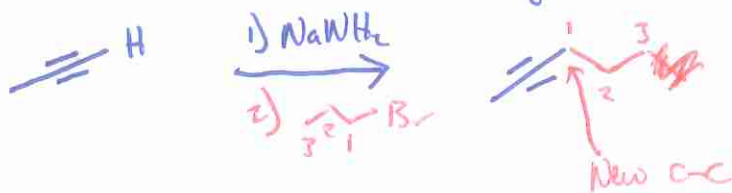


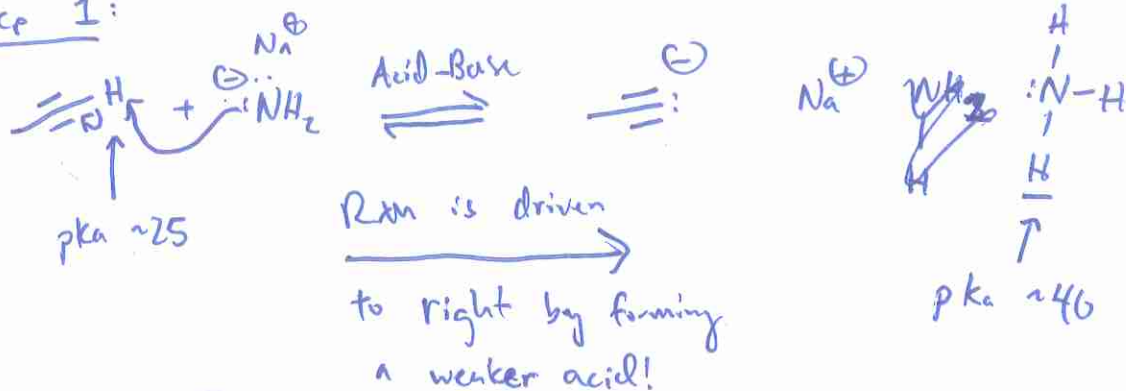
MTW

1

Recall the first C-C forming rxn you learned



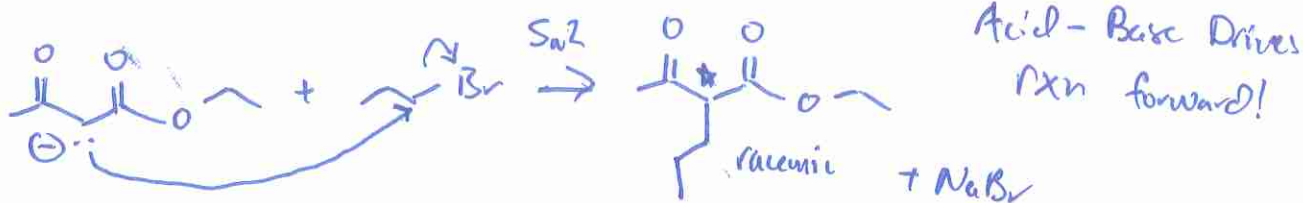
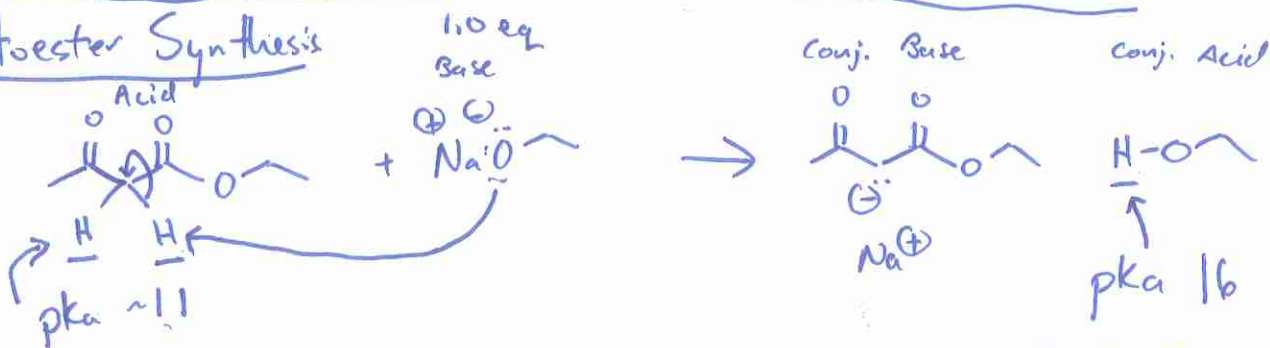
Step 1:



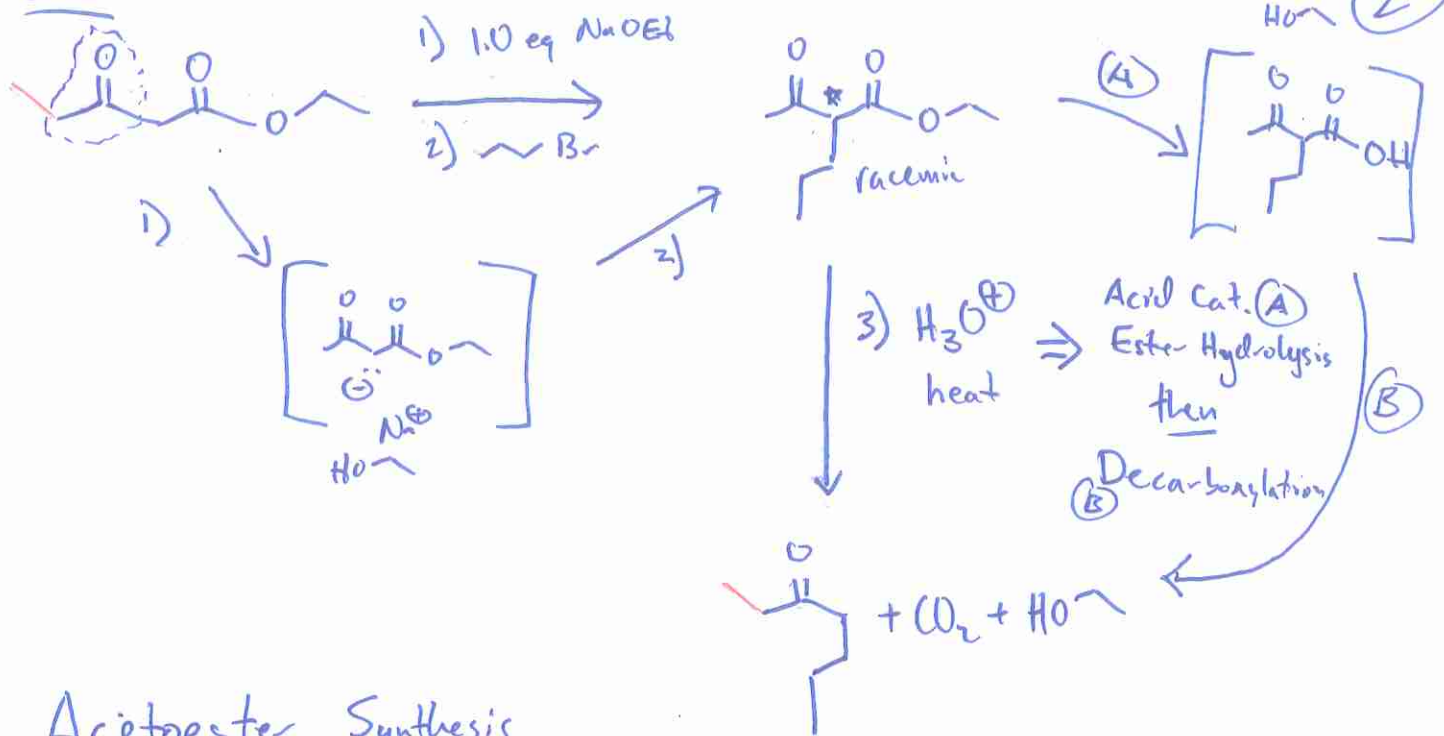
Step 2:



Acetoester Synthesis



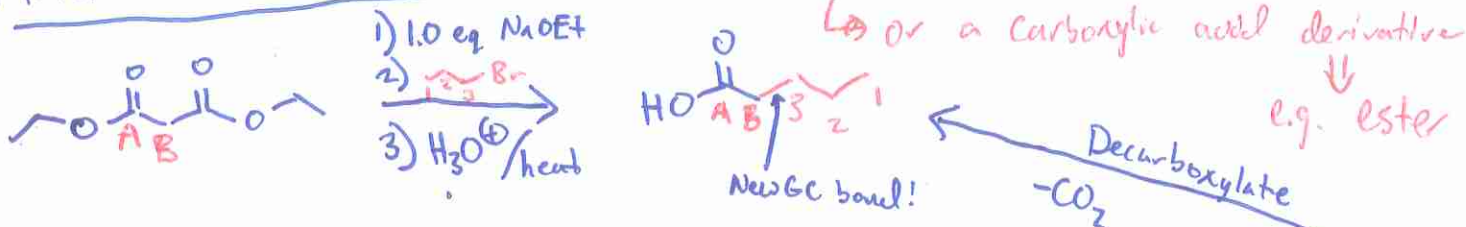
Cont.



