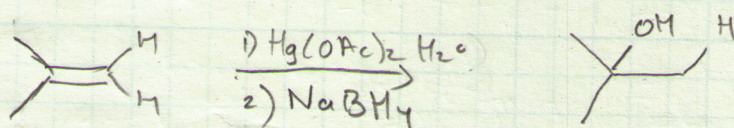


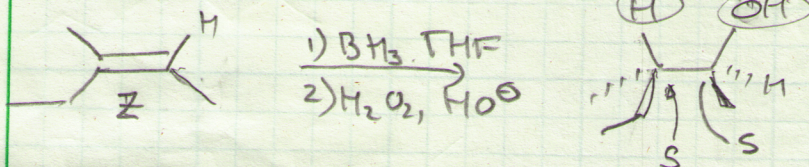
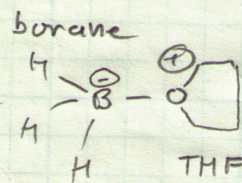
Anti-Markovnikov Hydration of an Alkene

Markovnikov Addⁿ



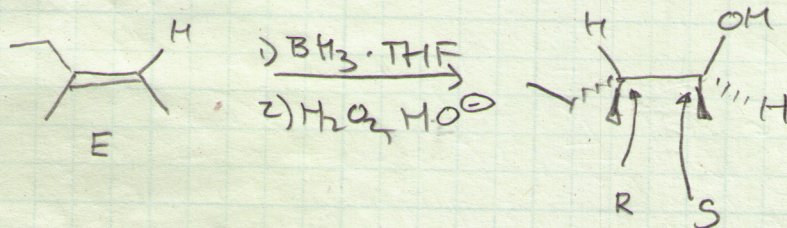
oxymercuration-demercuration

Hydroboration Oxidation
'H-B' "B → OH"



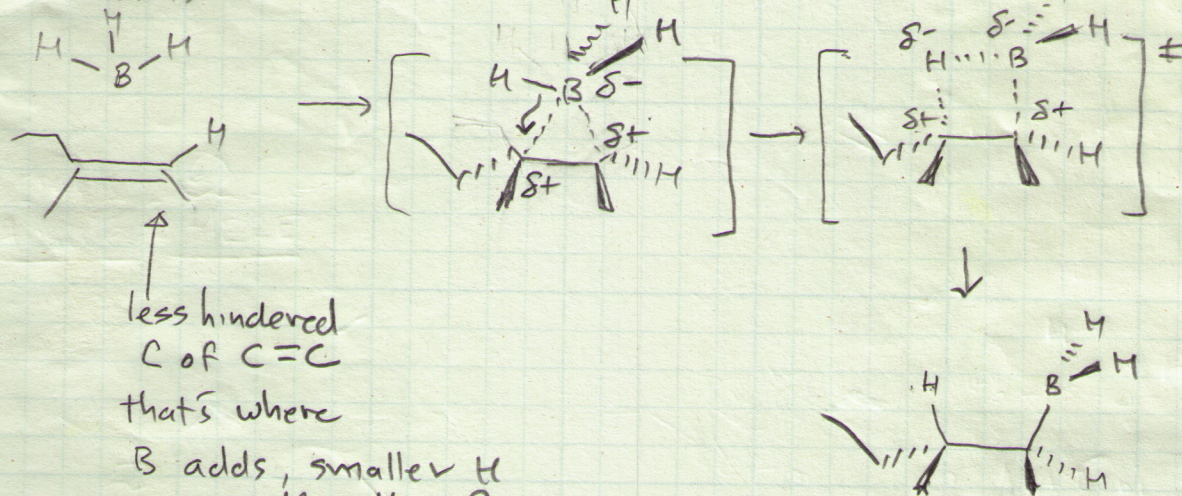
syn-addition of H and OH

STEREOSPECIFIC: different stereoisomeric products results from different stereoisomeric reactants.



