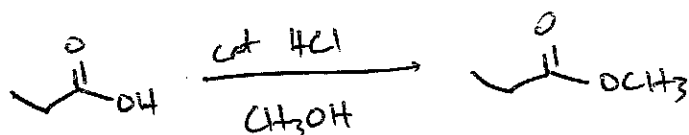


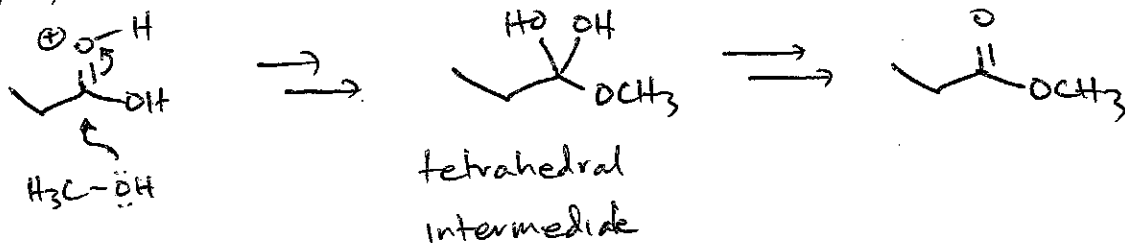
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Recall: Reactions of carboxylic acids

1) Acid-catalyzed ester formation

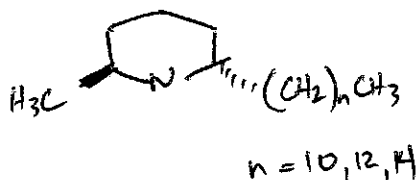


Mech: (highlights)

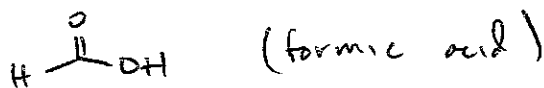


Carboxylic acids in ant chemical warfare (Science 343: 1014)
(2014)

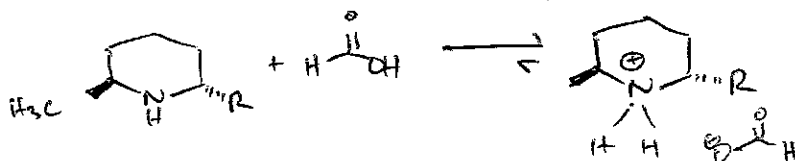
Fire ant venom:



Tawny crazy ant weapon:

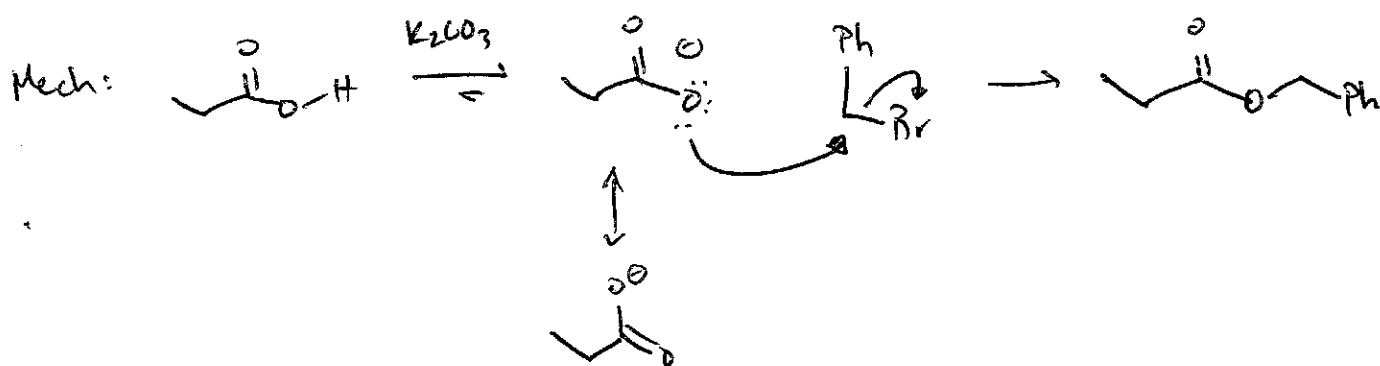
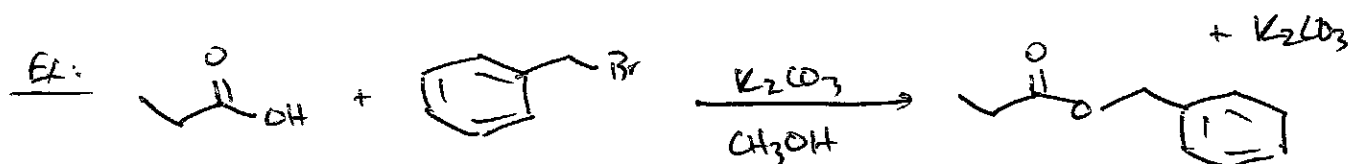


Discovery: T.C. ants use formic acid to detoxify fire ant venom. Mechanism...?