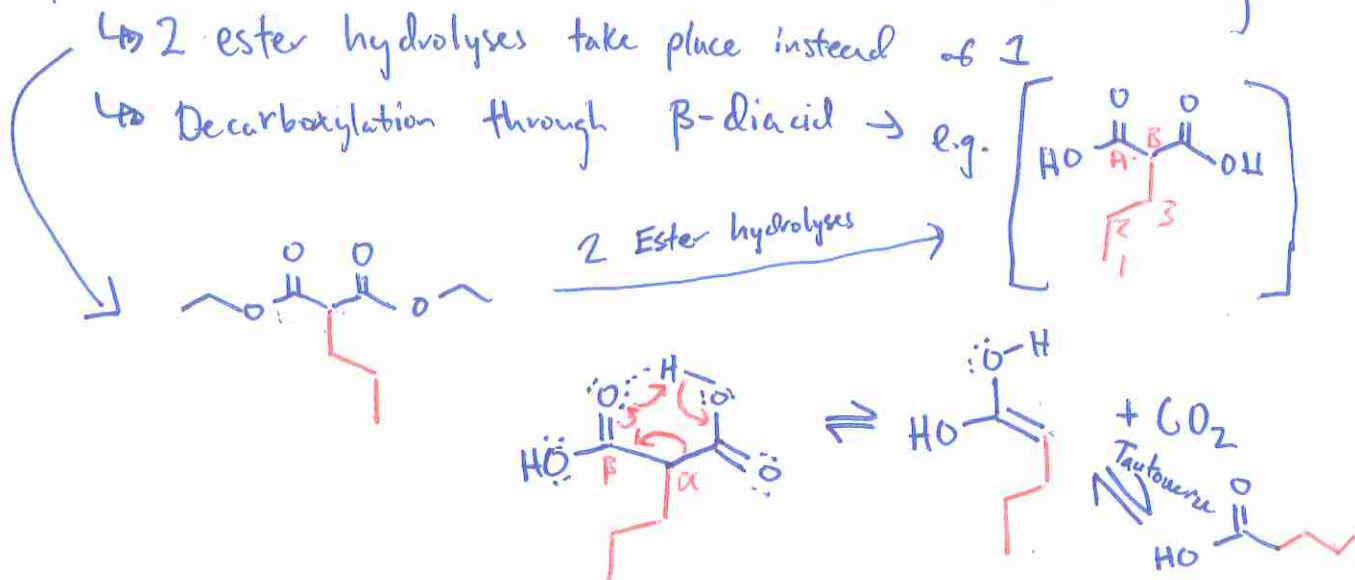
Acetoester Synthesis

\Downarrow
 KRE = Methyl Ketone

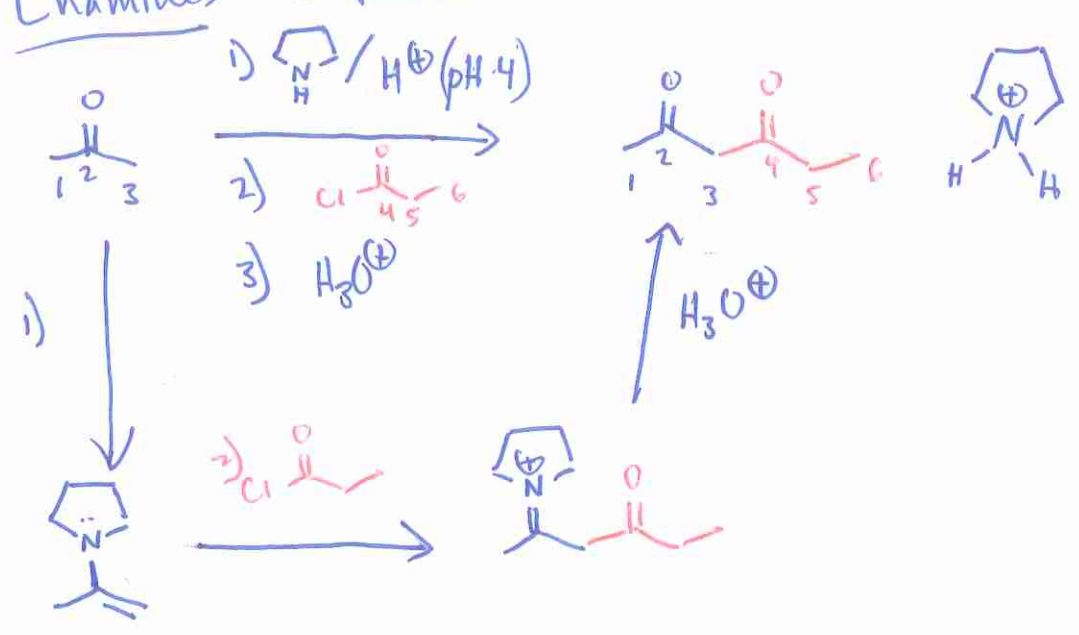
Malonic Ester Synthesis \rightarrow KRE = Carboxylic Acid w/ a new C-C bond



