

CHE 173

Winter, 2005

Specific Objectives for Quiz 9

1. Be able to name ethers or draw the structure of an ether given its IUPAC name.
2. Understand the structure, bonding, and physical properties of ethers and epoxides.
3. Know what a crown ether is and how to name them; be able to draw a crown ether given its name.
4. Understand the major function of crown ethers in organic chemistry.
5. Know how to prepare ethers by all of the following methods (including mechanisms):
 - (a) acid-catalyzed condensation of alcohols
 - (b) acid-catalyzed addition of alcohols to alkenes
 - (c) the Williamson ether synthesis
6. Know the following reactions that ethers undergo (including mechanisms):
 - (a) acid-catalyzed cleavage
7. Know how to prepare epoxides by the following methods (including mechanism and stereochemical considerations):
 - (a) from alkenes and peroxyacids
 - (b) base-catalyzed ring closure of vicinal halohydrins
8. Know the following reactions that ethers undergo (including mechanisms and regio- and stereochemical considerations):
 - (a) reaction with anionic nucleophiles under basic or neutral conditions (S_N2 -like)
 - (b) reaction with nucleophiles under acidic conditions (S_N1 -like)
9. Understand how to prepare sulfides (from thiols and alkyl halides) and the reactions they undergo (oxidation to sulfoxides and sulfones; alkylation to give sulfonium salts).
10. Be able to interpret spectra (IR, NMR) of ethers, epoxides and sulfides.
11. Be able apply all of the above chemistry (along with chemistry that you have learned previously) to synthesis problems.