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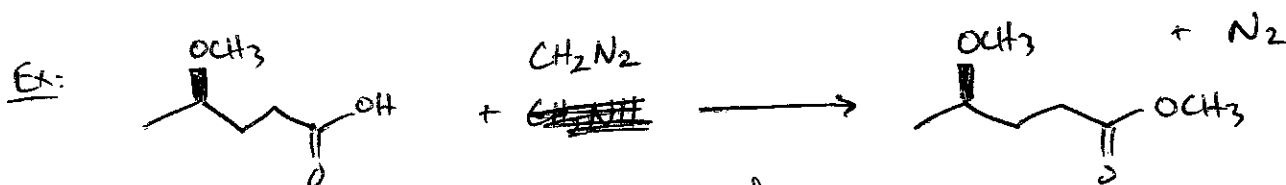
② Ester formation via S_N2 ("alkylation")



Limitation: carboxylate is not a strong nucleophile. Thus, must use excellent S_N2 electrophiles:

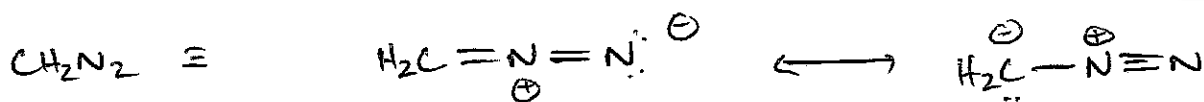


Special case: "Diazomethane" is source of methyl group

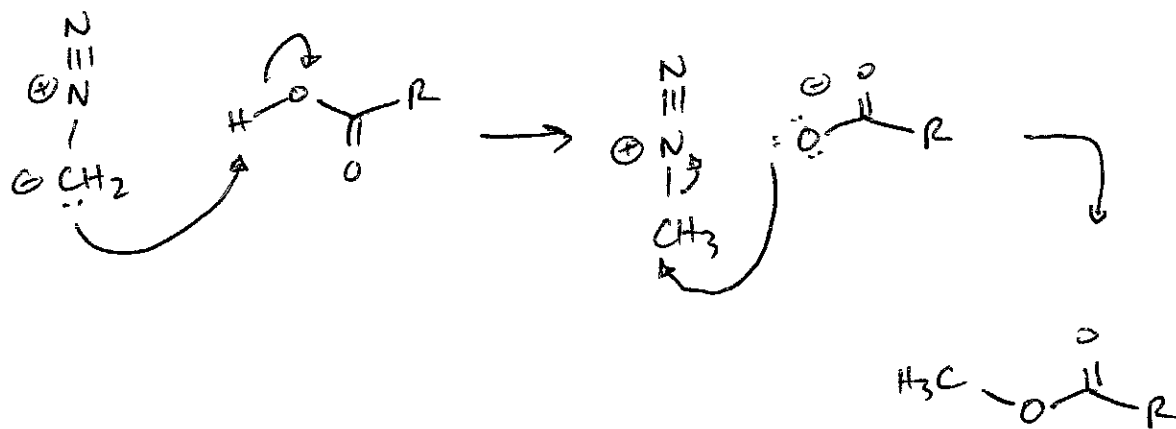


clean: only byproduct is inert gas
 mild: no acid or base needed

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$\text{N}_2 = \text{great leaving group}$



- Main drawback to this reaction:

- Diazomethane is very explosive!

