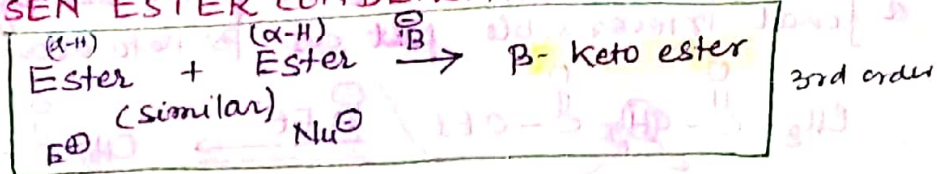


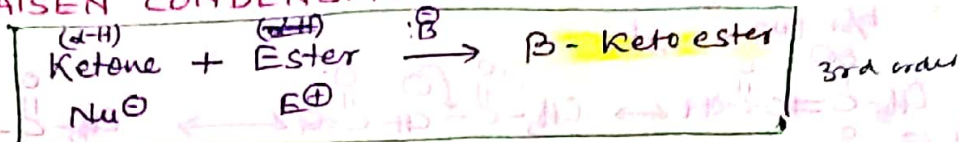
# CLAISEN ESTER CONDENSATION

Four Types →

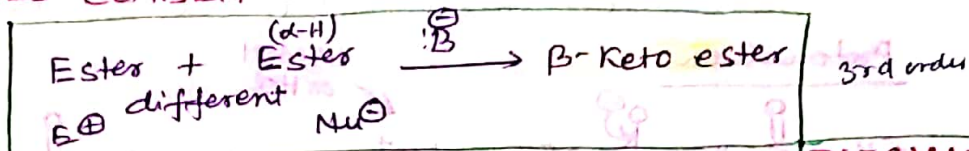
## ① CLAISEN ESTER CONDENSATION.



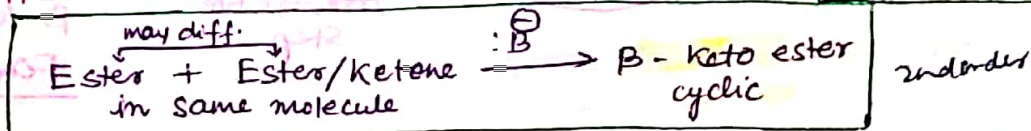
## ② CLAISEN CONDENSATION



## ③ CROSS CLAISEN CONDENSATION



## ④ INTRAMOLECULAR CLAISEN CONDENSATION

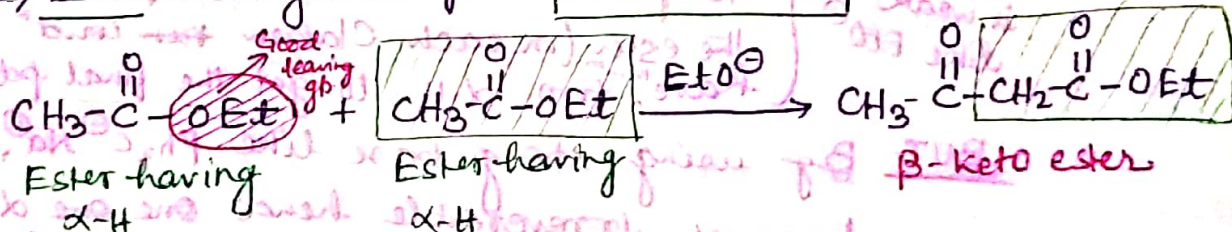


## DIECMANN COND.

## I: CLAISEN ESTER CONDENSATION:

Self condensation of esters (having  $\alpha$ -H)  $\xrightarrow{B^{\ominus}}$   $\beta$ -keto ester.

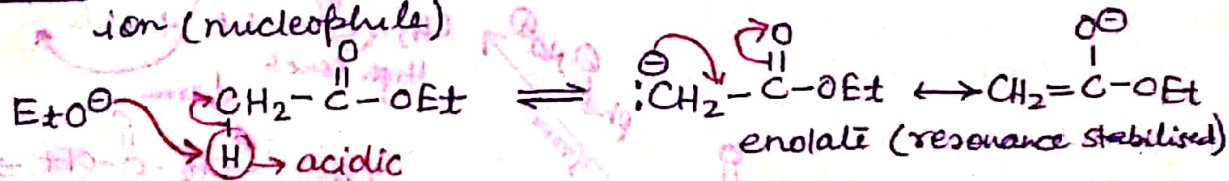
→ Base used generally is **Alkoxide  $^{\ominus}OR$**



