

(7) Today

Sections 11.7 - 11.11: Elimination Reactions

Section 17.6: Alcohols and Elimination Reactions

(9) Second Class from Today

Chap 12: Mass Spectrometry and Infrared Spectroscopy

Next Class (8)

Sections 11.7 - 11.11: Elimination Reactions

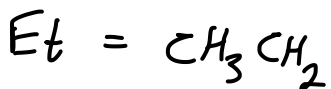
Section 17.6: Alcohols and Elimination Reactions

Chap 12: Mass Spectrometry and Infrared Spectroscopy

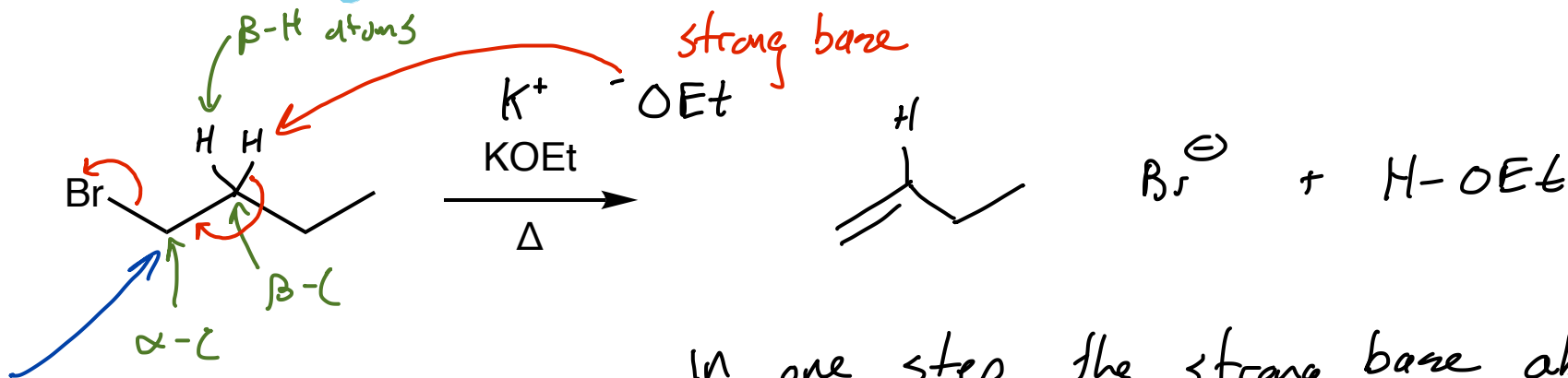
Third Class from Today (10)

