**Today**

Other Reactions including α,β-unsaturated carbonyls and the Wittig Reaction
16.13, 16.15

**Next Class**

Chap 17 Reactions at the α-C of a Carbonyl

Section 17.1 The Acidity of α-Hs

Sections 17.2, 17.3: Keto-Enol Tautomerization

**Second Class from Today**

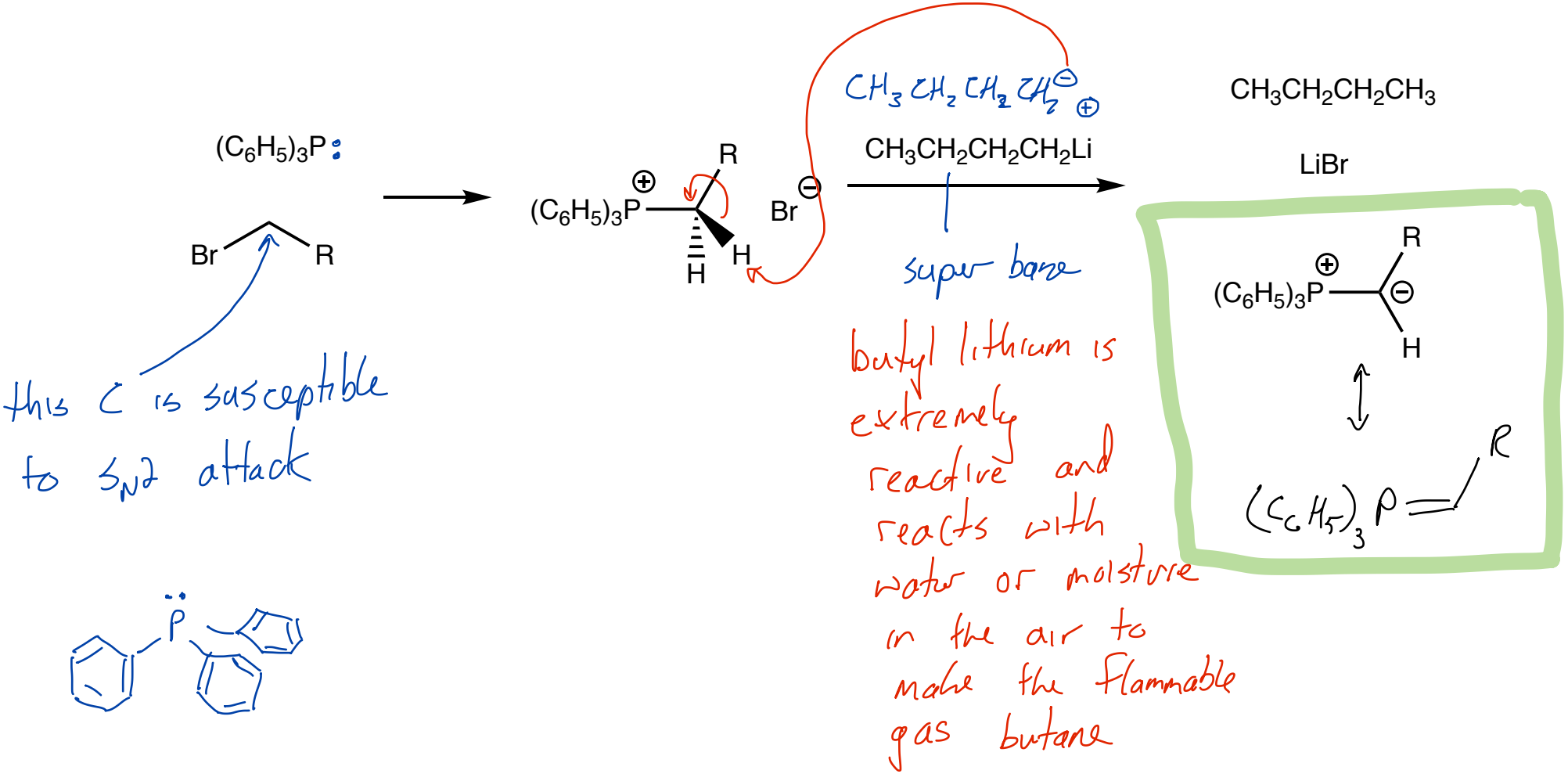
Keto-Enol Tautomerization
Sections 17.2, 17.3