Sequence of steps is analogous to Acetoester Synthesis:

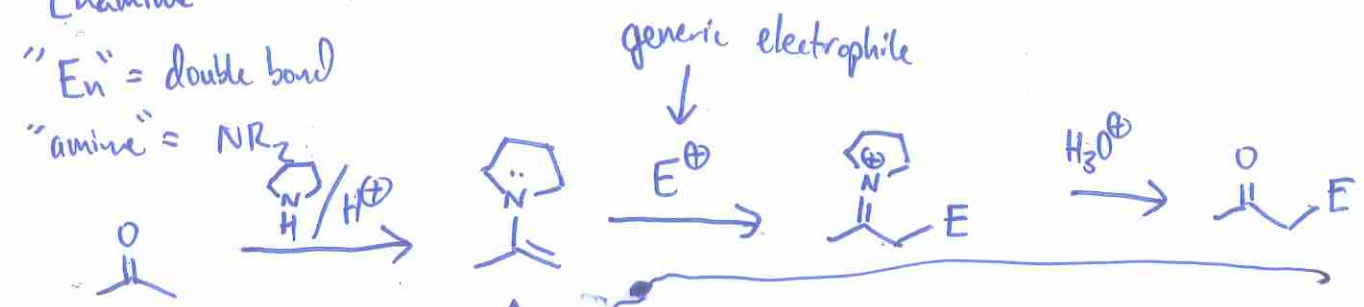


Enamines → React like enolates!