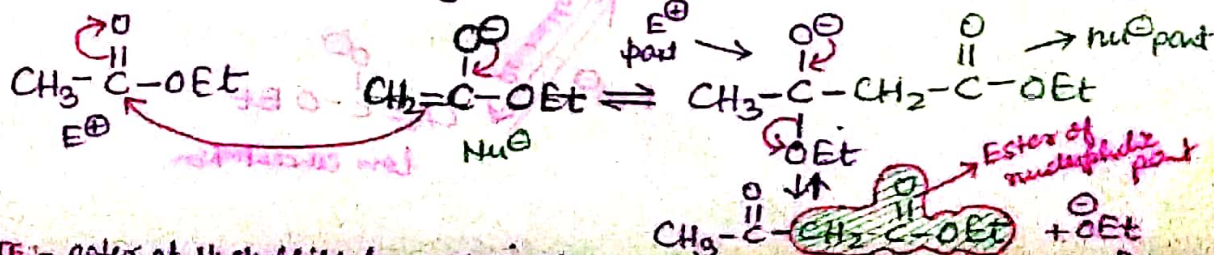
Note - Aldol is nucleophilic addition while this is  $nu^{\ominus}$  substitution.  
 $\therefore$   $^{\ominus}OEt$  is a good leaving group

Mech.

Step I: Attack of base on one of the ester to form enolate ion (nucleophile)



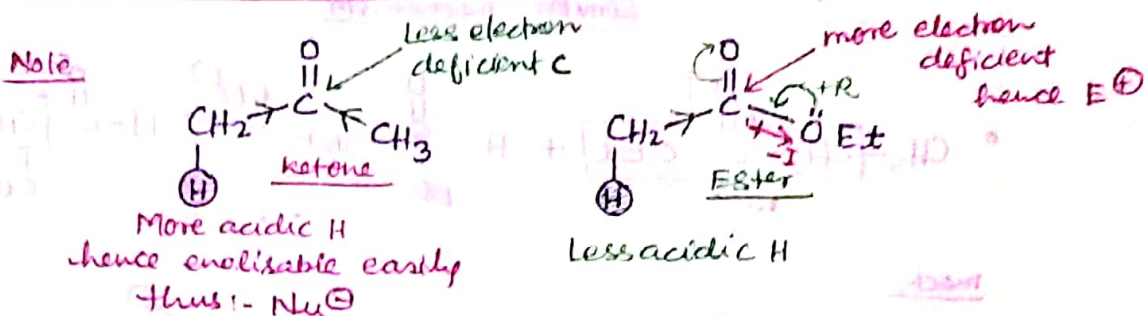
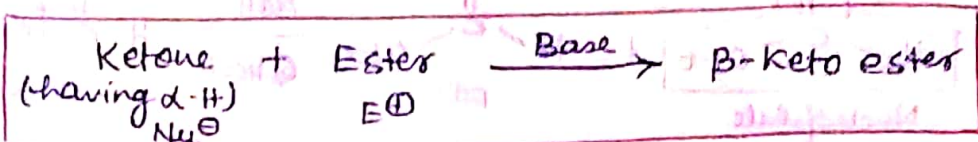
Step II: Attack of the formed enolate ion on another ester



