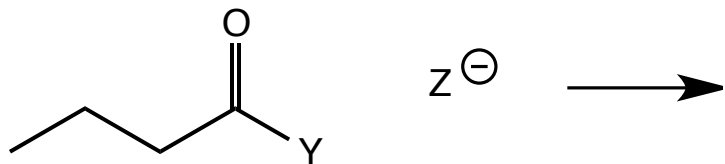
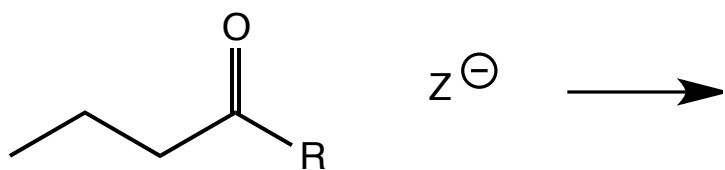


Reactions with Nucleophiles

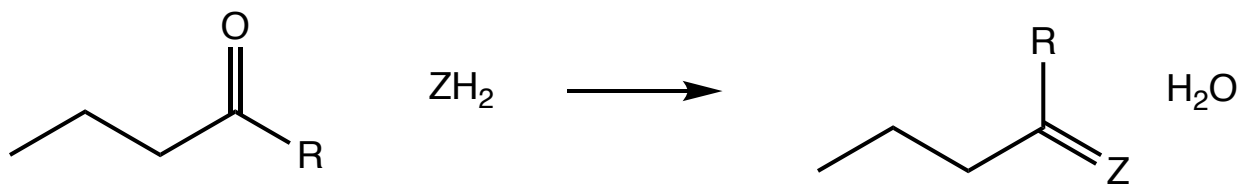
Acyl Substitution?



Nucleophilic Addition?

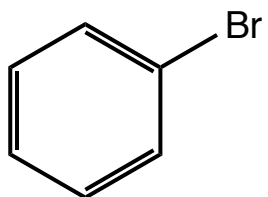


Nucleophilic Addition-Elimination

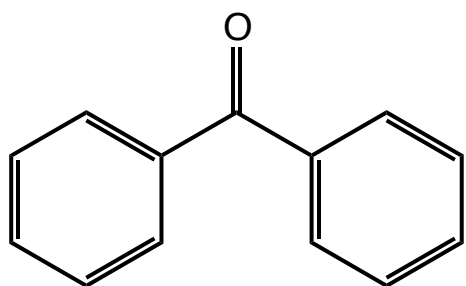
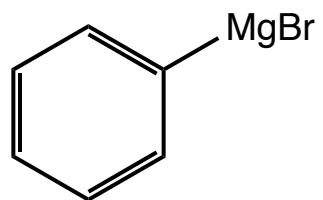


Percent Yield

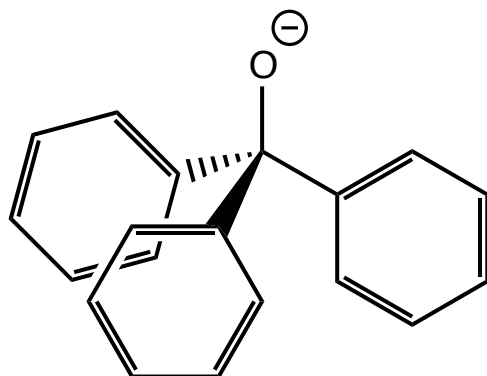
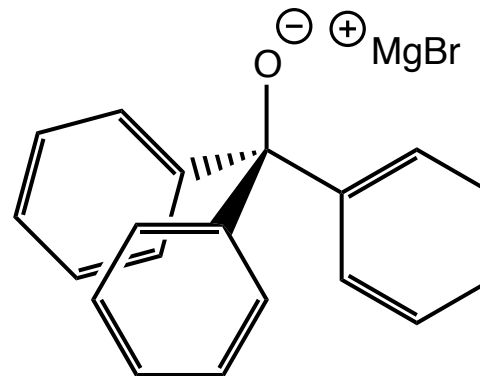
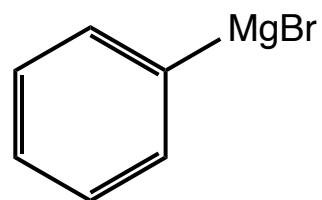
Review