Chap 13 : Nuclear Magnetic Resonance Spectroscopy

Elimination: The E2 Mechanism



Sections 11.7 - 11.11 and 17.6

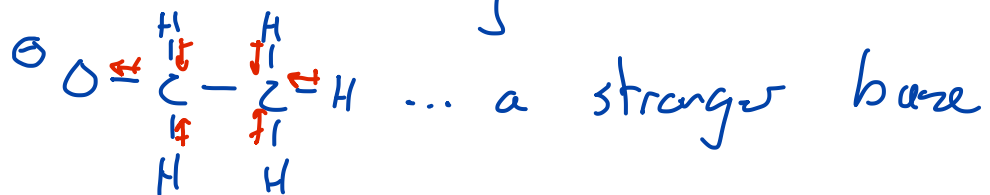


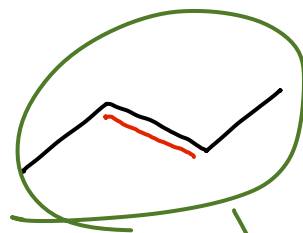
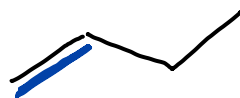
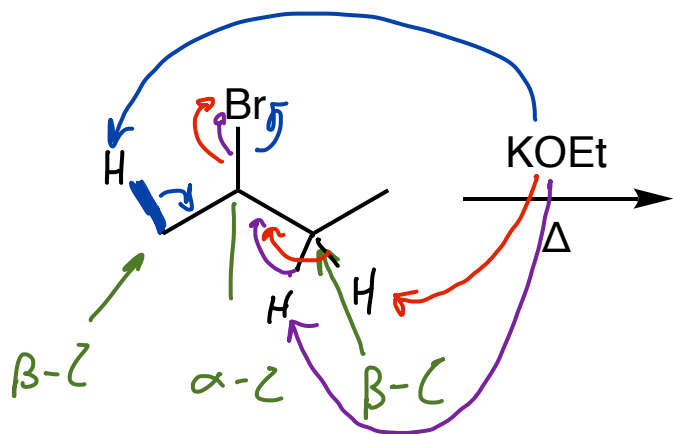
can't form a 1° C⁺ under typical lab conditions, but this molecule will undergo elimination

In one step, the strong base abstracts the $\beta-H$ (as an H^+), and the e^- 's that were in the $\beta-C$ to $\beta-H$ fall in to form a π bond between the $\alpha-C$ + $\beta-C$ while simultaneously pushing off the LG.

2 molecules collide in the rate determining step

$^{\ominus}OH$... the strong base of Gen Chem





this one

In E1 which was the major product?

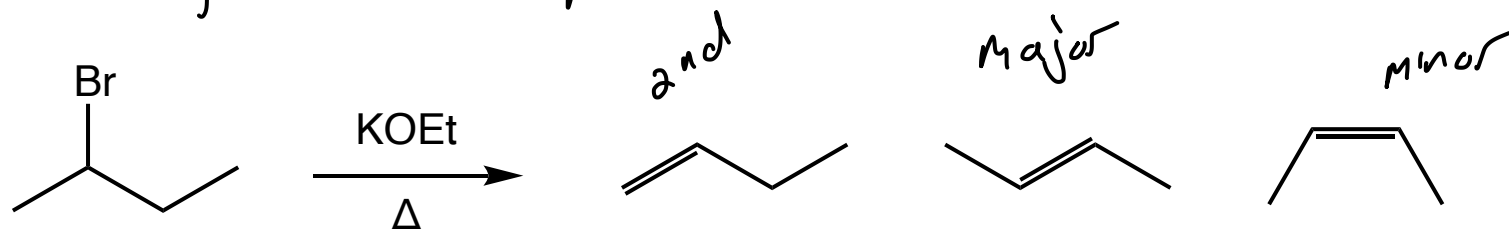
In E1, how do we determine what the major product is?

Thermodynamic control... equilibrium rxn
most stable product is major product

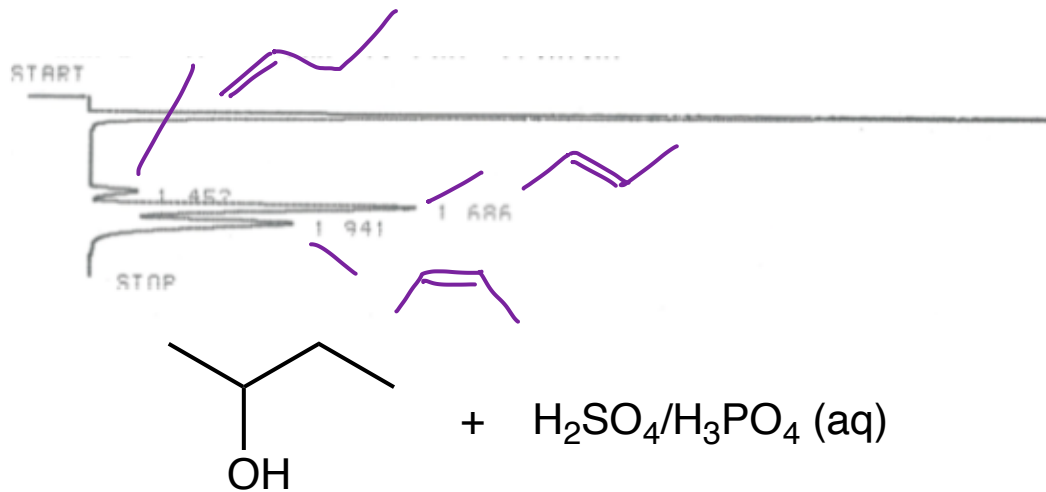
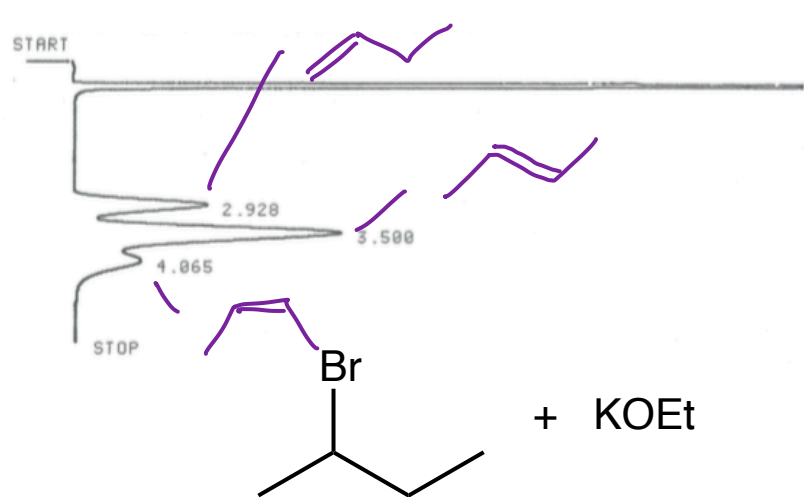
Elimination: The E2 Mechanism

