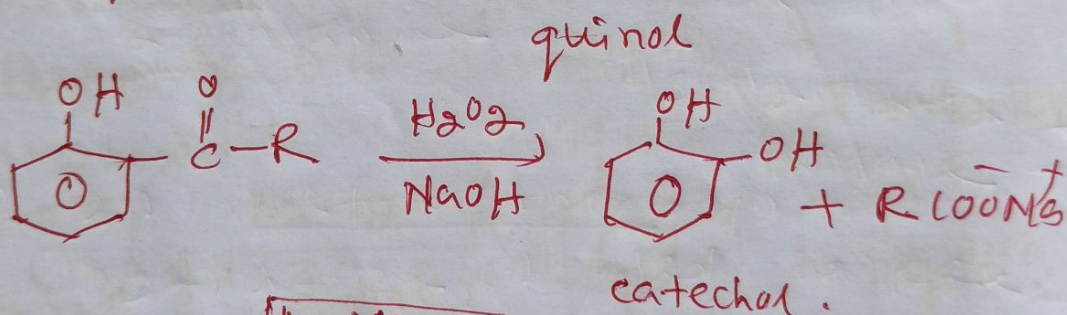
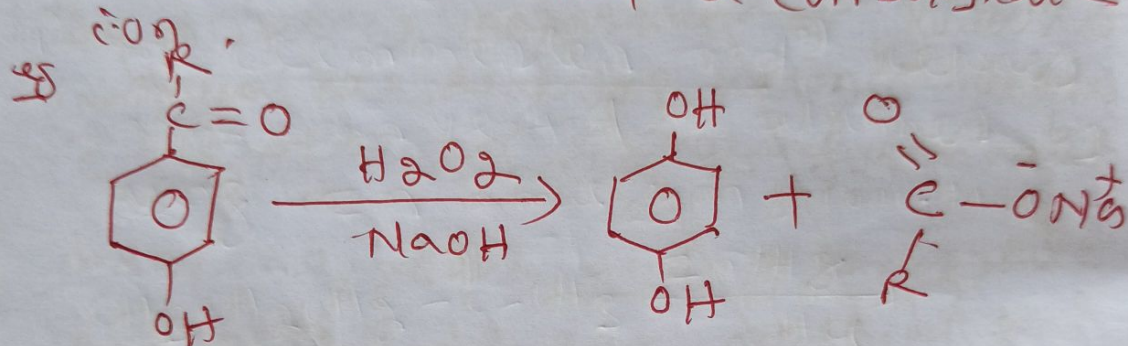


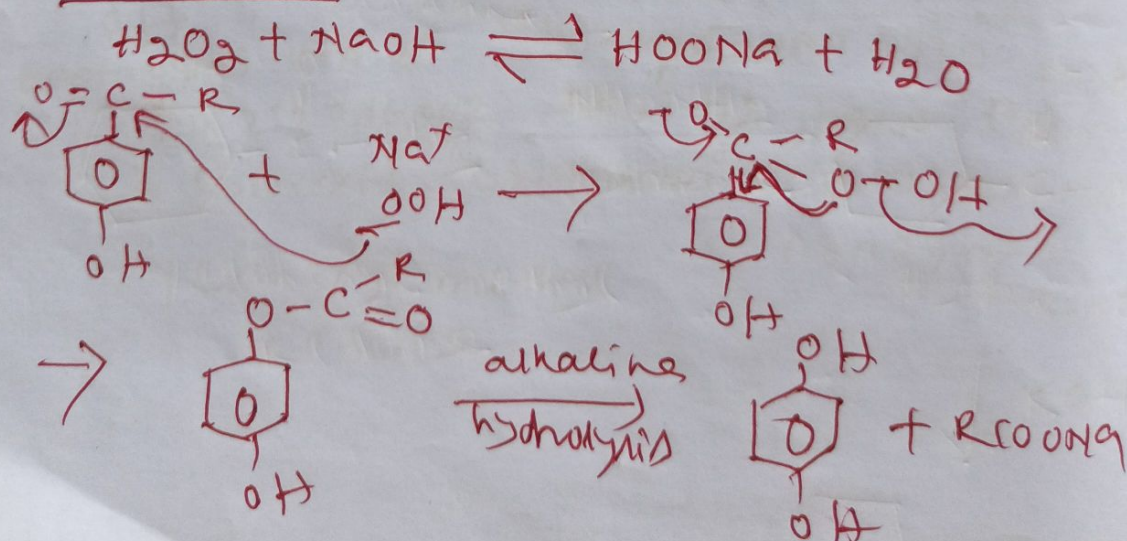
UNIT-VI

Dakin Reaction

Dakin reaction is a redox reaction in which an ortho or para hydroxylated phenyl aldehyde or ketone reacts with H_2O_2 in presence of base to form a benzene diol and a carboxylate



