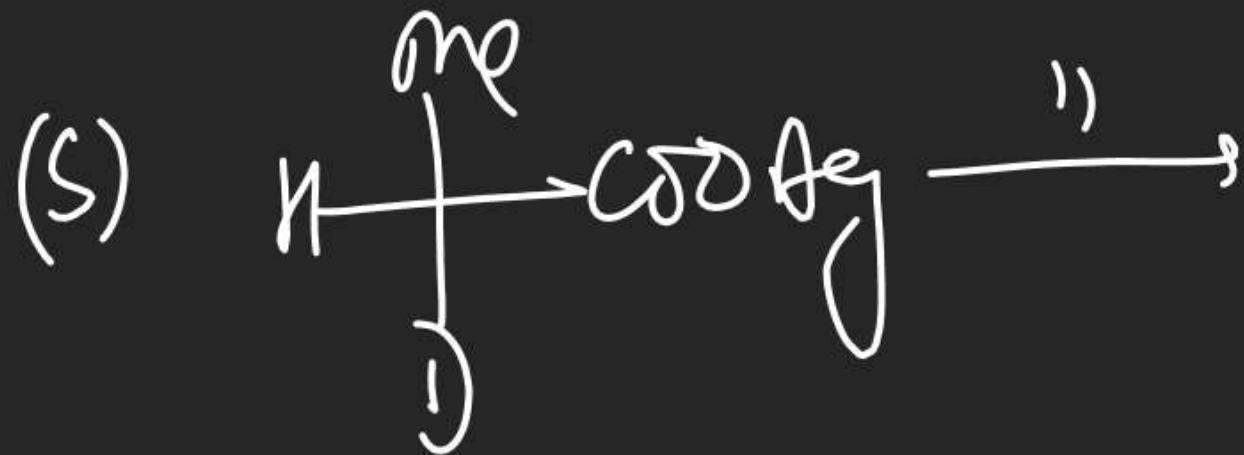
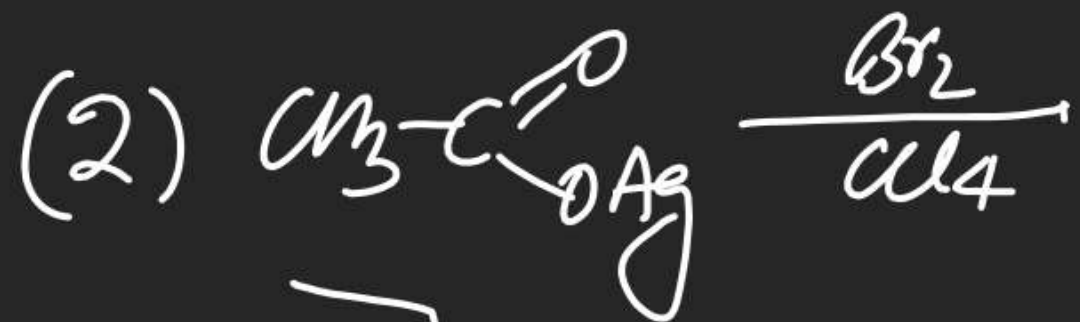
⇒ In this Reaction Ag salt of Carboxylic Acid is treated with Br_2/CCl_4 so that alkyl Bromide is obtained as a Product.



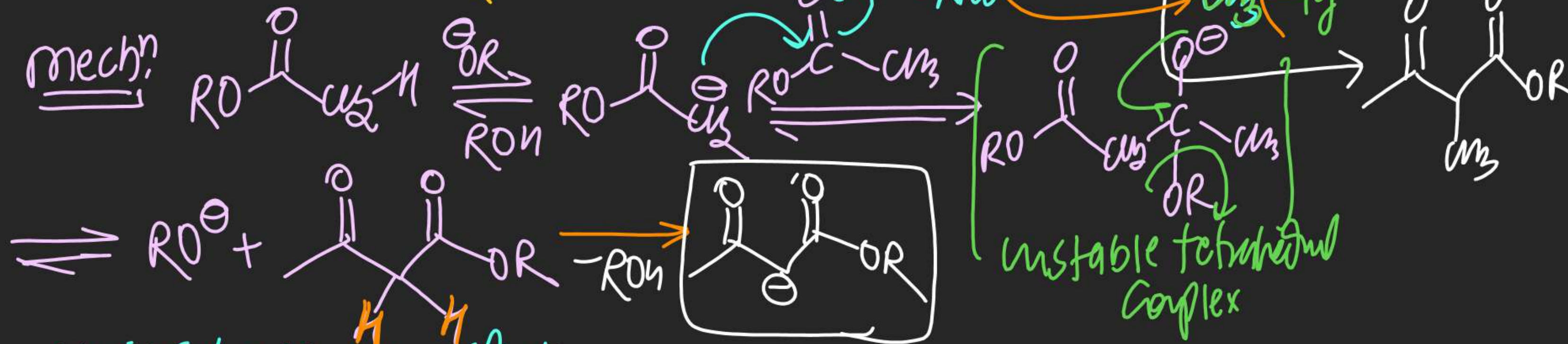
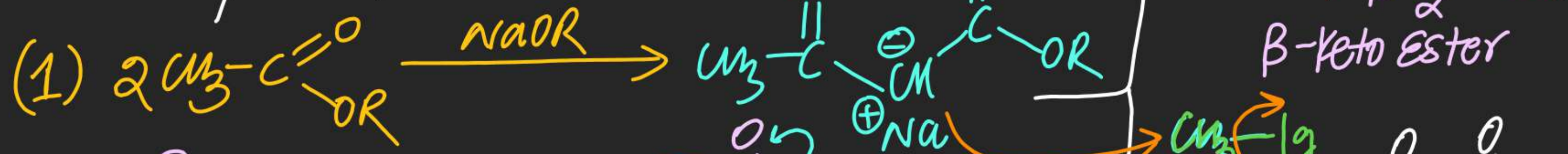
Mechⁿ:-



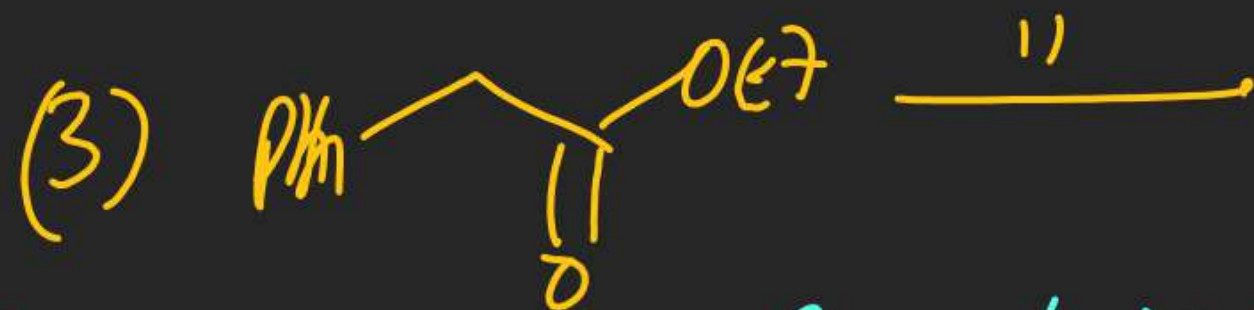
Note (i) degradation rxn
 (ii) Ester is side product.



(#) Claisen Condensation: Esters having α H atom whenever treated with sodium alkoxide gives β -keto ester as a product followed by Acidification



Note (i) Carbanion intermediate.



(#) Intramolecular claisen condensation: (5/6 membered ring)