Sections 11.7 - 11.11 and 17.6

not exactly the same product distribution as E1. Why different?



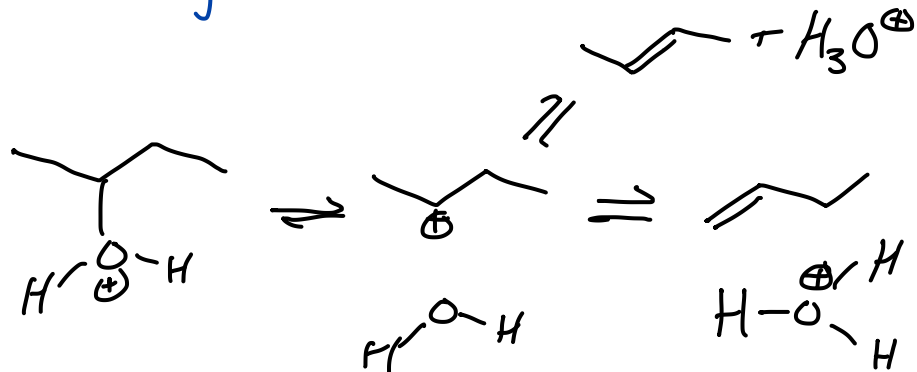
Is the most stable product always still the major product?



