

Course 343

Instructor Hackenberger

Day Wednesday

Date 11/20/13

Notes Taken By Guenette

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Submit notes to the Undergraduate Chemistry Office for posting.  
PLEASE COMPLETE NOTES IN INK AND DO NOT STAPLE.

Last lecture: - Oxidation and Reduction - Multi-Step Rxn. Pathways

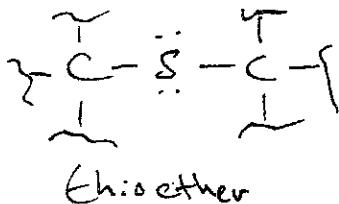
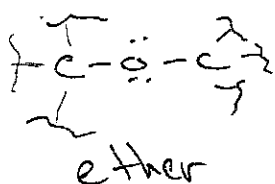
note: Cr(VI) in H<sub>2</sub>SO<sub>4</sub>, H<sub>2</sub>O → "Jones Conditions"

Ch. 11 - Ethers & related compounds

Office hours

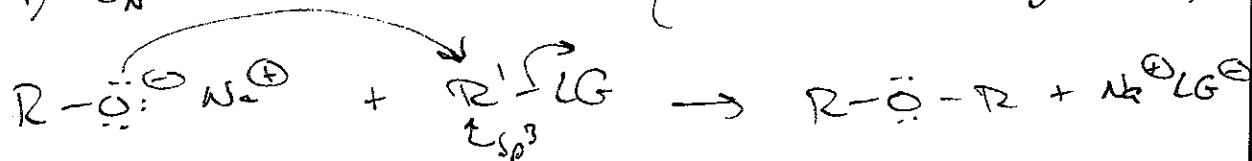
today 3:30 - 4:30 pm

Friday 12:00 - 12:30 pm



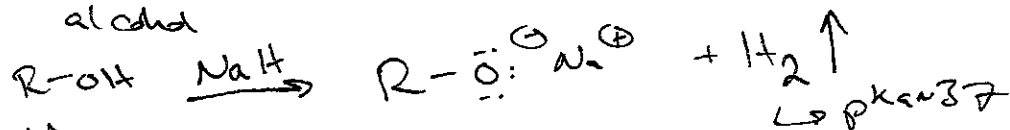
Synthesis of ethers

1) S<sub>N</sub>2 rxn of alkoxides ("Williamson ether synthesis")



Starting from an alcohol:

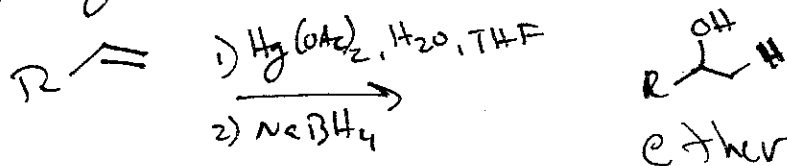
1<sup>st</sup> step - Quantitative Deprotonation of the alcohol



