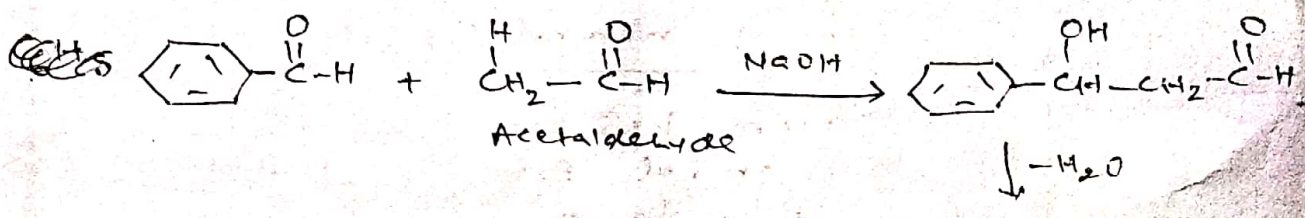
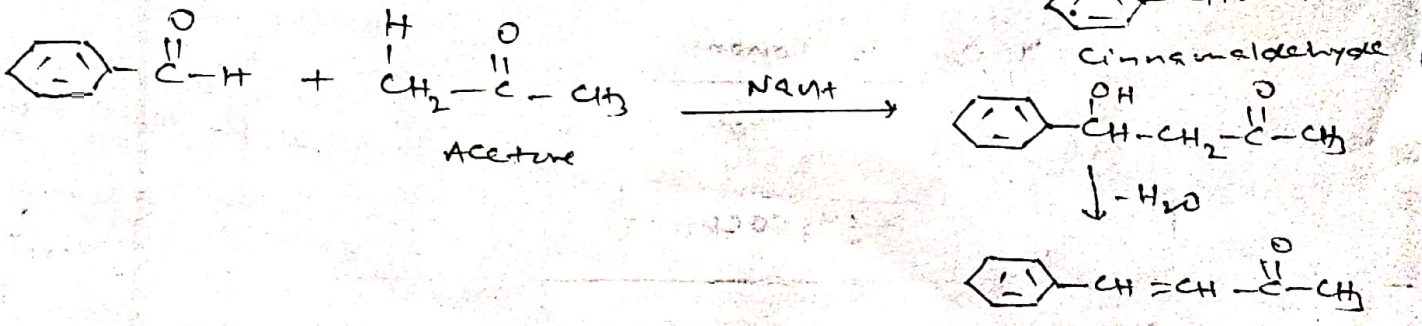
Claisen - Schmidt Reaction

or

Claisen Reaction.

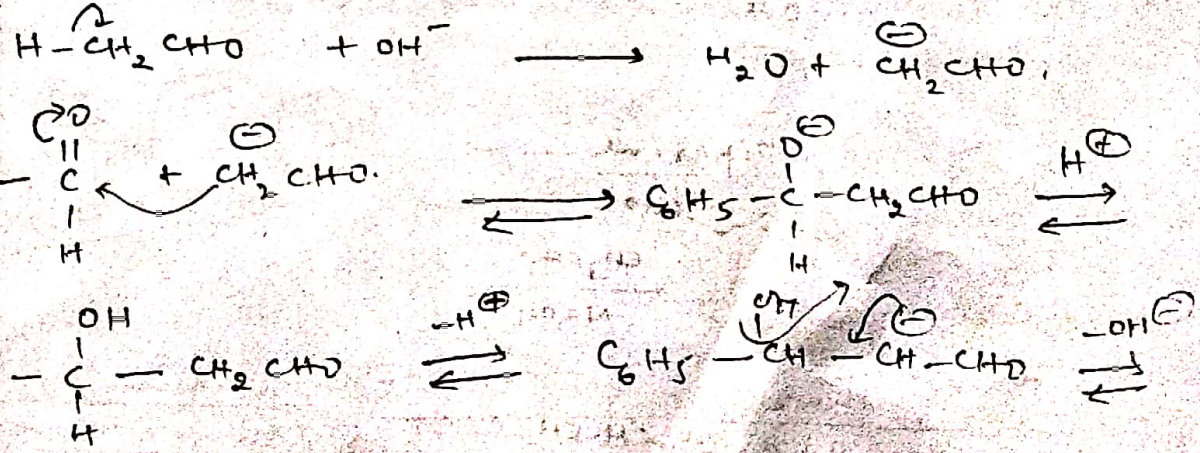
The condensation of aromatic aldehyde having no α-hydrogen atom, with aliphatic aldehydes, ketones or esters having active hydrogen, in presence of 10% alkali solution to give α,β-unsaturated aldehydes or ketones is known as claisen-schmidt reaction.





During claisen reaction the alkali should always dilute as the concentrated alkali cause Cannizzaro's rx.