Kinetic control - Fastest forming

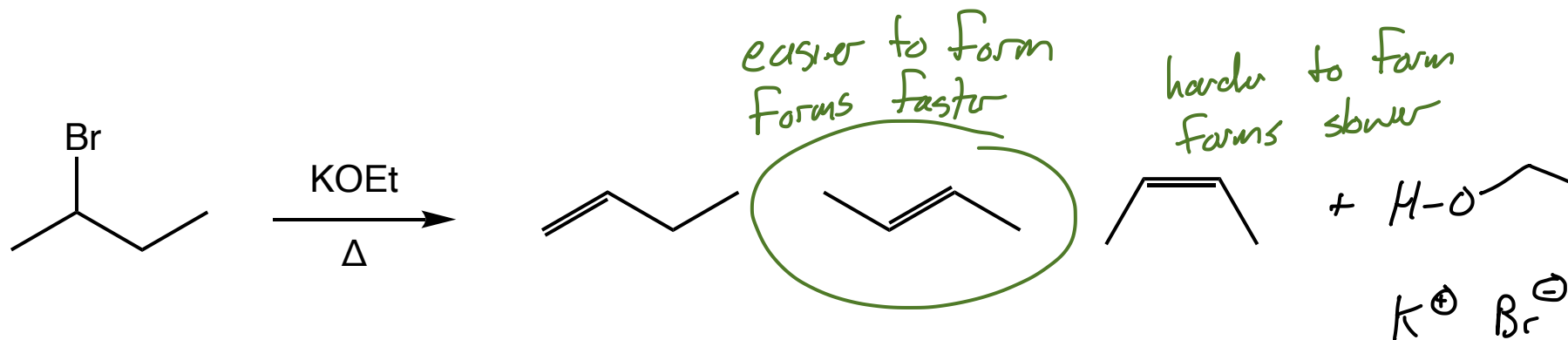
thermodynamic control - most stable

the product that forms the fastest is the major product



Elimination: The E2 Regiochemistry

Sections 11.7 - 11.11 and 17.6

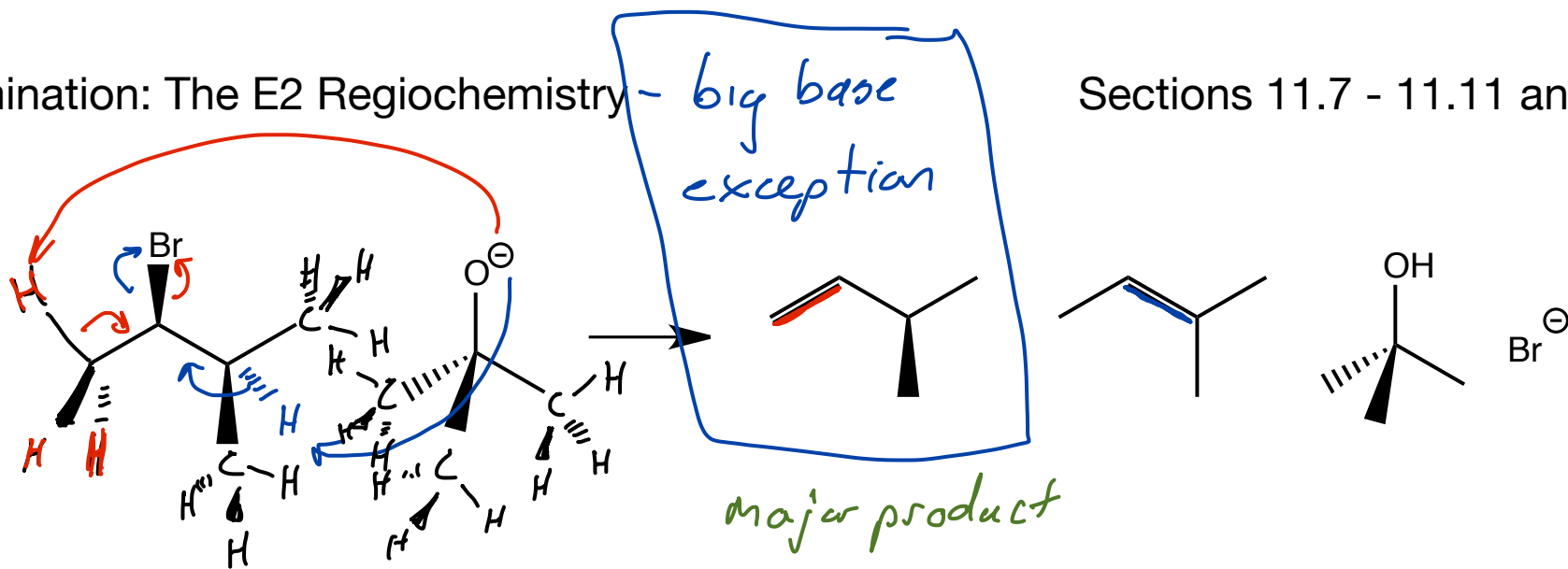


alkenes are nucleophiles + they react with electrophiles...

H⁺



no equilibrium can be established because none of the products is reactive enough



reaction is kinetically controlled ... product that forms fastest is major product.

For a base to react with the H^+ it needs to be able to get close to the H^+ ... in this case it is hard to get at the blue β -H because of all the CH_3 groups.

