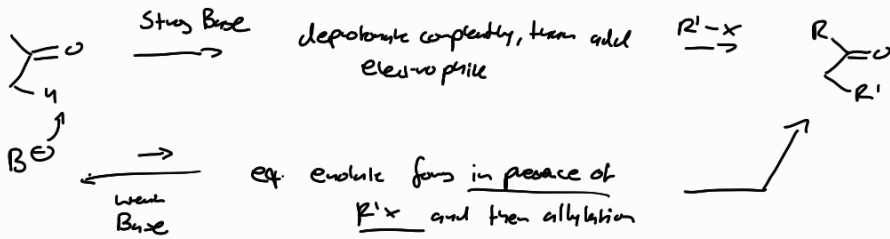
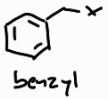
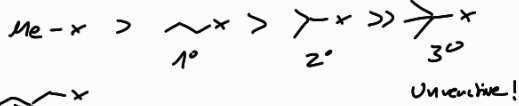


Enols continued Ch 25

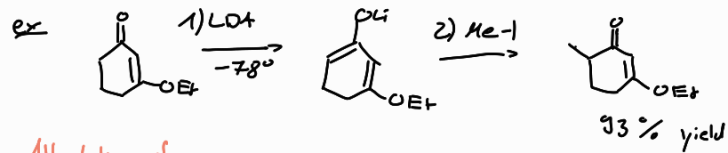


Good electrophiles?

Essentially SUZ

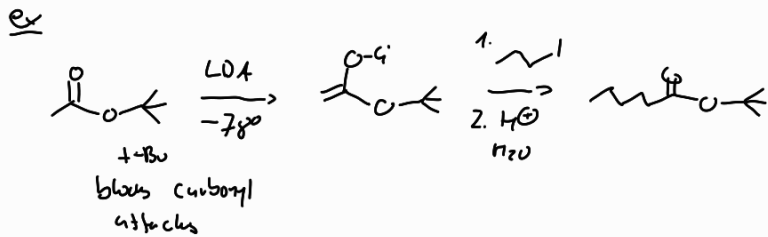


Li - evolves comparatively stable



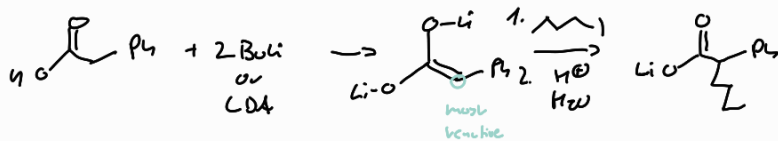
Alkylation of esters

add ester to solution of base and bulky ester



alkylation of acids

Two eq. base needed!




Li-enolates good for SN2

with ketones, esters, acids

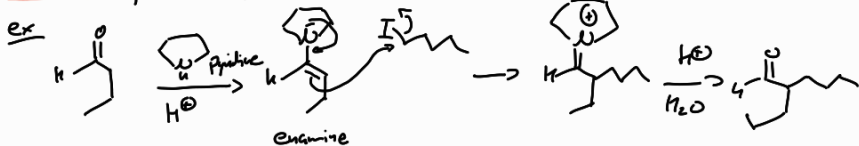
↳ Because Li^+ complexes with Oxygen

if larger loss are used $(k^{(t)}, c_0^{(t)}, \mu^{(t)})$ generate

more separated ionic bonds \Rightarrow O-alkylation 

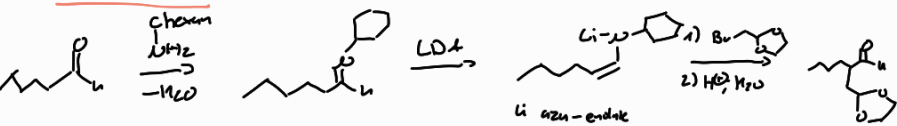
What about aldehydes?

a) Enamines for aldehyde on 2° amine



→ Works well with reactive alkyl halides

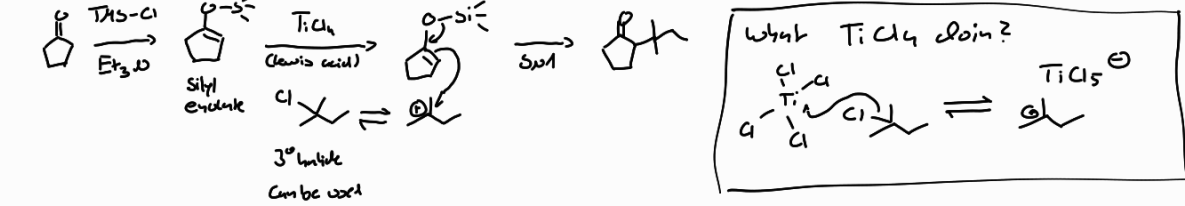
b) Azu-enolates (less reactive alkyl halides)



Aldehyde + 1° amine

→ Enamine and azu-enolates are useful in SN2-alkylation on α -carbon of aldehydes

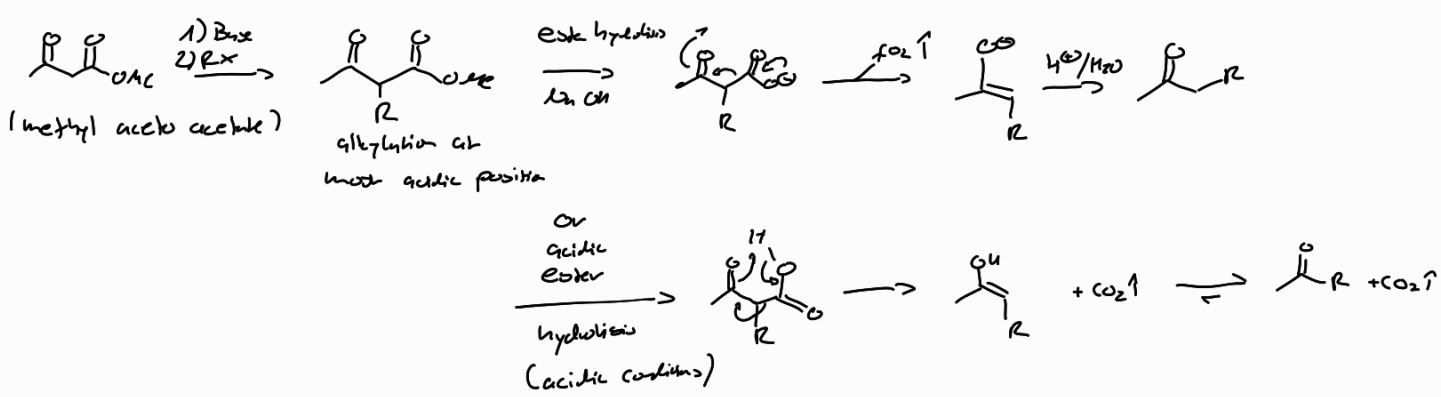
c) Si-enolates for ketones and aldehydes can be done under acidic conditions



→ Si-enolates are useful for SN1 alkylation at α -carbon

c) Use β -dicarbonyls \Rightarrow more acidic and easily alkylated (pKa ~10-15)

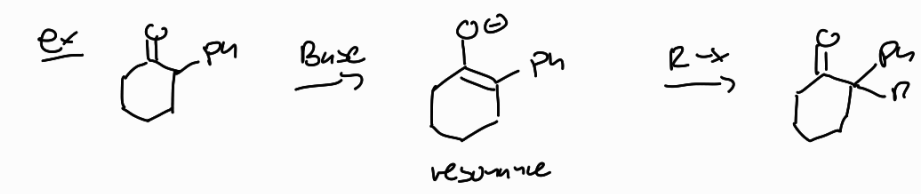
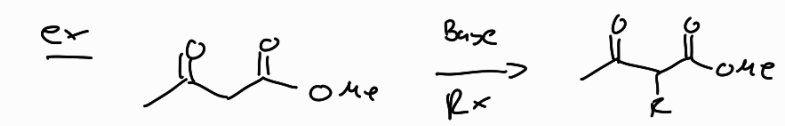
ex aceto acetate (β -keto ester)



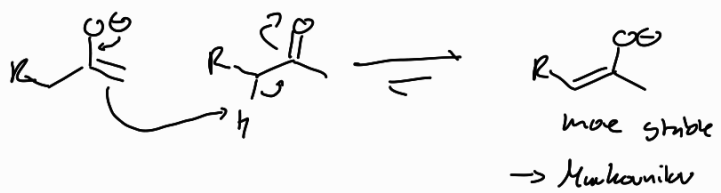
Keton alkylation and regioselectivity

Thermodynamic vs. Kinetic enolate formation

Mostly thermodynamic enolates favored

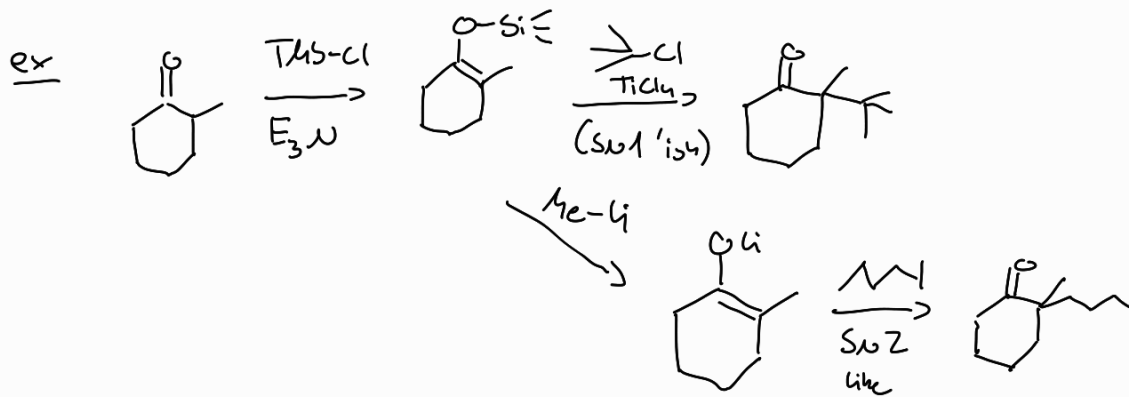


Enolate formation mostly in eq.:



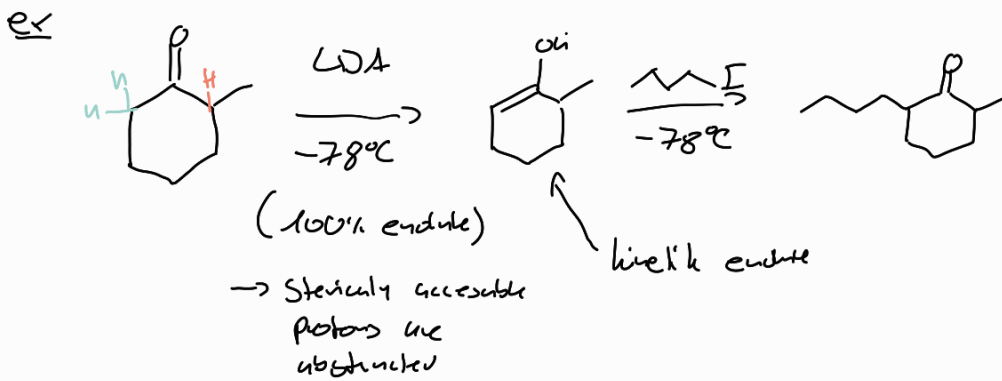
= Thermodynamic enolate

In particular Si enolates are good for forming thermodynamic enolates



Kinetic enolates?

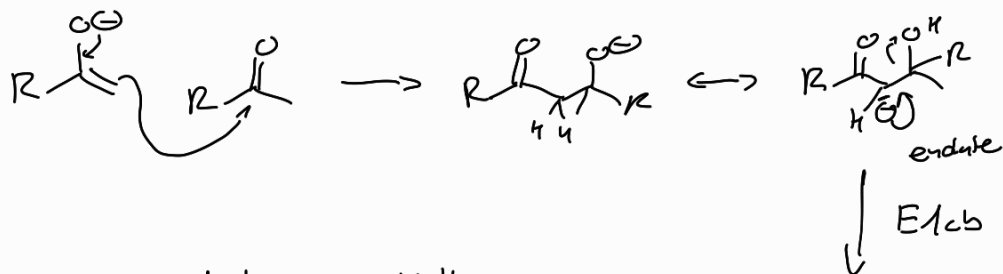
→ Strong base at low T



Condensation of carbonyl compounds

Ch 26

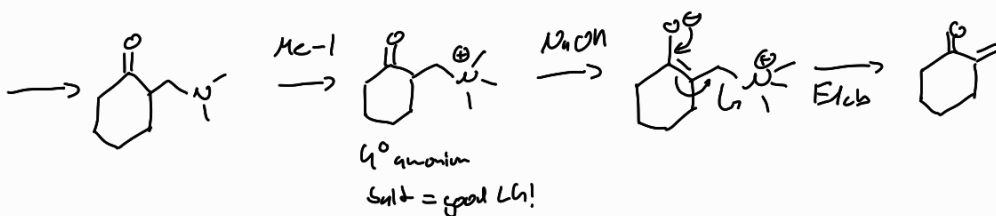
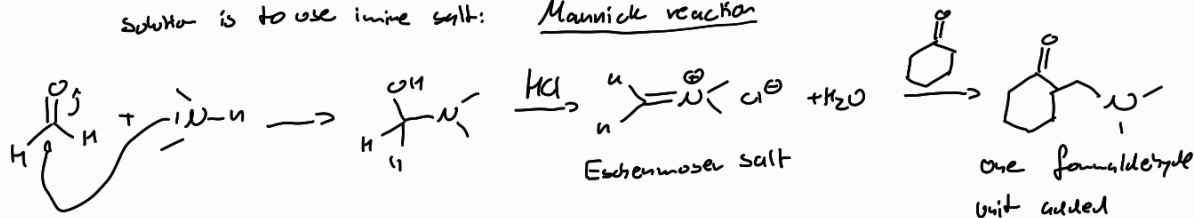
Aldol reaction:



Efficient if one compound lacks α -H !!

