



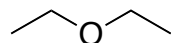
Chem 342 • Organic Chemistry II

Lecture Summary 17 - 27 Feb 2009

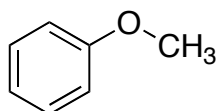
Chapter 18 - Ethers and Epoxides; Thiols and Sulfides

Ethers

Ethers are similar to alcohols but have only carbons bonded to the oxygen. Thus, they are not acidic and are relatively inert. Ethers are commonly used as organic solvents.



diethyl ether



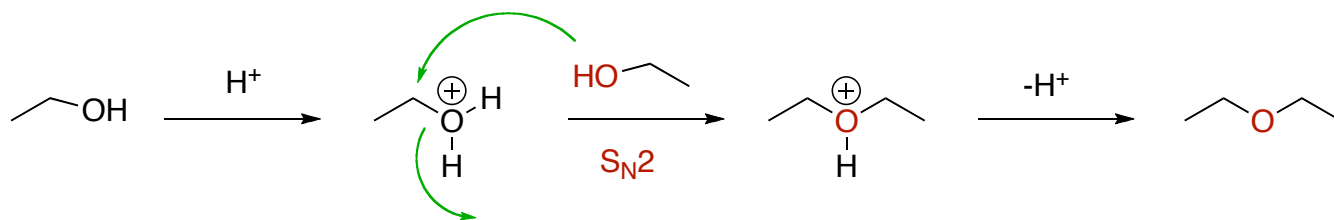
methyl phenyl ether
(methoxybenzene)



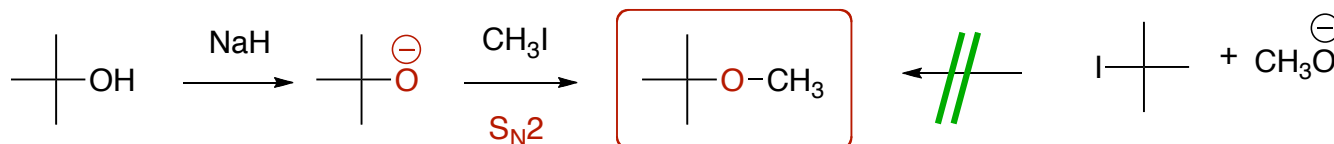
tetrahydrofuran

Preparation of Ethers

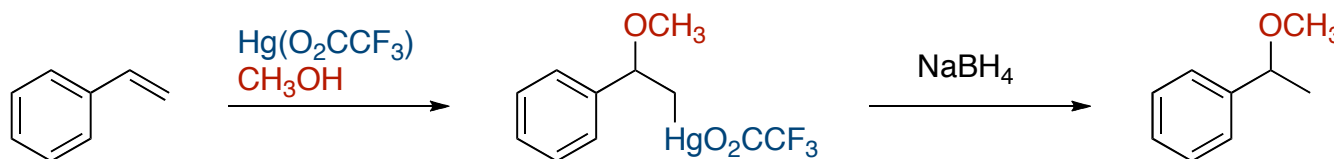
Industrially, small, symmetrical ethers can be prepared from primary alcohols by an acid catalyzed process.



To make unsymmetrical ethers or ethers from secondary or tertiary alcohols, the Williamson Ether Synthesis must be used. Note that the choice of alcohol and alkyl halide is important. Since this involves a S_N2 reaction, the alkyl halide must be unhindered.

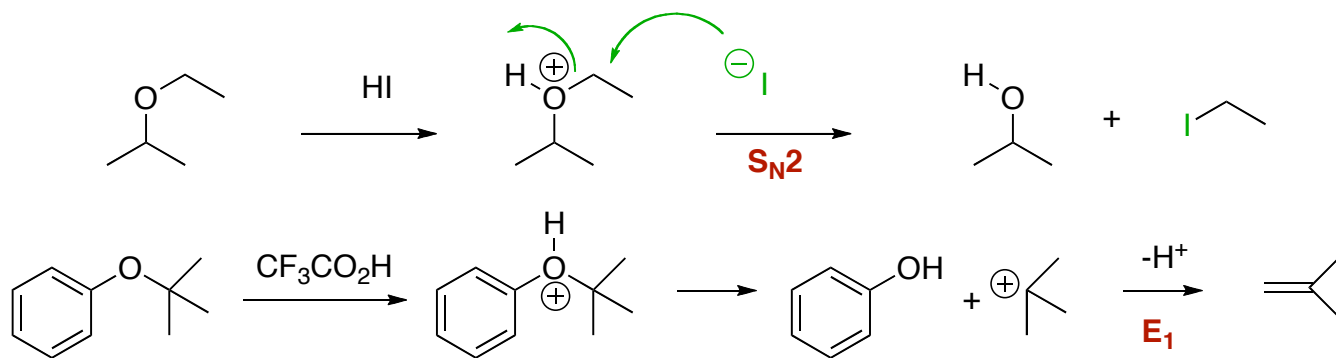


Ethers can also be made by oxymercuration reactions.

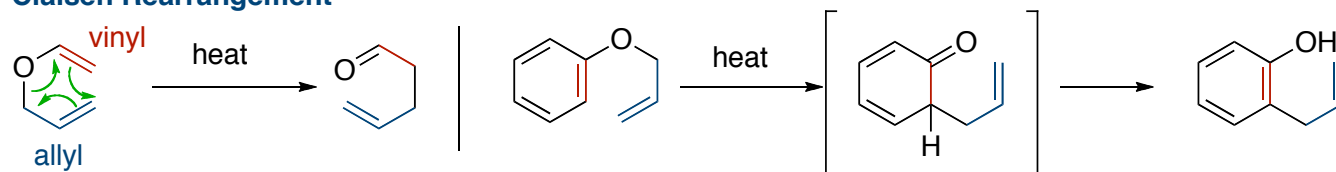


Reactions of Ethers

Ethers are very stable and often used as solvents to carry out organic reactions. However, under strong acid conditions with a nucleophilic conjugate base, they can be cleaved by an S_N2 reaction. Tertiary ethers undergo cleavage by an E_1 mechanism. Allyl Vinyl Ethers undergo a Claisen Rearrangement when heated.



Claisen Rearrangement



Preparation of Epoxides

Epoxides can be made in one step by reaction with meta-chloroperbenzoic acid (MCPBA). This is a stereospecific reaction and both C-O bonds are formed at the same time. They can also be prepared in two steps by formation of a halohydrin followed by treatment with NaH (a Williamson Ether Synthesis).