+ Mg

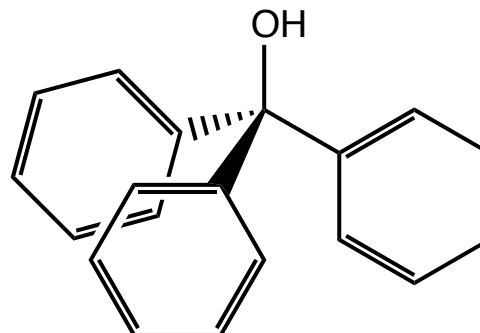


+



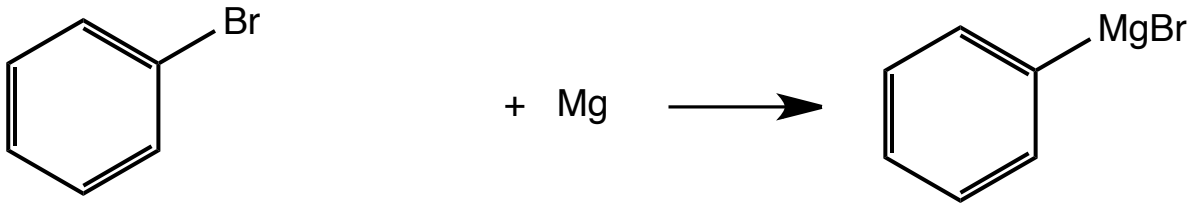
Mg⁺

xs dilute HCl(aq)

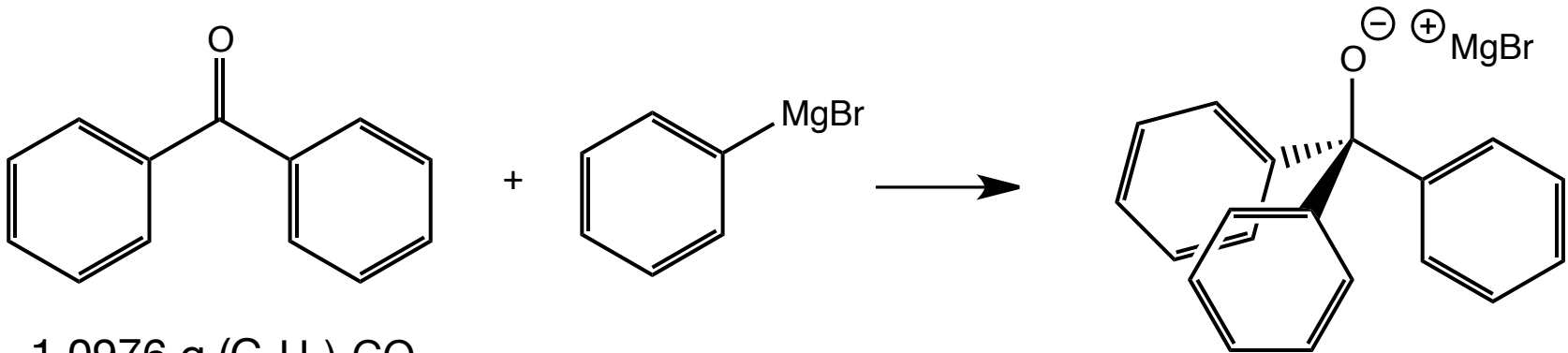


+ ClMgBr

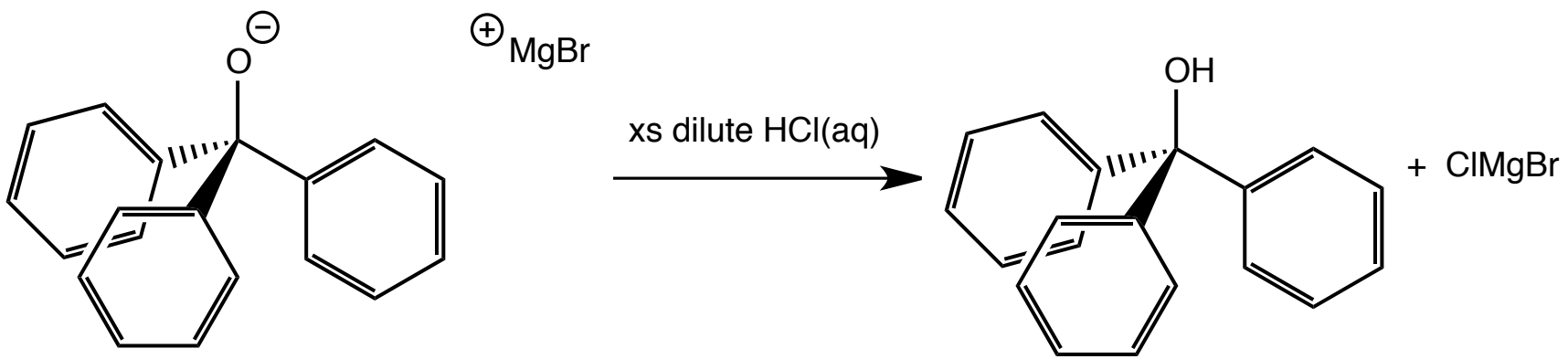
Percent Yield



0.9809 g C₆H₅Br 0.1589 g Mg



1.0976 g (C₆H₅)₂CO



1.0098 g (C₆H₅)₃COH isolated

0.9809 g $\text{C}_6\text{H}_5\text{Br}$

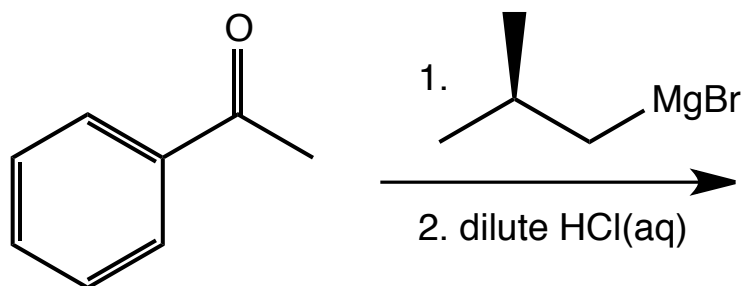
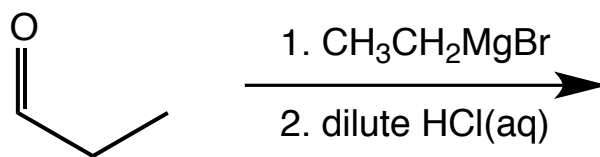
0.1589 g Mg

1.0976 g $(\text{C}_6\text{H}_5)_2\text{CO}$

1.0098 g $(\text{C}_6\text{H}_5)_3\text{COH}$ isolated

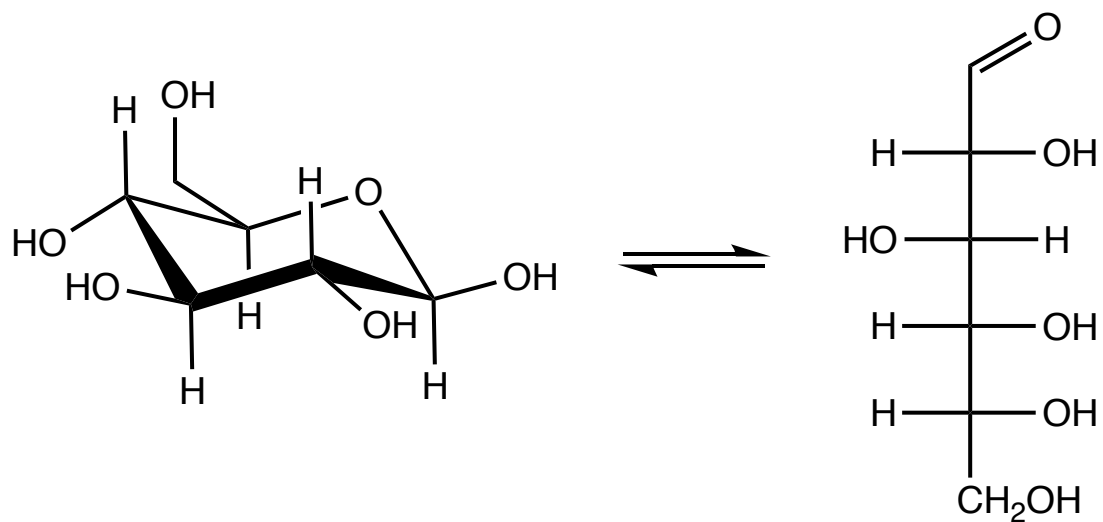
Nucleophilic Addition Reactions Practice

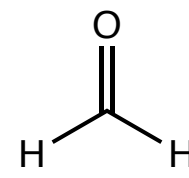
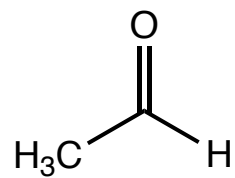
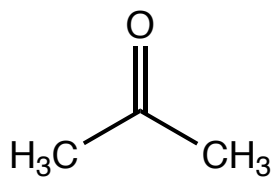
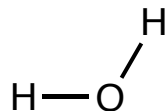
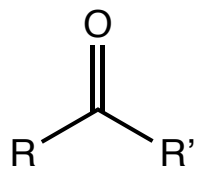
Section 19.4



Reactions of Aldehydes and Ketones with Oxygen Nucleophiles:
Why do I care again?

