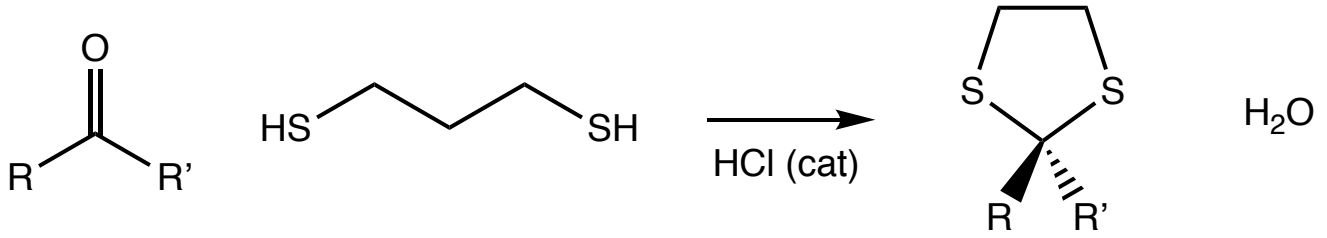
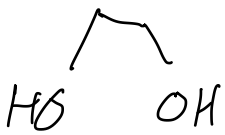
Today

Other Reactions
16.11-16.13, 16.15

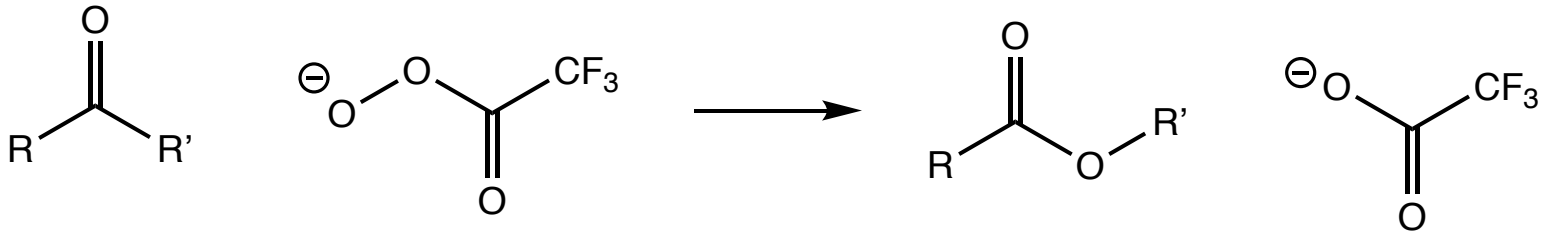
Next Class

Reactions at the α-Carbon
17.1-17.5





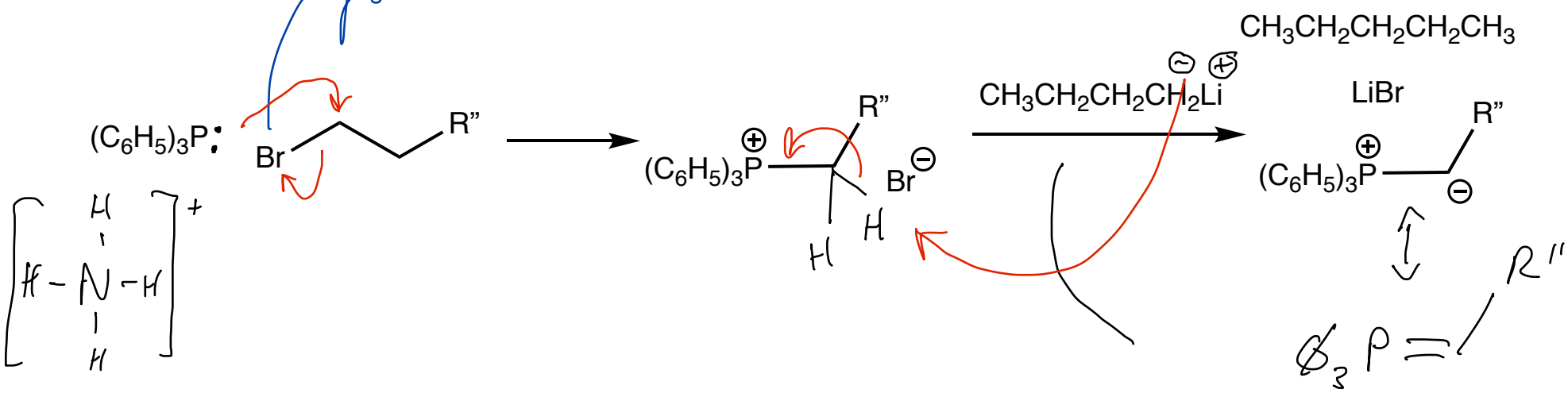
S below O on P. table so it has nucleophilic lone pairs like O and do analogous reactions

