

Lecture outline

Retrosynthetic analysis —

What structural units can be made by an aldol and by a Claisen condensation?

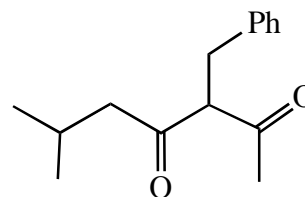
Aldol:

Claisen:

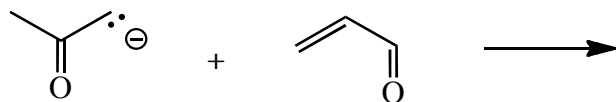
a. Identify new C–C bond and the locations of what used to be the reactant carbonyl group and the reactant enolate, and then "reverse" the condensation

b. Determine if the proposed condensation is reasonable. Many compounds of the structure types shown above can't be prepared by a simple aldol or Claisen condensation.

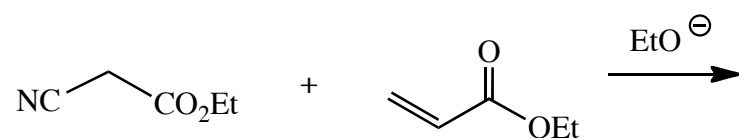
e.g., How would you use aldol or Claisen condensation to make the following?



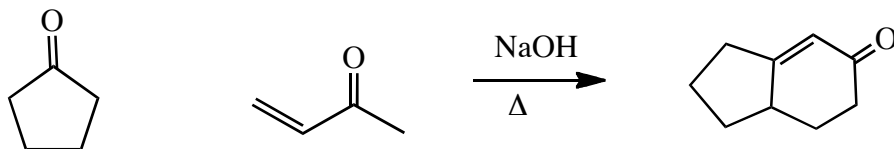
And now a return to conjugate additions. Enolate ions are good at doing conjugate additions to α,β -unsaturated carbonyl compounds. This is called the Michael reaction or "a Michael addition".



This reaction works especially well with stabilized enolates —



This process is the key to the famous Robinson annulation — a classic method for building a new 6-membered ring —



mech:

What general structural unit can be made by a Michael addition?

We'll finish with some synthesis problems.