

(9) Today

Sections 11.7 - 11.11: Elimination Reactions

Section 17.6: Alcohols and Elimination Reactions

Competition between SN1, E1, SN2, and E2

Next Class (10)

Chap 12: Mass Spectrometry and Infrared Spectroscopy

(11) Second Class from Today

Chap 12: Mass Spectrometry and Infrared Spectroscopy

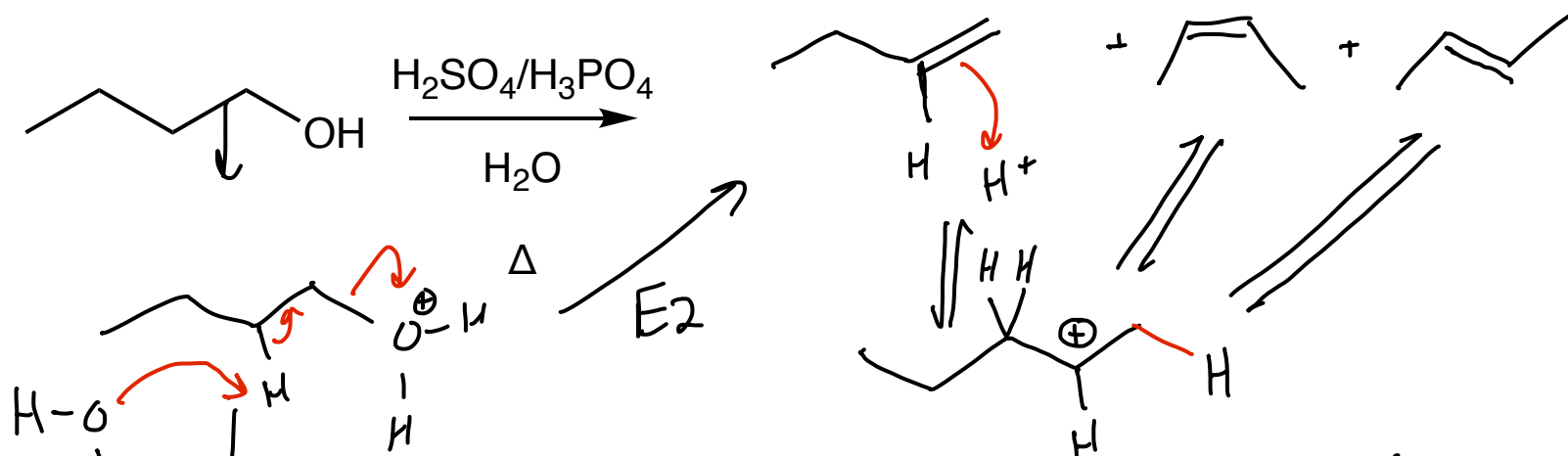
Third Class from Today (12)

Chap 13 : Nuclear Magnetic Resonance Spectroscopy

Test one week from today

Elimination: Issues with Acid Catalyzed Elimination of Alcohols

Sections 11.7 - 11.11 and 17.6



CCCC[OH2+] + H-O-H

CCCC[OH2+]