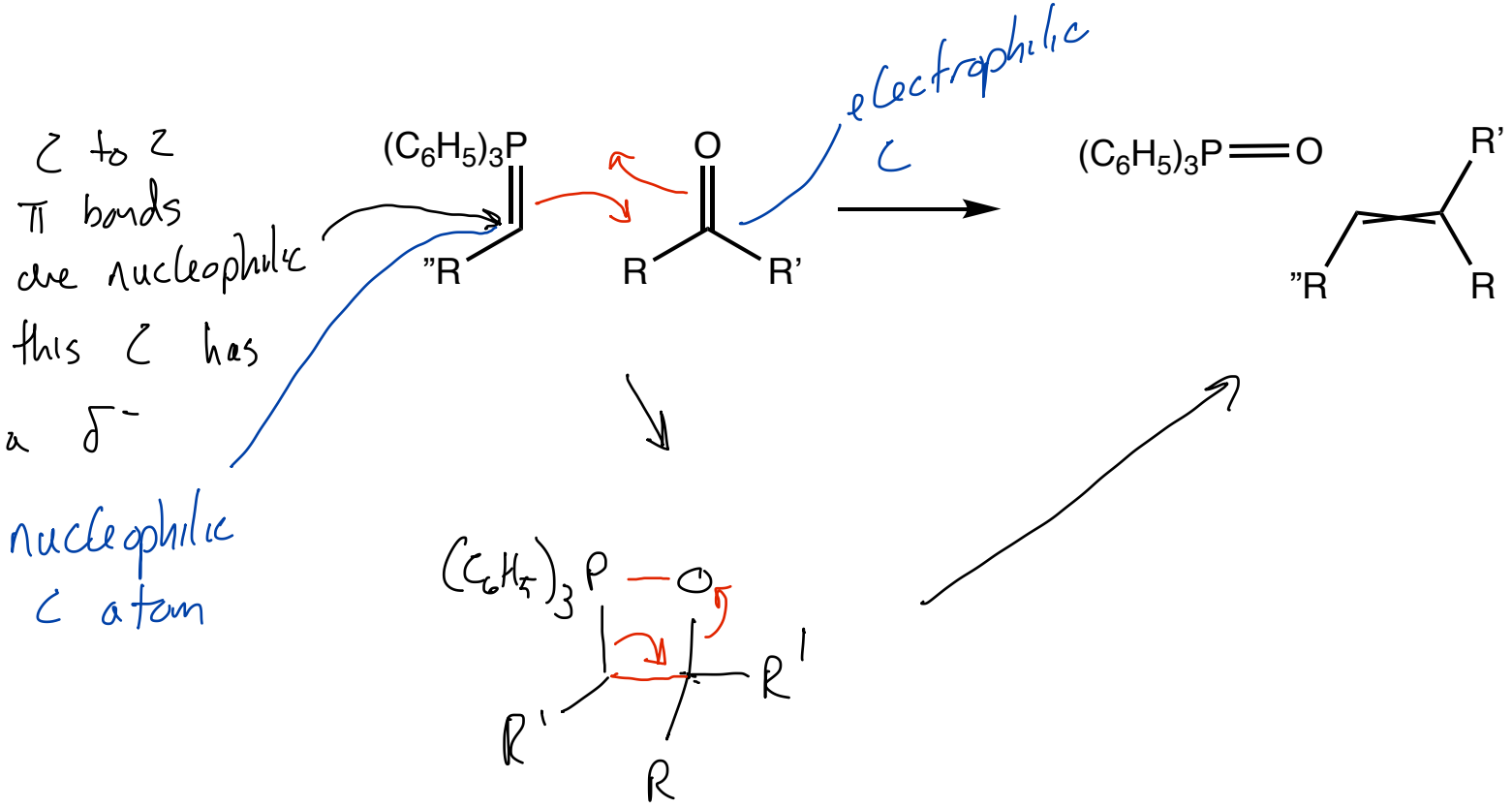
Alkylation of the α-C of a Carbonyl
Section 17.6, 17.7