Sections 19.5 and 19.10





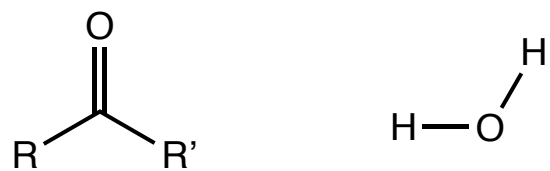
99.8 : 0.2

42 : 58

0.1 : 99.9

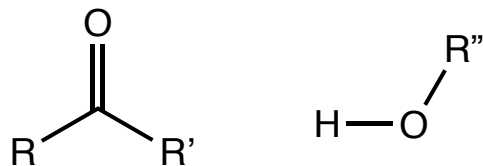
Mechanism - Hydration

Sections 19.5



Reactions of Aldehydes and Ketones* with Oxygen Nucleophiles -
Hemiacetals and Acetals

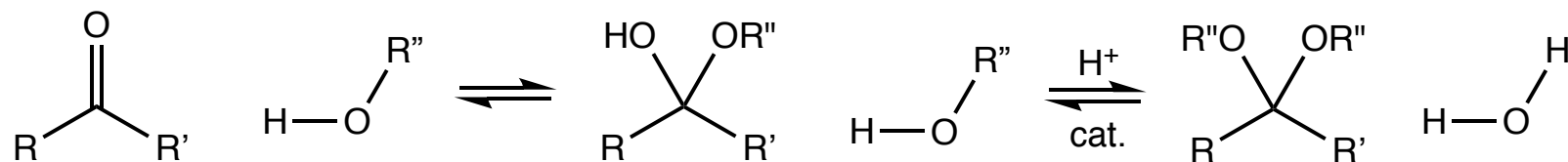
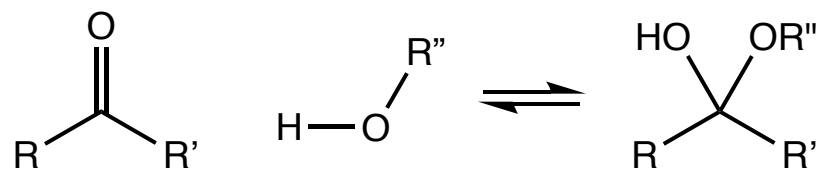
Sections 19.10



*Even though, nomenclature-wise, ketones form hemiketals and ketals chemists typically refer to the entire class of molecules as hemiacetals and acetals.

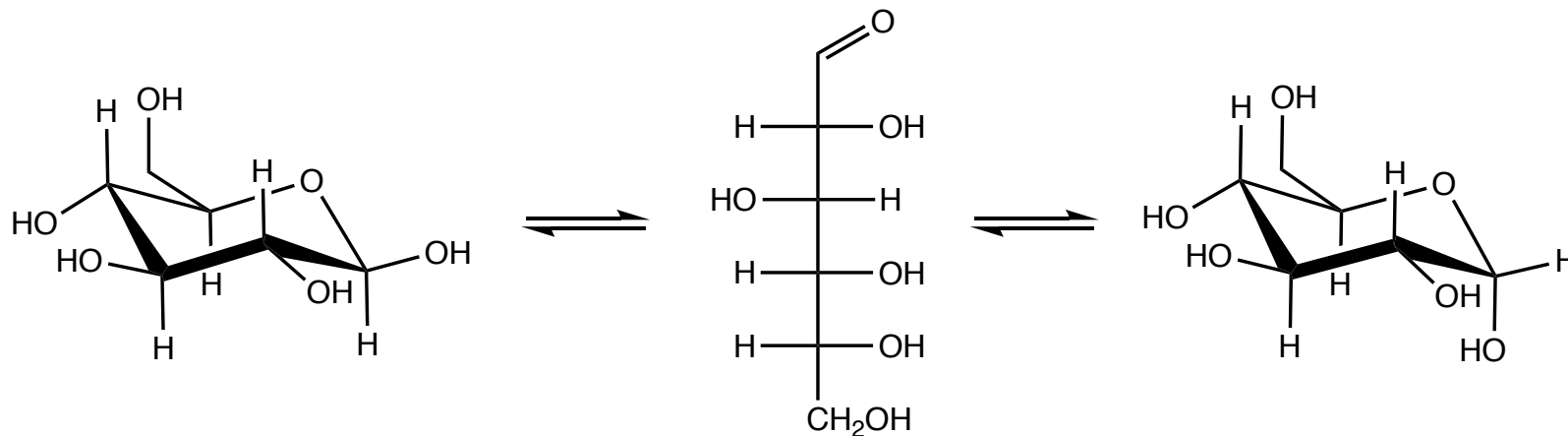
Reactions of Aldehydes and Ketones with Oxygen Nucleophiles - Acetals and Hemiacetals