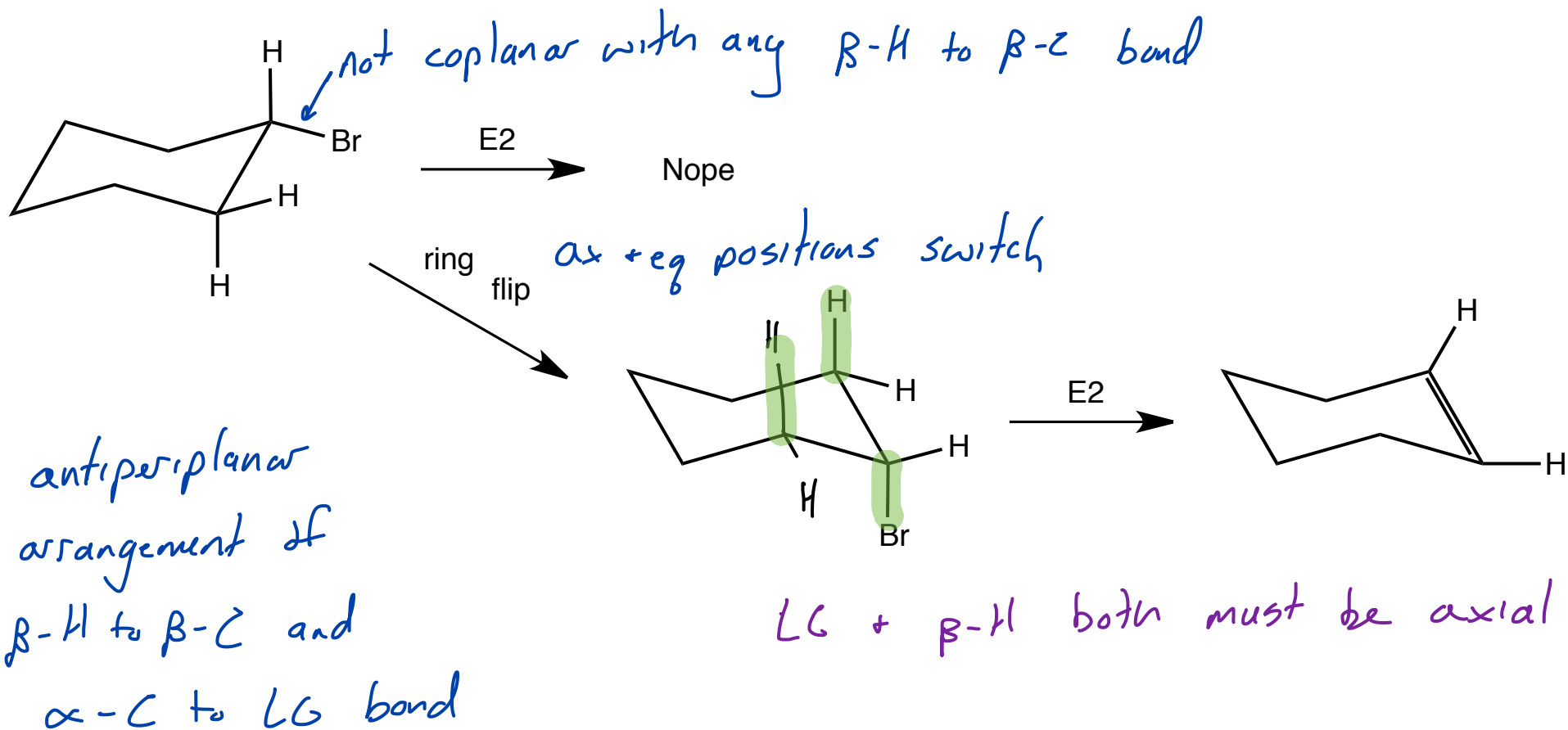
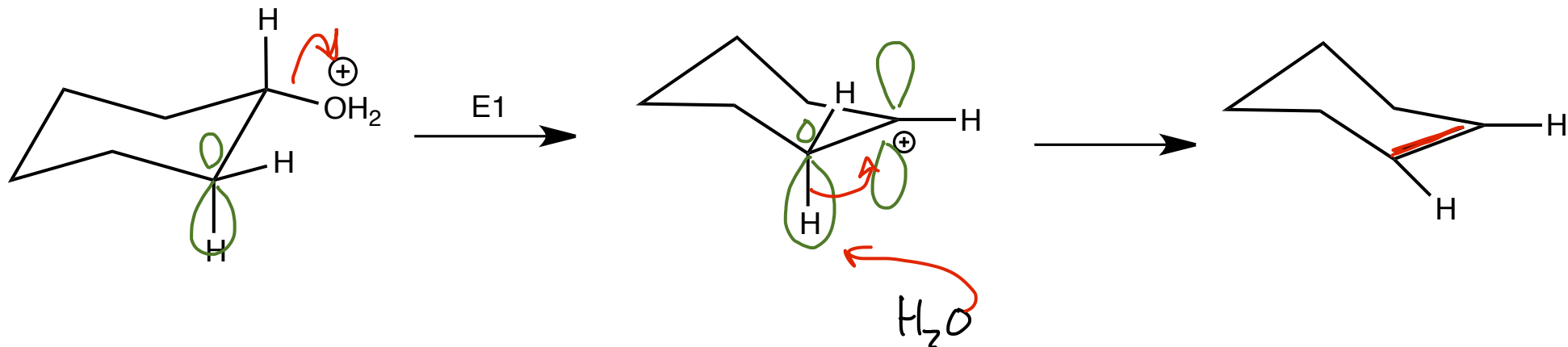
not enough energy in boiling acid to make this form