**Third Class from Today**

Aromaticity
Chap 8 and 18

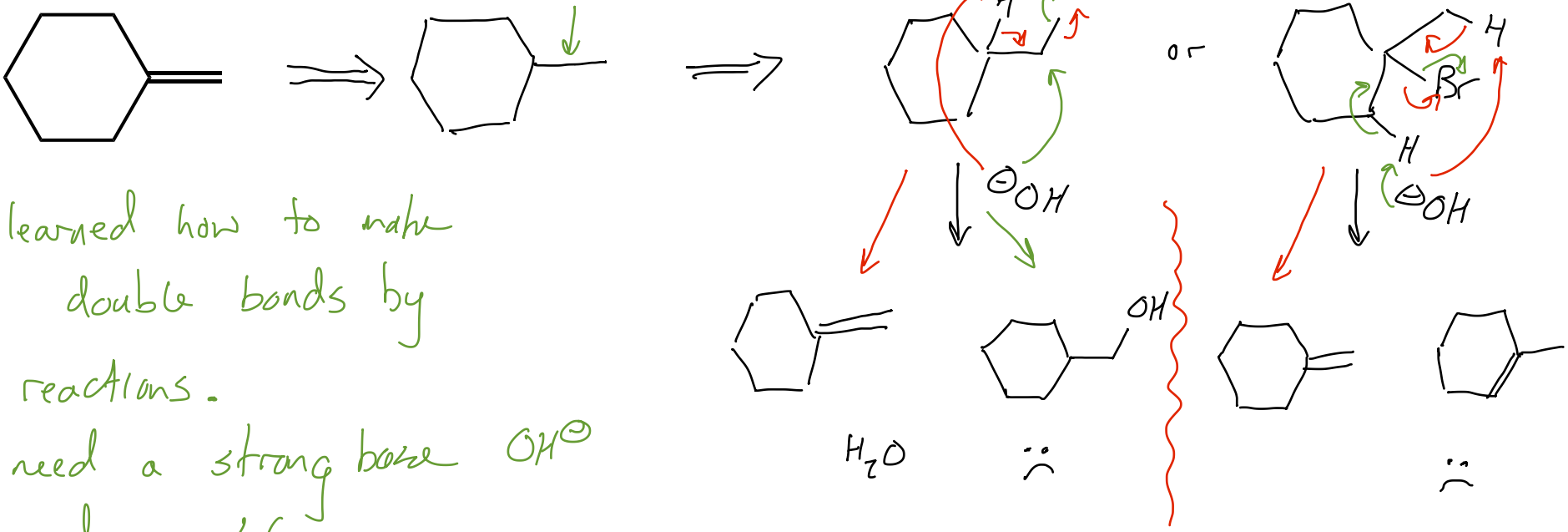
**On a separate piece of paper rework test 2 and end in on Friday, April 14**


$(C_6H_5)_3P$:
Br
R
this C is susceptible to $S_N2$ attack
$(C_6H_5)_3P$
R
H
H
Br
$CH_3CH_2CH_2CH_2^{\ominus}$
$CH_3CH_2CH_2CH_2Li$
super base
butyl lithium is extremely reactive and reacts with water or moisture in the air to make the flammable gas butane
$CH_3CH_2CH_2CH_3$
LiBr
$(C_6H_5)_3P$
R
H
$(C_6H_5)_3P$
R




a O=C reacts with the C=P to make a new C=C bond and P=O

## Retrosynthetic analysis: what can I make methylene cyclohexane from?




We learned how to make C=C double bonds by E2 reactions.