syn addⁿ of H and OH

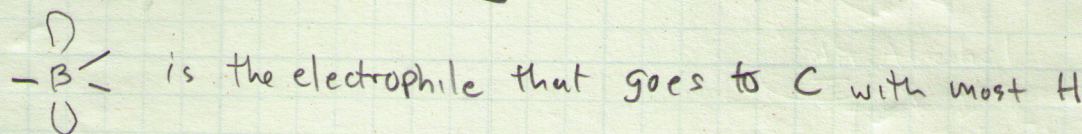
Mechanism



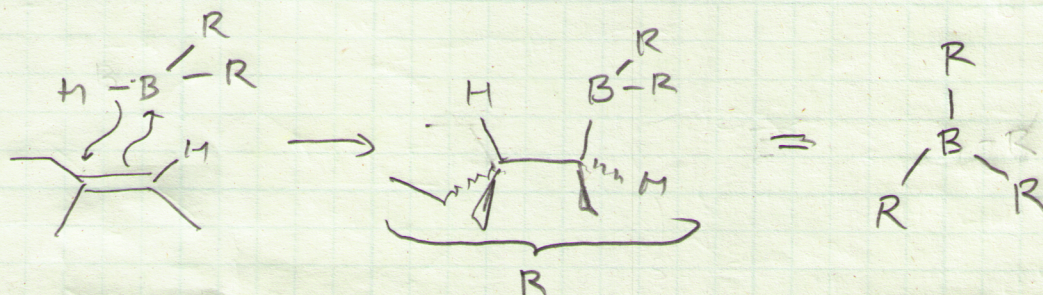
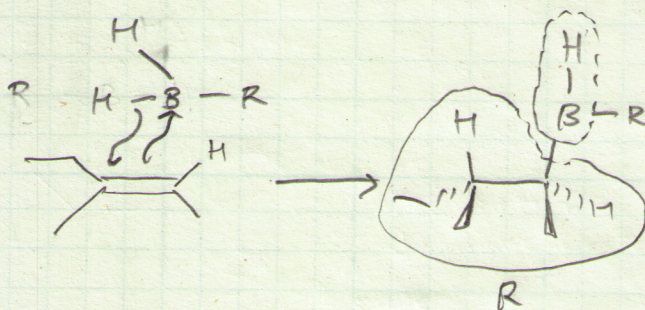
less hindered C of C=C
that's where
B adds, smaller H
goes to the other C.

(This directs regioselectivity)

