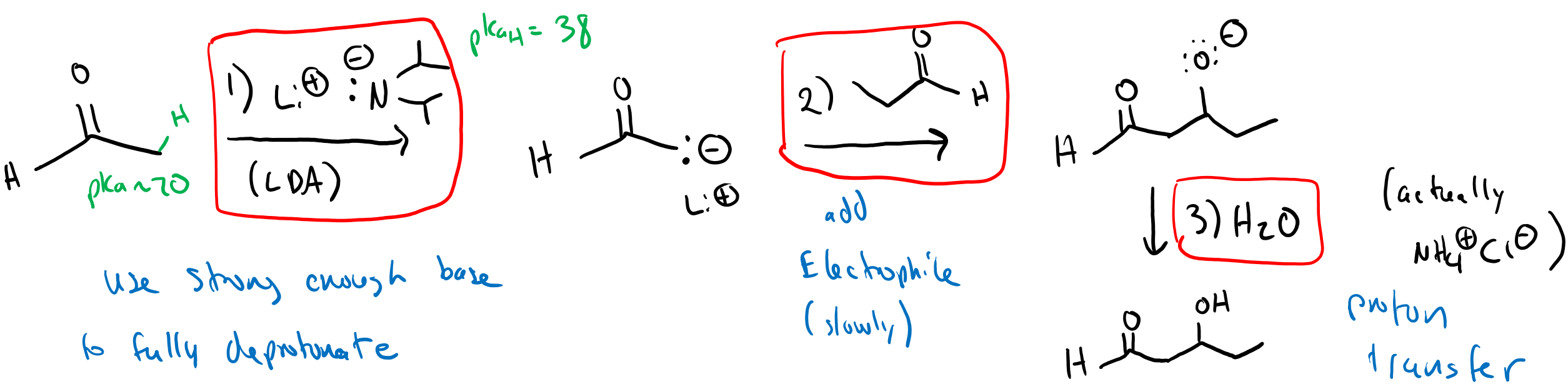
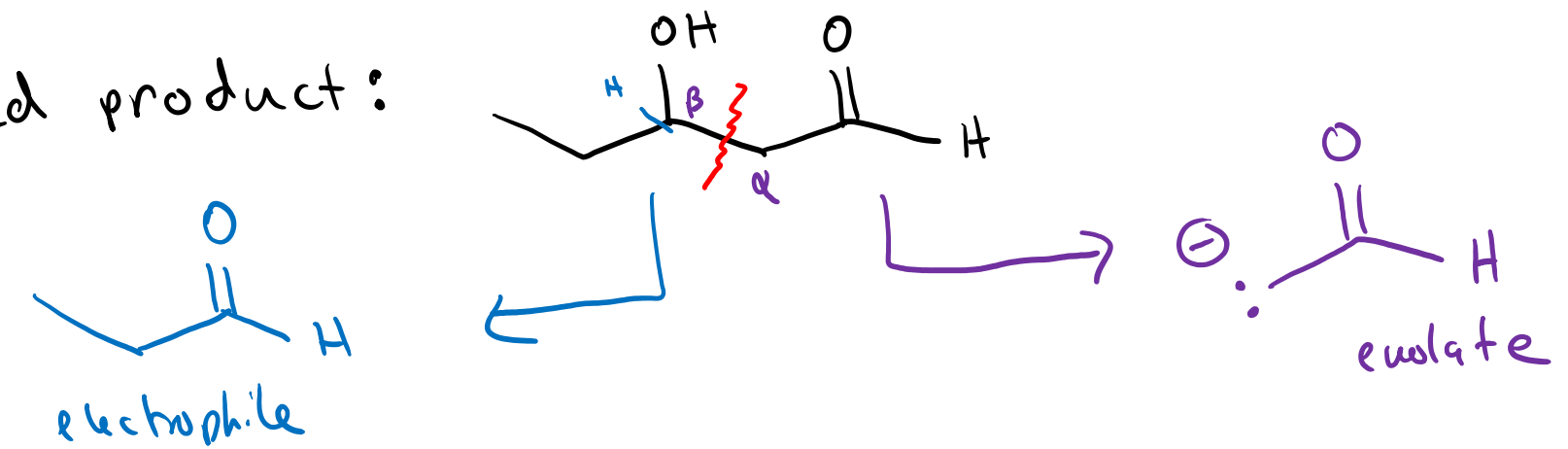