We need a strong base $OH^{\ominus}$

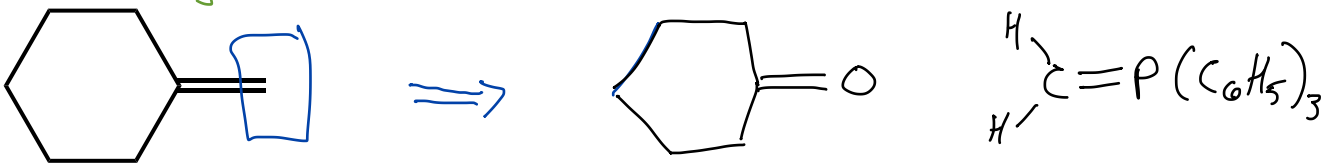
We need a LG

we would get a mixture of Sn2 and E2 products

we would get a mixture of E2 products

## Retrosynthetic analysis: what can I make methylene cyclohexane from?

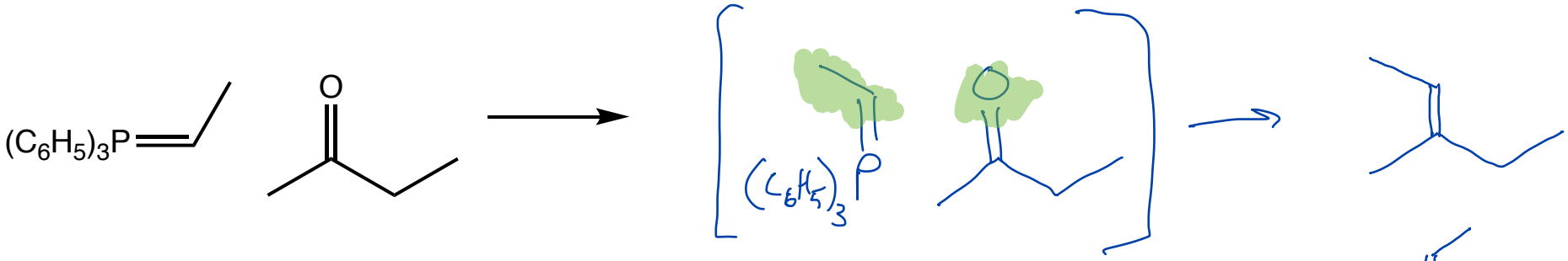
Make this from the reaction of a phosphine ylide 'cuz they're good at making C=C bonds




C=O needs to be where the C=C is going to go

the C fragment that is added is ....

$CH_2$

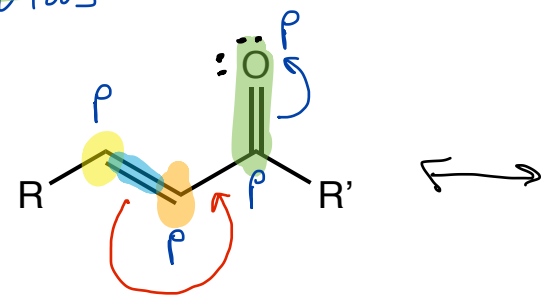


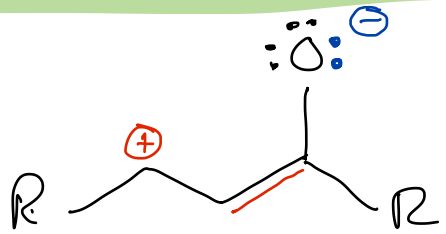

The mechanism places the P up by the O because the O leaves with the P

lined up this way helps us recognize $CH_3$ C H will switch in for O H

# α,β-unsaturated carbonyls

3 or more p orbitals in a row means we have e⁻ delocalization → we need to draw resonance contributors

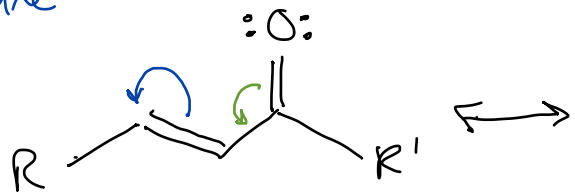


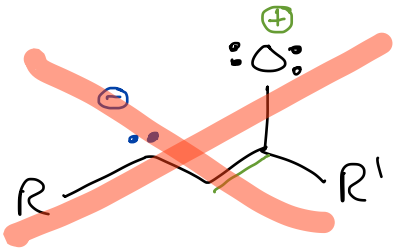



electron delocalization causes β-C to be electrophilic too.