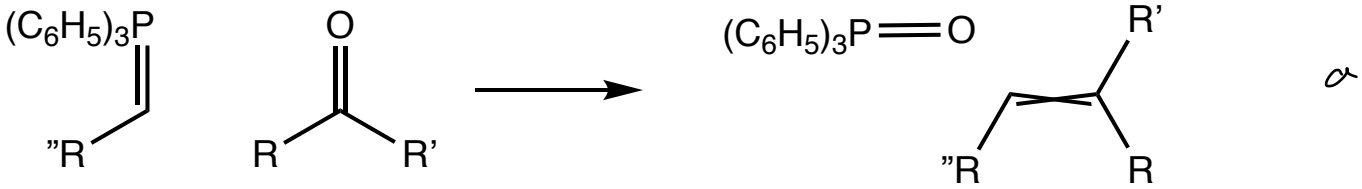


R' = H > 3°-alkyl > 2°-alkyl ~ phenyl > 1°-alkyl > CH_3

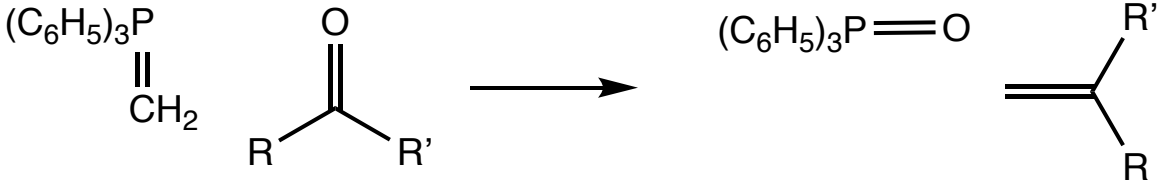
Skipping in 2022

good LG attached to the 1° C S_N2



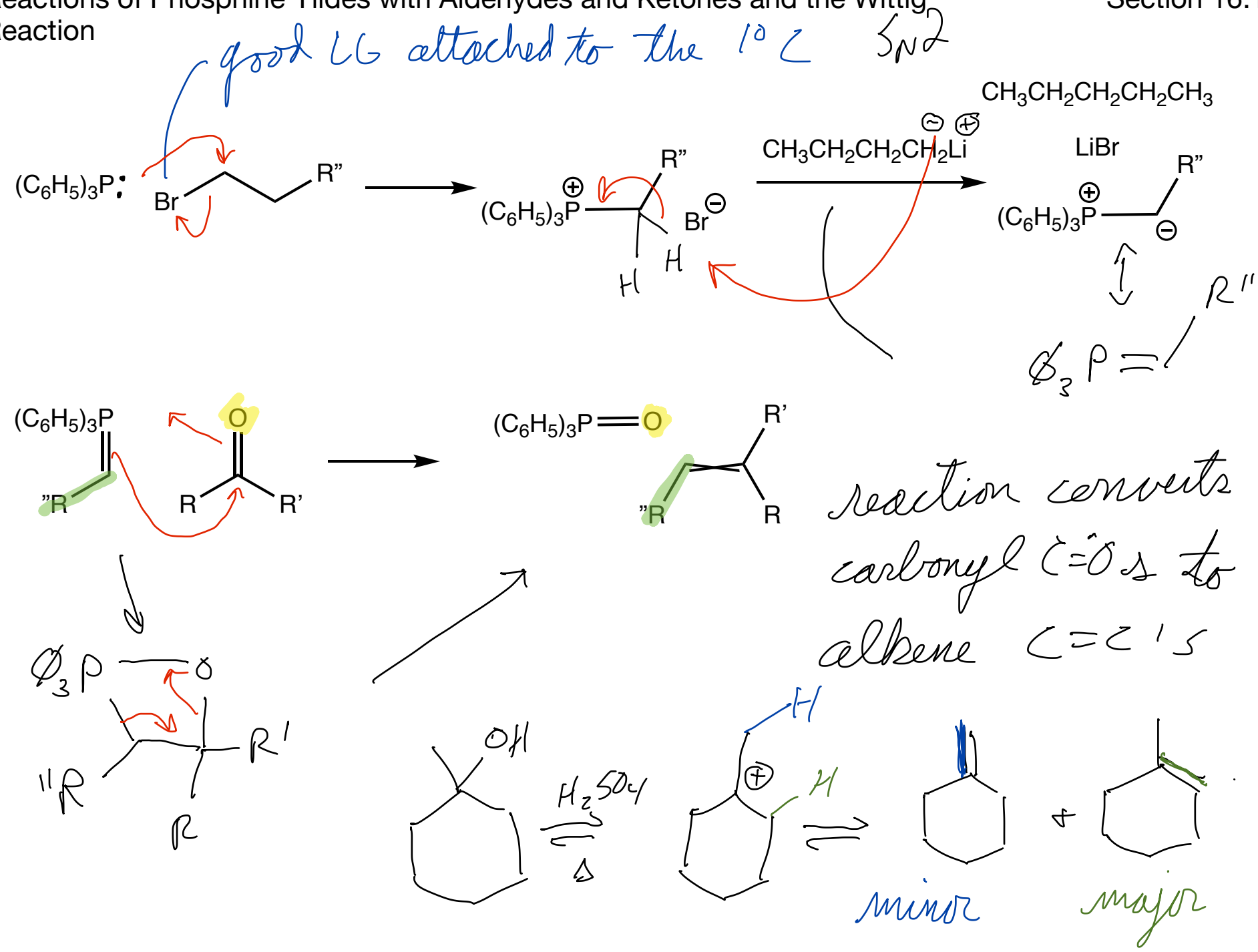


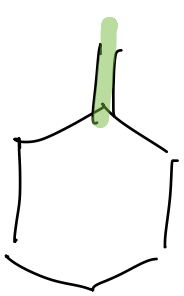
or

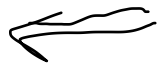


butyl lithium is super base

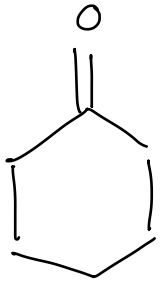
Reactions of Phosphine Ylides with Aldehydes and Ketones and the Wittig Reaction