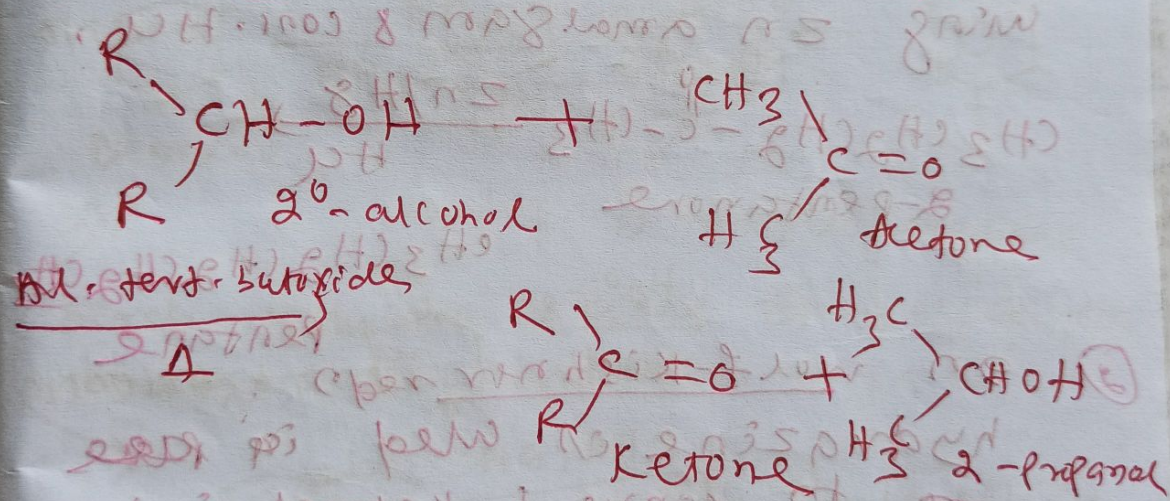
Mechanism $(H_2O_2 \rightarrow H_2OOH)$



application → Dakin reaction is used to synthesize catechol. catechol is used as the starting material for the synthesis of catecholamines.

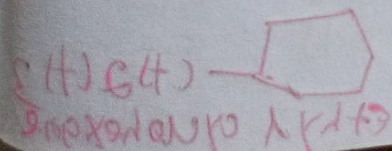
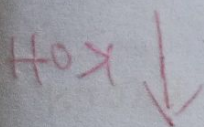
Oppenauer oxidation

It is a method for selectively oxidizing 2°-alcohols to ketones. In this process the appropriate 2°-alcohol is refluxed in excess of acetone in presence of aluminium tertiary butoxide as catalyst.



application

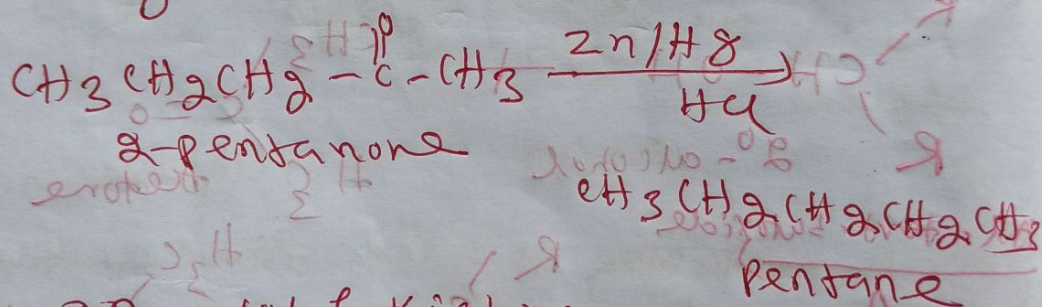
Oppenauer oxidation is an important reaction used in the synthesis of alkaloids, hormones, steroids & terpenes.



