



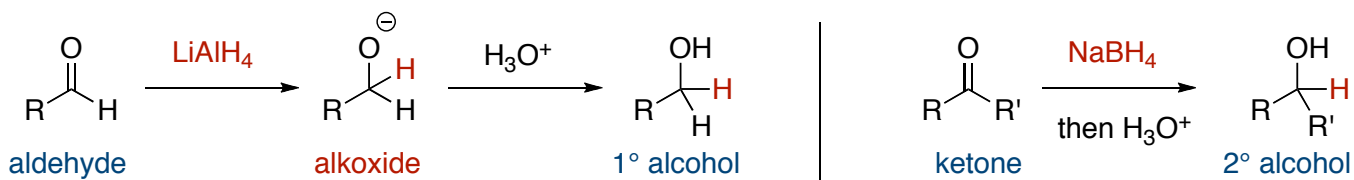
# Chem 342 • Organic Chemistry II

Lecture Summary 15 - 23 Feb 2009

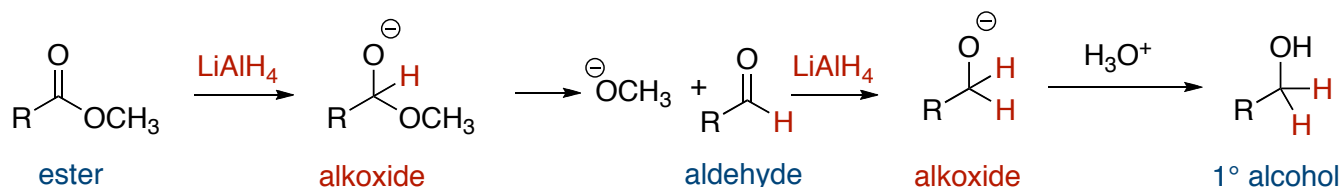
## Chapter 17 - Alcohols and Phenols

### Preparation of Alcohols

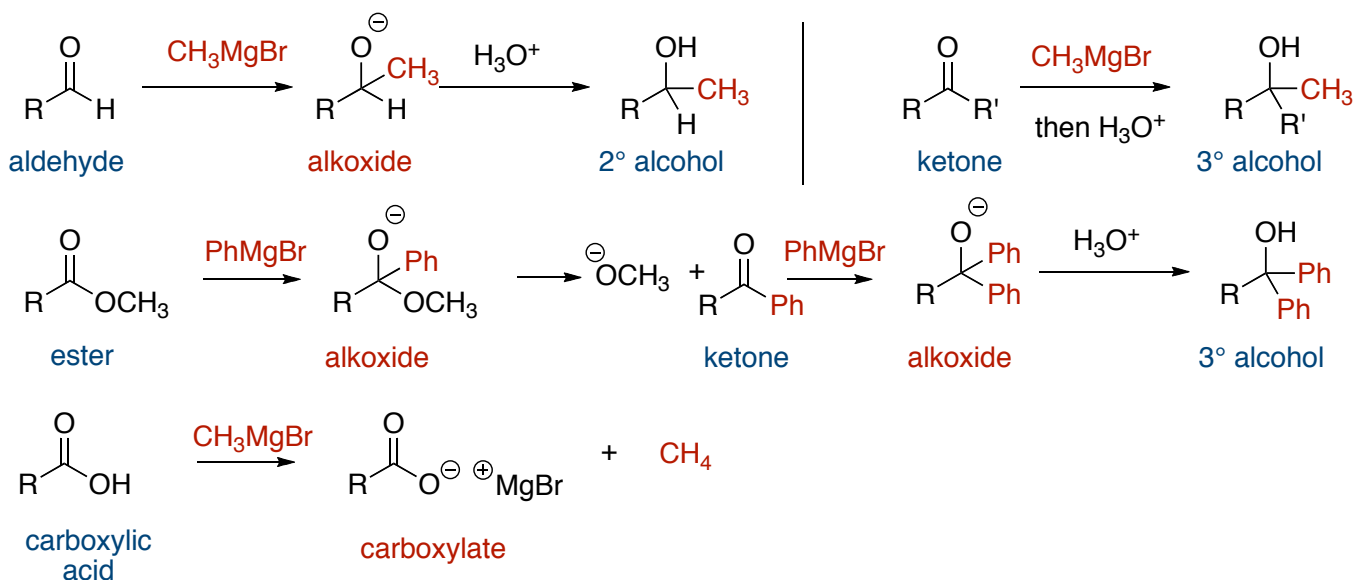
Alcohols can also be prepared by the reduction of carbonyl compounds. Aldehydes afford primary alcohol and ketones, secondary alcohols. Carboxylic acid derivatives also give primary alcohols on reduction. *Lithium Aluminum Hydride* and *Sodium Borohydride* are the reducing agents of choice with the former being more reactive.



$\text{NaBH}_4$  is not reactive enough to reduce esters or carboxylic acids.  $\text{LiAlH}_4$  is necessary