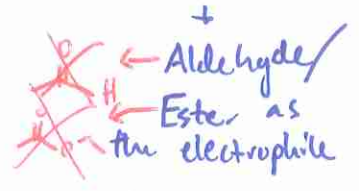


Enamine

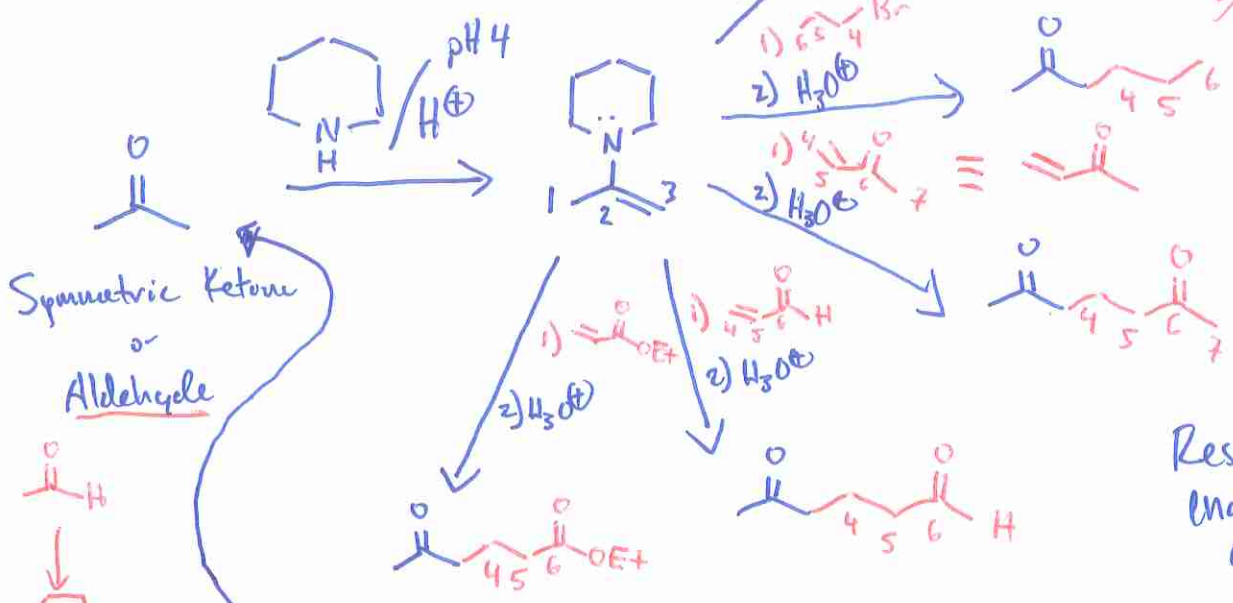
"En" = double bond
 "amine" = NR_2



Can't do Enamine +



KRE = new C-C bond on α -Carbon



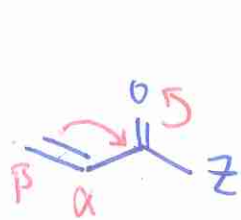
Restrictions for making Enamines

- ↳ Symmetric Ketones
- ↳ No Esters, Amides

Michael Reaction

(4)

Nucleophile adds to the β -Carbon of a "Michael Acceptor"



Michael Acceptor

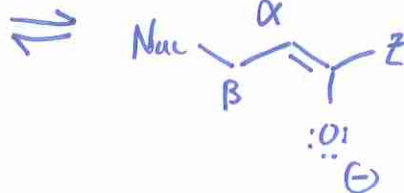
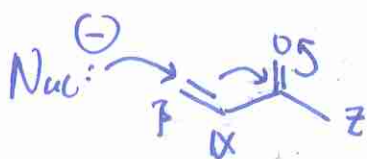


α, β -unsaturated "Carbonyl"
if $Z = H$ "Aldehyde"
 $Z = CH_3$ "Ketone"

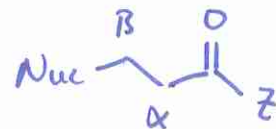
↓
★ Table 19.1 p 793



(+) on β -Carbon helps to explain why Michael Acceptors are electrophilic on the β -Carbon



