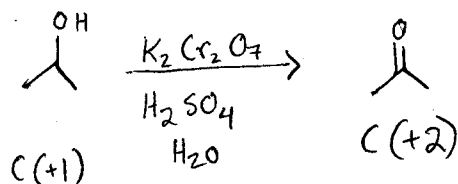
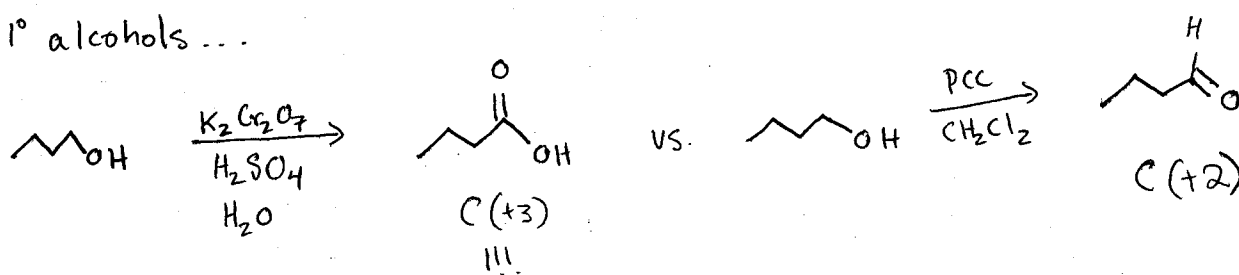


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Recall: Oxidation of alcohols...



For 1° alcohols...



Note: Oxidation requires (in this case) C-H bonds on the carbon being oxidized.

Thus,

1) cannot "over-oxidize" a secondary (2°) alcohol $\Rightarrow$ stops @ ketone

2) No oxidation of 3° alcohol $\left(\begin{array}{c} \text{OH} \\ | \\ \text{R}-\text{C}-\text{R}' \\ | \\ \text{R}'' \end{array} \right)$

Read: look at 10.11 in the text carefully!

$\Rightarrow$ design of multi-reaction routes for synthesis of complex molecules from simple starting materials

Section 10.8

Terminology important for next semester -

not covered in this course

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Chapter 11 Ethers and related compounds

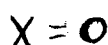
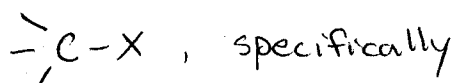
Rec Problems - 1-24, 30, 40-42, 44, 46-65, 68, 69, 71, 75 (not e, g), 77-79

Generic ether



(R, R' - 1st atom
is a carbon)

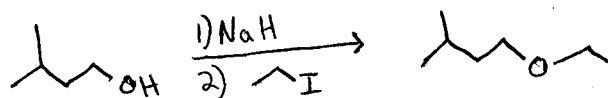
Continuing with a theme



Synthesis of ethers

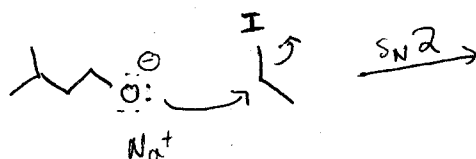
1) Williamson ether synthesis
 (S_N2 rxn of alkoxides)

Ex:

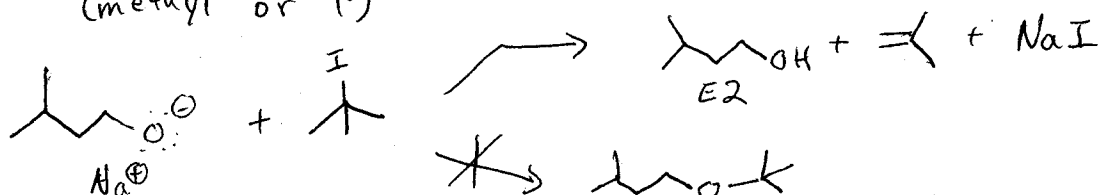


Step 1: Quantitative deprotonation of alcohol

Step 2:



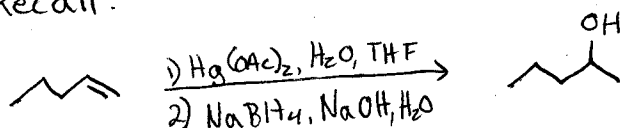
Limitation: alkyl halide must be a good S_N2 substrate
 (methyl or 1°)



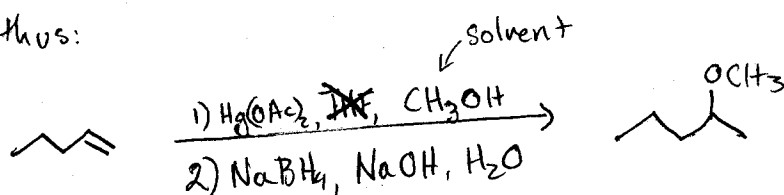
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2) Alkoxymercuration - Reduction Process

Recall:



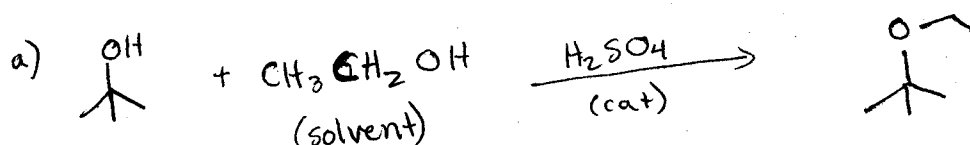
thus:



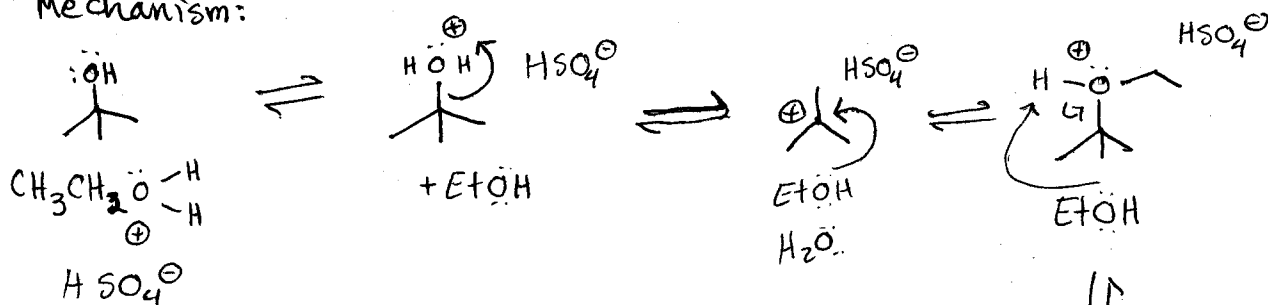
Limitation: simple alcohols so can be used as solvent

3) Acid-catalyzed rxns - from alcohols or alkenes

Most useful versions involve a 3°C^+ intermediate.

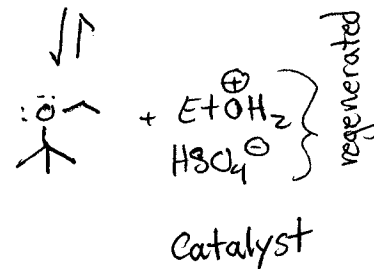


Mechanism:



Perspective:

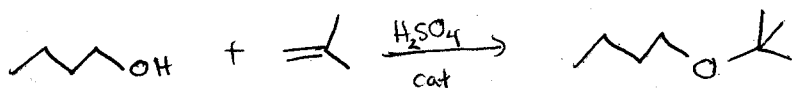
$\text{S}_{\text{N}}1$ (proton transfer too)



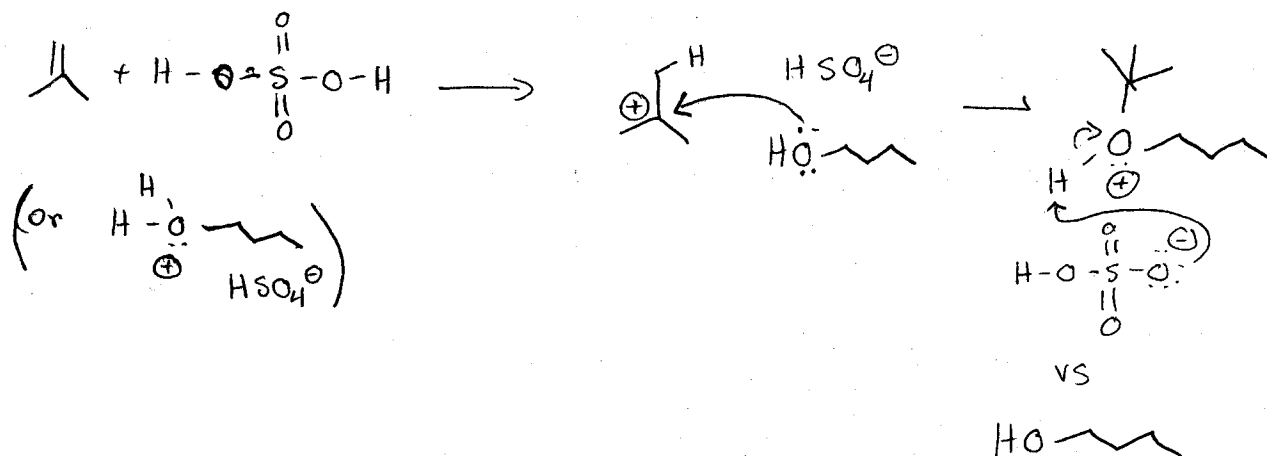
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(b) From alkenes:

Ex:

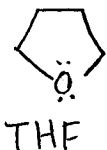


Mech: (variation on HX addn):

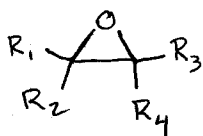


Cyclic ethers

Recall:



Epoxides: 3-membered ring w/ 2 carbons + 1 oxygen



⇒ highly strained!

(% unusual reactivity relative to other ethers)

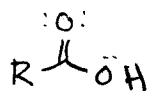
* b/c for this rxn, often
 use up all the alcohol-
 use HSO_4^- to deprotonate

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Synthesis of epoxides

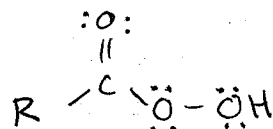
1) Alkene + peracid

Recall: carboxylic acid



$\text{pK}_a \sim 5$

"Peracid" is short for percarboxylic acid



↑
bond b/t 2 electronegative atoms
= weak bond, reactive

Ex:

