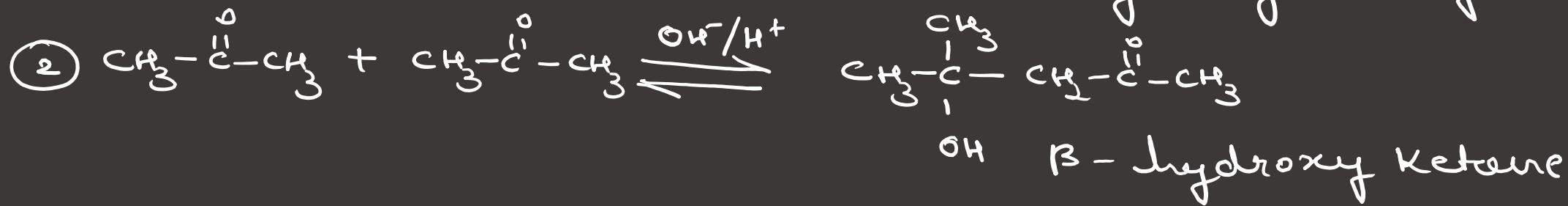
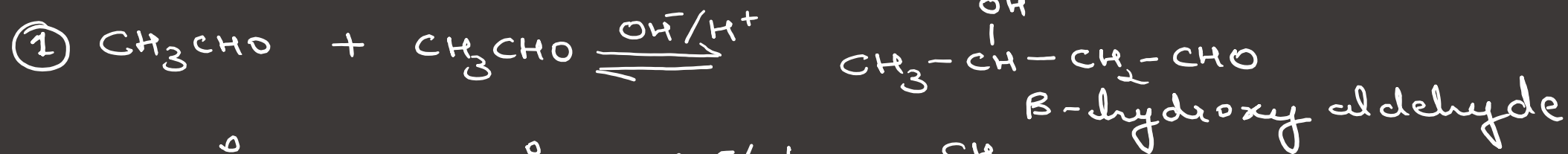




Aldol Condensation.



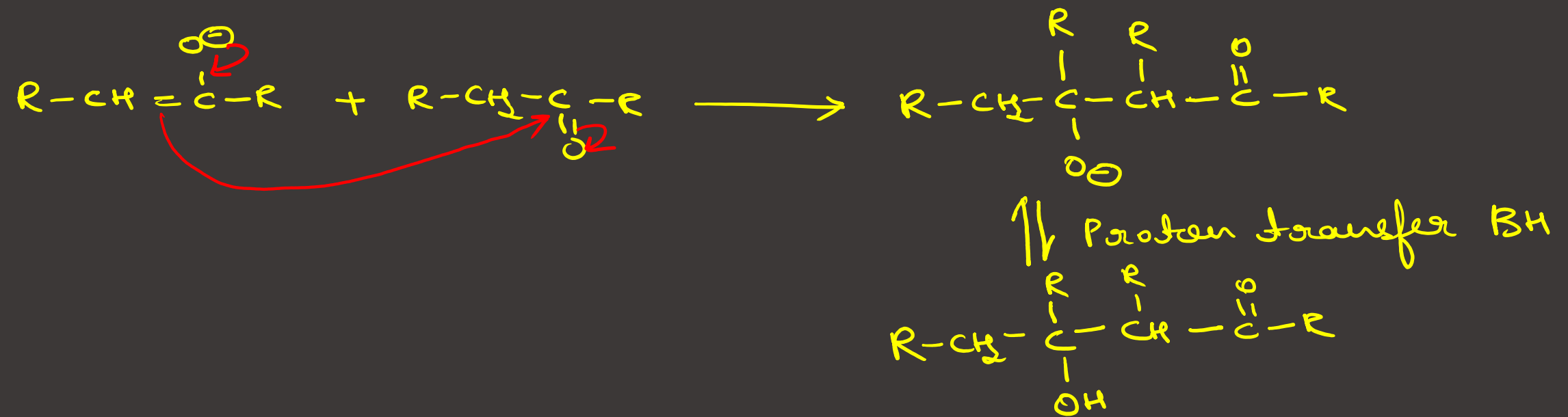
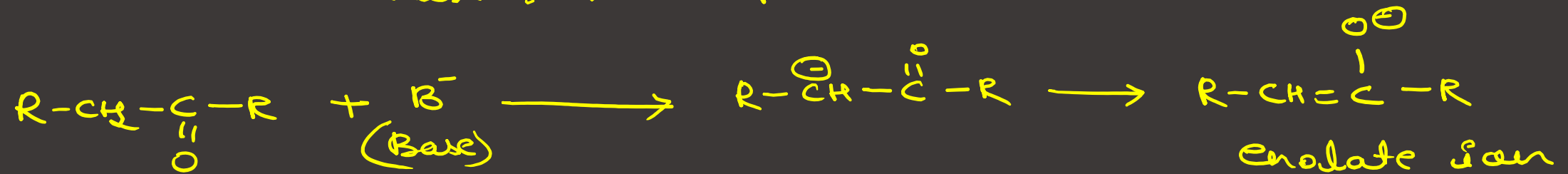
Key Points

- Acid/Base is catalyst
- Presence of α H is must.
- In case of large ring product can undergo Self condensation Reaction.