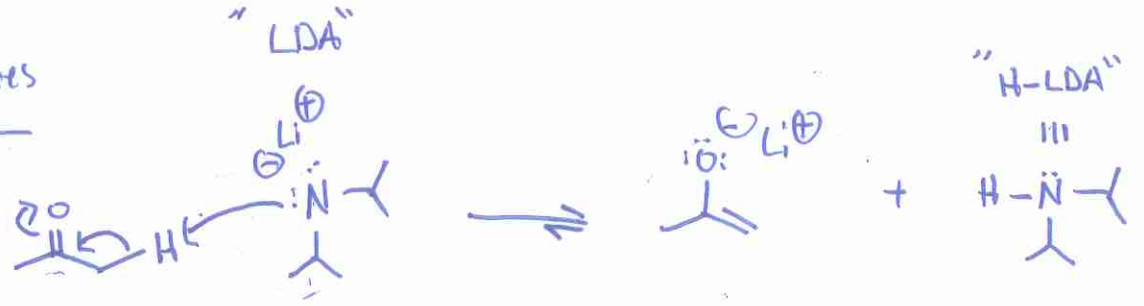
2) H_3O^+
mild



KRE = Nucleophile on β -Carbon

Enolates

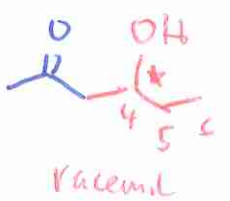
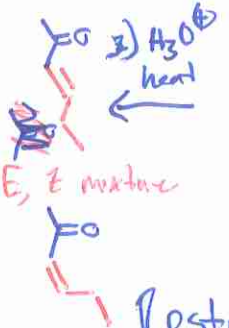
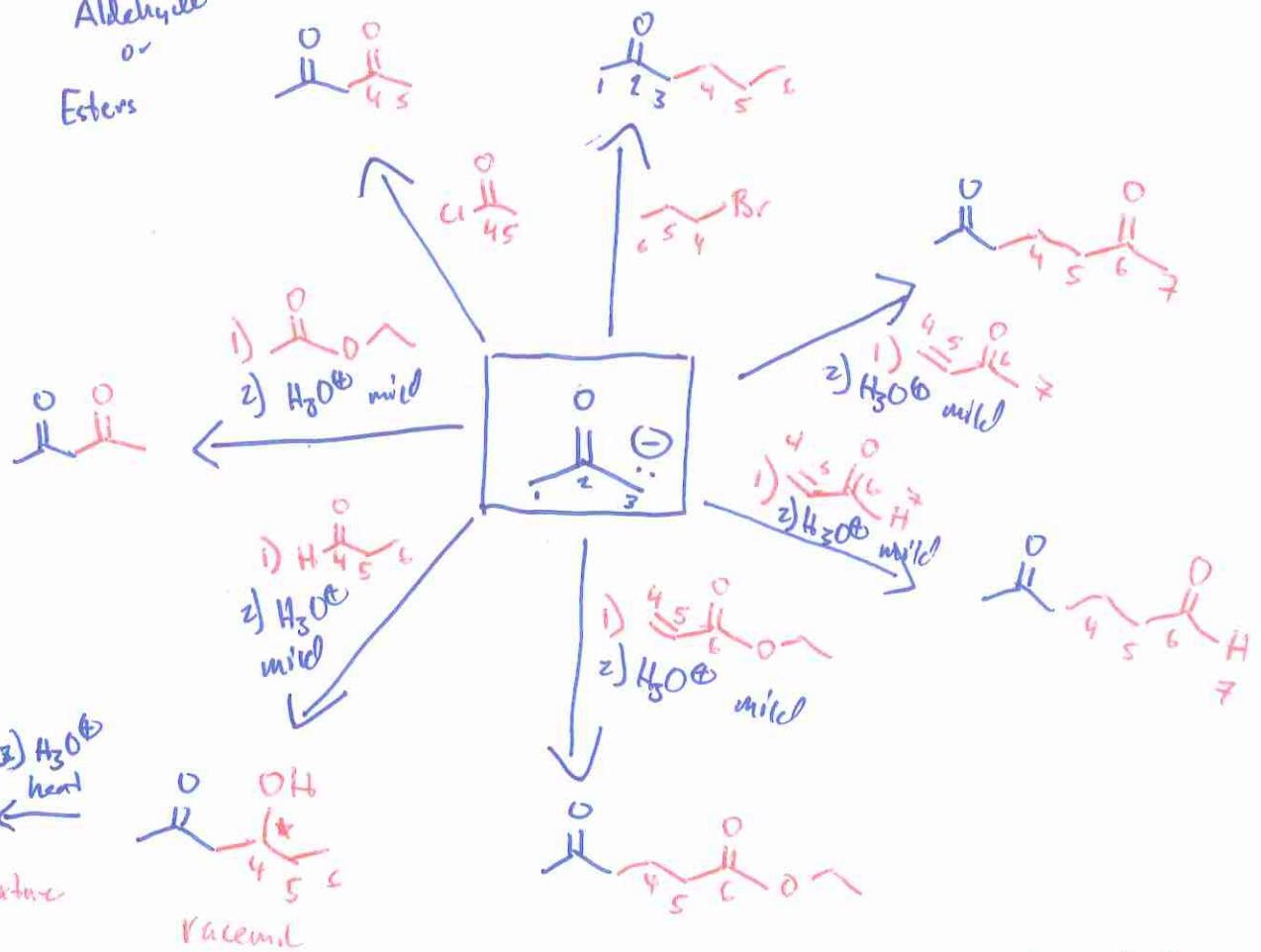
(5)



Think of $\text{C}^{\ominus}=\text{C}=\text{O}$ as $\text{C}^{\ominus}-\text{C}=\text{O}$ ← Nucleophilic on α -Carbon