1. even though no strong base is present, the reaction has to go by E2. That's why this one ~~was~~ don't at the highest temp.
2. other products... 1-butene is in an acid solution, so it can react with the H^+ generate a new C^+ which will undergo an E1 rxn

Alkene that forms reacts to make a C^+ and new alkenes not at the the position of the original $\alpha\text{-C}$

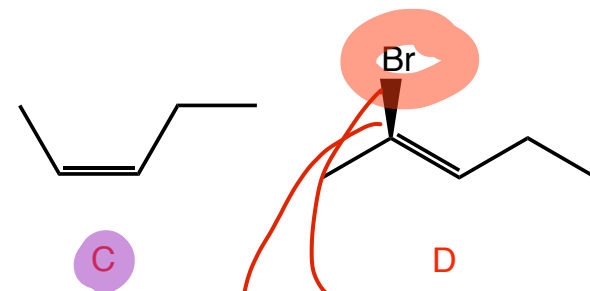
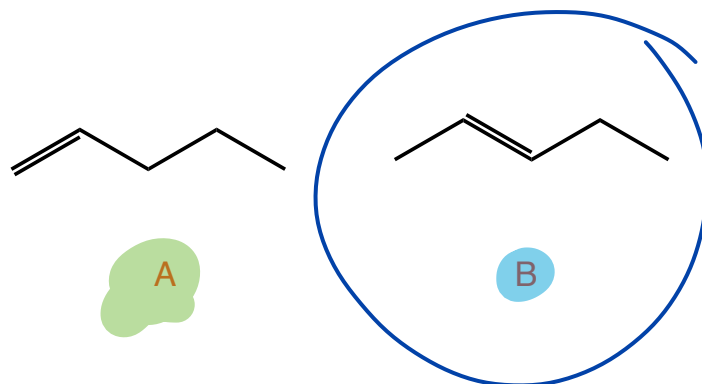
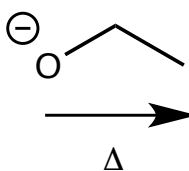
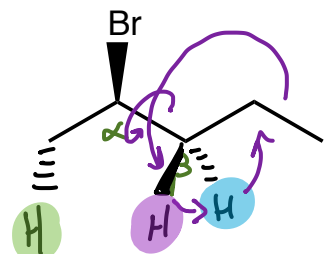
Elimination: The Stereochemistry of the Mechanisms

Sections 11.7 - 11.11, 17.6



Elimination

E2



Mechanism?

Outcome?

What's wrong with the wrong ones?

Major?