Mechanism



Applications

(1) Claisen-schmidt reaction is generally used for the

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Synthesis of α, β - unsaturated carbonyl compounds which are used in perfumery e.g. cinnamaldehyde, benzylidene acetone etc.

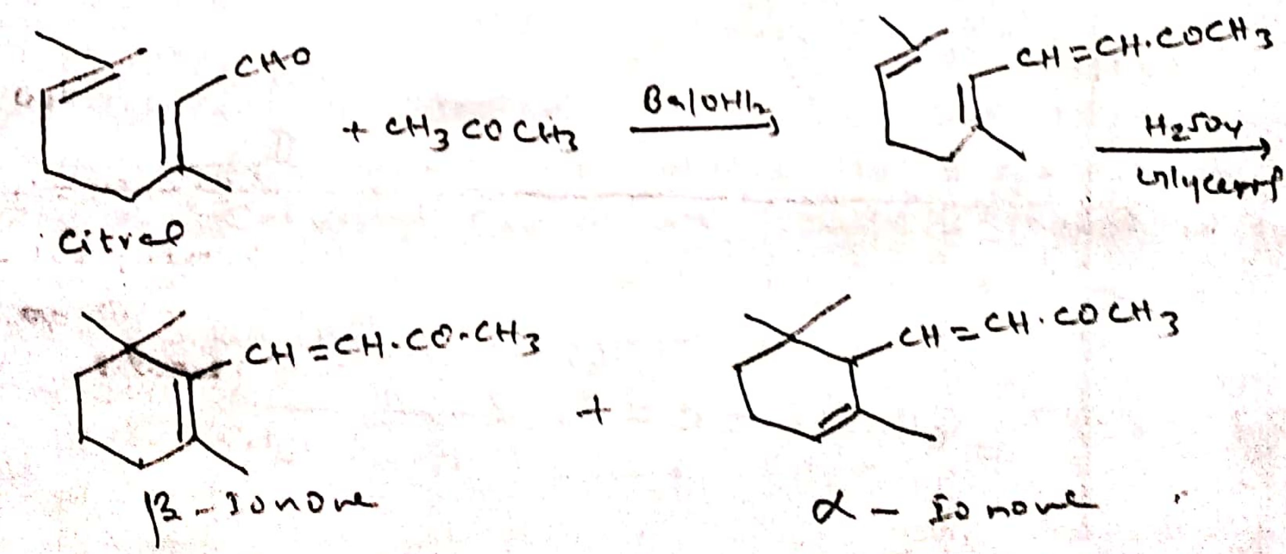
$C_6H_5CHO + H_3C\,CHO \xrightarrow{NaOH} C_6H_5CH=CHCHO$ Cinnamaldehyde.

$C_6H_5CHO + H_3C.CO.CH_3 \longrightarrow C_6H_5CH=CH.CO.CH_3$ Benzylidene acetone.

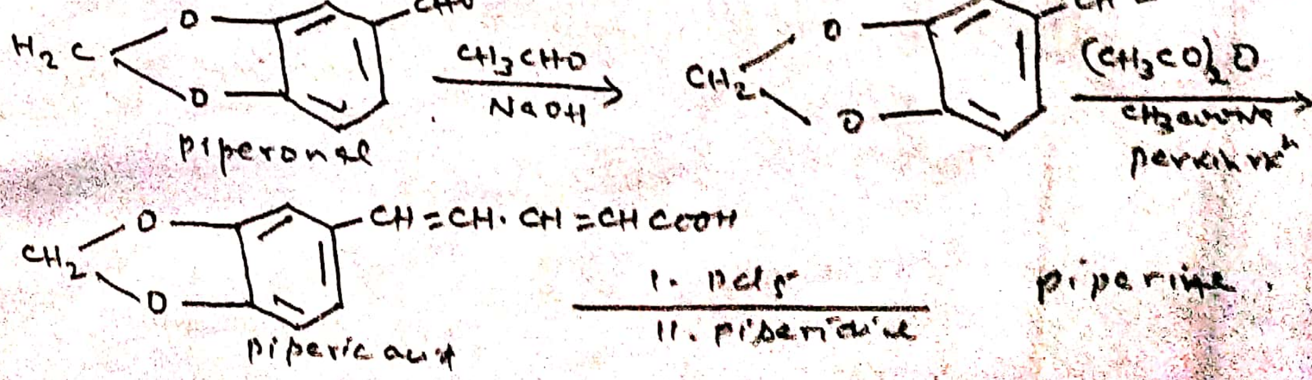
(11) <u>Synthesis of natural products</u>

Claisen reaction has been used during synthesis of various natural products viz. β-ionone, piperine, flavonols and flavones etc.

<u>Synthesis of β-ionone.</u>



<u>Synthesis of piperine.</u>



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