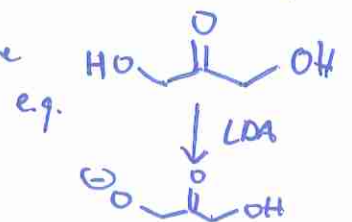


Symmetric Ketone
or
Aldehyde
or
Esters



Restrictions \rightarrow Enolate is derived from a symmetric ketone

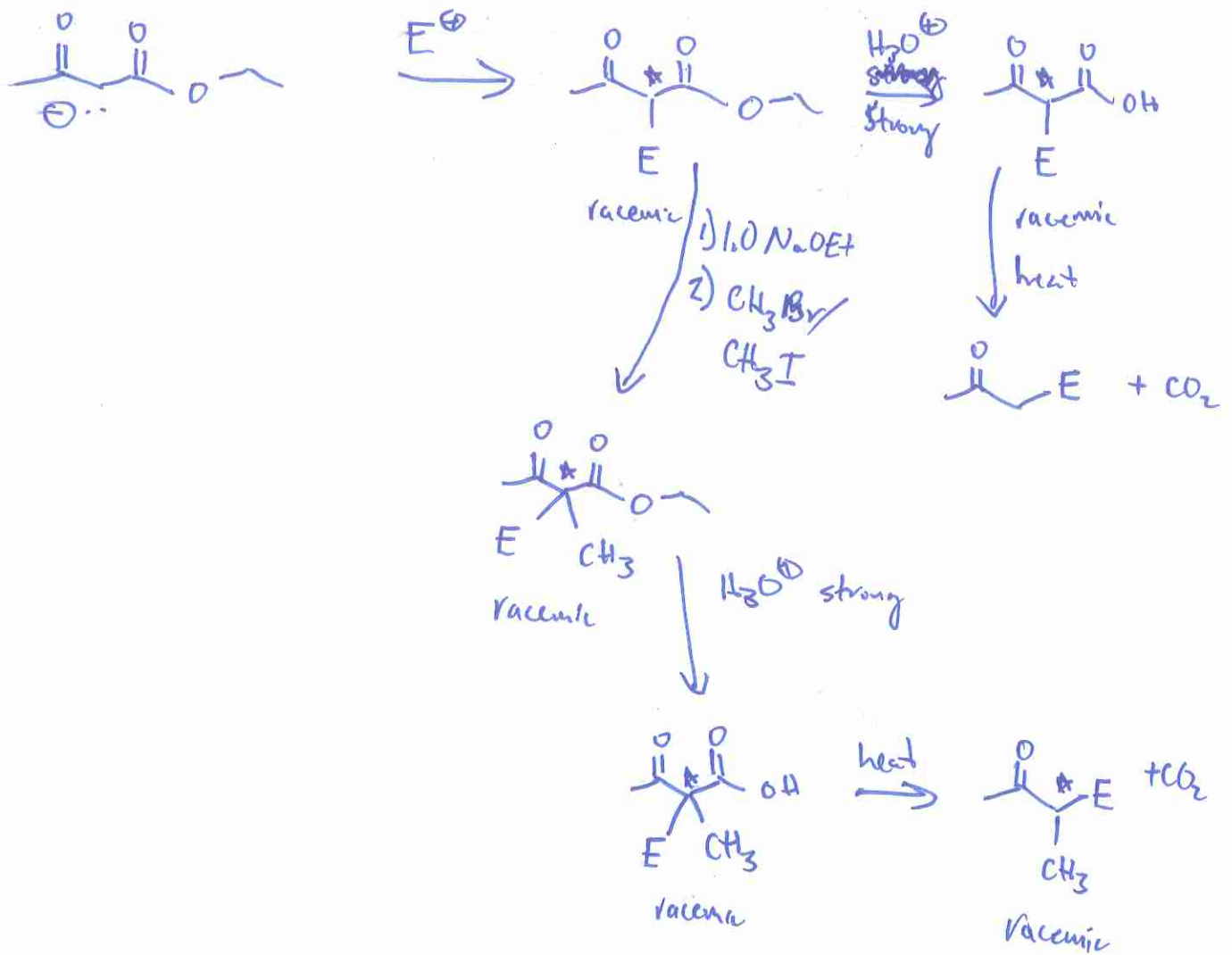
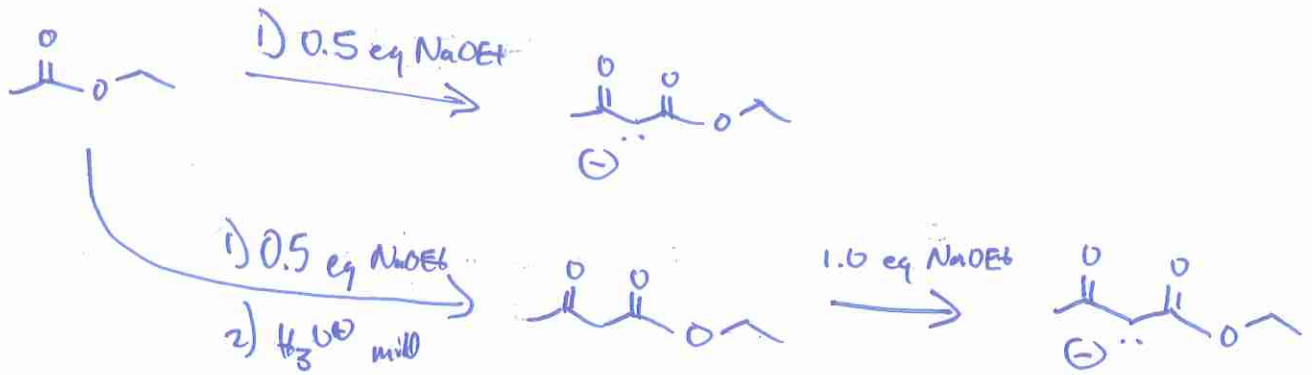
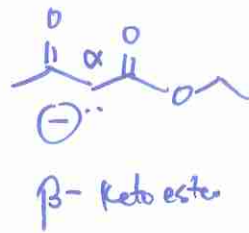
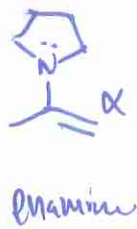
\rightarrow Can't have acidic groups on ketone