Aldol and Claisen Condensations

3/22/2022

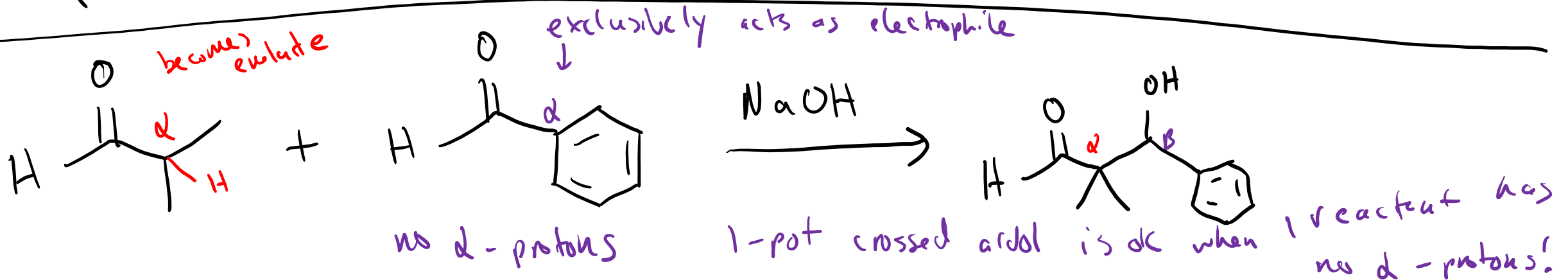
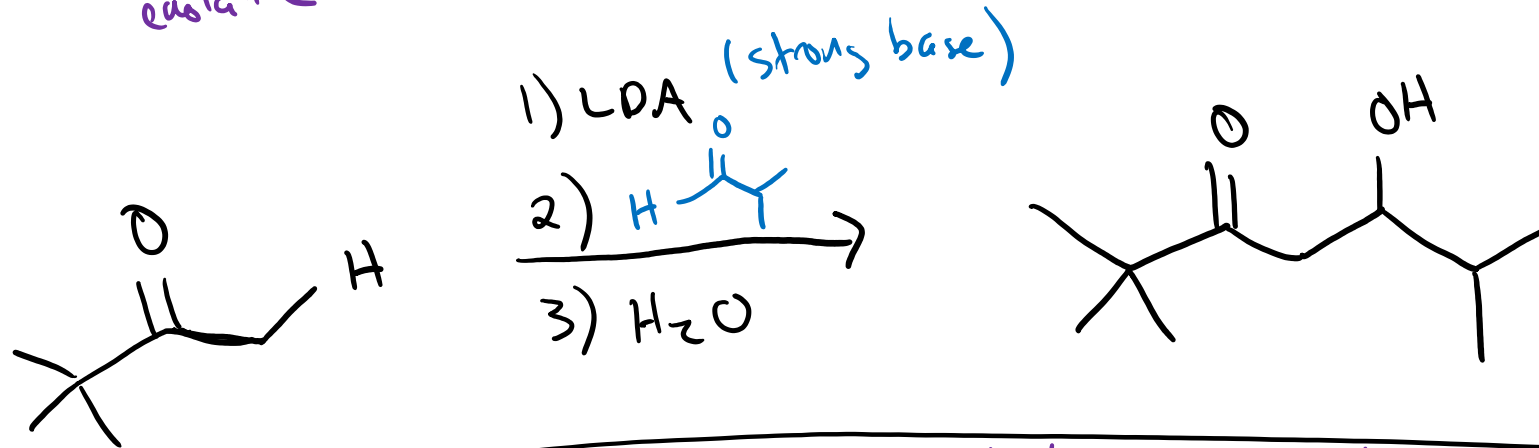
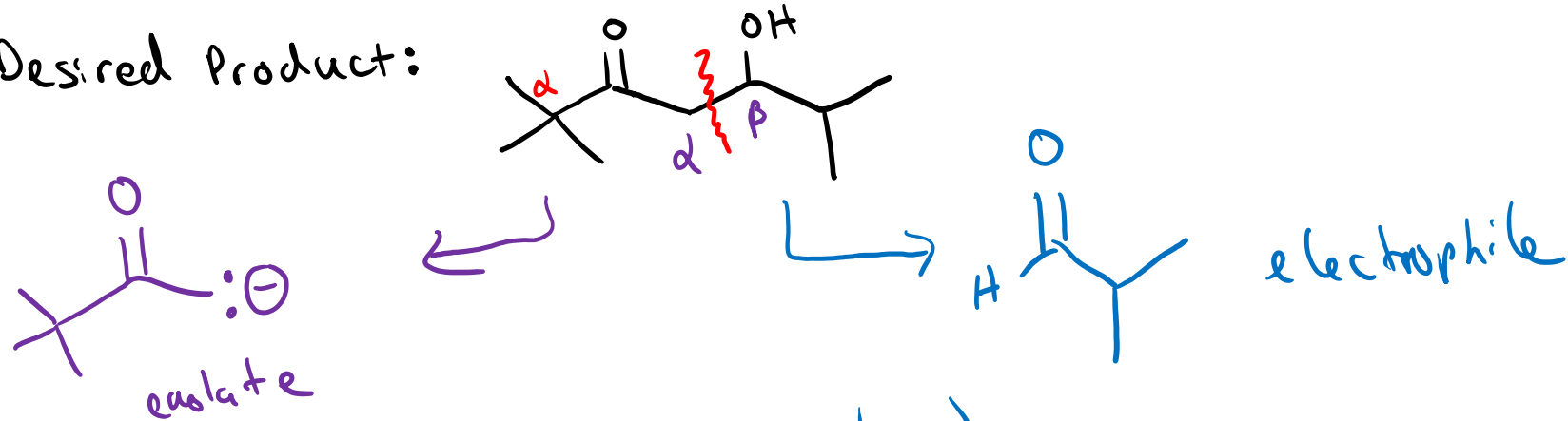
Crossed Aldol: Strategy → need to fully convert one of the ketones/aldehydes into an enolate, then add it to the other ketone/aldehyde - stepwise rxn!

Desired product:



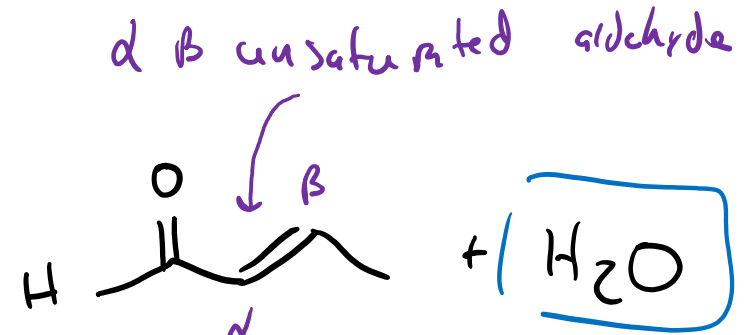
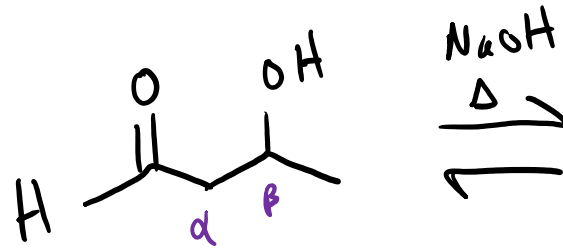
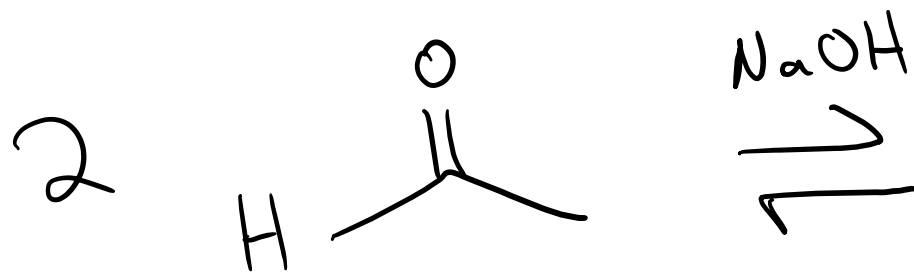
Crossed Aldol: Examples