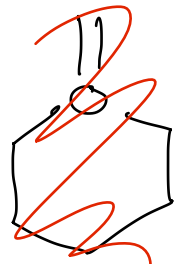




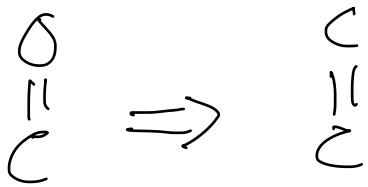
? Wittig rxn

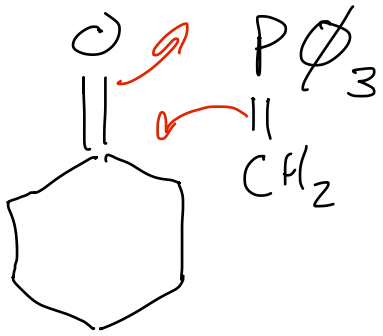


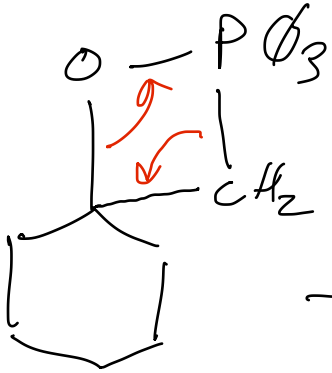
or

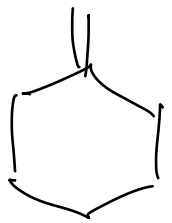


not possible









Wittig reagents are great for making terminal alkenes.