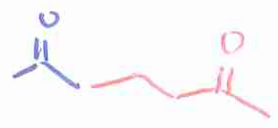


6



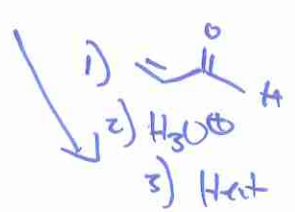
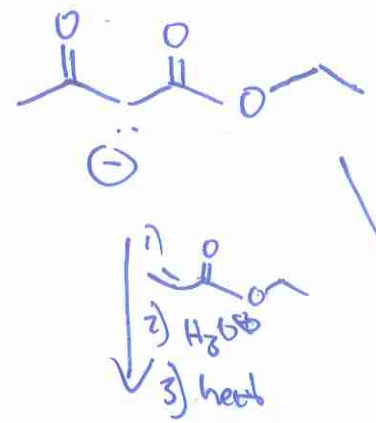
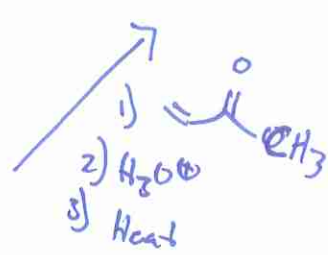
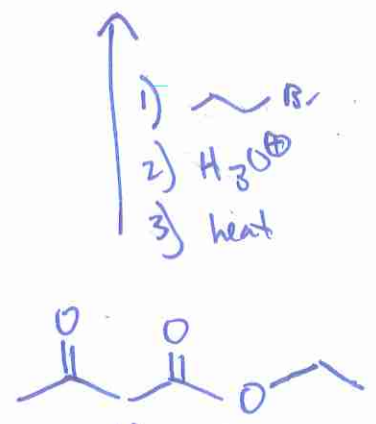
is like



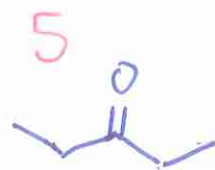
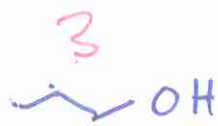


Electrophile
Restrictions

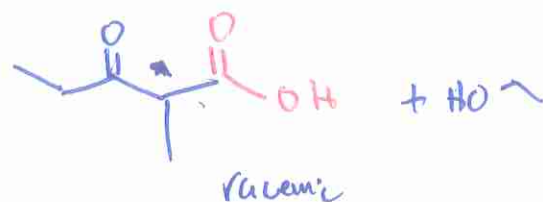
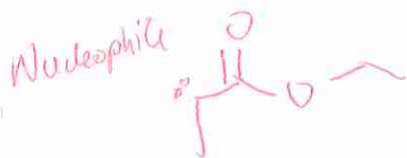
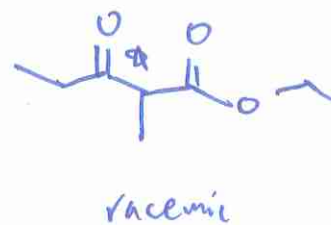
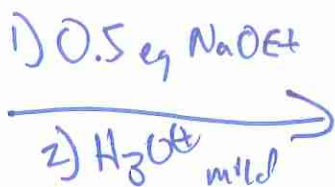
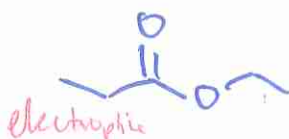
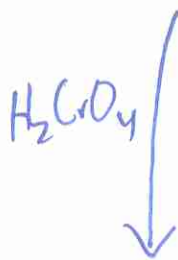
- Not acid chlorides
- Not Esters
- Not w/ Aldehydes

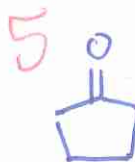
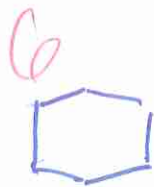


★ Can add 2 carbon groups to the same α carbons \rightarrow Only $-CH_3$ for 2nd addition



⑧
Symmetric
Ketone





9