Base Catalysed Mechanism :-

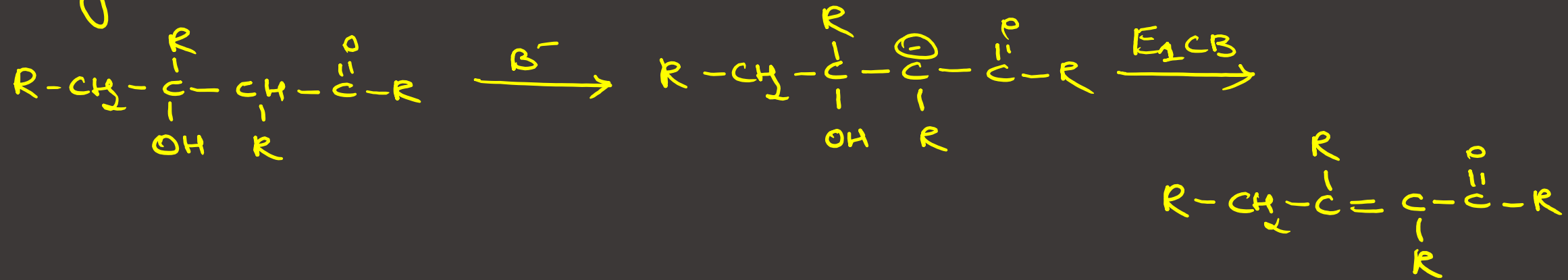
(a) Addition Phase :- Nucleophilic Addition.



★ Proton transfer reactions are always reversible reactions ★



(b) Dehydration Phase:-



Aldol reaction is reversible in both acidic and basic condition



The reaction is usually unfavourable for Acyclic Ketone

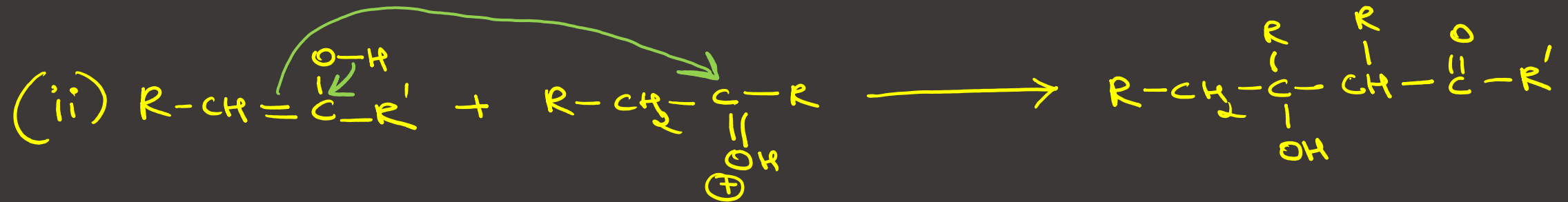
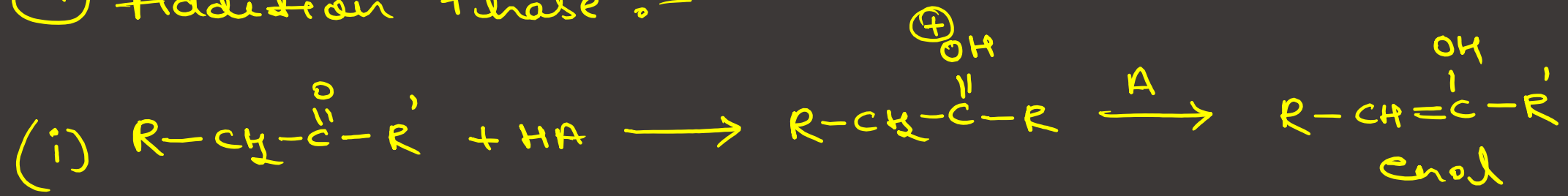
Because (1) $-\overset{\text{O}}{\underset{\text{||}}{\text{C}}}-$ is less electrophilic in ketone due to +I effect of alkyl group attached.

(2) Due to steric hindrance the probability of enolate/enol nucleophilic attack decreases.