Desired Product:



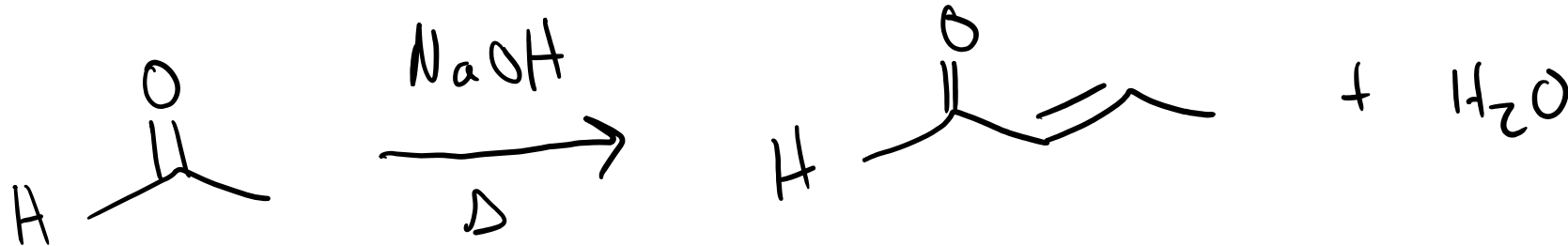
Aldol Condensation

often not isolated
in good yield
↓

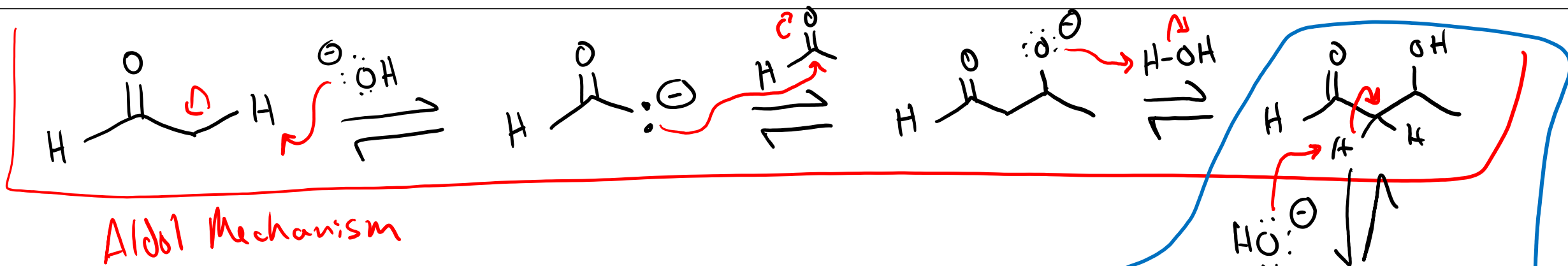


condensation
(water formed)
or dehydration

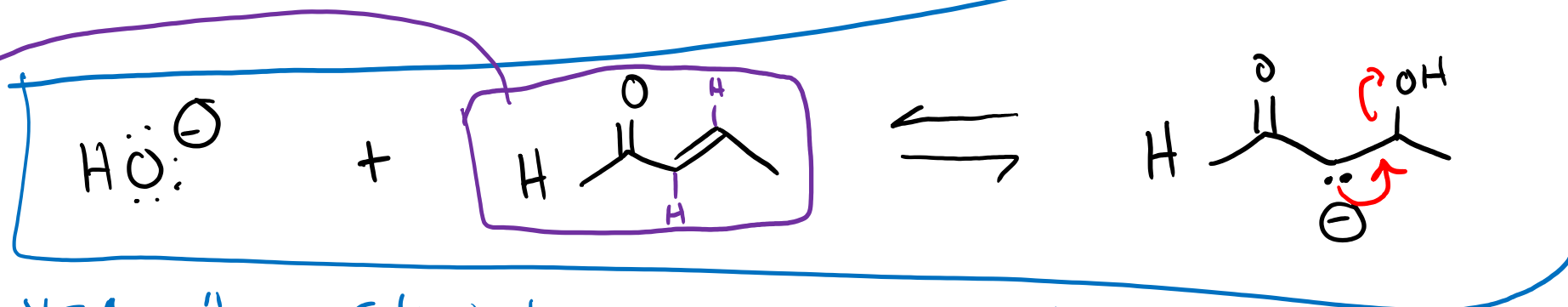
overall:



Aldol Condensation: Mechanism and Stereochemistry



major isomer
is more
stable alkene

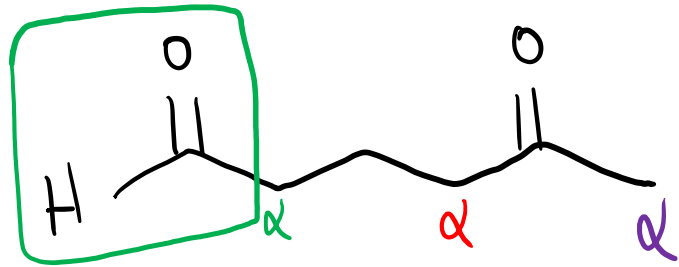


"E1_{cB}" : Elimination via conjugate base intermediate

