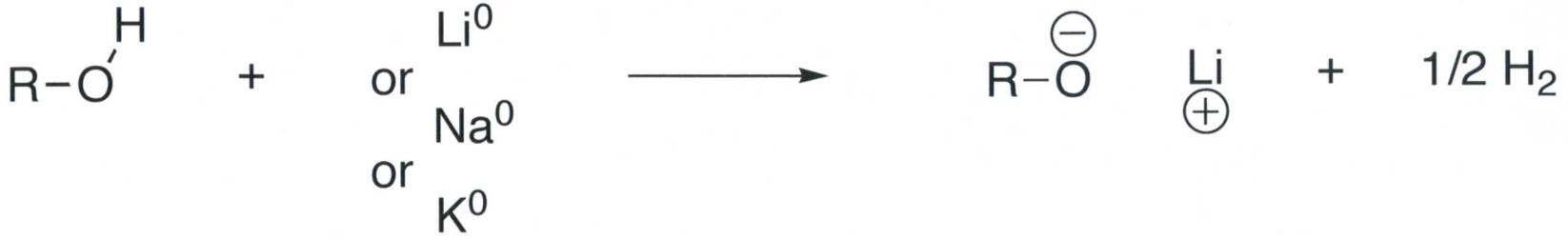
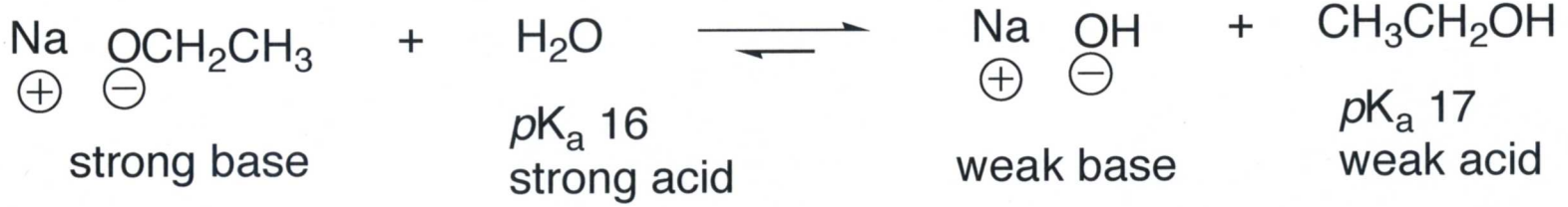
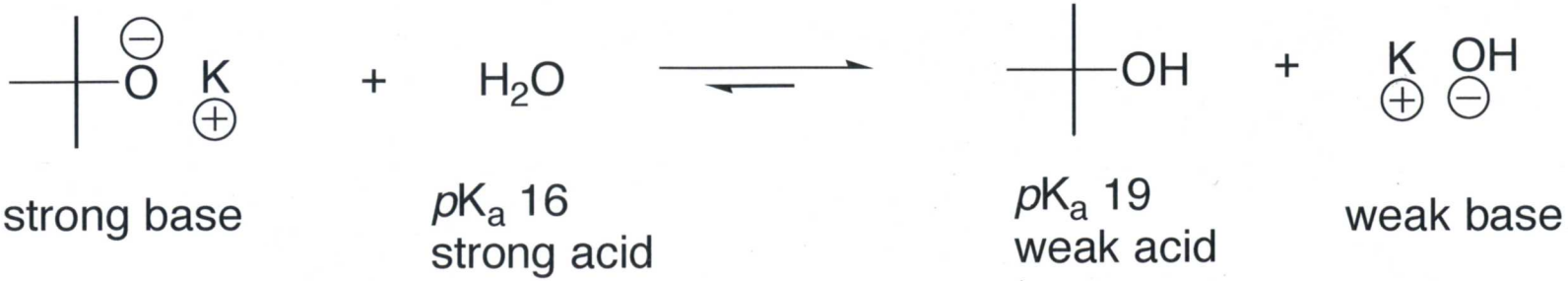
Reactions and Synthesis (Preparation) of R-OH