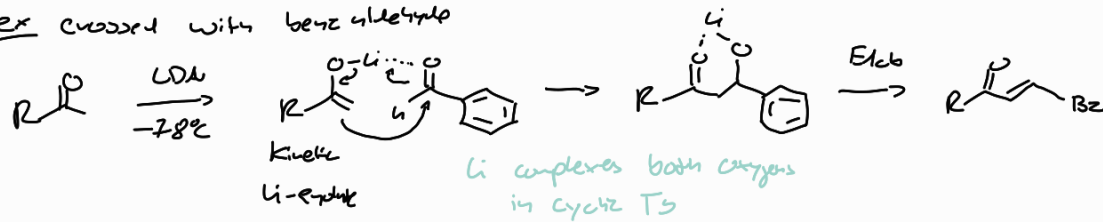
ex Formaldehyde lacks α -H, but too reactive → "over alkylated"

solution is to use imine salt: Mannich reaction



$$\text{H}_2\text{C}=\text{CH}_2 + \text{Cyclopentadiene} \xrightarrow{\text{HCl}} \text{Cyclopentadienyl cation} + \text{Cl}^-$$

ex crossed with benz aldehyde

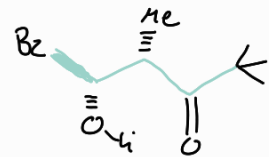
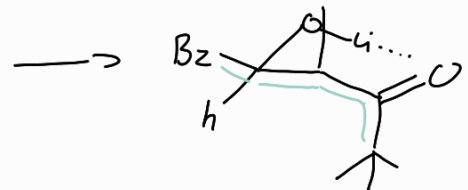
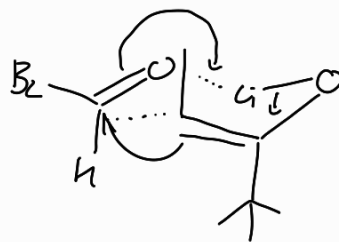
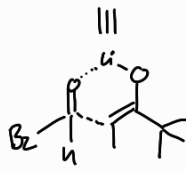
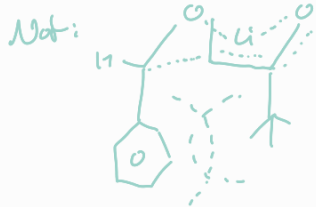


$\xrightarrow[\text{-Irg}]{\text{LDH}}$

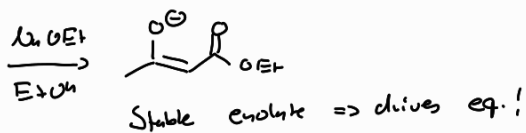
Zimmermann-Twist
Ts hypothesis

78% yield ; 100% syn

alkylidene appendage
will have Bz equivalent



CC(=O)OCC $\xrightarrow[\text{EtOH}]{\text{NaOEt}}$ CC(=C)OCC \rightarrow CC(=O)C(C)OCC \rightarrow CC(=O)C(C)C(=O)OCC + OEt^-
 Ethyl Acetate β -keto ester



→ favorable for 5- and 6-ring

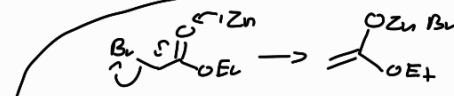
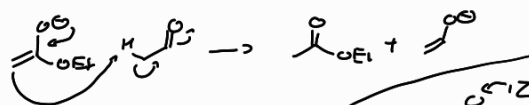
If aldehyde is electrophile...

\Rightarrow Solutions:

9) Li-oxide at -20°C , then add aldehyde/ketone

b) Generate Si-enolate, isolate and activate with Lewis acid in presence of ketone/aldehyde

c) Geneale este Zn evoluție! Fie α -helix este:

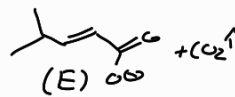
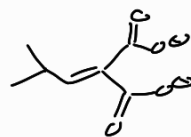
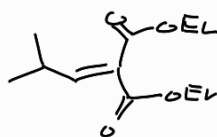
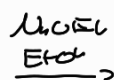
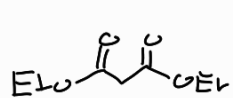


- Stable
- no conjugation
- reacts with aldehyde; ketone



Aldoles with enolates from 1,3-dicarbonyls

Knoevenagel condensation



E is favored
in decarboxylation