Sections 19.10

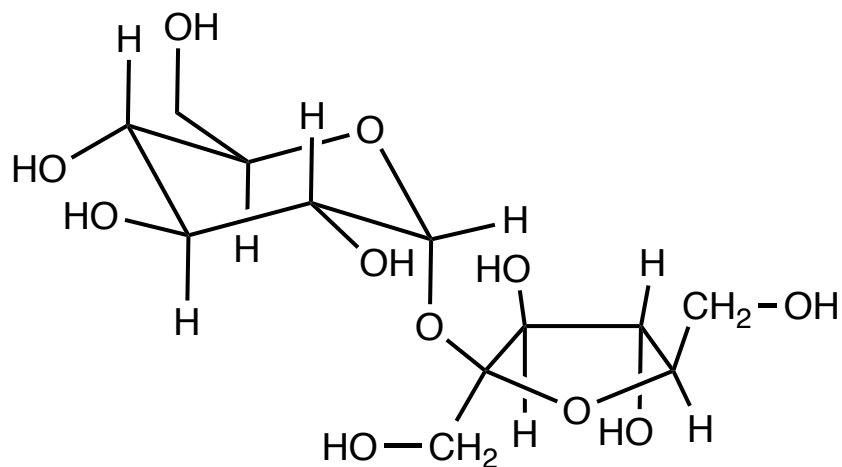


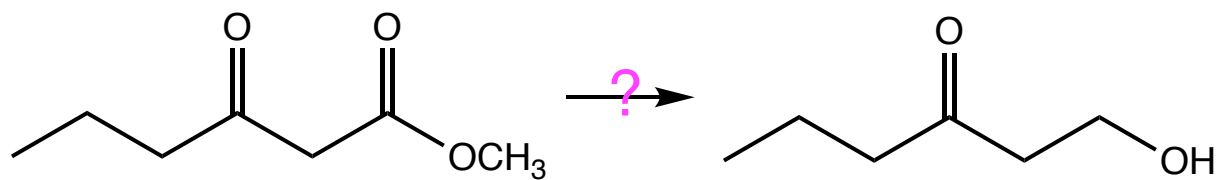
Reactions of Aldehydes and Ketones* with Oxygen Nucleophiles - Where else did we just see a hemiacetal?