Breaking the O-H bond of R-OH with Metals

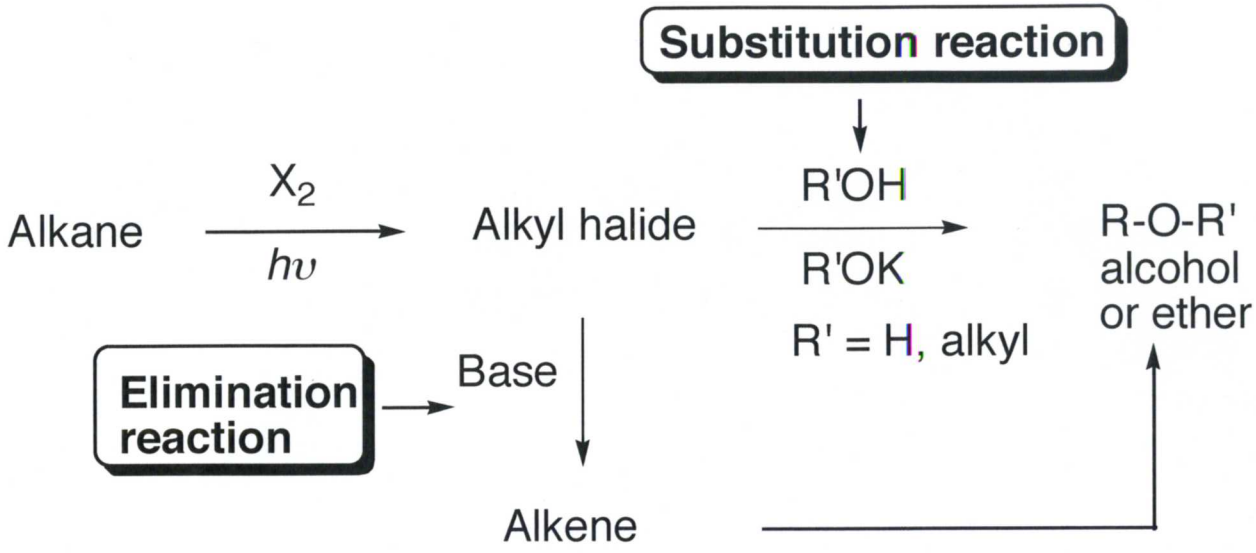


Breaking the O-H bond of R-OH by Acid-Base Reaction

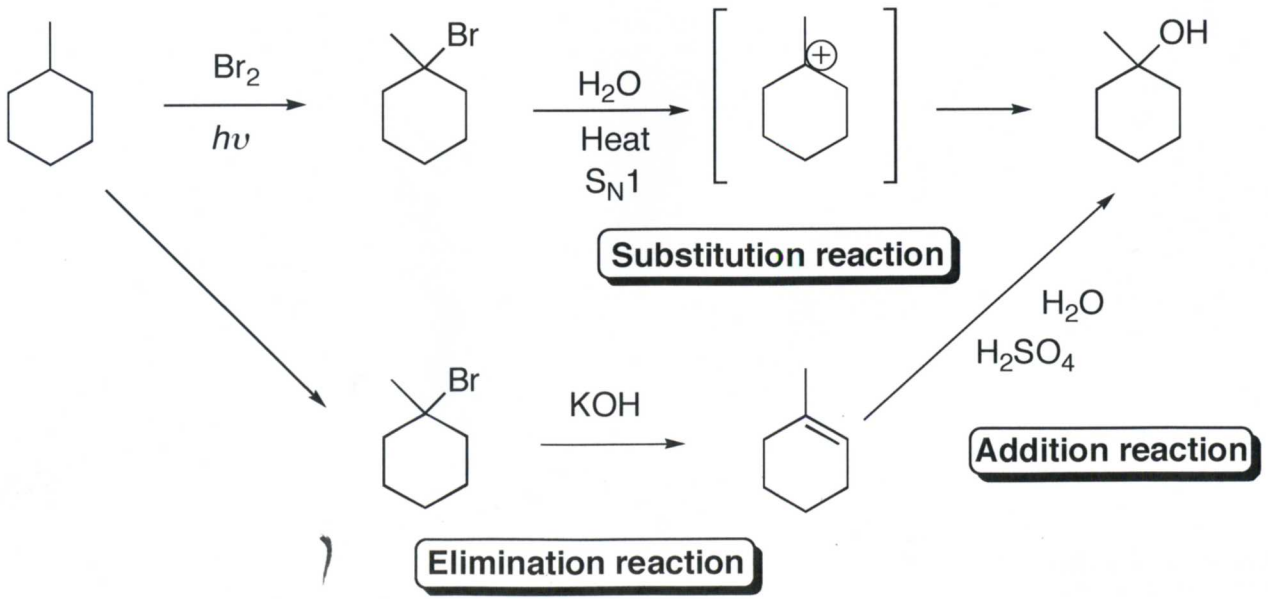




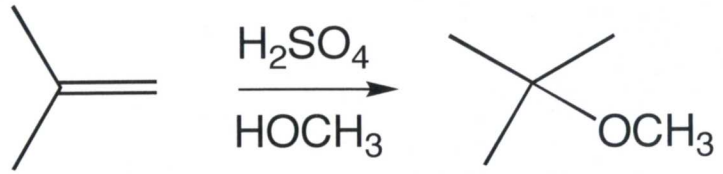
Preparation alcohols or ethers from alkanes



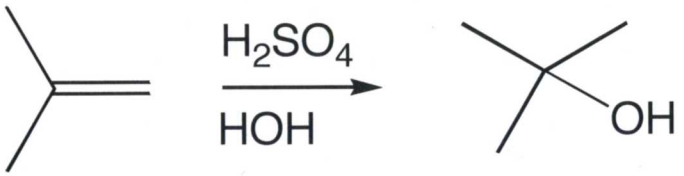
example:

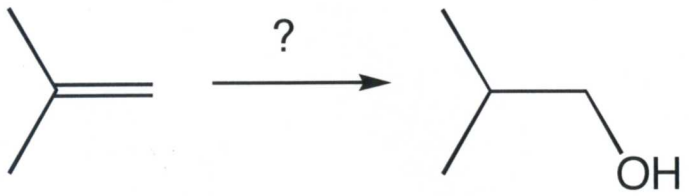


Preparation alcohols or ethers from alkenes



Markovnikov Addition

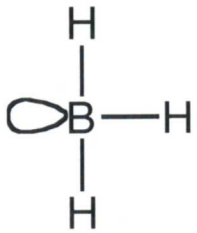




? = 1. B_2H_6
2. H_2O_2, NaOH

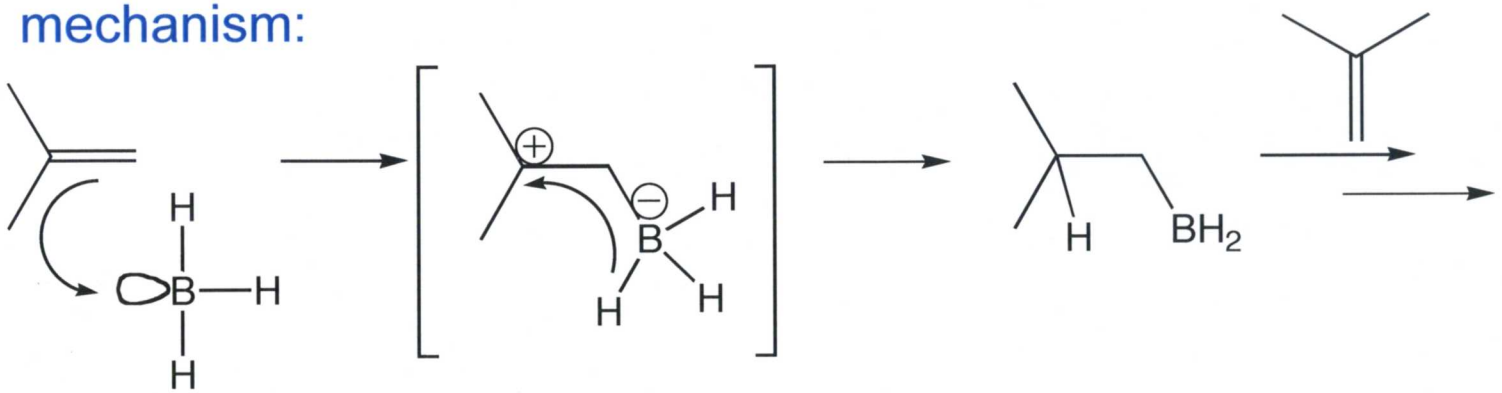
B_2H_6 behaves like BH_3, which is a Lewis acid:

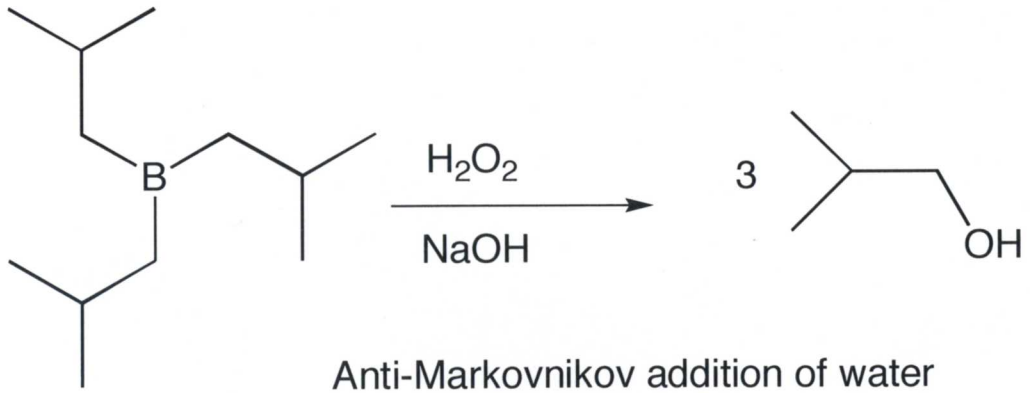
example:



Preparation alcohols or ethers from alkenes - hydroboration

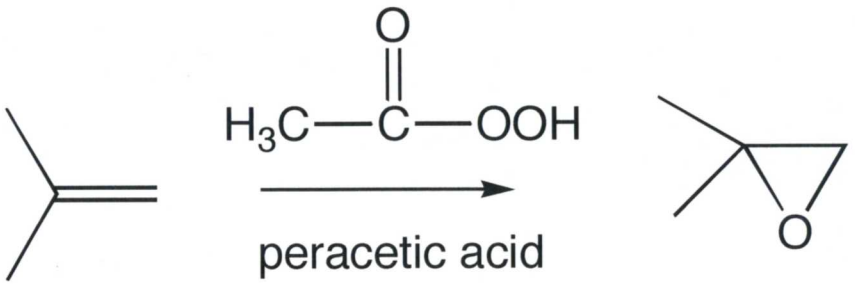
mechanism:





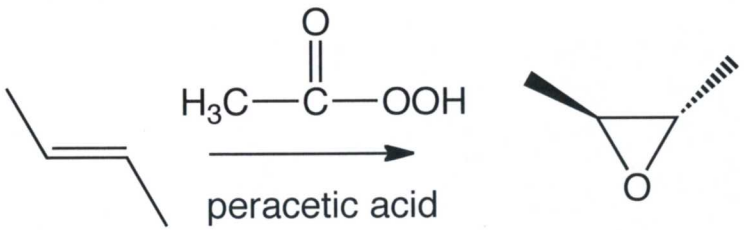
Anti-Markovnikov addition of water

Preparation ethers from alkenes - epoxidation



an epoxide
aka oxirane
3 membered ether ring

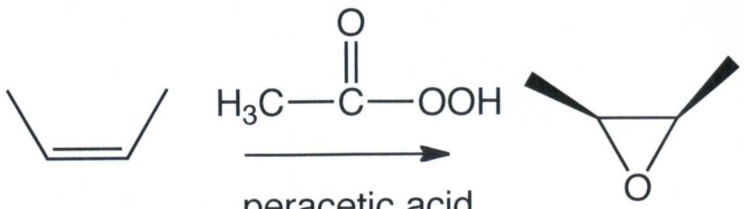
Epoxide formation is a stereospecific reaction



formed as racemate

(racemic mixture =

1:1 mix of enantiomers)

