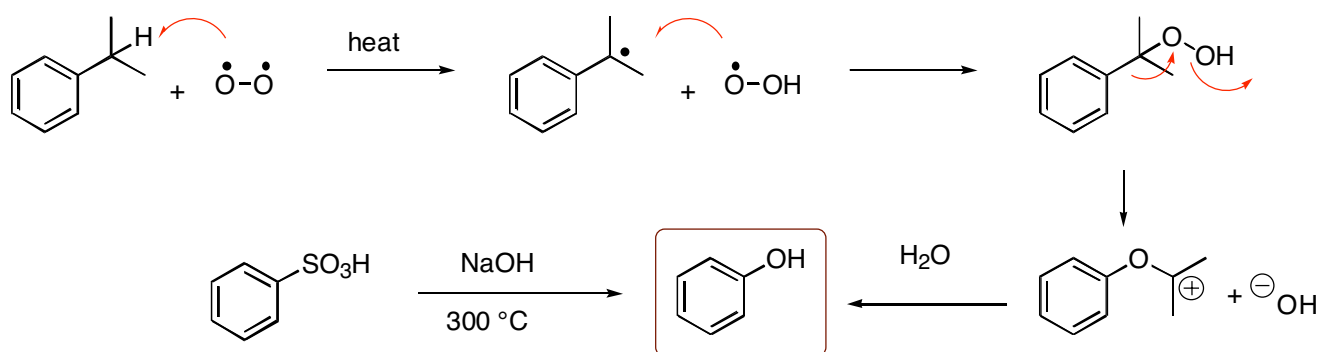


These notes can be obtained at: <http://www.ndsu.nodak.edu/instruct/grcook/chem342/notes.shtml>

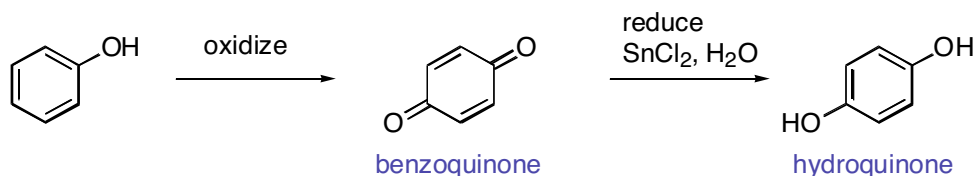
Chapter 17: Alcohols and Phenols

Preparation of Phenols

Phenols can be prepared from isopropyl benzenes with oxygen, or from sulfonic acids with hydroxide.



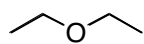
Phenols can be oxidized to benzoquinones. These can be reduced to 1,4-dihydroxybenzene (a hydroquinone).



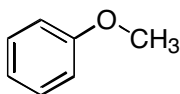
Chapter 18: Ethers and Epoxides; Thiols and Sulfides

Ethers

Ethers are similar in structure to alcohols but having only carbons bonded to oxygen.



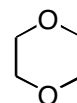
diethyl ether



methyl phenyl ether
(methoxybenzene)



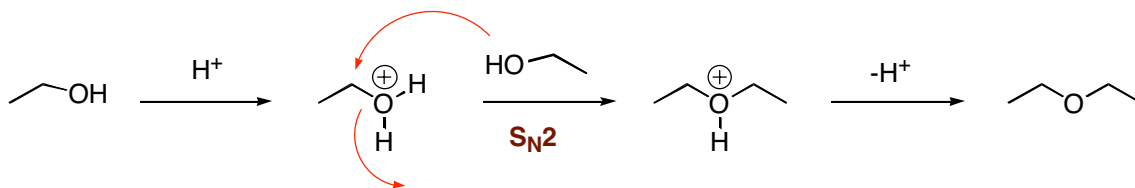
tetrahydrofuran



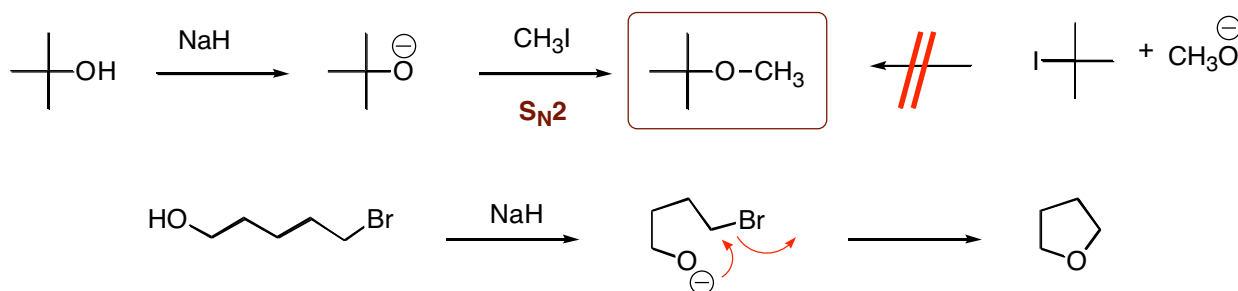
1,4-dioxane

Preparation of Ethers

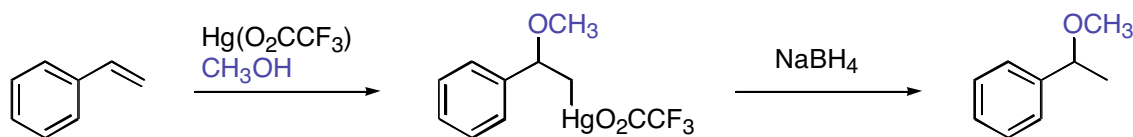
Industrially, symmetrical ethers can be prepared from primary alcohols by an acid catalyzed process.



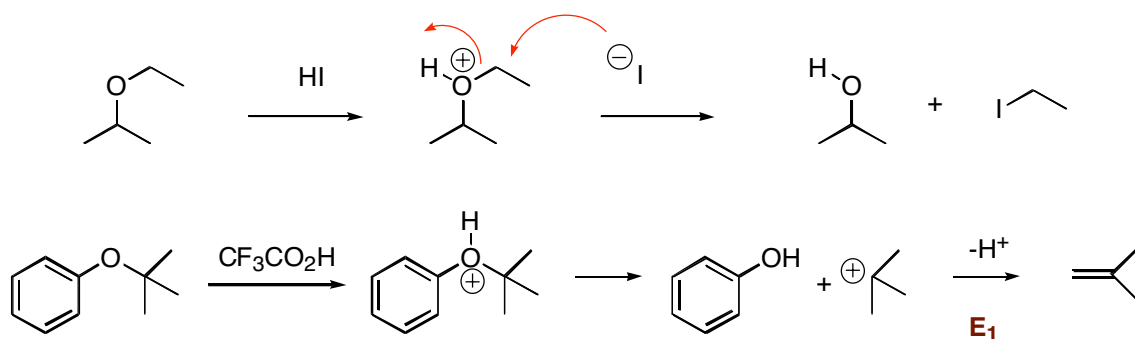
To make unsymmetrical ethers or ethers from secondary or tertiary alcohols, the **Williamson Ether Synthesis** must be used. Note that the choice of alcohol and alkyl halide is important. Since this involves a S_N2 reaction, the alkyl halide must be unhindered.



Ethers can also be made by oxymercuration reactions.



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.