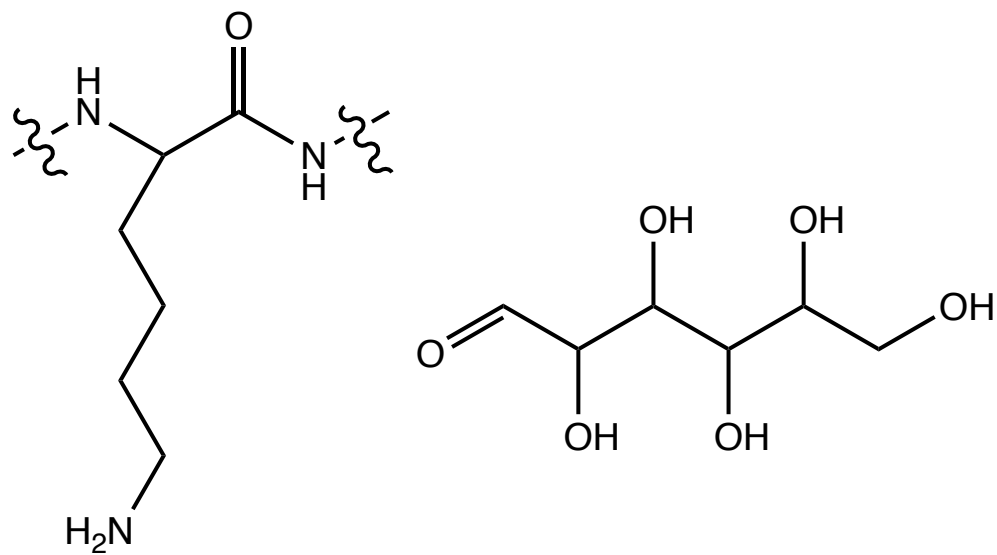
Sections 19.10

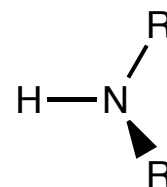
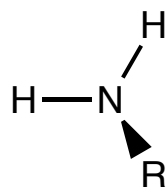
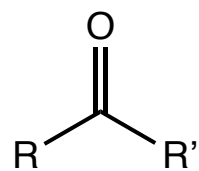


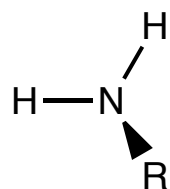
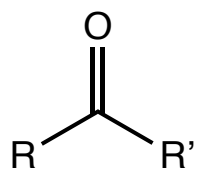
and an acetal & a ketal



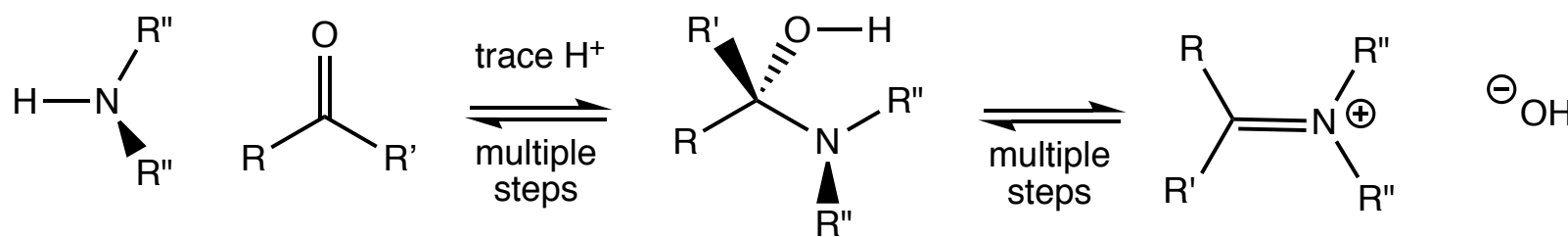
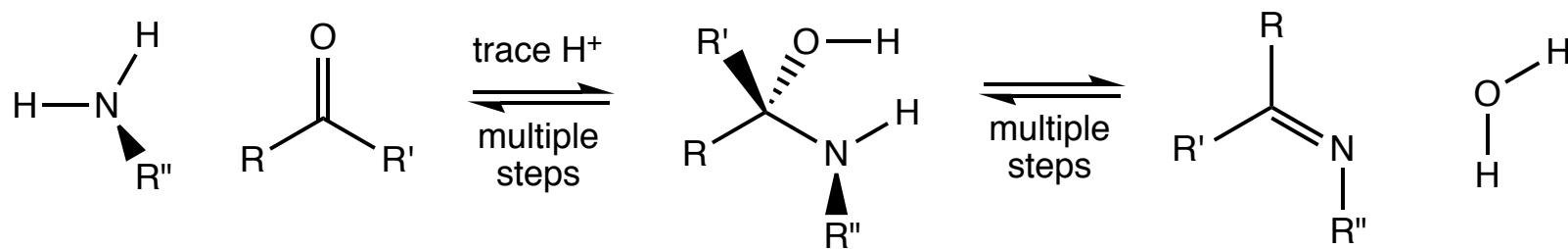