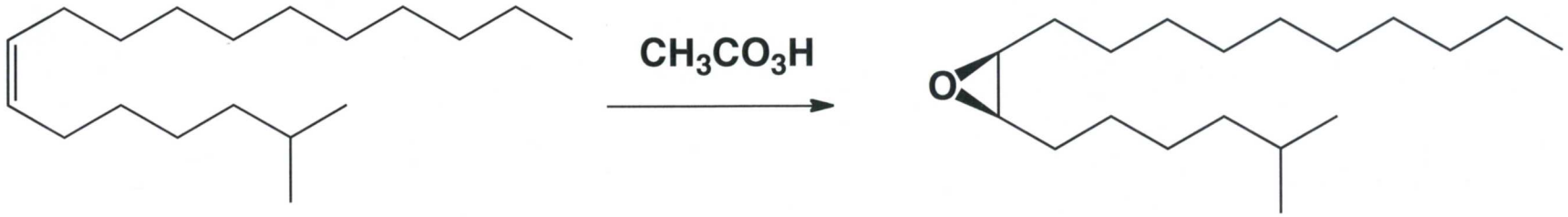


formed as single compound

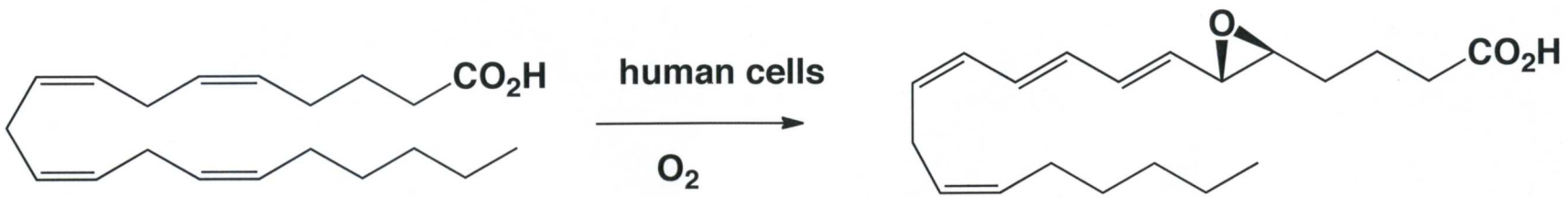
(meso compound =

achiral but has stereocentres)

Preparation ethers from alkenes - epoxidation



Disparlure = sex pheromone of Gypsy Moth



Arachidonic Acid =

all Z 5,8,11,14-eicosatetraenoic acid

Leukotriene A_4

inflammatory signal

for asthma, allergic reaction

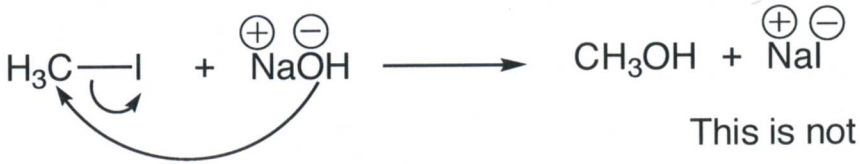
Alcohols and Ethers from Alkyl Halides

R-X → ROH
R-X → ROR'

X = Cl, Br, I S_N2, S_N1
S = substitution N = nucleophilic
2 or 1 = rate depends on 2 concentrations or 1 concentration

S_N2

- S tereospecific (the stereochemistry of the reactants determines the stereochemistry of the products)
- I n version of configuration
- C oncerted (bonds are broken and formed at the same time)
- B i molecular
- 1° halides work the best
- 2° halides work ok
- 3° halides don't work
- I n general C=C-X (vinyl halides) also fail for this type of reaction



This is not reversible, because I- is more stable than OH-