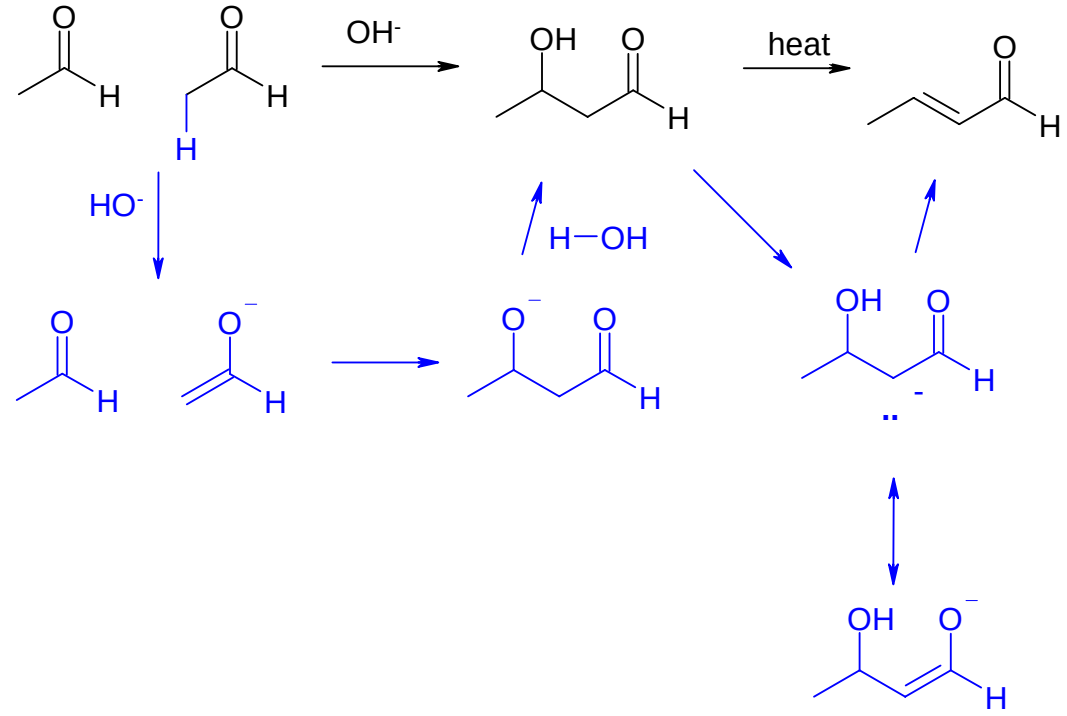
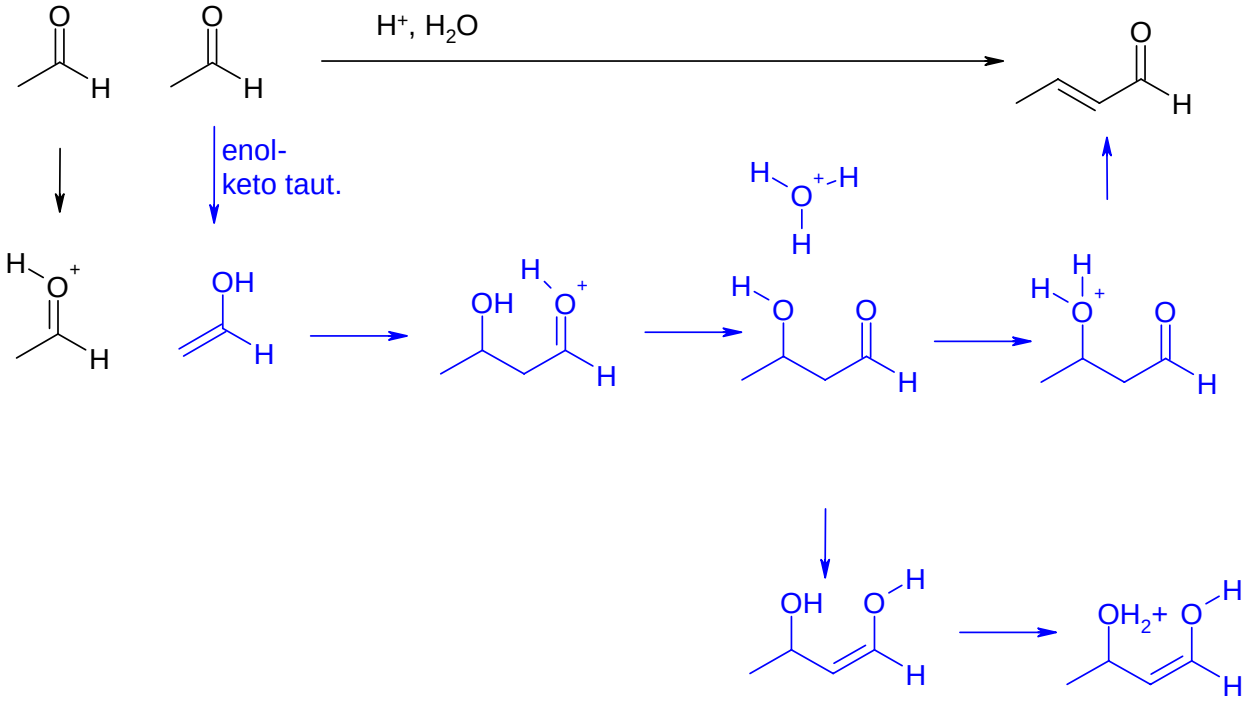
Chapter 24
Condensations

