(10) **Today**

Competition between SN1, E1, SN2, and E2

Chap 12: Mass Spectrometry and Infrared Spectroscopy

Next Class (11)

Chap 12: Mass Spectrometry and Infrared Spectroscopy

(12) **Second Class from Today**

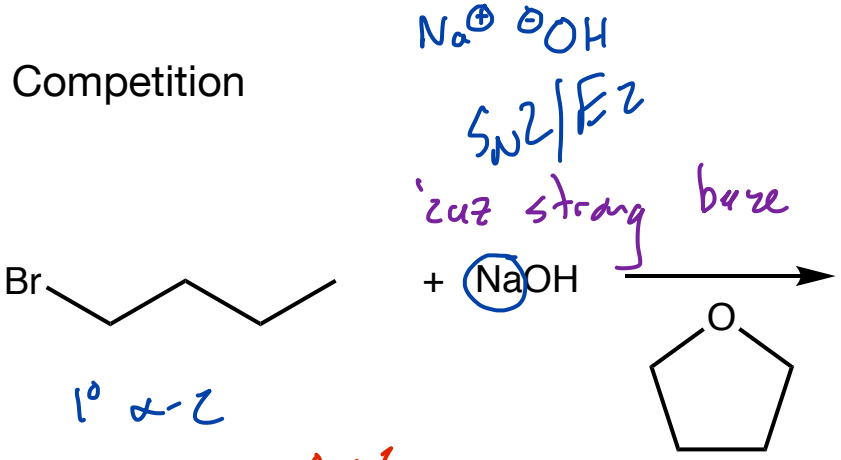
Chap 12: Mass Spectrometry and Infrared Spectroscopy

Third Class from Today (13)