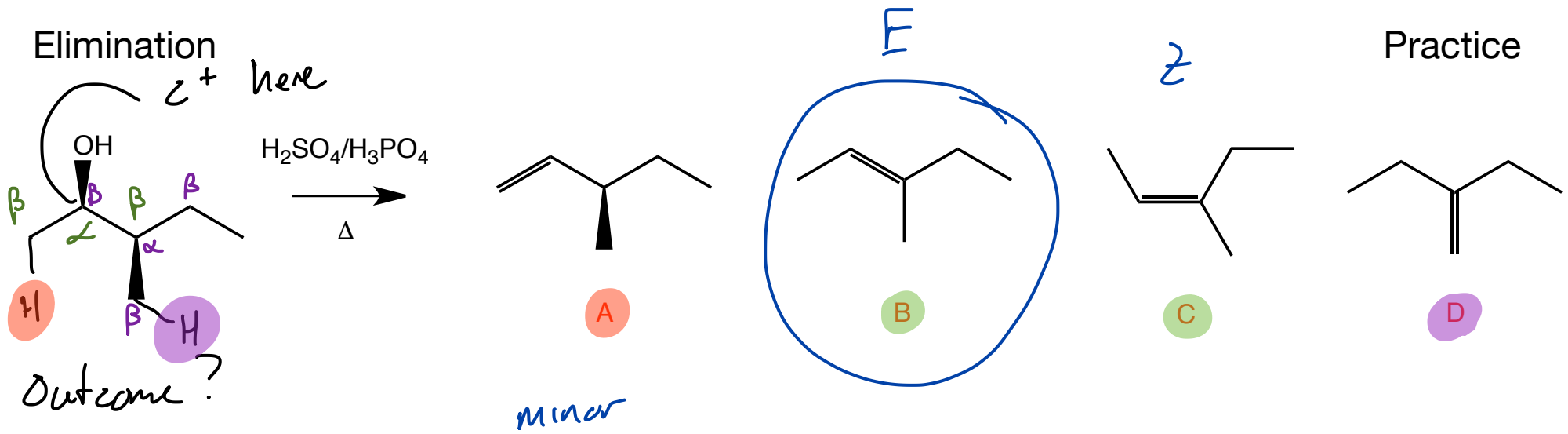
Practice

LG has to leave and it's still here

all bonds connected to sp^2 C's in db must be coplanar

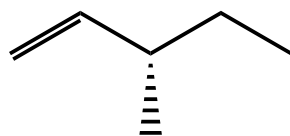
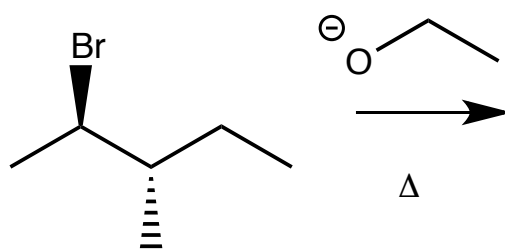
E2 strong base

1. Find α -C
2. Find β -H's
3. Consider mechanism
4. Form $\equiv \alpha$ to β -C

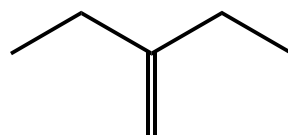


- E1 no strong base
reasonable Z^+
- E2 possibly running at a low level
1. Find α - Z
 2. Find β -H's
 3. Consider mechanism
 4. Form $\neq \alpha$ to β - Z