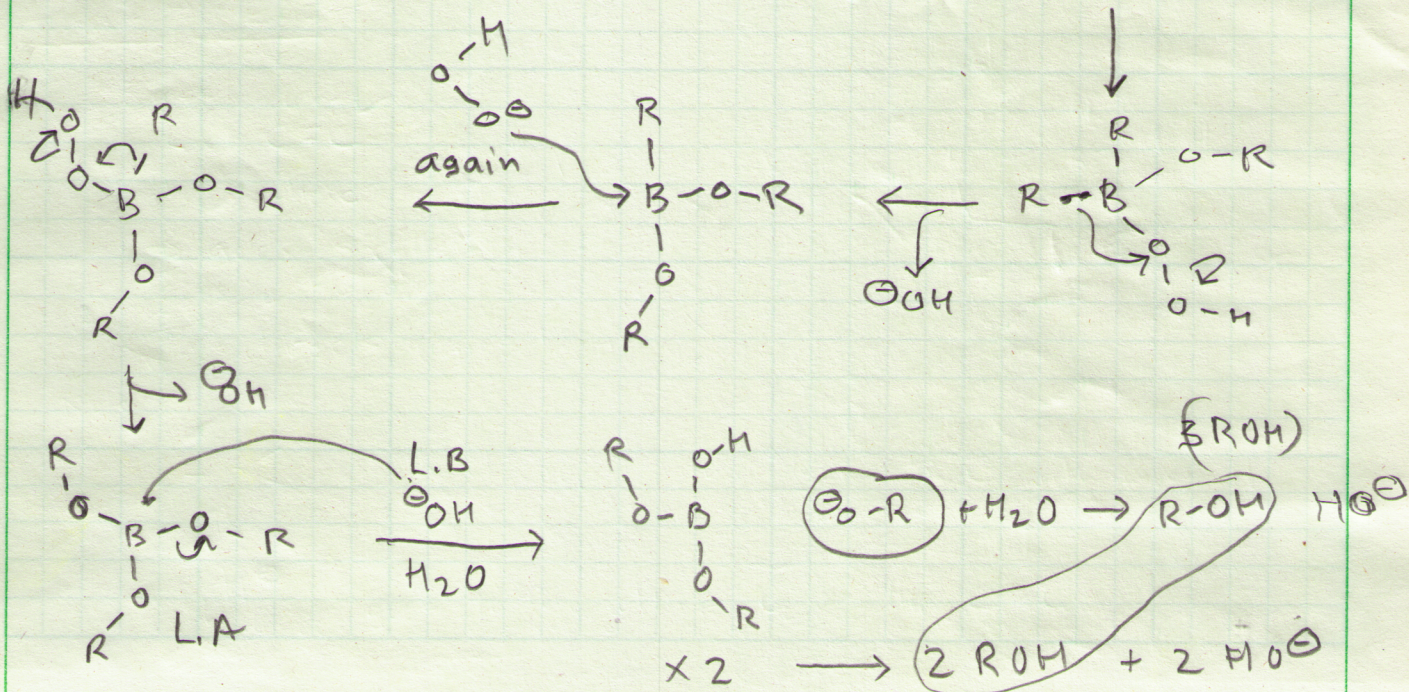
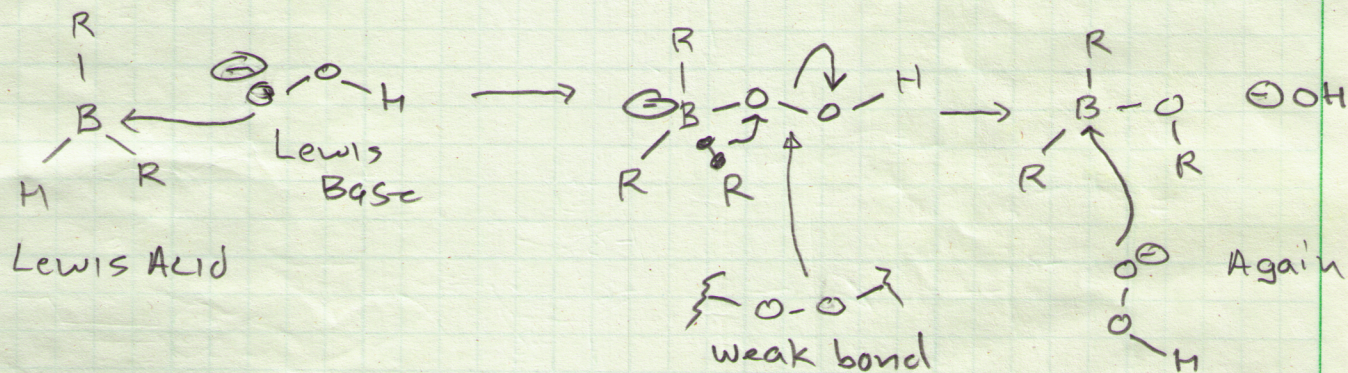
Note



H^- hydride goes to the other C of the C=C

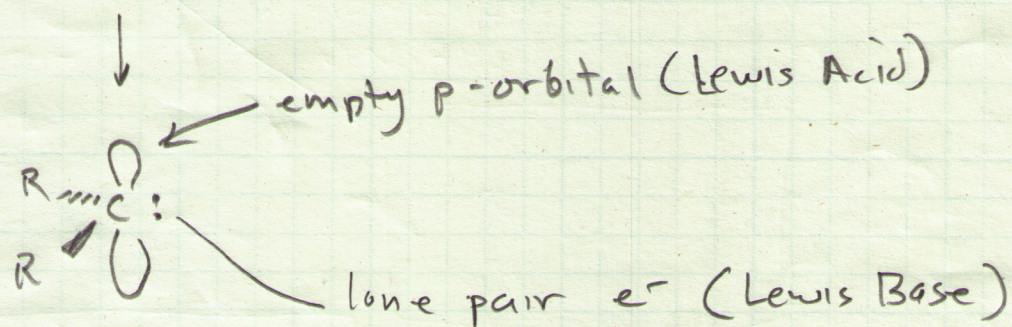


Oxidation step $(\text{H}-\text{O}-\text{O}-\text{H} + \text{HO}^\ominus \rightarrow \text{O}^\ominus-\text{O}-\text{H} + \text{H}_2\text{O}-\text{H})$
in H_2O