The Aldol Condensation. (Condensation reaction between 2 aldehydes or ketones)

Mechanism under basic conditions. Can form the β-hydroxy carbonyl or the αβ-unsaturated carbonyl.

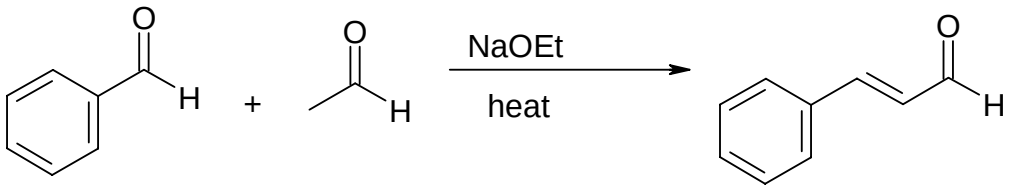


Mechanism under acidic conditions. Will probably eliminate to form the αβ-unsaturated carbonyl.

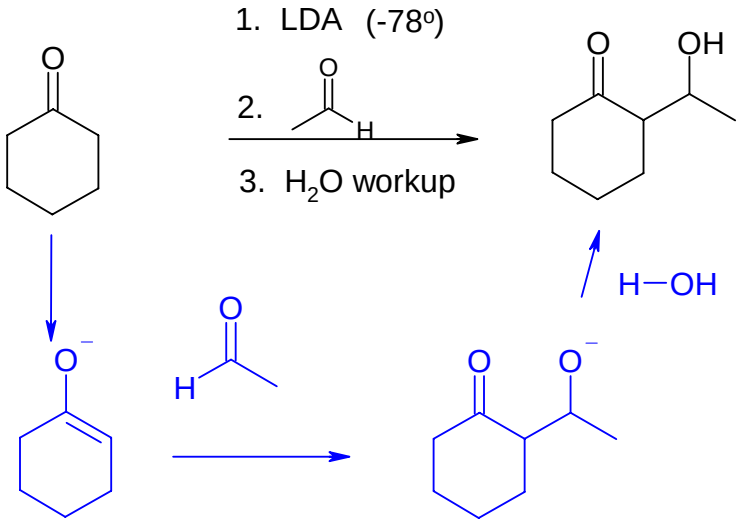


Crossed Aldols. What happens when you want one aldehyde to be the electrophile and one aldehyde to be the nucleophile. You have to control this. There are three methods described.