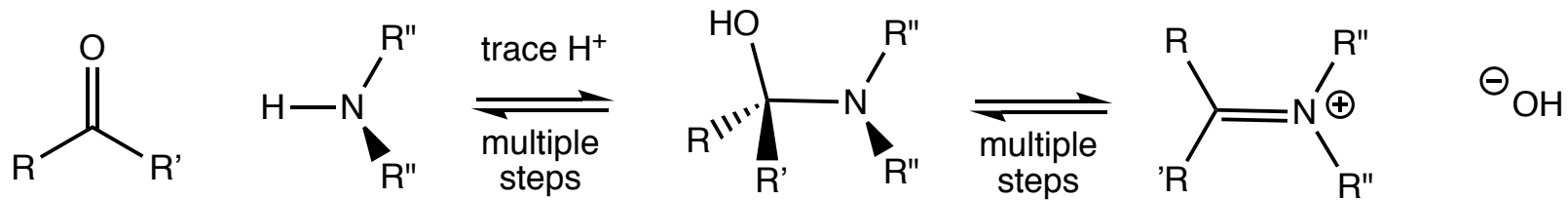


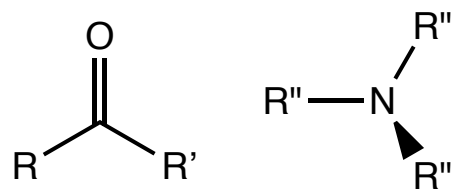
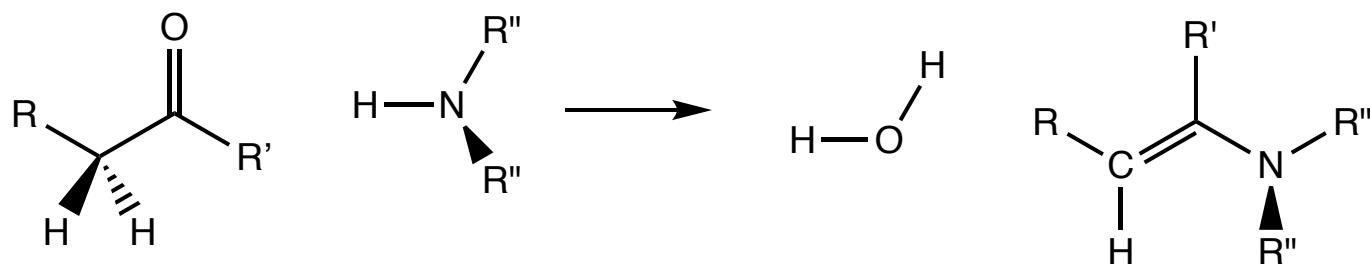
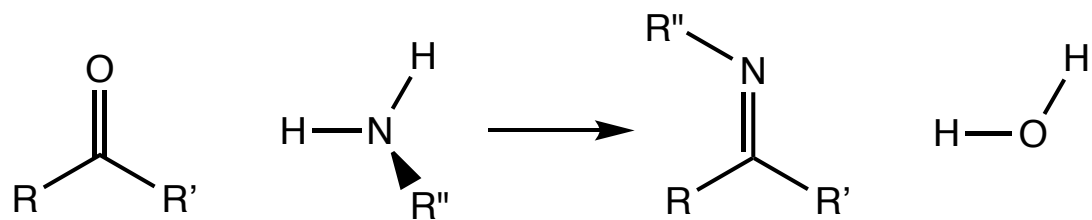
Reactions of Aldehydes and Ketones with Nitrogen Nucleophiles: 2°
Amines vs 1° Amines



Reactions of Aldehydes and Ketones with Nitrogen Nucleophiles: 2°
Amines vs 1° Amines