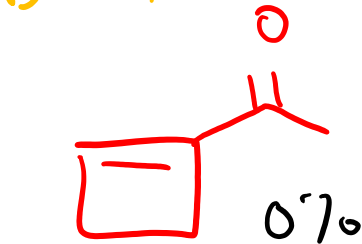
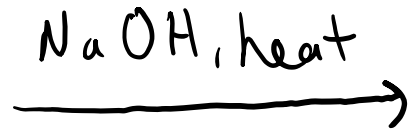
↳ unimolecular kinetics

→ trans or
usually E

Intramolecular Aldol Condensation END OF QIT MATERIAL (21.3)



Electrophile
(less hindered
& more E^+)

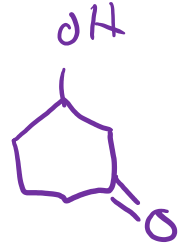
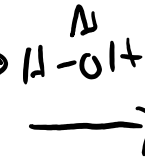
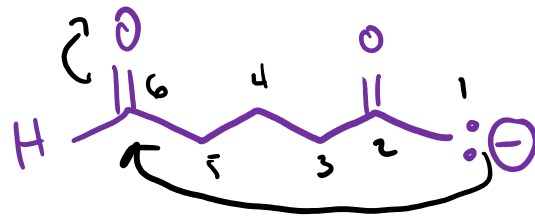


lots of
ring strain
(angle strain)

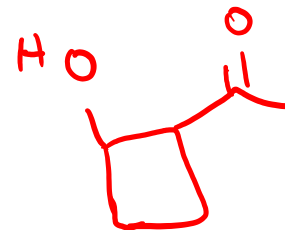
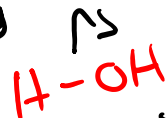
or



