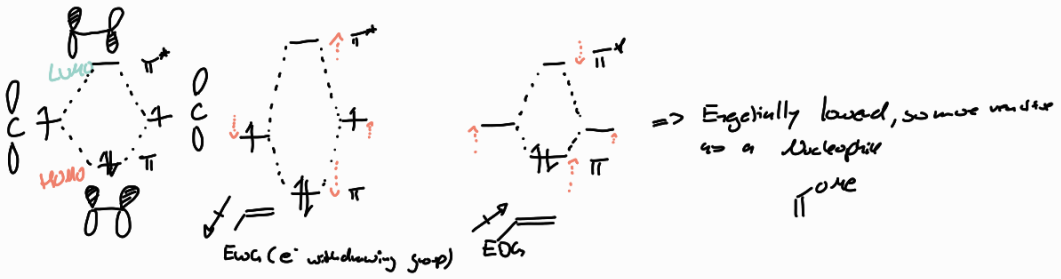
Nucleophilic alkenes

Ch. 29

C–C 378 kJ/mol

C=C 728 kJ/mol (+351 kJ/mol)

C≡C 962 kJ/mol (+237 kJ/mol)

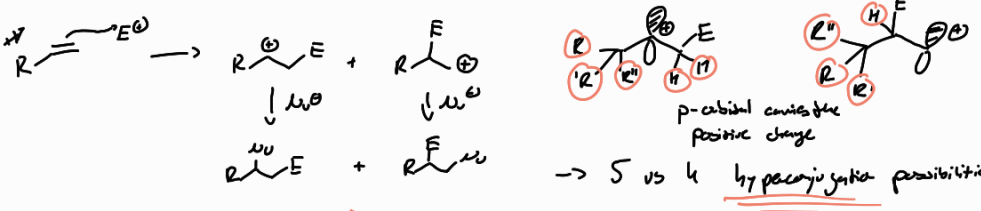


=> Energetically lowered, so more reactive as a nucleophile

=> Reactivity decreases, π is Energetically more stable

-> Reacts as electrophile

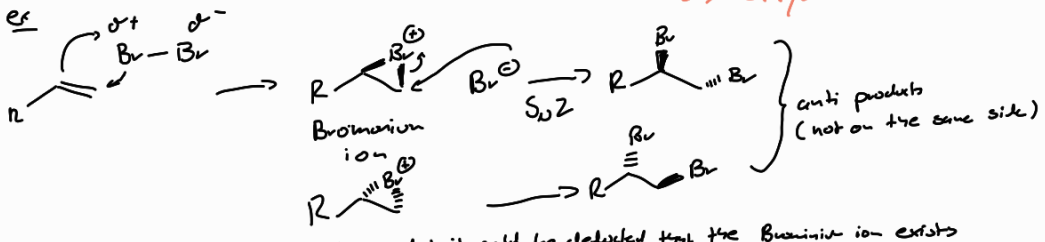
Markovnikov's rule: "Most EN atom ends up on most substituted carbon"



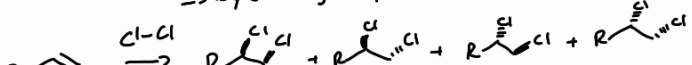
-> 5 vs 4 hyperconjugation possibilities

Markovnikov: >

↳ Clayden

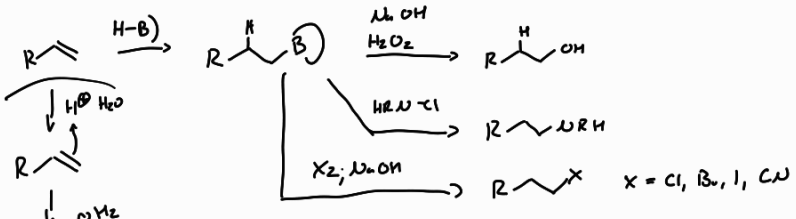


=> By examining the product it could be deduced, that the Bromonium ion exists



=> all products observed; Reaction does not include the "Chloronium ion"

Hydroboration



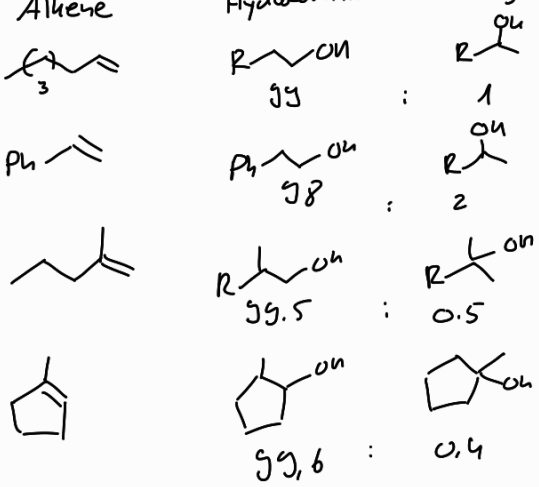
But why? Markovnikov does get violated?