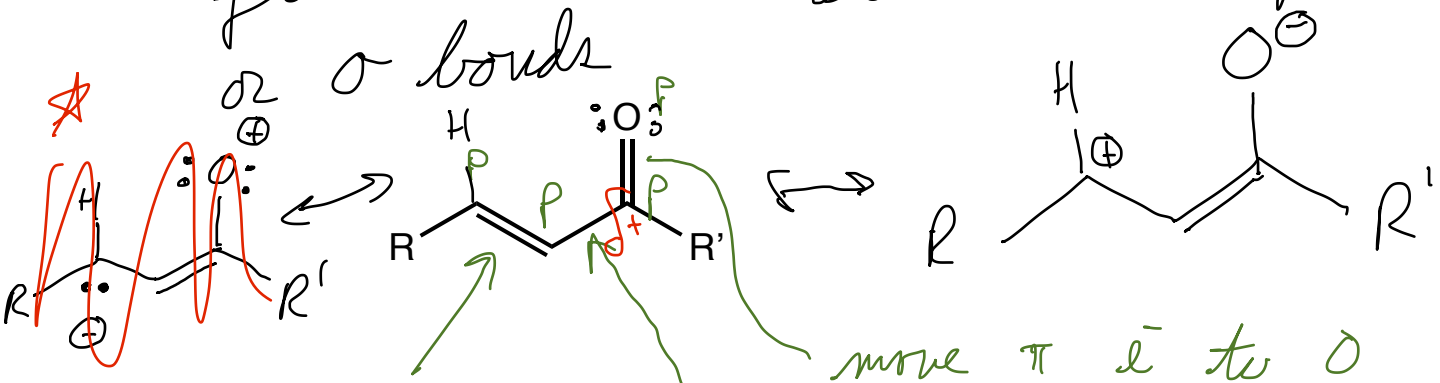
α,β-unsaturated carbonyls: introduction

resonance contributor

Section 16.15, 16.16

just move π bonds and lp e⁻'s not atoms

σ bonds

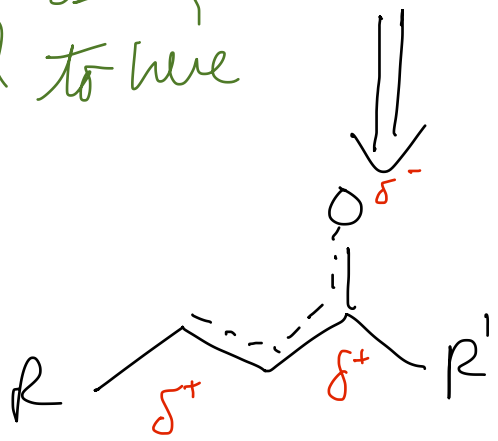


move π e⁻ to O

move this π bond to here

$FC_2 = 4 - 5$

$= -1$

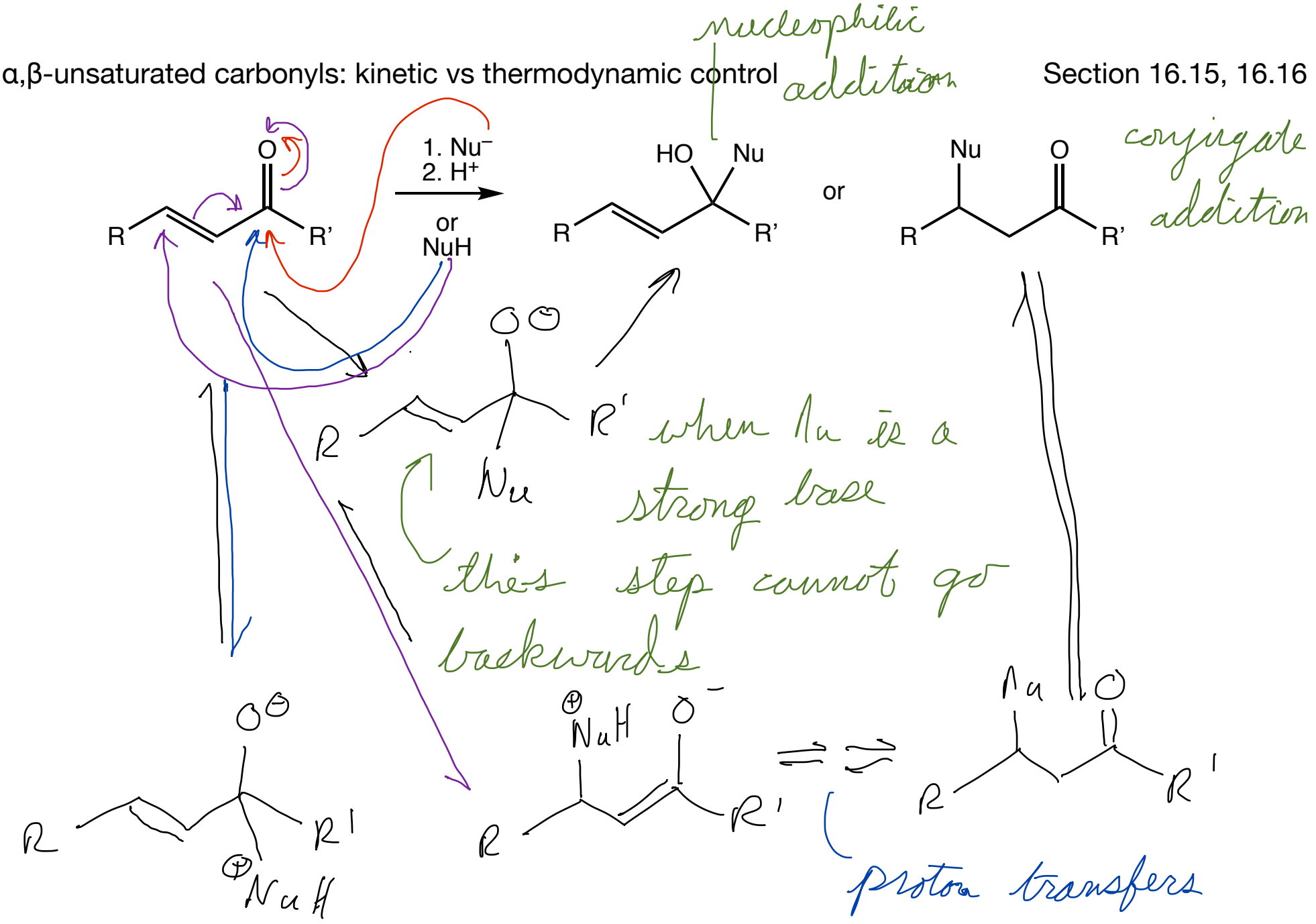


* too much going wrong with this drawing

"wrong" charges

O atom with an incomplete octet