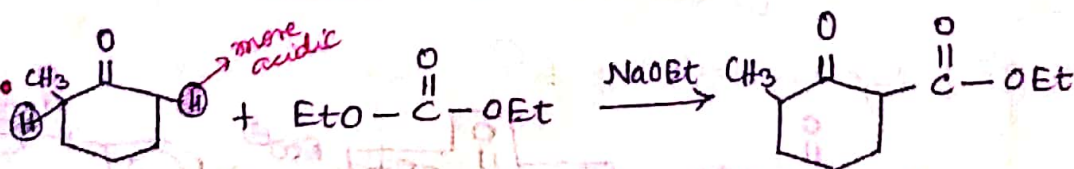
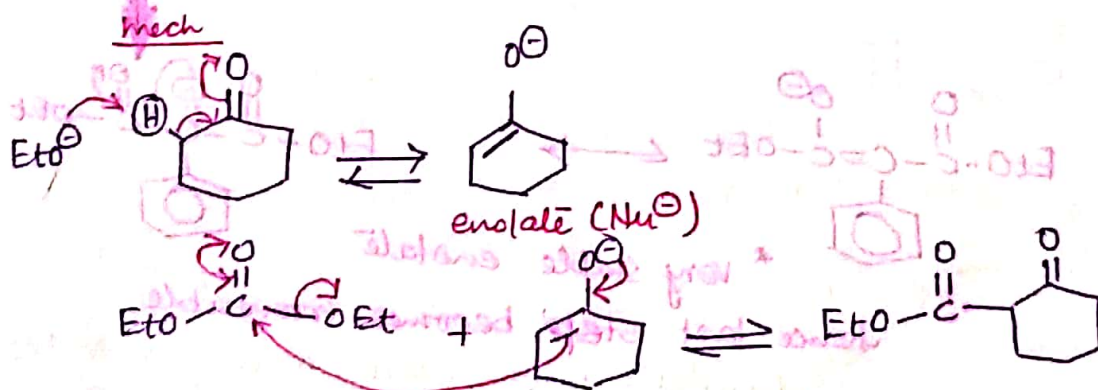
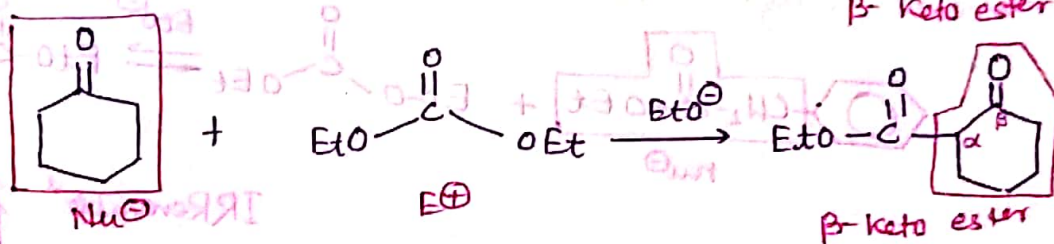
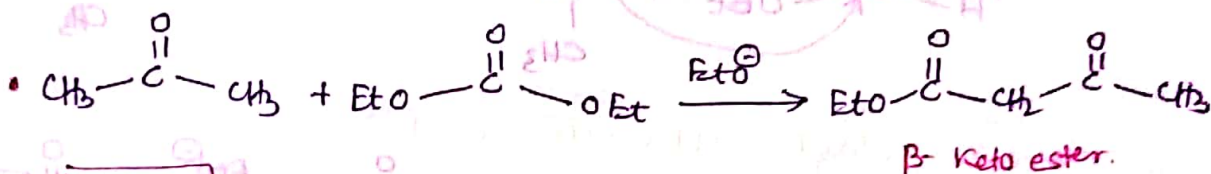
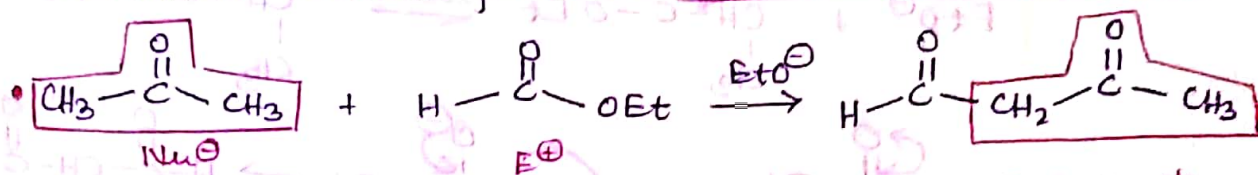
NOTE - ester of nucleophilic part remained in left and at  $\beta$ -keto ester



## II CLAISEN CONDENSATION



To avoid mixture formation we take ester without  $\alpha$ -H



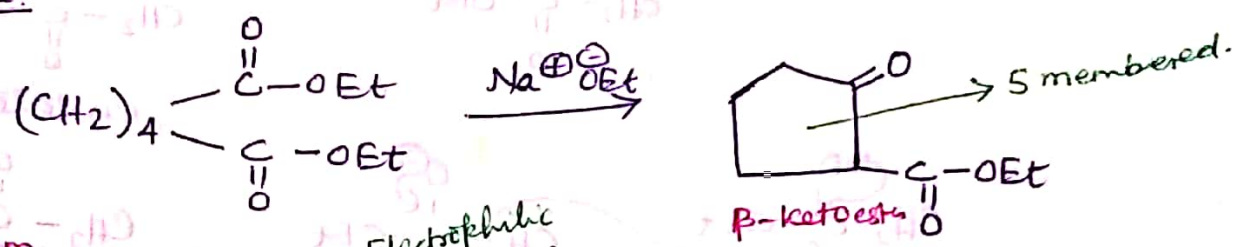
- ① hydrogen is abstracted by base in 1st step due to three reasons:
- ① ① hydrogen is more acidic in comparison with ②
  - ② ① hydrogen is less hindered and

Dep → ③ If we abstract ② then completion of rxn will not occur  
 ∴ to convert a reversible pdt into irreversible pdt deprotonation is the initiation step which is not possible if we abstract ②

### III. INTRAMOLECULAR CLAISEN CONDENSATION RXN OR, DIECKMANN CONDENSATION.

When the two ester groups are present in the same molecule, one acting as Nu<sup>⊖</sup> and other as E<sup>⊕</sup> to produce a 5 or six membered cyclic β-keto ester. Such rxn is called Dieckmann condensation.

example:-



Mechanism.