$\Delta, NaOH$



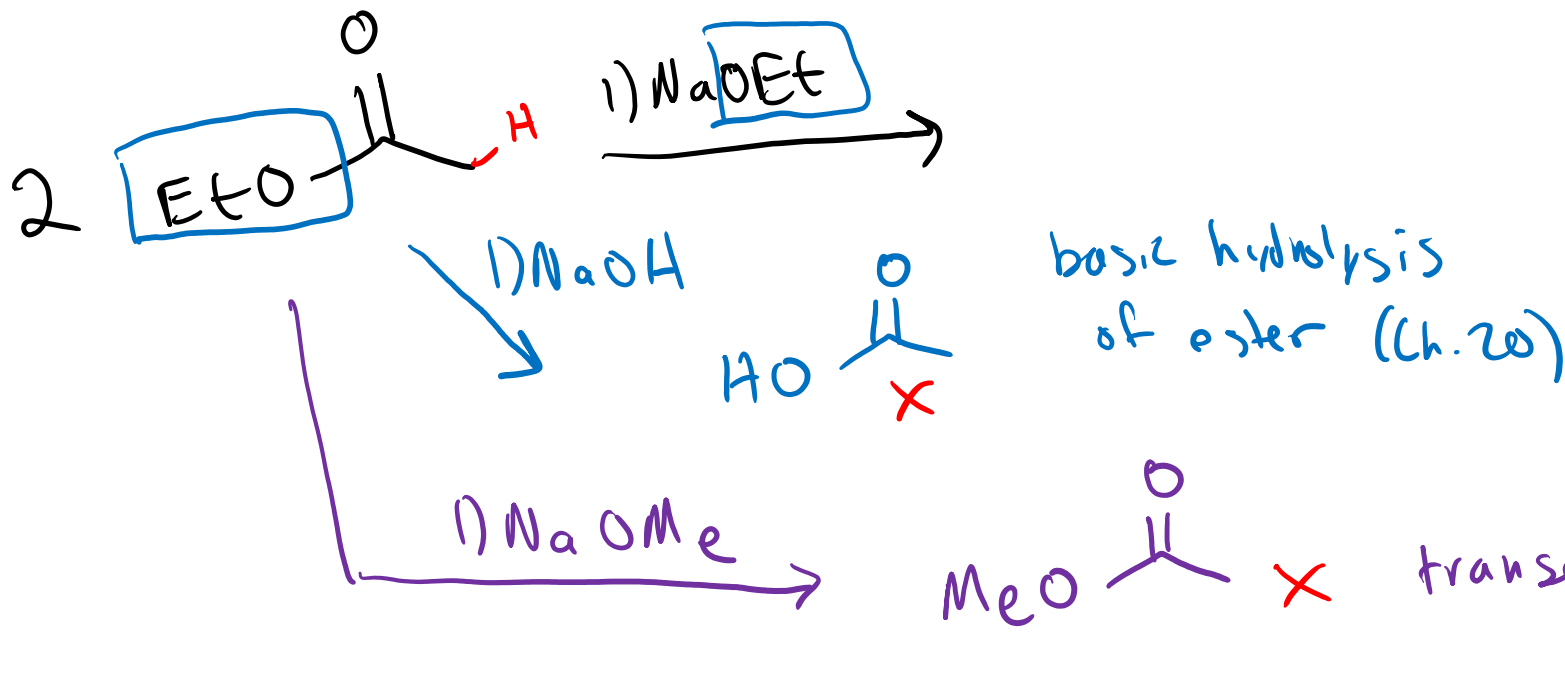
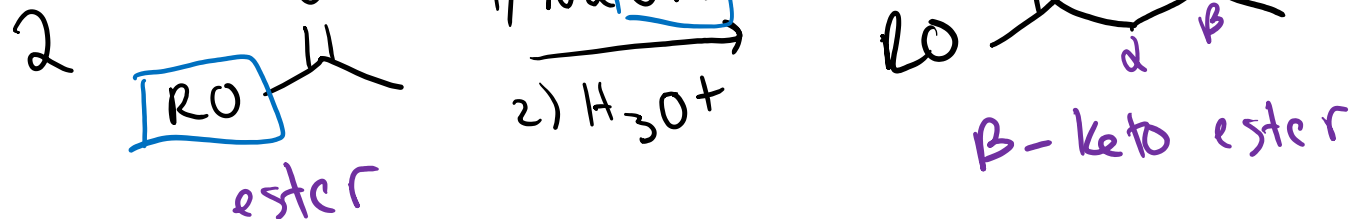
5- or 6-membered rings are preferred (least amount of ring strain)
never 4- or 3- if 5- or 6- is possible



Claisen Condensation

base must match OR group of ester!

(21.4)



whatever base we choose could act as nucleophile instead!