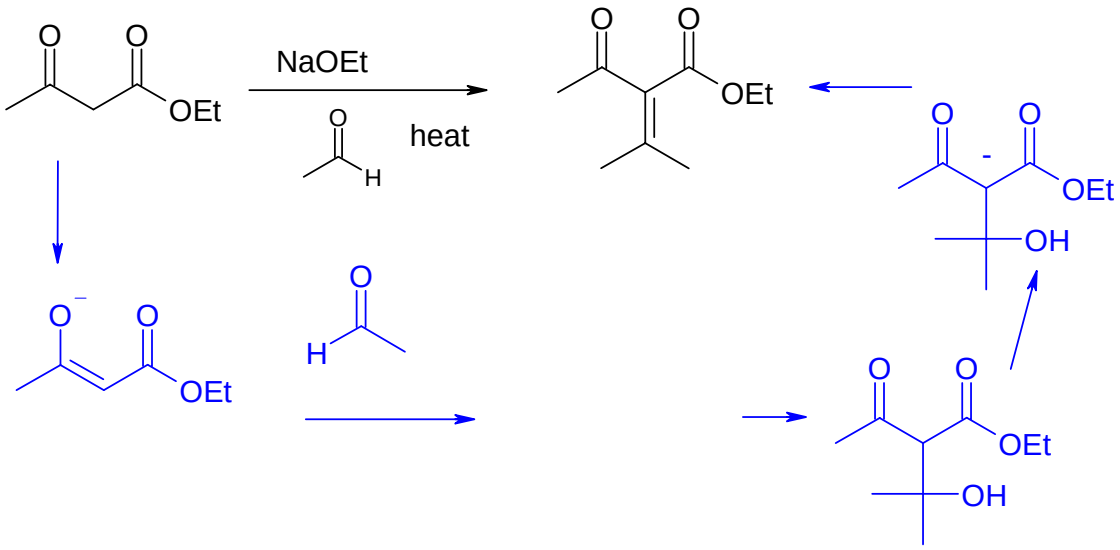
No β hydrogen. Make sure that one aldehyde does not have a β hydrogen so it can't form the enol or enolate. It will have to be the electrophile and so the other species will be the nucleophile.



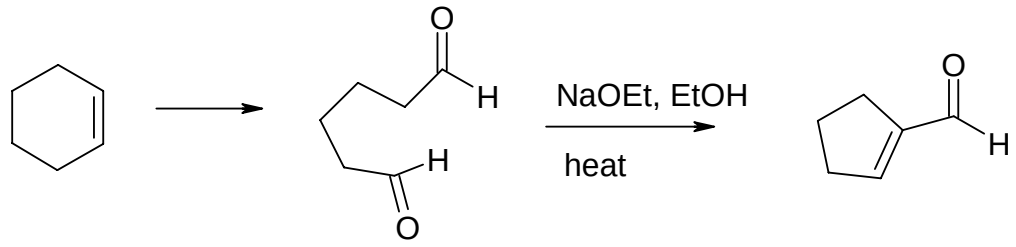
Use LDA. Deprotonate one ketone completely with LDA to make the enolate. Second, add the second ketone(or aldehyde) and it will be attacked by the enolate.



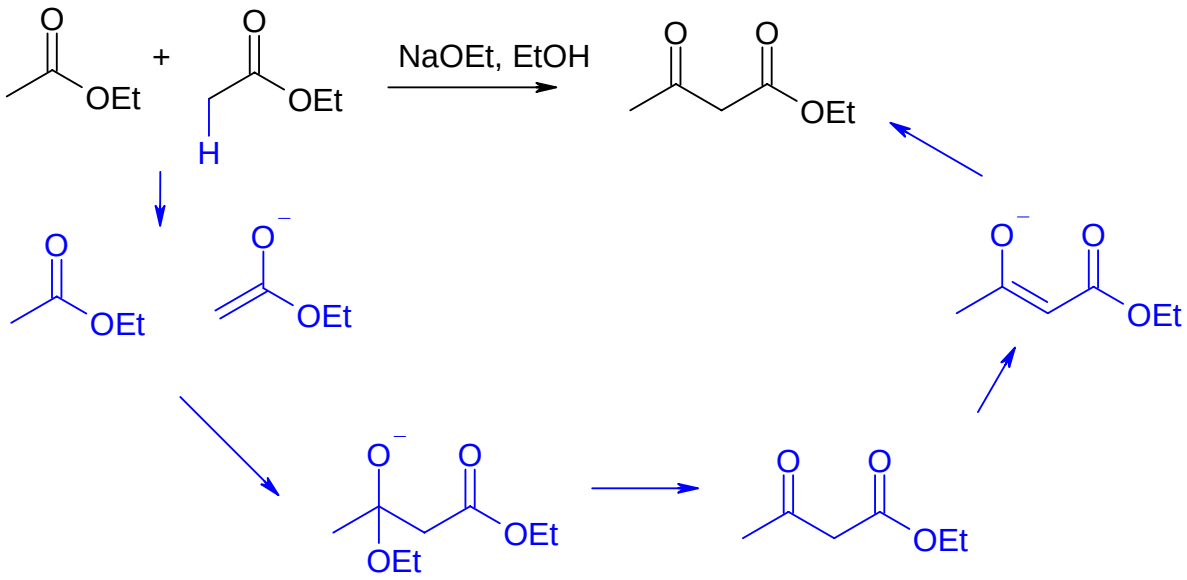
Use a 1, 3-dicarbonyk or a carbonyl with an especially acidic hydrogen. The base will deprotonate the acidic hydrogen and the resulting enolate will be the nucleophile.