2<sup>nd</sup> step - S<sub>N</sub>2 reaction w/ appropriate R'-LG

2) Alkoxymercuration + reduction

Oxymercuration



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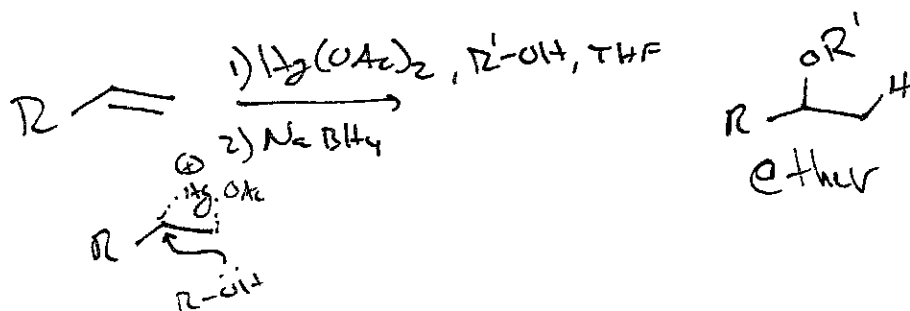
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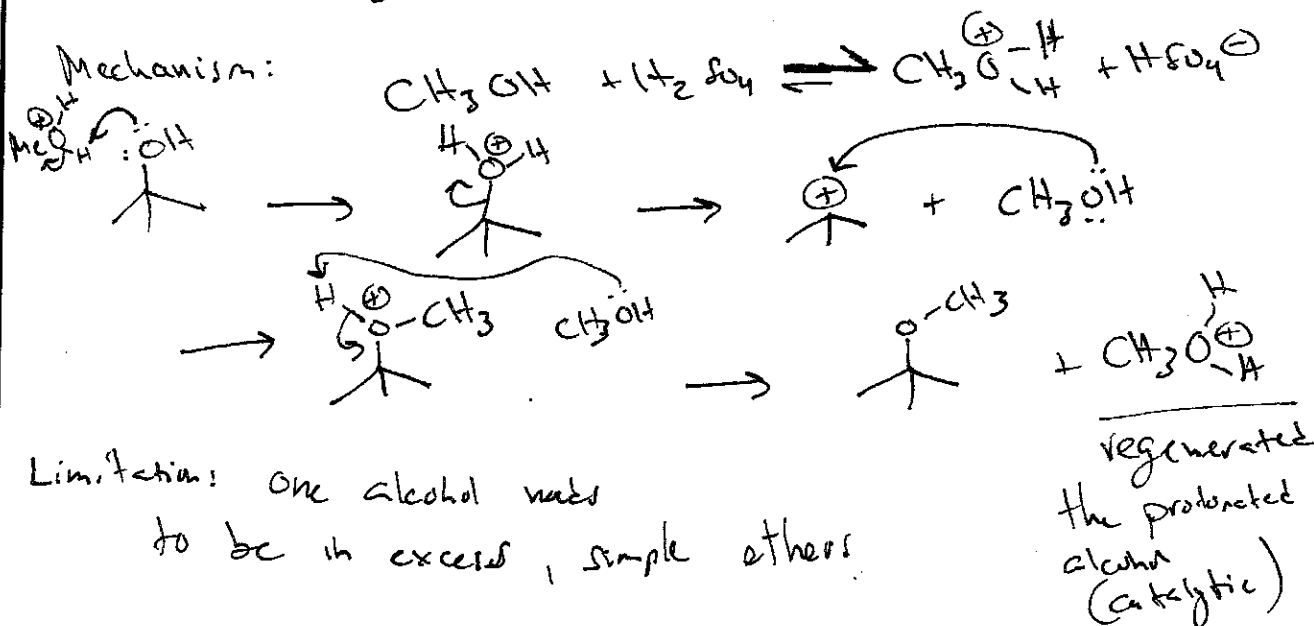
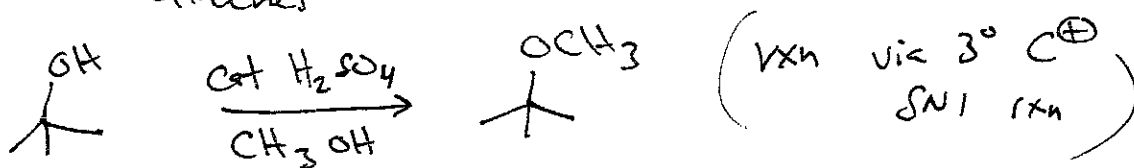
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Alkoxymercuration: Ether synthesis using the mercuration  
 rxn rxn in ROH instead of H<sub>2</sub>O



Limitation: Simple alcohols only (need to solvate mercury salt)

3) Acid catalyzed reactions of alcohols or alkenes



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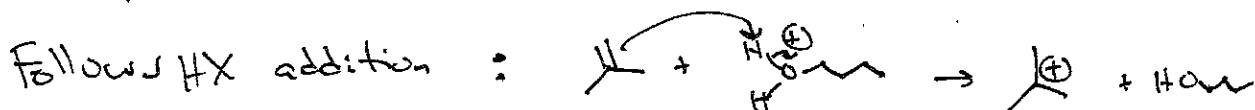
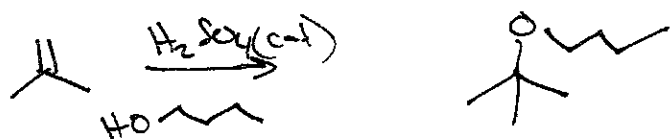
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3) cont → ether synthesis from alkenes

