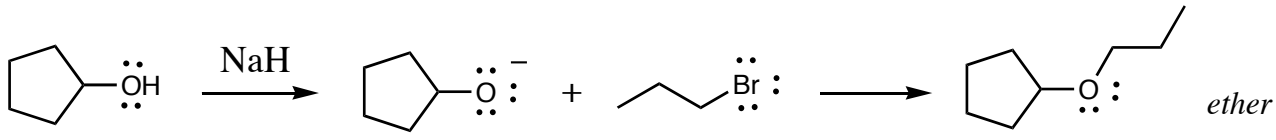
Reaction List - Ch 16
Formation and Reactions of Ethers, Sulfides and Epoxides

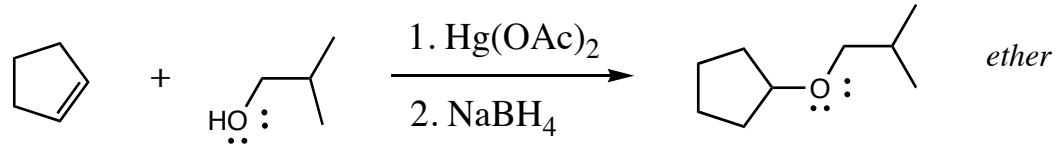
Synthesis of Ethers and Sulfides

Williamsen ether synthesis



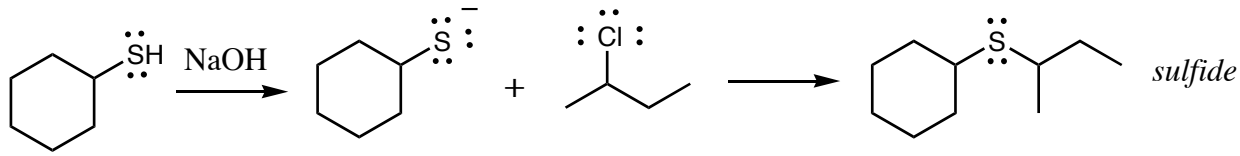
tosylate may be used instead of alkyl halide
alkyl halide or tosylate must be 1º to avoid E2 products
instead of NaH, Na (methyl or 1º) or K (2º or 3º) may be used

Alkoxymercuration-reduction



same as oxymercuration-reduction with an alcohol replacing water
ether always goes to the more substituted side

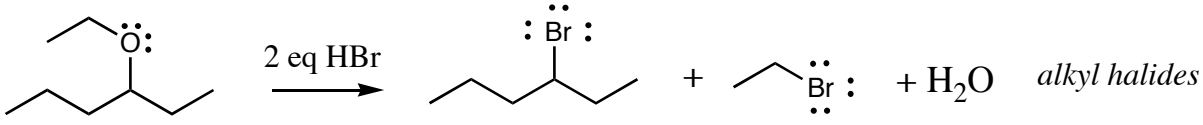
Synthesis of sulfides



tosylate may be used instead of alkyl halide
sulfides are poor bases, so 2º alkyl halides can be used without E2 products forming

Reactions of Ethers and Sulfides

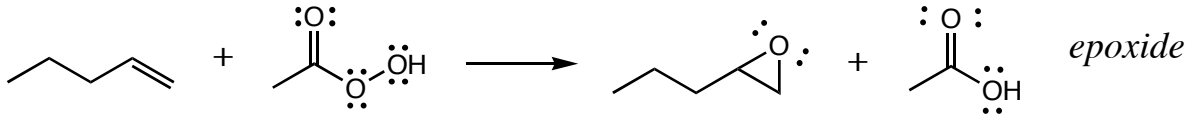
Cleavage of ethers with HX



only works with HI and HBr
symmetrical ethers form only one alkyl halide; unsymmetrical ethers form two
aryl ethers give phenol instead of an aryl halide

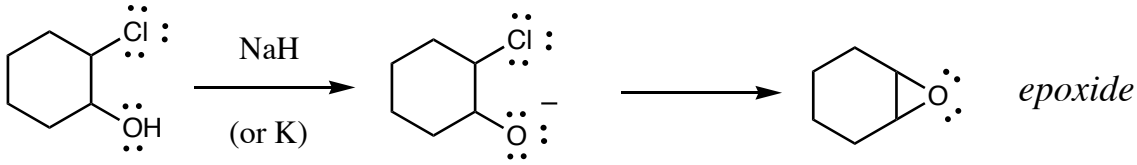
Synthesis of Epoxides

Oxidation of alkenes with peroxyacid



alkene is oxidized and peroxyacid is reduced
syn addition is observed
$PhCO_3H$ is often used because it is soluble in organic solvents
MMPP is often used because the byproduct crystallizes out of solution

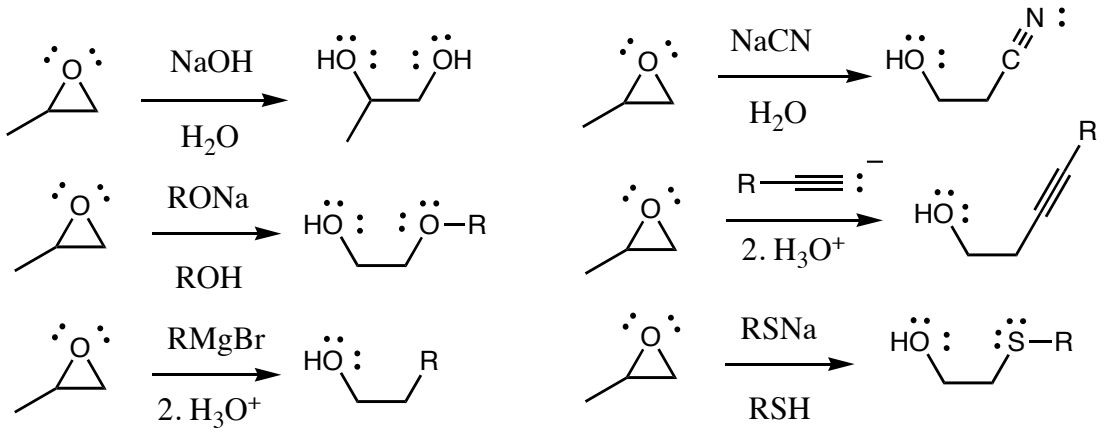
Cyclization of halohydrins



halohydrins are formed from alkenes and X_2, H_2O
the C with the halogen is inverted

Reactions of Epoxides

Ring opening by a strong Nu



Nu attacks the less substituted side
the C that gets attacked is inverted

Ring opening by a weak Nu

Nu attacks the more substituted side