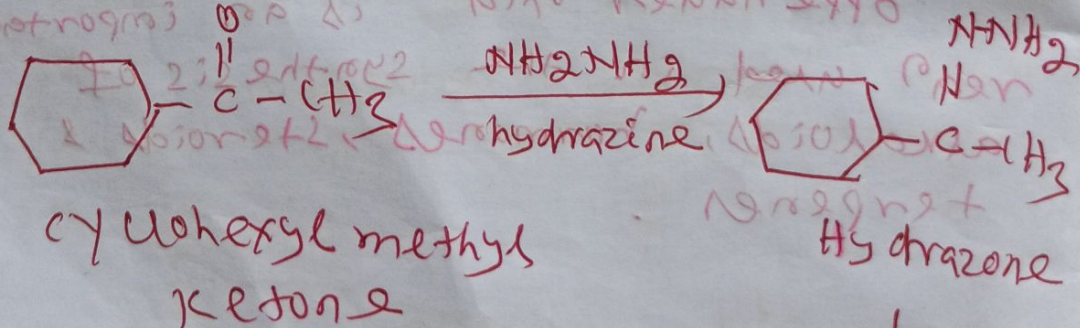
Clemmensen reduction and Wolf Kishner reduction

Both the reduction method involves the conversion of a keto group (>C=O) in to a methylene ($\text{-CH}_2\text{-}$) group

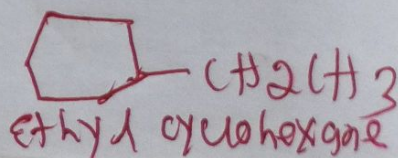
① In clemmensen redⁿ ketones are converted to alkanes by using Zn amalgam & conc. HCl.



② In Wolf-Kishner redⁿ hydrazine is used in place of to convert ketones into alkane

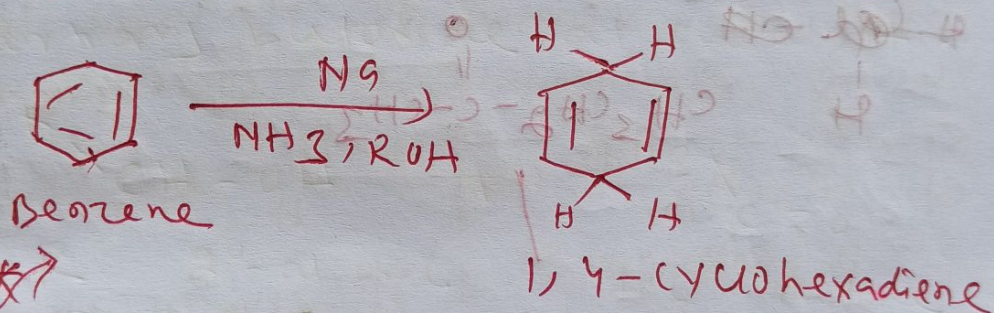


↓ KOH

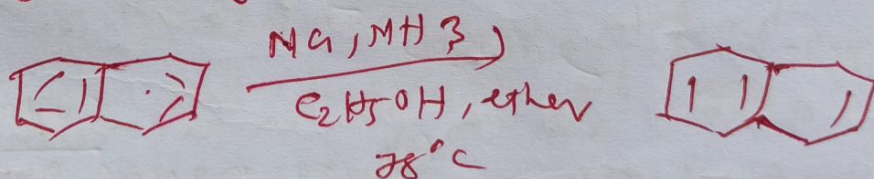


Birch reduction

When aromatic rings are partially reduced by Na, K or Li in liquid ammonia usually in the presence of an alcohol like ethyl alcohol, isopropyl or t -butyl alcohol, 1-4 addition of hydrogen takes place and ~~con~~ non-conjugated cyclohexadienes are produced. This reaction is called Birch redⁿ.



Birch reduction is used for selectively hydrogenating aromatic rings.