EN(B) < EN(H)

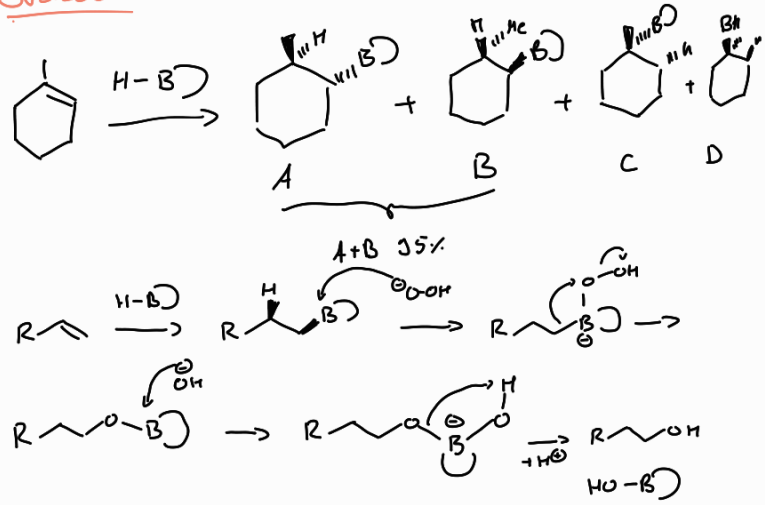
different Boranes reagents: $H_3B \cdot SMe_2$; H_3B-N; H-B; 9 BBN

Different reactivity

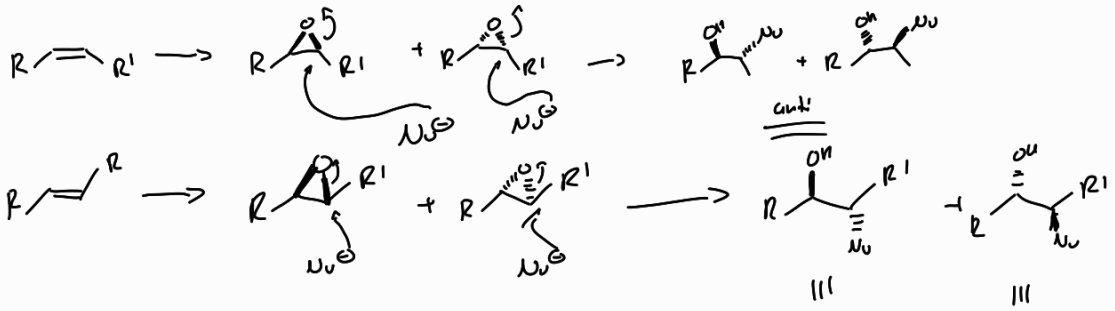
Alkene — Hydroboration with $H_3B{-}SMe_2$



Stereochem

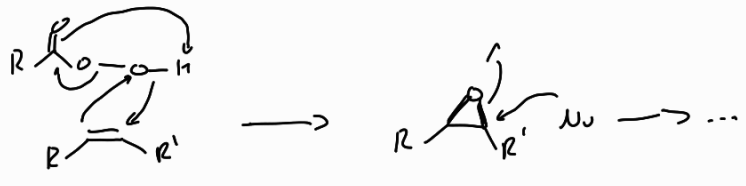


Epoxidation



=> cis alkene → anti
trans alkene → syn

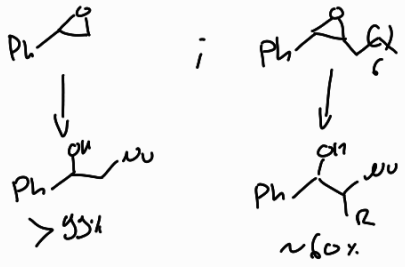
Mech



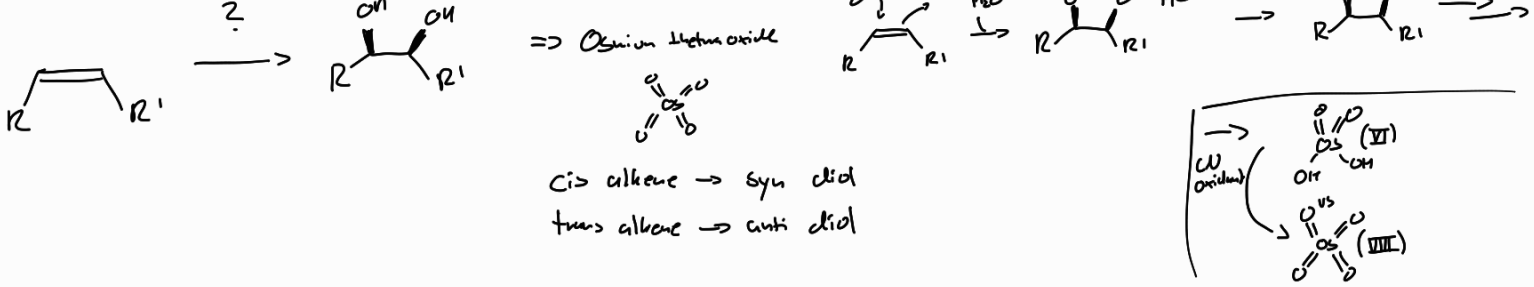
Butterfly mechanism

=> attack at less steric hindered R

ex



Nucleophiles:

- $N_3^\ominus$ azide
- $CN^\ominus$ Cyanide
- $OH^\ominus$
- R MgBr Grignard
- RLi
- $LiAlH_4$ (reduction)

Dihydroxylation