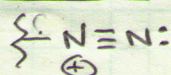
Alkenes to cyclopropanes

Carbene is conceptually an electrophile and Nucleophile

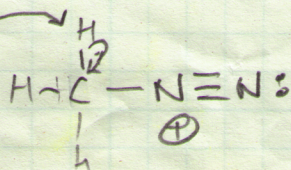


How to make carbenes

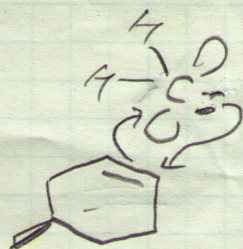
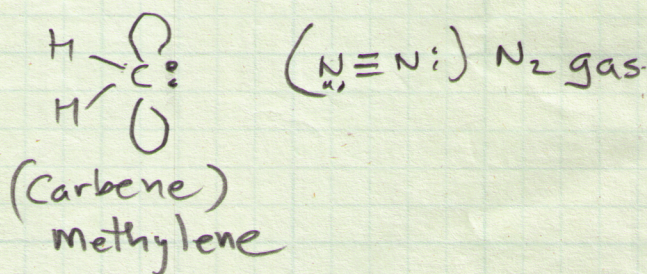
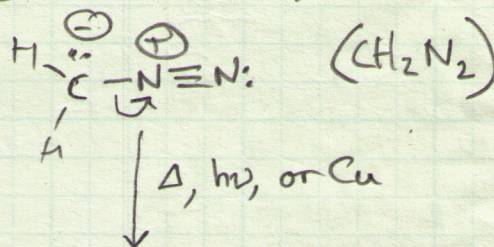
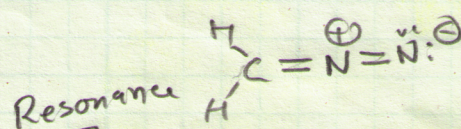
Diazomethane



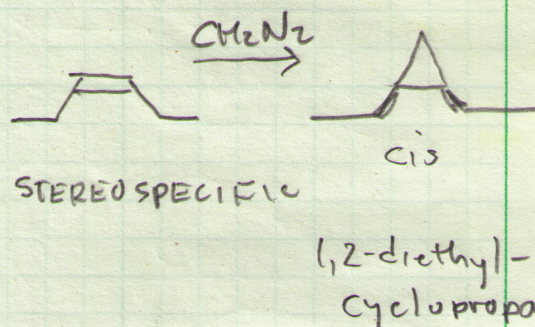
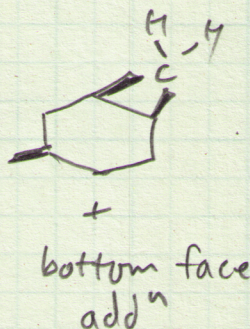
Base:



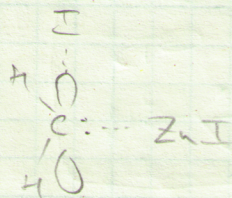
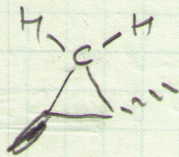
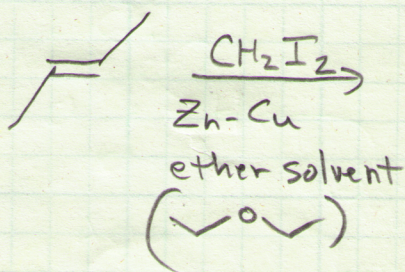
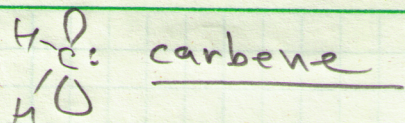
<diazomethane>



top face
addⁿ



Simmons-Smith Reagent to generate



NOTE: Diazomethane ($\text{CH}_2=\text{N}^+=\text{N}^-$) is explosive
Simmons-Smith Reagent NOT explosive.

Dichloro carbenes $\rightarrow$ dichlorocyclopropanes

chloroform