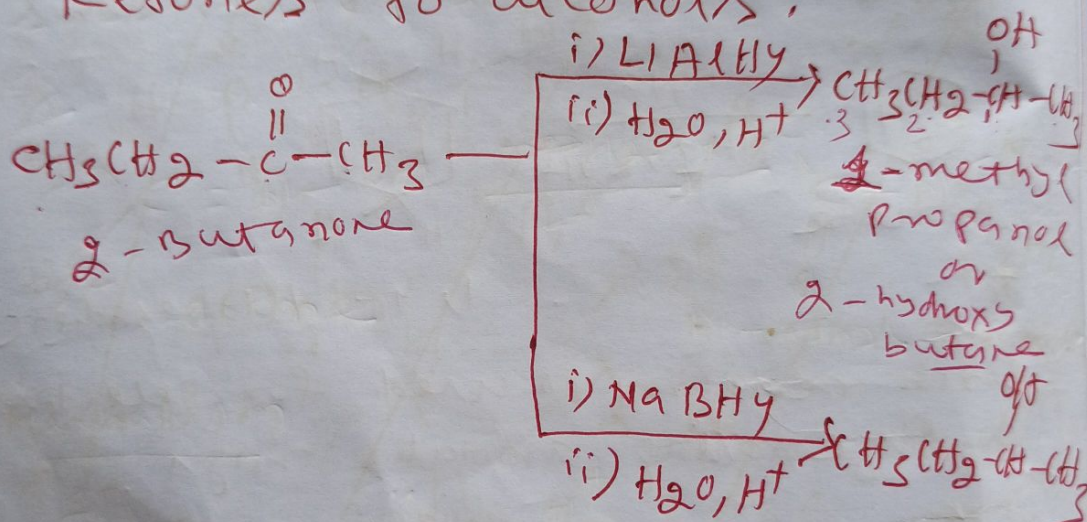


Metal hydride reduction

Metal hydride reduction

→ For this the reduction procedure involves the use of metal hydride. Two valuable reducing agents are lithium aluminium hydride (LiAlH_4) and sodium borohydride (NaBH_4)

→ Both reduce aldehydes and ketones to alcohols.



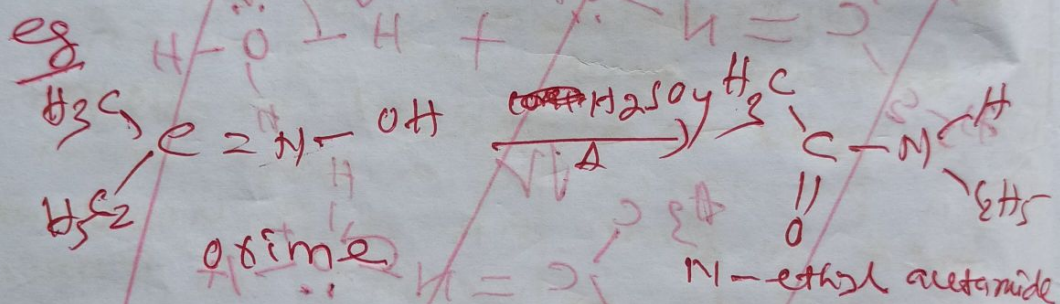
→ LiAlH_4 is a powerful reducing agent that reduces aldehydes, ketones, carboxylic acids, amides and nitriles.

→ It reduces ($\text{C}=\text{O}$) but it does not reduce olefinic double bond ($\text{C}=\text{C}$)

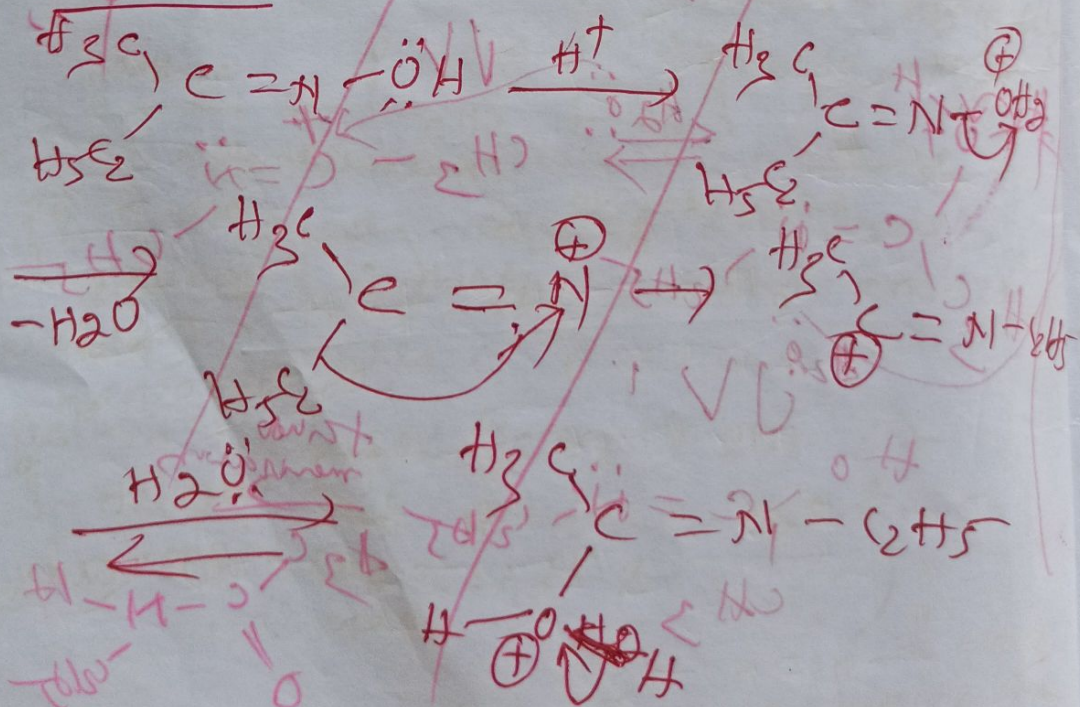
sodium borohydride (NaBH_4) $\rightarrow$ Δ
 more specific and reduces only
ketones and aldehydes to
 corresponding alcohols without
 affecting other functional groups.

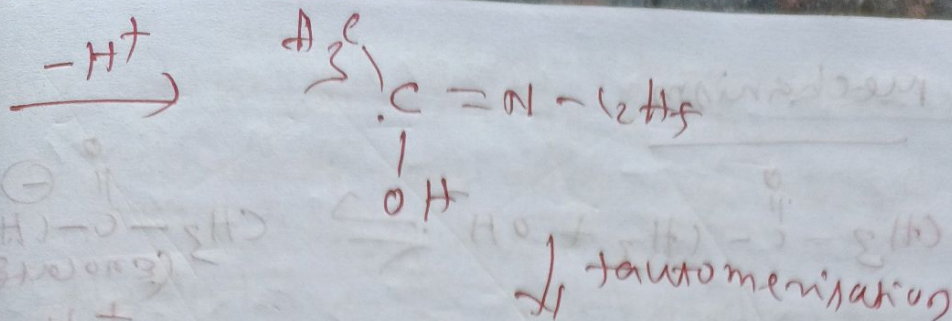
Beckmann Rearrangement

is an acid induced rearrangement
 of an oxime functional group to
 substituted amides.



Mechanism

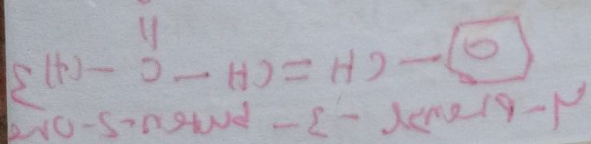
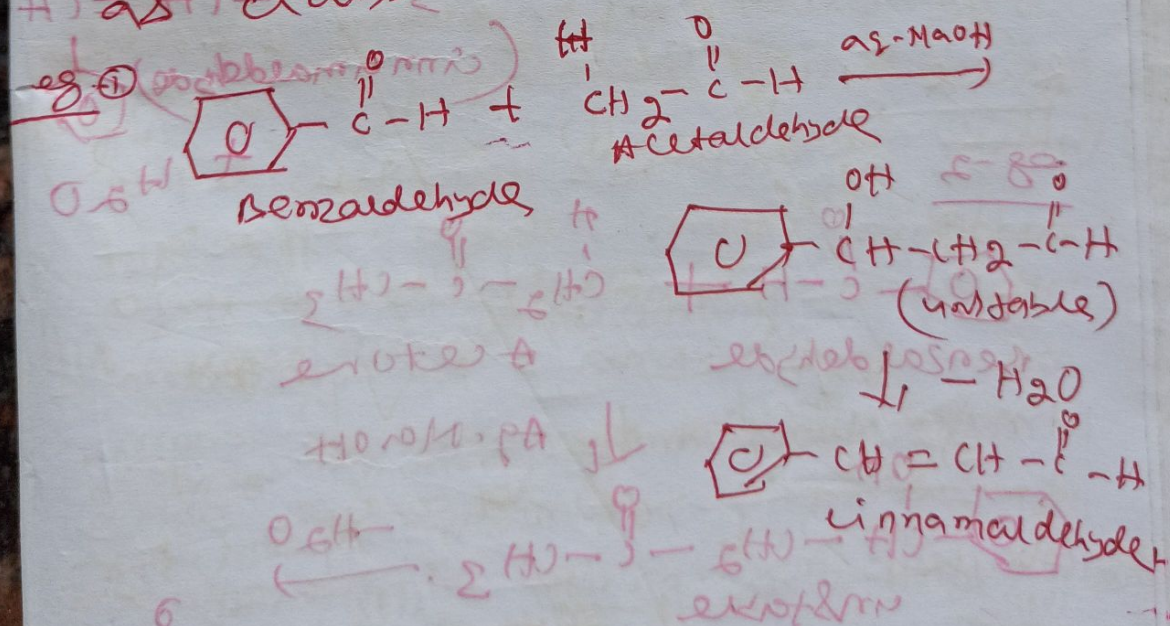




