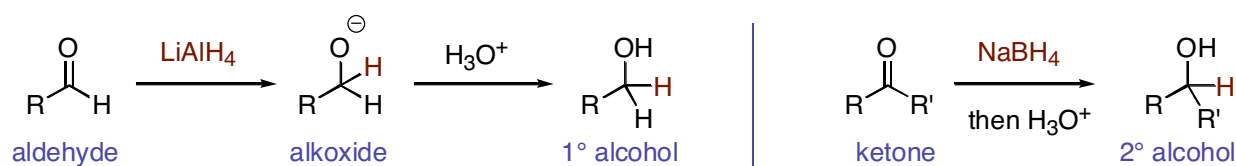


These notes can be obtained at: <http://www.ndsu.nodak.edu/instruct/grcook/chem342/notes.shtml>

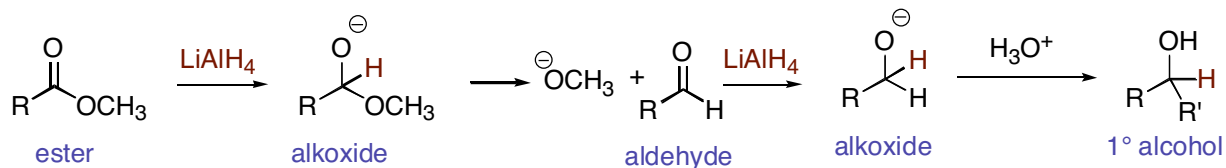
Chapter 17: Alcohols and Phenols

Preparation of Alcohols

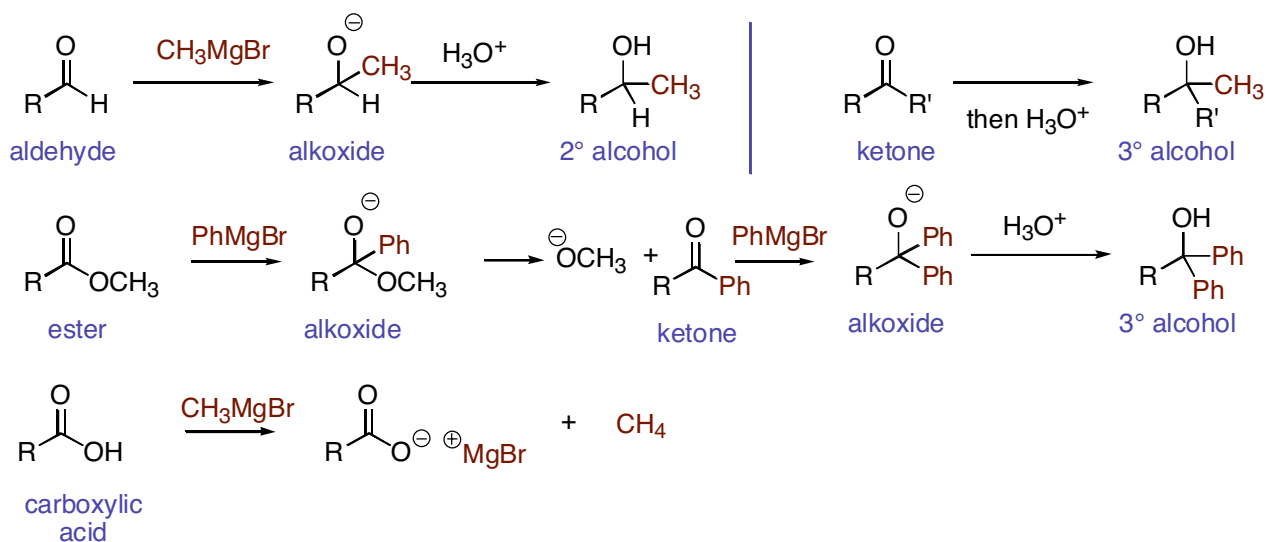
Alcohols can be prepared by the reduction of carbonyl compounds. Aldehydes afford primary alcohol and ketones, secondary alcohols. Carboxylic acid derivatives also give primary alcohols on reduction. Lithium Aluminum Hydride and Sodium Borohydride are the reducing agents of choice with the former being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



NaBH_4 is not reactive enough to reduce esters. LiAlH_4 is necessary



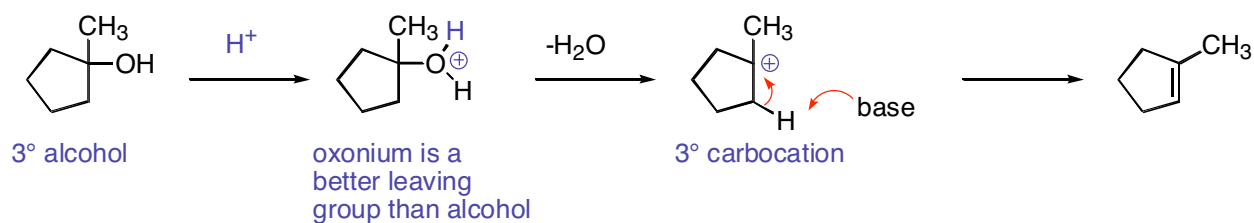
Grignard Reagents (carbon nucleophiles) also add to carbonyl compounds. When added to aldehydes, 2° alcohols are formed. Addition to ketones or esters gives 3° alcohols. Grignard reagents are sensitive to any weakly acidic proton. Thus, carboxylic acids, alcohols, amines, etc will simply protonate the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



Reactions of Alcohols

Alcohols can undergo elimination reactions under the right conditions. Tertiary alcohols will do E1 elimination with acid catalysts. For secondary and primary alcohols, the alcohol can be activated with POBr_3 and a mild base will carry out an E2 elimination.

Acid Catalyzed Dehydration - E1 elimination



POBr_3 Promoted Dehydration - E2 elimination