Section 19.8

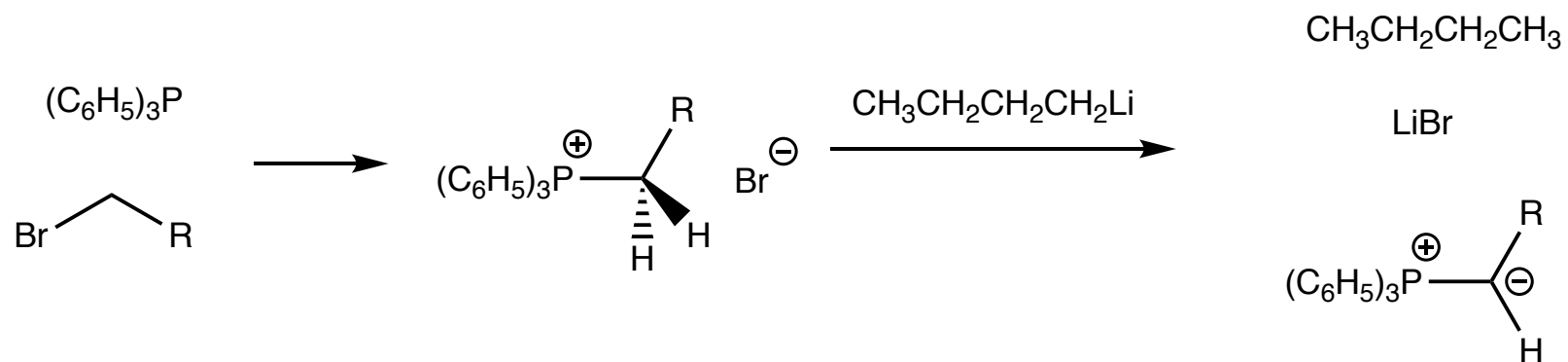




$\text{R}'' \neq \text{H}$

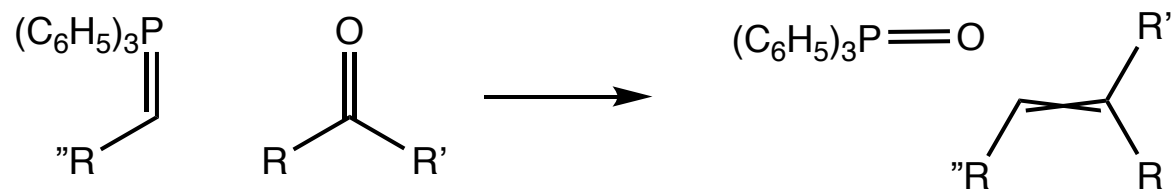
Reactions of Phosphine Ylides with Aldehydes and Ketones and the Wittig Reaction

Section 19.11



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

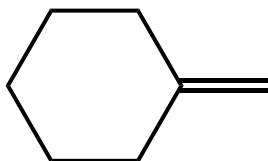
Section 19.11



Wittig Reaction: an excellent way to make terminal alkenes

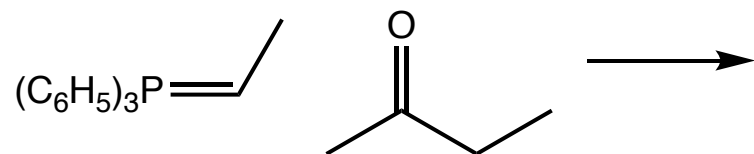
Section 19.11

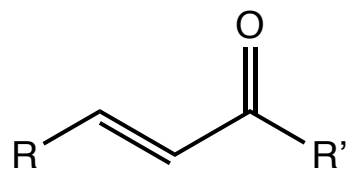
Retrosynthetic analysis: what can I make methylene cyclohexane from?

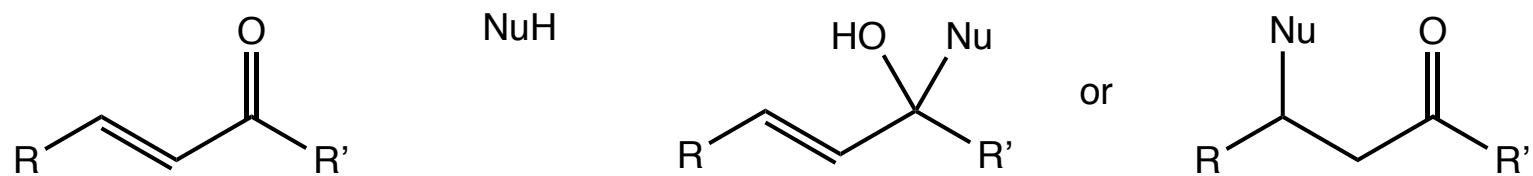
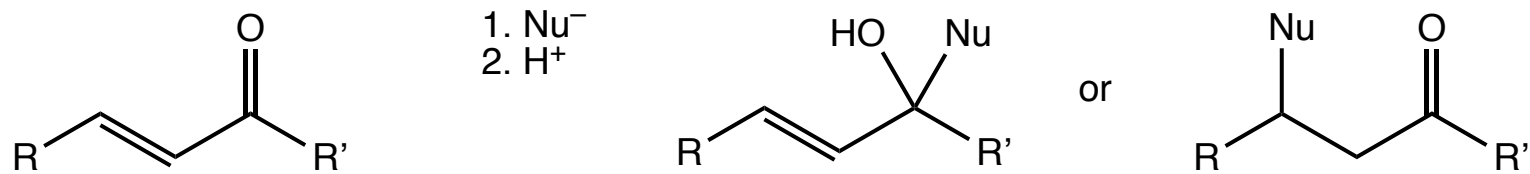


Wittig Reaction: predict product

Section 19.11







Still it is difficult to predict the outcome for reactions under kinetic control.

