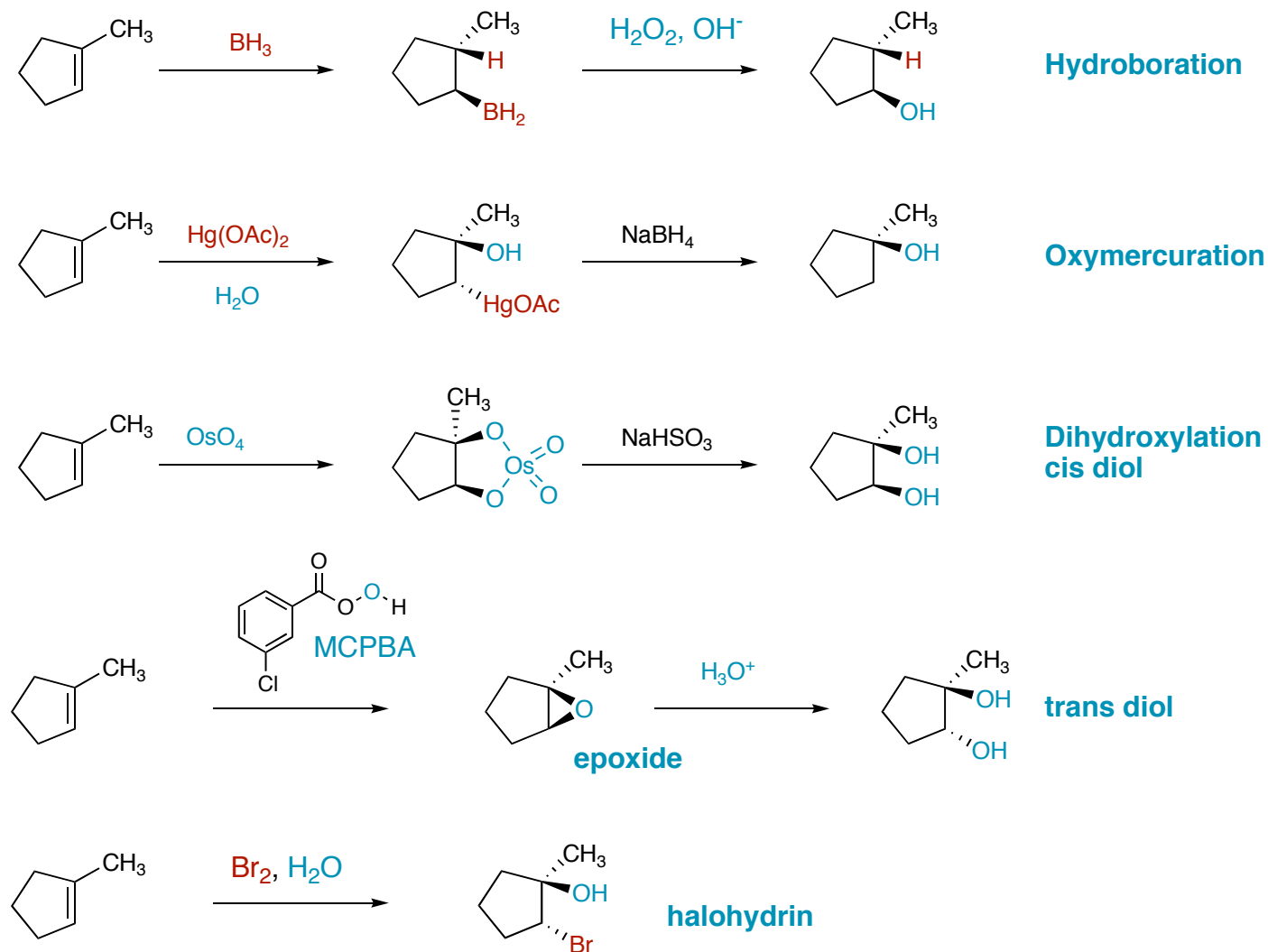


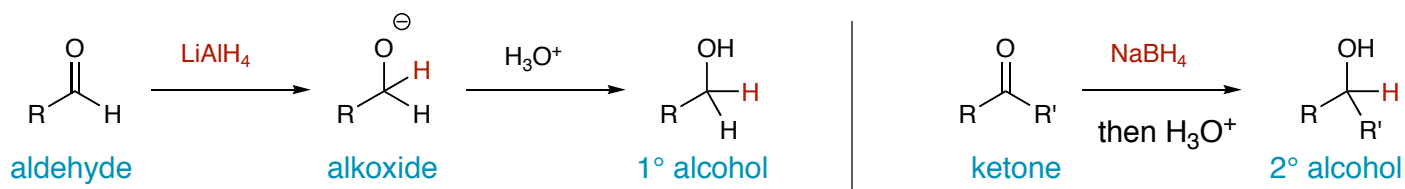
Chapter 17 - Alcohols and Phenols

Preparation of Alcohols

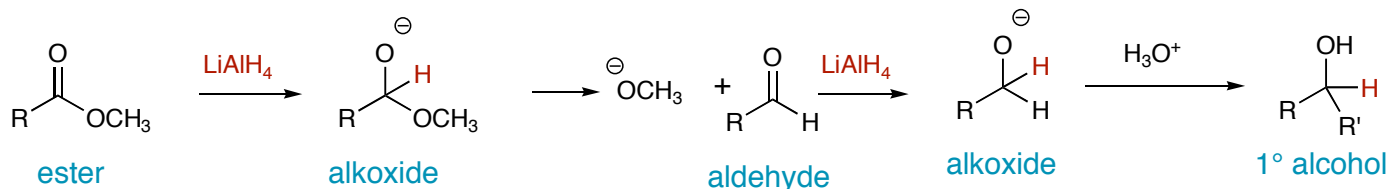
Recall some of the addition chemistry from last semester. *Trans*-diols can be prepared by the acid catalyzed opening of epoxides with water. Epoxides can be prepared directly from alkenes with a peracid. Halohydrins can also be prepared by addition chemistry.



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.



NaBH_4 is not reactive enough to reduce esters or carboxylic acids. 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.