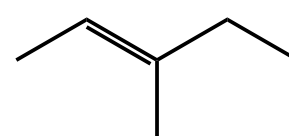
Elimination



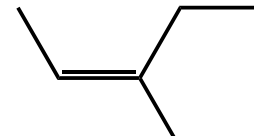
A



B



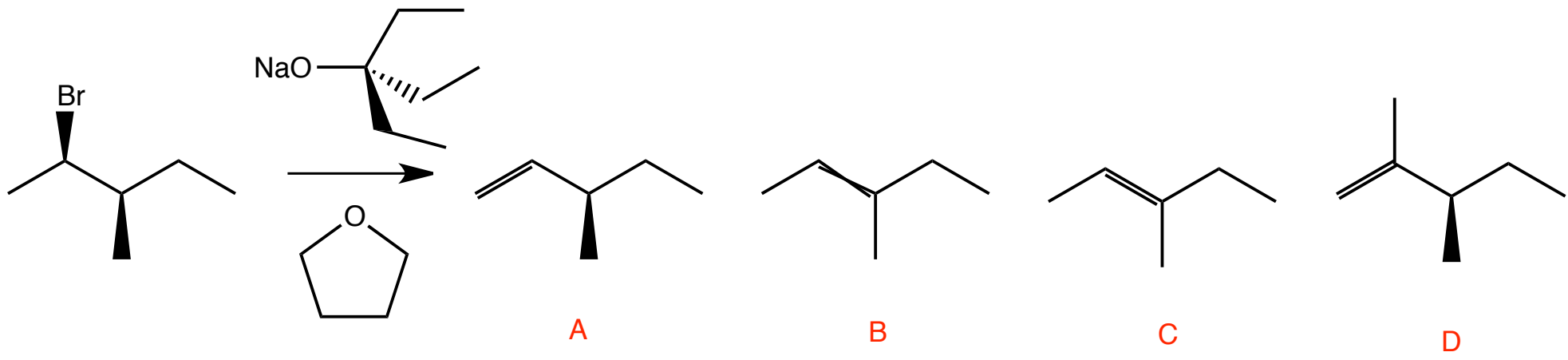
C



D

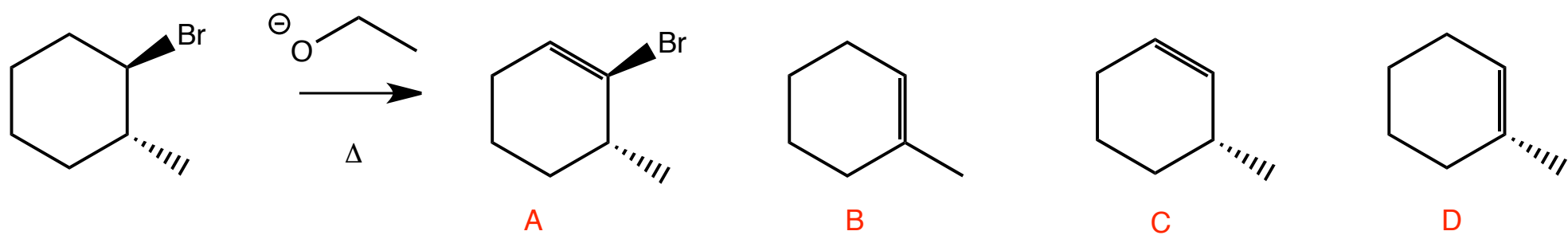
Practice

Elimination

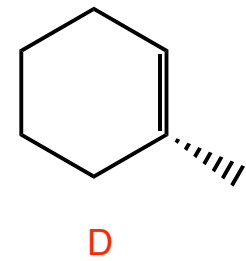


Practice

Elimination



Practice



S_N2/E2

strong bases
good nucleophiles

3° E2 with strong bases
3° NR with anything else

1° S_N2 + E2 possible
| |
cold hot

2° S_N2 E2
weak strong
base base

S_N1/E1

very weak base (H₂O)
very weak nucleophiles (ROH)

run cold / RT S_N1

run hot and weak bases
just remove H⁺ instead
of forming substitution
product

always a little of the one
you don't want

Check for reasonableness
can C⁺ form? * resonance of 2°, 3° ✓

Conjugate Acid	pK _a	Nucleophile
HI	-10	I ⁻
HBr	-9	Br ⁻
HCl	-7	Cl ⁻
CH ₃ OH ₂ ⁺	-2.5	CH ₃ OH
H ₃ O ⁺	-1.7	HOH
HF	3.2	F ⁻
H ₂ S	7.0	HS ⁻
HC≡N	9.1	C≡N ⁻
NH ₄ ⁺	9.4	NH ₃
CH ₃ CH ₂ SH	10.5	CH ₃ CH ₂ S ⁻
CH ₃ OH	15.5	CH ₃ O ⁻
HOH	15.7	HO ⁻
HCCH	25	HCC ⁻

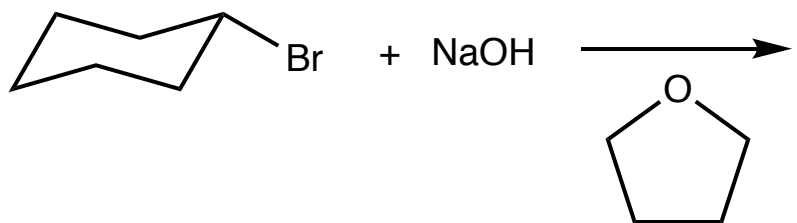
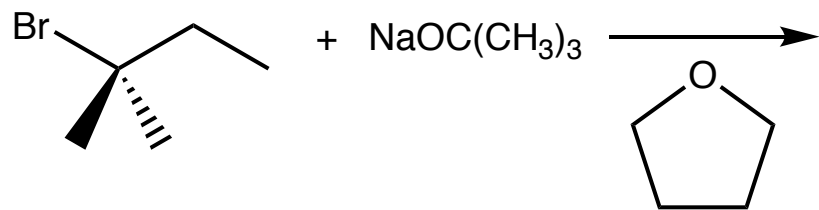
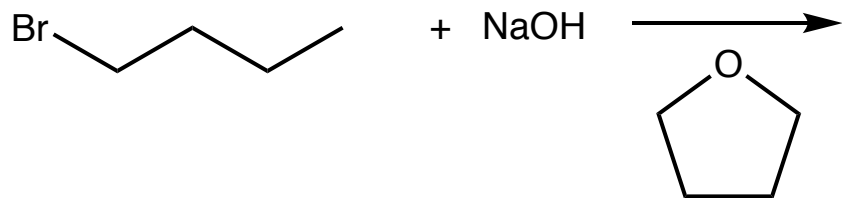
S_N2 on 2° C

pretty
strong
base

E₂ on 2° C

Competition

Section



blank

Section