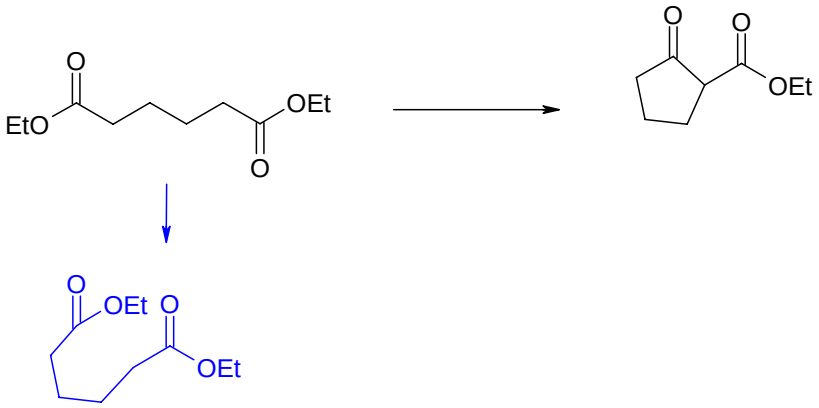
An Intermolecular Aldol.



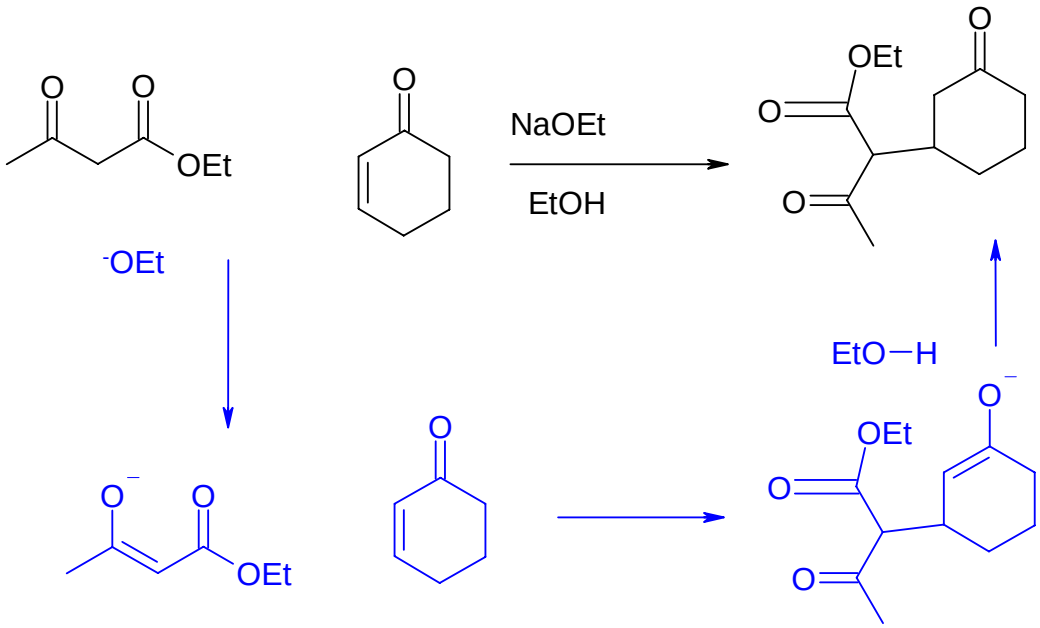
The Claisen Condensation. Reaction between 2 esters.



An Intramolecular Claisen Condesation is called a Dieckman Condensation.



The Micheal Addition. A 1,4 addition to enones. Cuprates, 1, 3 diones, and enamines add 1,4 to enones.



Robinson Annulation : A Micheal Reaction followed by an aldol reaction.