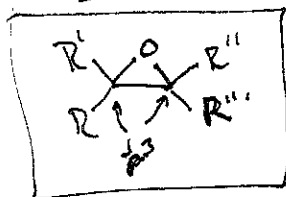


⇒ analogous  
trans-  
formation

Ethers can be linear or cyclic: (THF) cyclic ether

Special types of cyclic ethers

3-membered ring → epoxides



- highly strained → very reactive

especially reactive towards nucleophiles

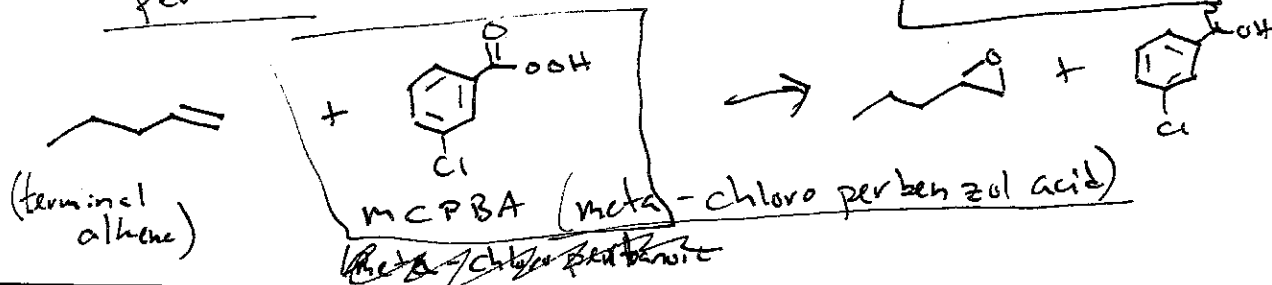
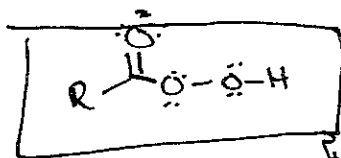
- possible to isolate (and sometimes stored)

→ very attractive building blocks in organic synthesis  
due to these properties

Synthesis of Epoxides

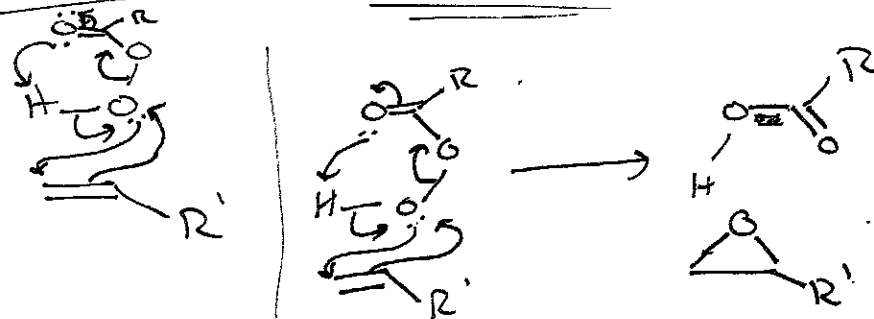
1) Alkene + per acid

peracid - oxidized carboxylic acid



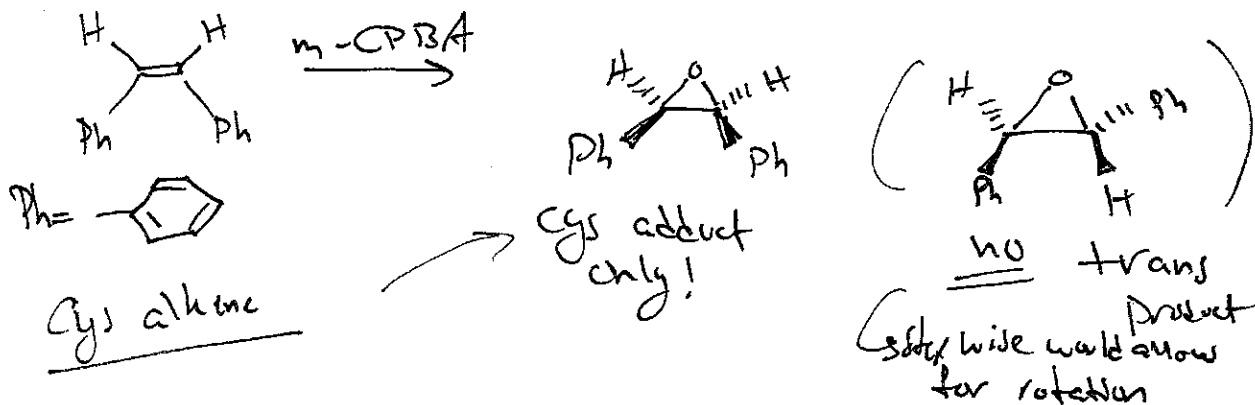
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Mechanism → concerted



analogous to the  $Br_2 + Cl_2$  addition rxns!

Concerted mechanism is supported by stereochemistry



~~epoxide formation~~

2) Cyclization of chlorohydrins