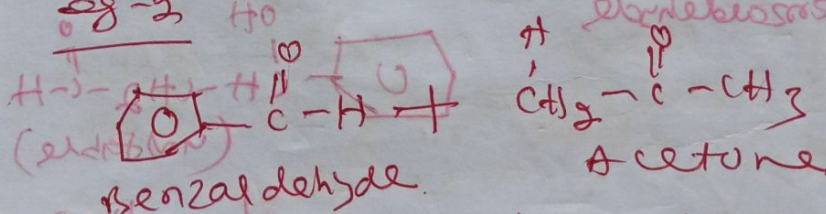
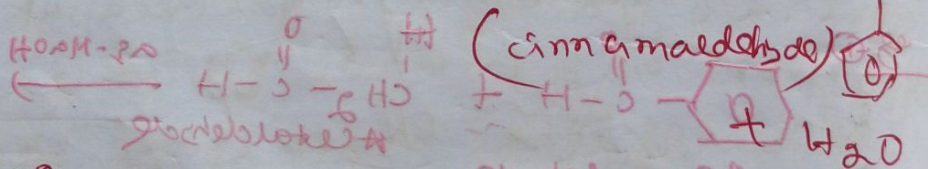
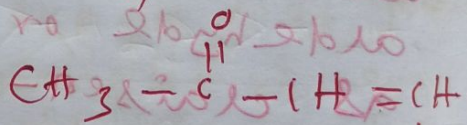
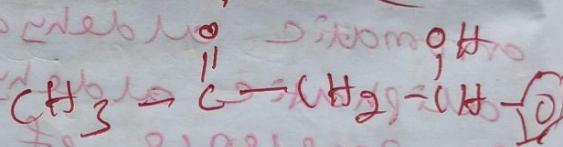
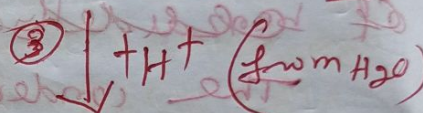
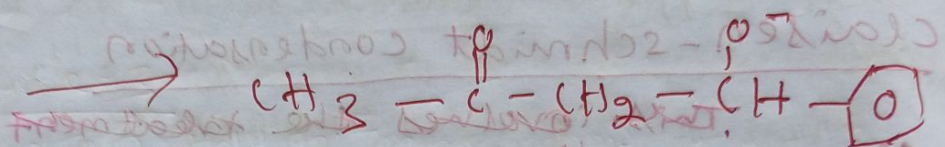
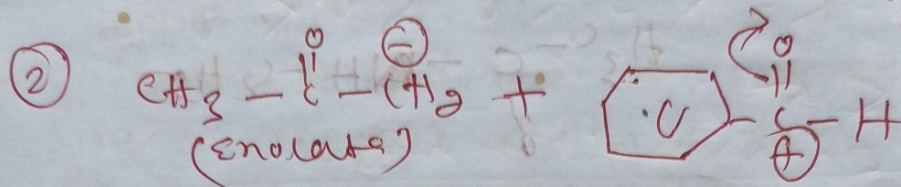
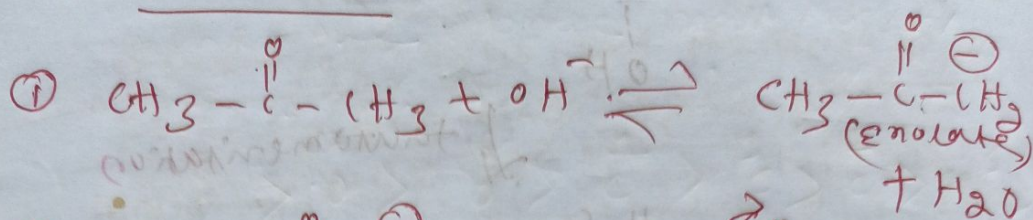
Claisen-Schmidt condensation

This involves the treatment of ~~two~~ aldehydes

The condensation of an aromatic aldehyde with an aliphatic aldehyde or ketone in presence of a base ~~or~~ acid to form an α, β -unsaturated aldehyde or ketone is known as Claisen-Schmidt condensation.



Mechanism



Ag, MeOH