② Acid Catalysed Mechanism :- \star Enol less nucleophile than enolate \star

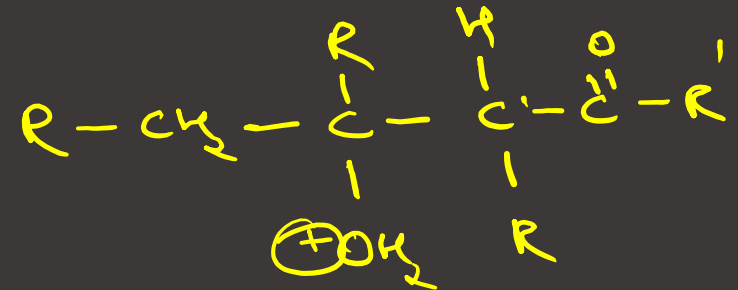
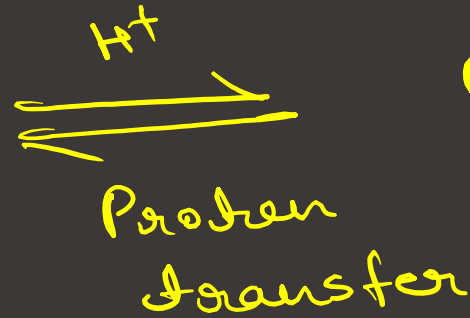
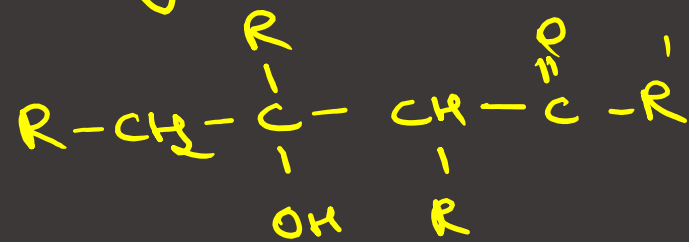
① Addition Phase :-



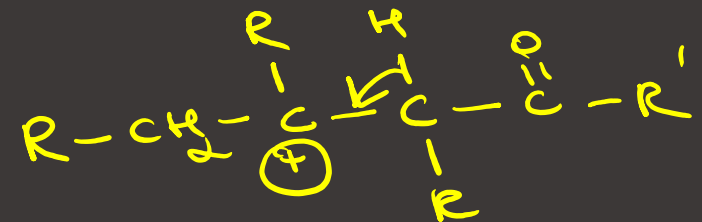
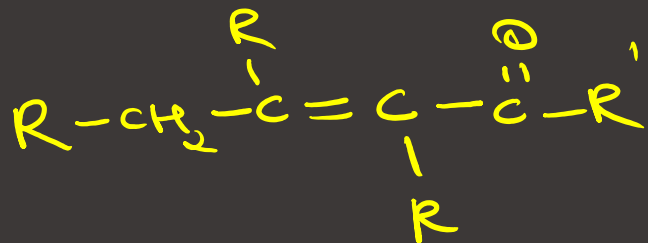
Protonated E^+
(Better electrophile
than the unprotonated
aldehyde/ketone)



(b) Dehydration Phase

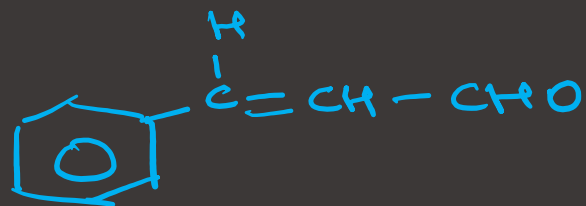
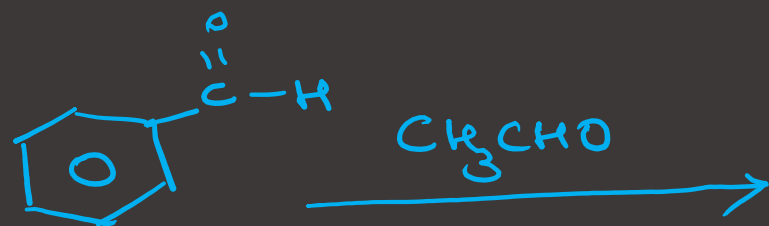


-HO Better L.G
E1 reaction

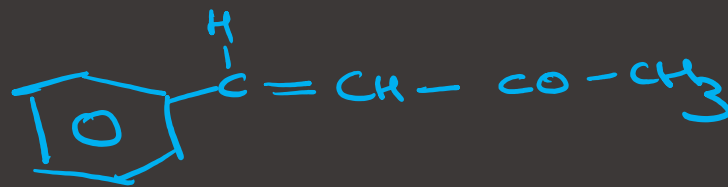
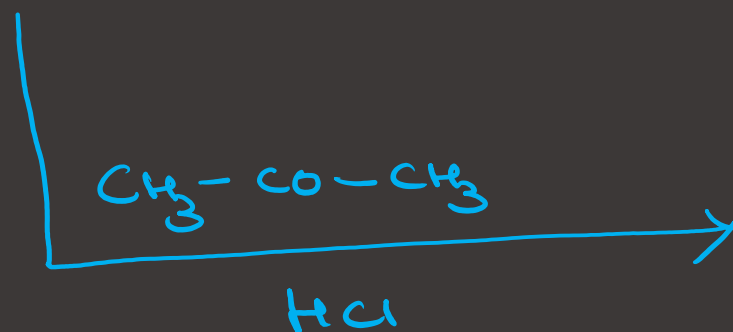




Conjugated - Aldol / mixed Aldol : (Claisen - Schmidt Condensation)



Cinnamaldehyde





Condition for Crossed Aldol.

- 1) only one enolizable component (aldehyde/ketone having α -H)
- 2) No other compound containing more acidic hydrogen than aldehyde/ketone eg CH_3NO_2
- 3) The carbonyl E^+ should be more reactive than than compound being enolised.