③ Carboxylic acid \rightarrow acid chloride $(\text{R}-\overset{\text{O}}{\parallel}{\text{C}}-\text{Cl})$

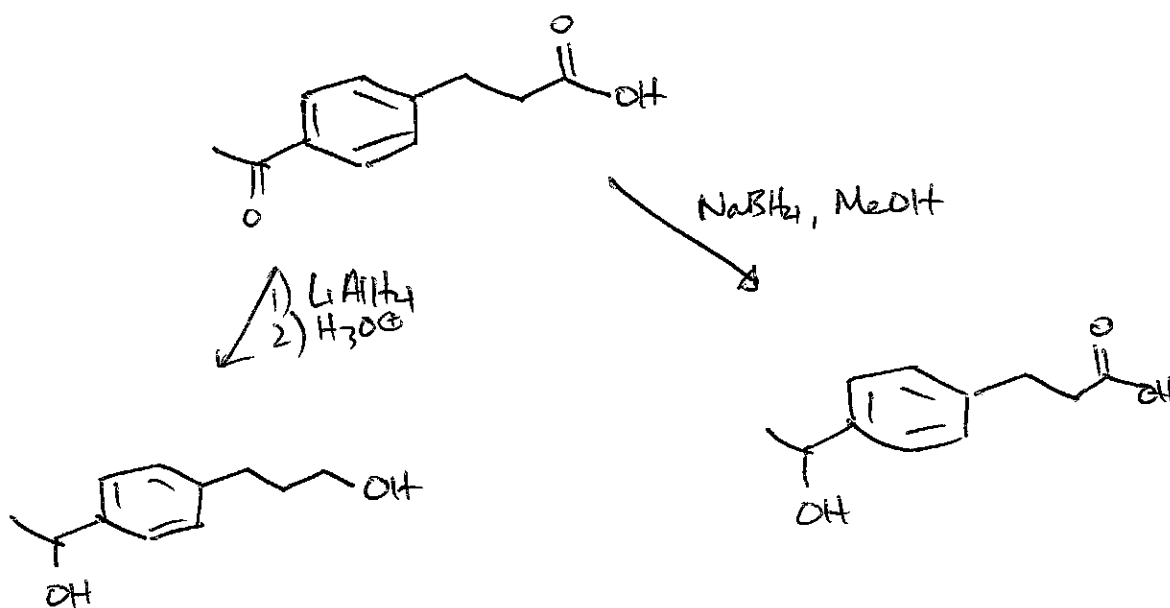
two standard methods (reagents)



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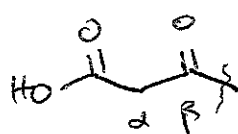
- NaBH_4 : less reactive than LiAlH_4 , does not reduce carboxylic acids

(~~NaBH₄~~ is "chemoselective")



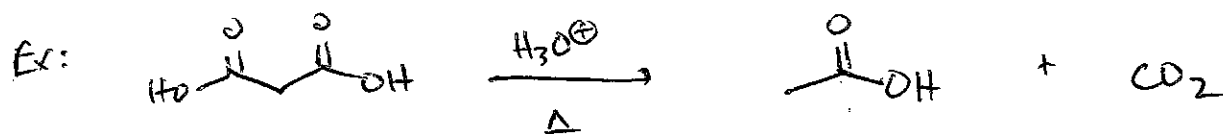
⑥ Decarboxylation (loss of CO_2)

- occurs in a special case:



\rightleftharpoons

carboxylic acid with a β -carbonyl



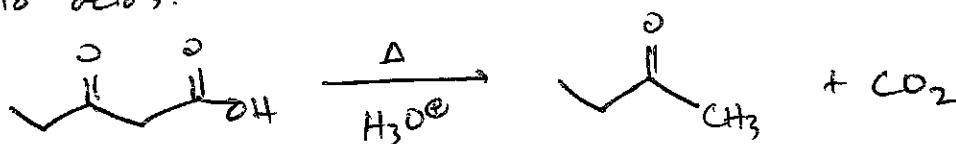
Course _____ Instructor _____

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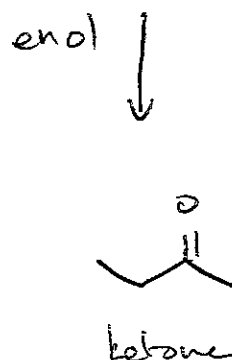
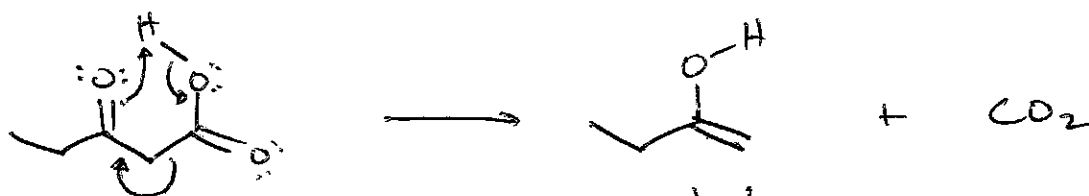
Notes Taken By _____ Total # of Pages _____

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β -keto acids:



concerted mech:



Recall mechanism
for isomerization of
enol to ketone
p. 655-656