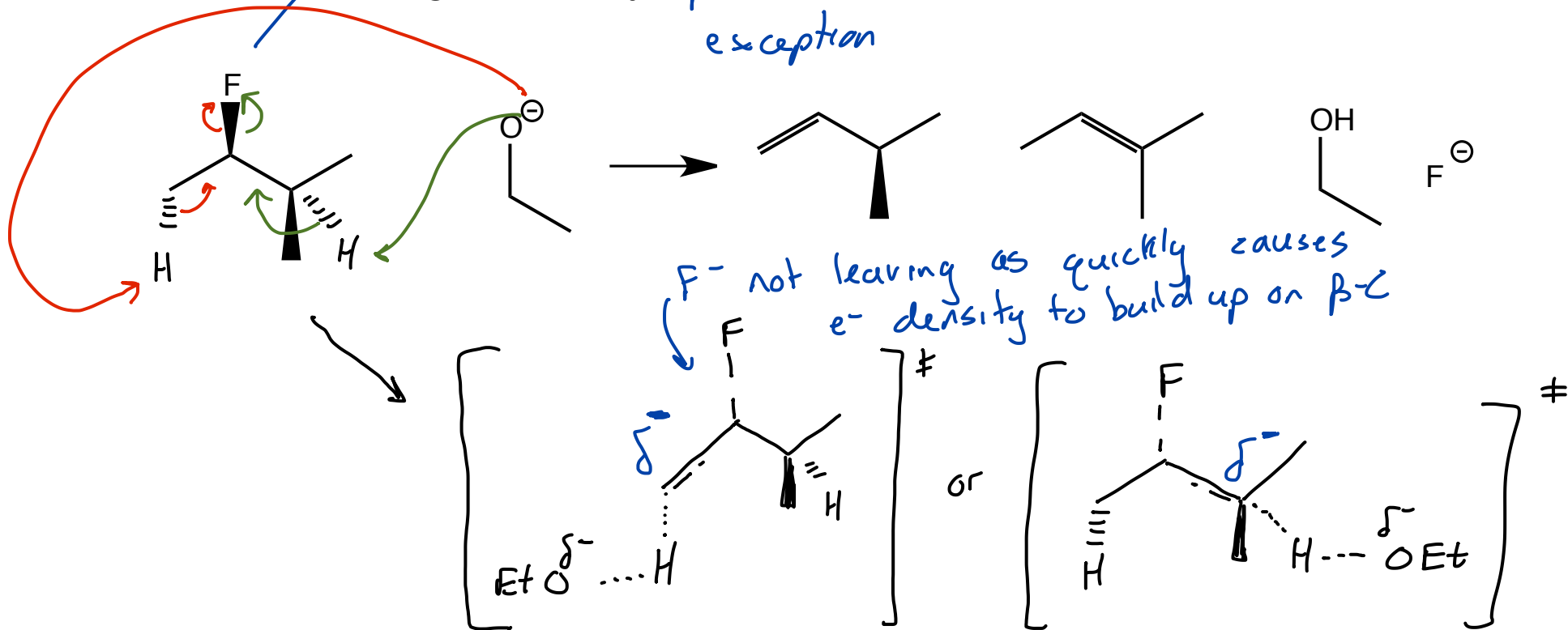
Since there is no steric crowding at the primary β -H's it's easier/faster for this big base to react there.

Elimination: The E2 Regiochemistry

N based LG too

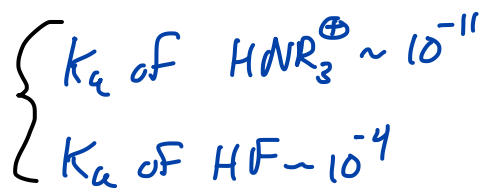
poor LG exception

Sections 11.7 - 11.11 and 17.6



The buildup of \ominus charge is more stable on the 1° β-C because there is less e⁻ density on neighboring atoms to destabilize the \ominus charge.

not so good LG



K_a of HBr $\sim 10^9$
very weak base } good LG