- C atom has an incomplete octet
- created charge separation

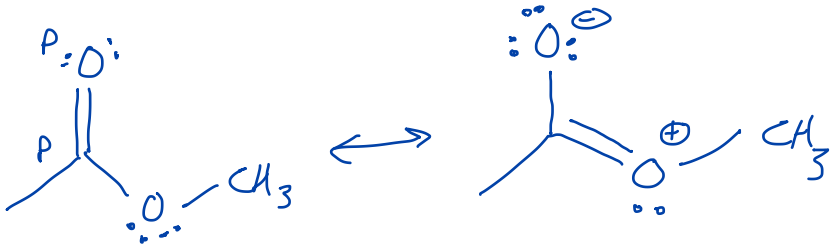
we started with a perfectly good Lewis structure

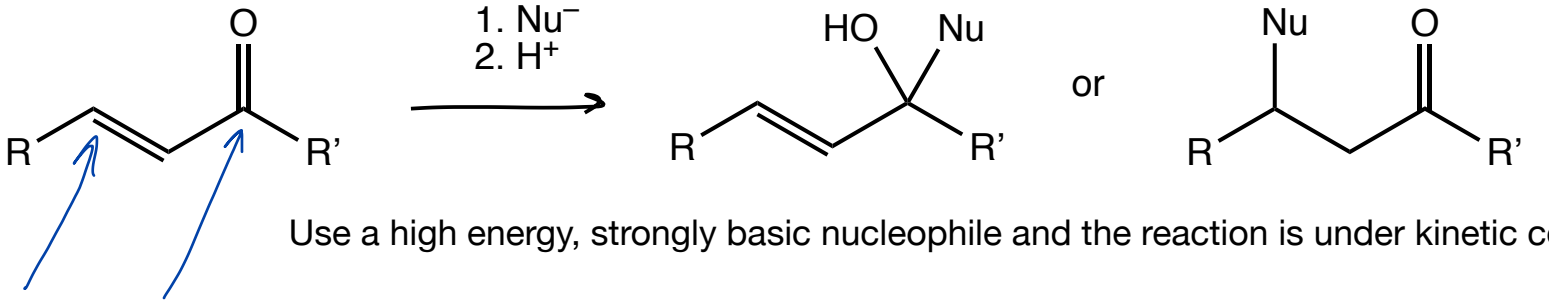


insignificant contributor because there are too many (3) issues

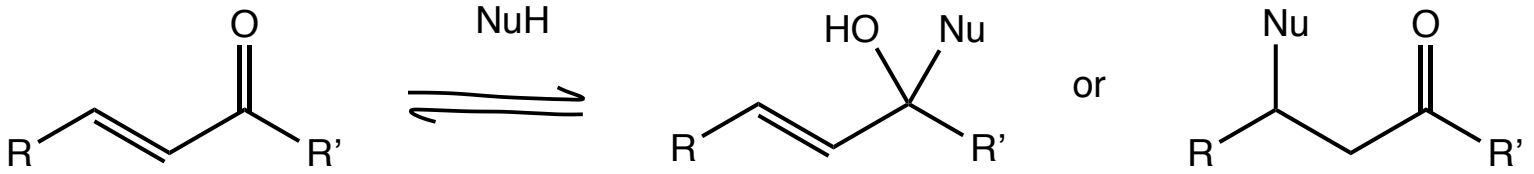
- O atom has an incomplete octet
- created charge separation
- "wrong" charges → more eneg atom is ⊕ less eneg atom is ⊖






Use a high energy, strongly basic nucleophile and the reaction is under kinetic control.

Nucleophile can attack either spot




Use a lower energy, weakly basic nucleophile and the reaction will be under thermodynamic control.