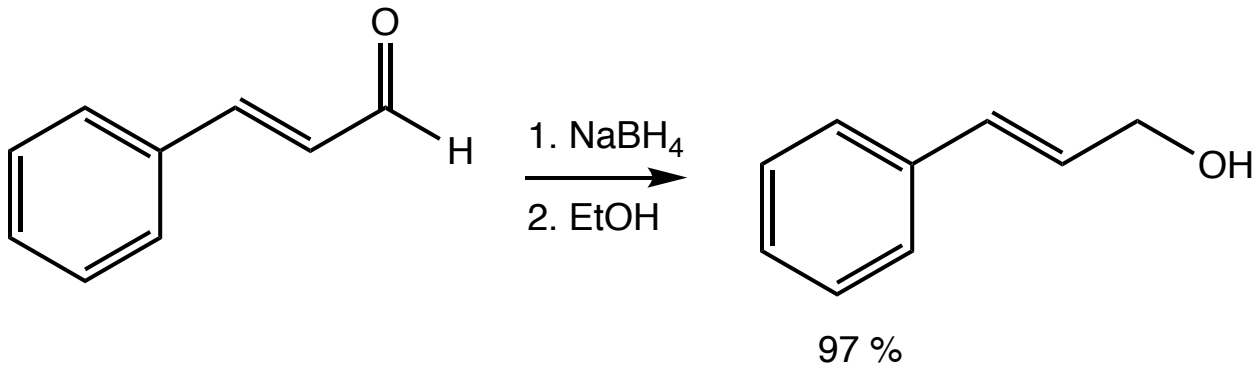
The β-C of an α,β-unsaturated carbonyl is electrophilic


nucleophilic addition
1. Nu⁻
2. H⁺
or
NuH
HO Nu
R R'
or
Nu O
R R'
conjugate addition
when Nu is a strong base this step cannot go backwards
proton transfers
weak bases can be released from the C=O's C.

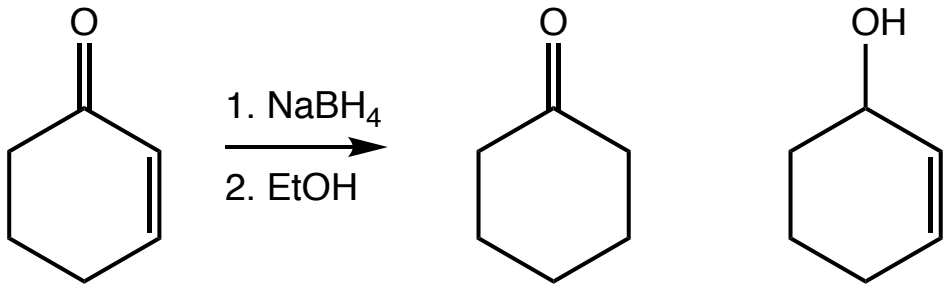
reactions with single direction arrows are under kinetic control. What ever happens fastest gives the most product

reactions that have equilibrium arrows are under thermodynamic control the most stable product is the major product

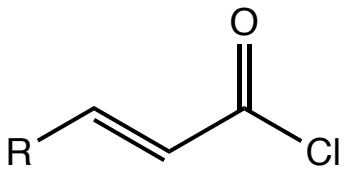
Still it is difficult to predict the outcome.

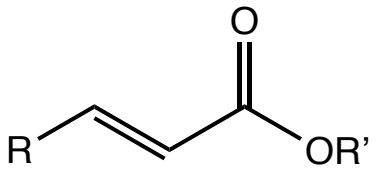


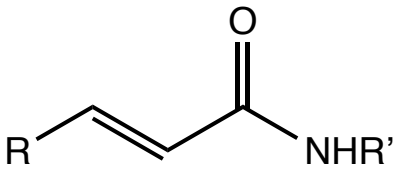
97 %



49 % 51 %


O
R
Cl


O
R
OR’


O
R
NHR’