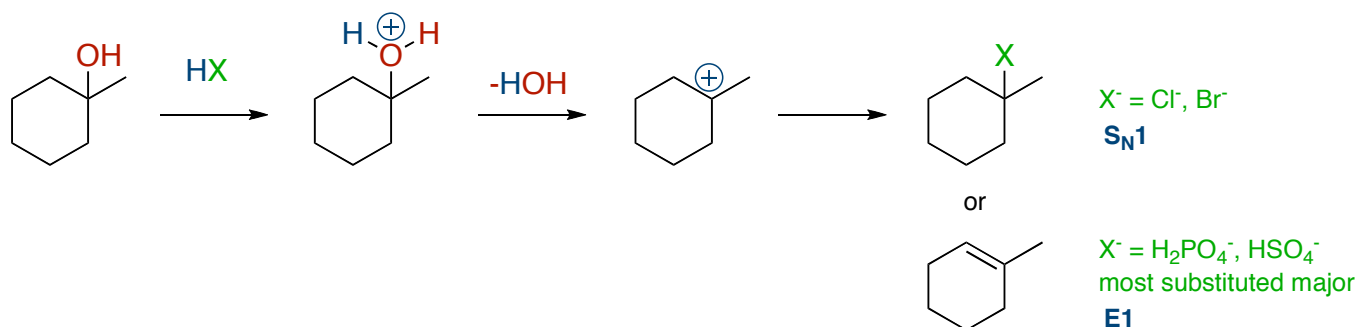


Grignard Reagents (carbon nucleophiles) also add to carbonyl compounds. When added to aldehydes, 2° alcohols are formed. Addition to ketones or esters gives 3° alcohols. Grignard reagents are sensitive to any weakly acidic proton. Thus, carboxylic acids, alcohols, amines, etc will simply protonate the carbon nucleophile and destroy the organometallic reagent. These functional groups are incompatible with Grignard Reagents.



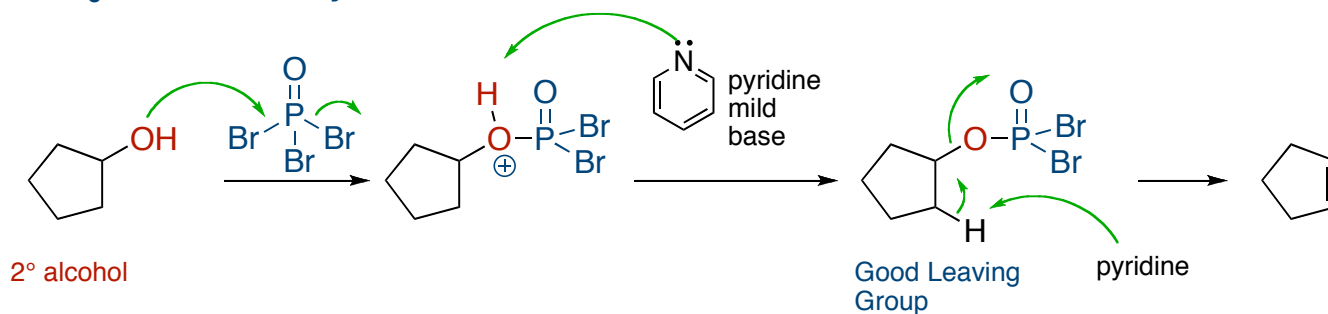
## Reactions of Alcohols

Tertiary alcohols can undergo E1-elimination or S<sub>N</sub>1 substitution in acidic conditions. Protonation of the alcohol makes the OH into a good leaving group. Depending on the counterion, the intermediate carbocation can undergo addition (chloride or bromide) or elimination (phosphate or sulfate).

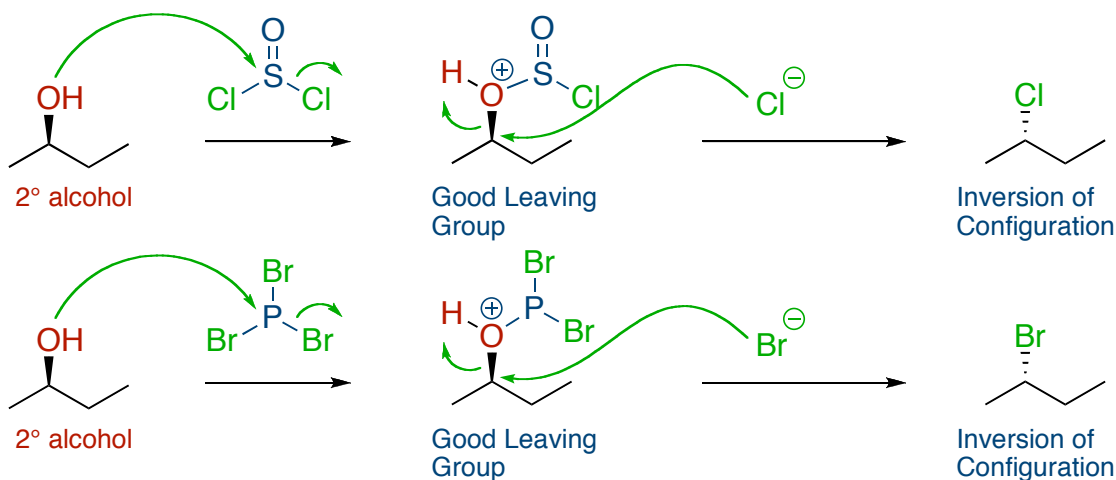


Secondary, and particularly, primary alcohols require E2 or S<sub>N</sub>2 reactions and there are several reagents that have been developed to convert alcohols into alkenes or alkyl halides.

### POBr<sub>3</sub> Promoted Dehydration - E2 elimination

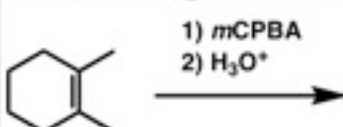


### Electrophile Promoted Substitution - S<sub>N</sub>2 - 1° and 2° Alcohols

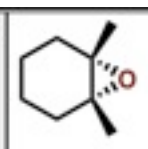
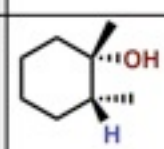
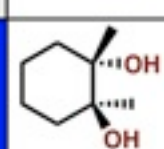


## Daily Quiz

Q: What is the product of the following reaction sequence?



1) *m*CPBA  
2) H<sub>3</sub>O<sup>+</sup>

<input type="checkbox"/> 1:	
<input type="checkbox"/> 2:	
<input checked="" type="checkbox"/> 3:	
<input type="checkbox"/> 4:	