Chap 13 : Nuclear Magnetic Resonance Spectroscopy

Test on substitution and elimination on Friday

Competition



$Na^{\oplus}\ {}^{\ominus}OH$

$S_N2/E2$

'cuz strong base

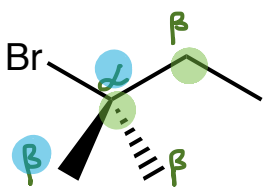
predominant rxn path S_N2

HO

Na Br

1° α-C

S_N2 'cuz 1° α-C



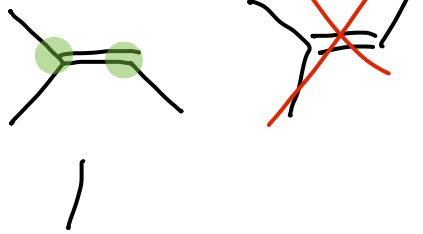
+ $NaOC(CH_3)_3$

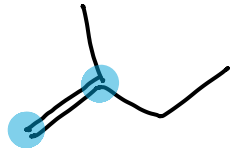
O

S_N2/E_2 'cuz strong base

$Na^{\oplus}\ {}^{\ominus}OC(CH_3)_3$

predominant rxn path E2



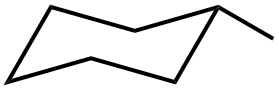


3° α-C

E2 'cuz 3° α-C inaccessible to Nu

big base exception so this is major product

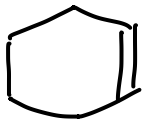
2-methyl-2-butene

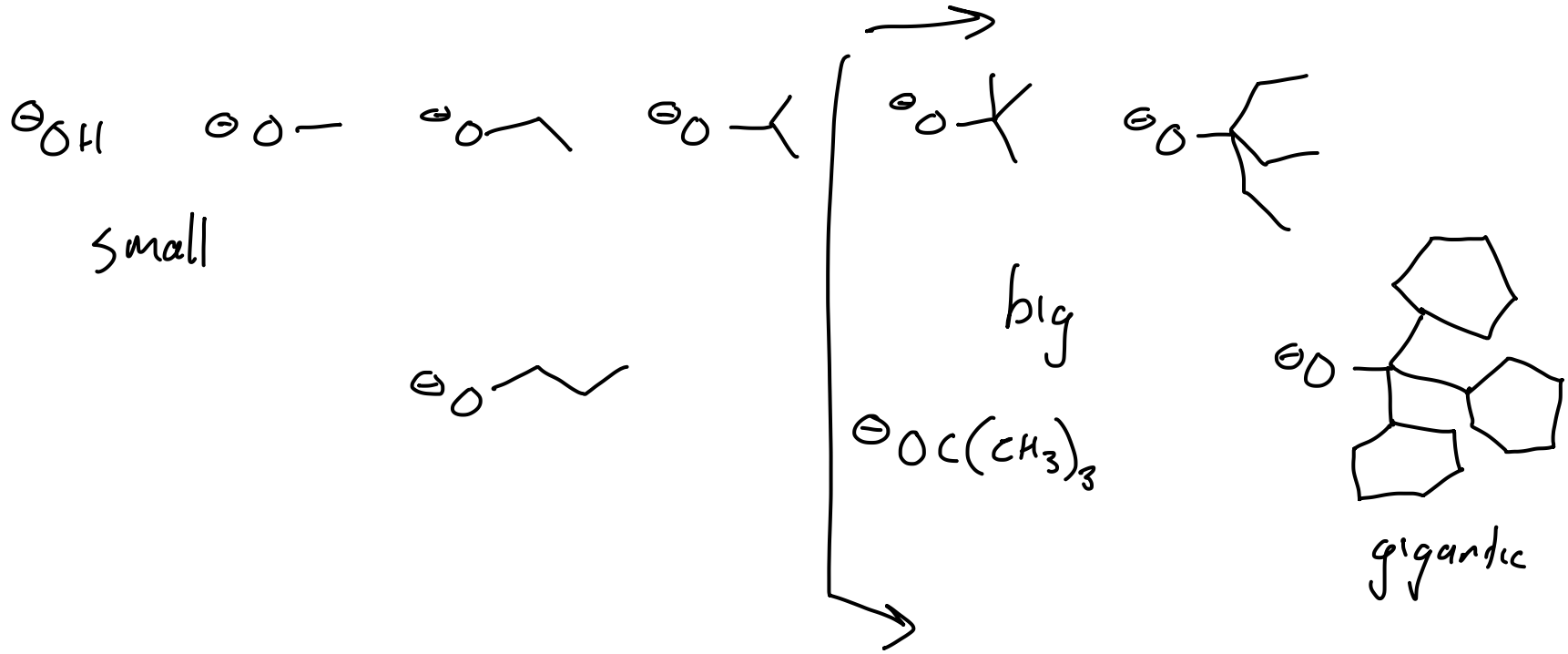


+ NaOH

O

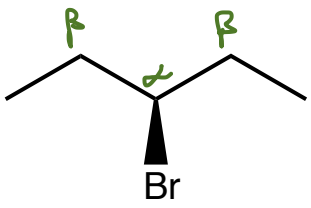
$Na^{\oplus}\ {}^{\ominus}OH$




small
big
gigantic

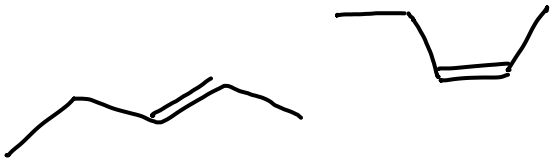
Competition

S_N2 / E2



$Na^{\oplus}\ {}^{\ominus}OH$

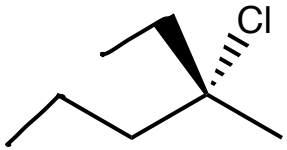
+ NaOH → (EtOH)



major

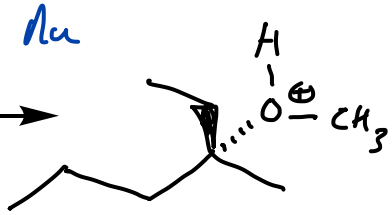
2° α-C so S_N2 + E2 are possible

since $^{\ominus}OH$ is a strong base E2 predominates

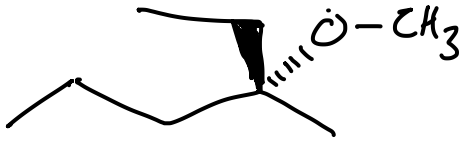


+ CH_3OH → (weak base, weak Nu)

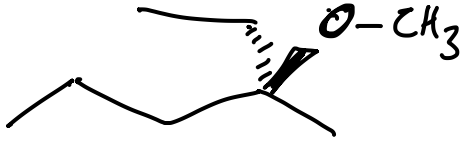
S_N1 / E1



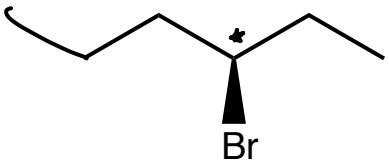
$Cl^{\ominus}$



HCl

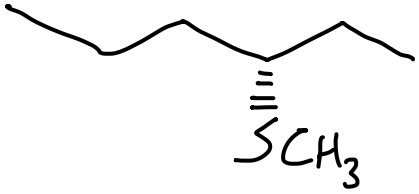


no heat so S_N1 predominates



$Na^{\oplus}\ {}^{\ominus}SCH_3$

+ $NaSCH_3$ → (O)



$Na^{\oplus}\ Br^{\ominus}$

S_N2 / E2

good nucleophile

2 α-C

S_N2 / E2 possible ... not an $RO^{\ominus}$ base so S_N2

CH_3-O-H

$H-O-H$