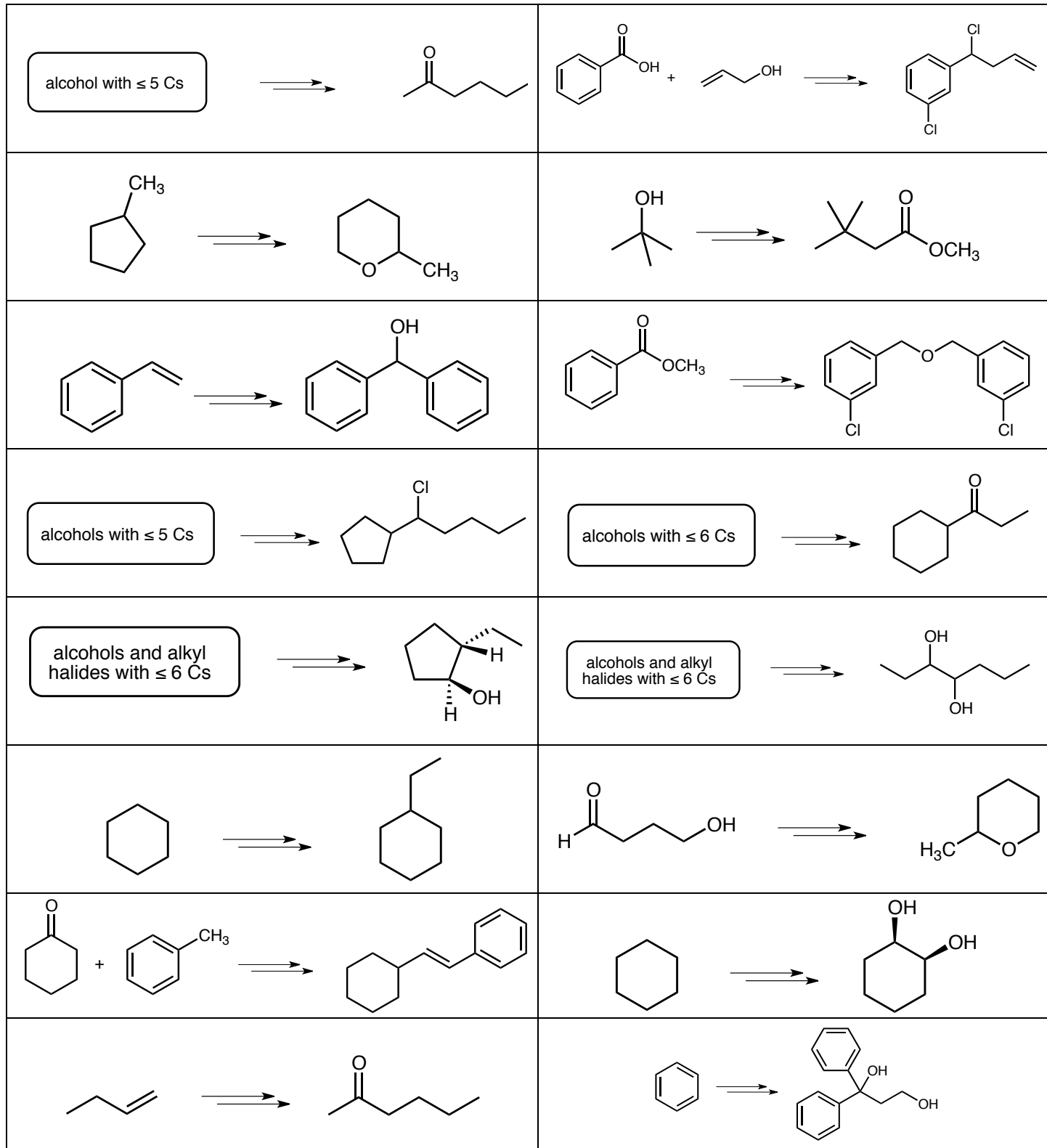


CHAPTER 17: ALCOHOLS AND PHENOLS

The key step in many of the syntheses below is the addition of an organometallic reagent, such as a Grignard or acetylide, to a ketone or aldehyde. Redox reactions of carbonyls and alcohols are also featured. Alcohols may need to be protected (trimethylsilyl ether or benzyl ether) in some sequences.



CHAPTER 18: ETHERS AND EPOXIDES; THIOLS AND SULFIDES

Ethers can be formed by condensation reactions and through Williamson ether synthesis. Many of the syntheses below feature opening epoxides with nucleophiles (e.g., alkoxides and Grignard reagents) and by nucleophilic addition under acidic conditions. Stereospecific epoxidation of *cis*- and *trans*-alkenes can be used to influence the stereochemistry of the final product in some sequences.

$\text{H}_3\text{C}-\text{C}\equiv\text{CH} \Rightarrow \begin{matrix} \text{HO} & \text{H} \\ & \\ \text{R} & \text{S} \\ & \\ \text{H}_3\text{C} & \text{OH} \end{matrix} \text{CH}_3$	
	$\text{H}_3\text{C}-\text{C}\equiv\text{CH} \Rightarrow \begin{matrix} \text{HO} & \text{CH}_3 \\ & \\ \text{R} & \text{R} \\ & \\ \text{H}_3\text{C} & \text{OH} \end{matrix} \text{H}$

CHAPTER 19: ALDEHYDES AND KETONES: NUCLEOPHILIC ADDITION REACTIONS

Each of the syntheses below features nucleophilic addition to a ketone or aldehyde. Nucleophiles can include cyanide, acetylides, Grignards and phosphorus ylides (Wittig reaction). Additionally, condensation with amines and alcohols is required in several sequences to provide imines, enamines, acetals and hemiacetals. Acetals are frequently used as protecting groups.

