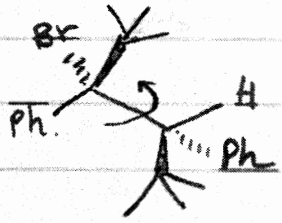
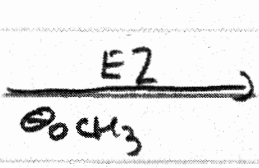
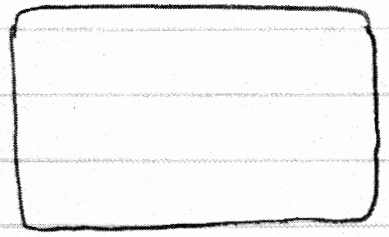
Ch9-10

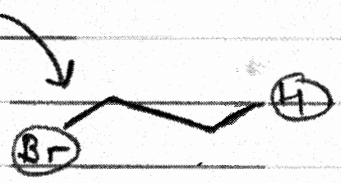
What if drawn as follows, show E2 product





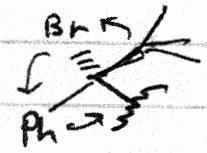


① Need to rotate molecule until H and Br are anti and in same plane Goal



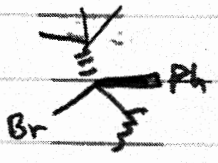
② Add other groups to each C using wedges ◣ and ||||| bonds

original

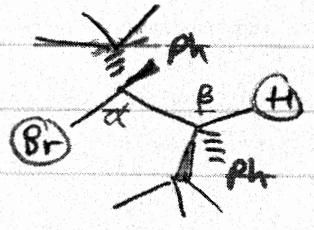


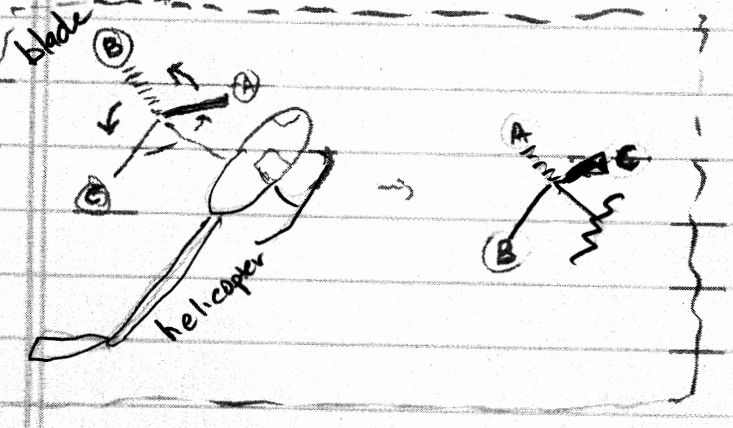
rot 60° CCW

rotated

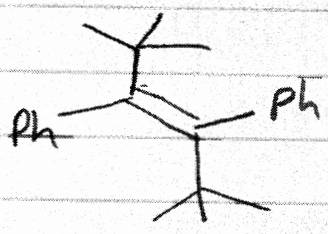


now join to other half





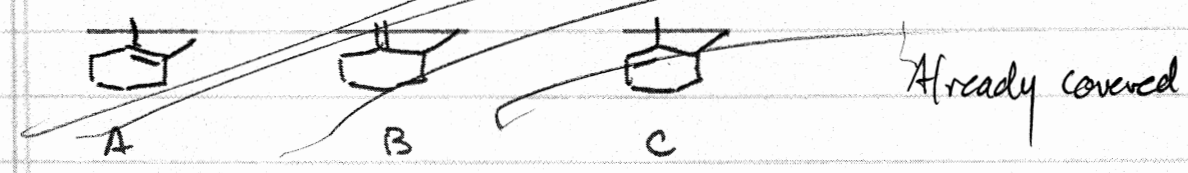
↓ E2 $C_\alpha = C_\beta$



STOP HERE

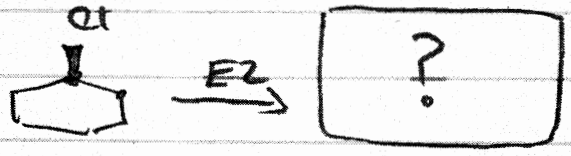
Ch 9-11

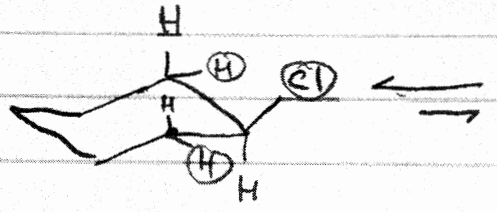
Arrange in order of stability

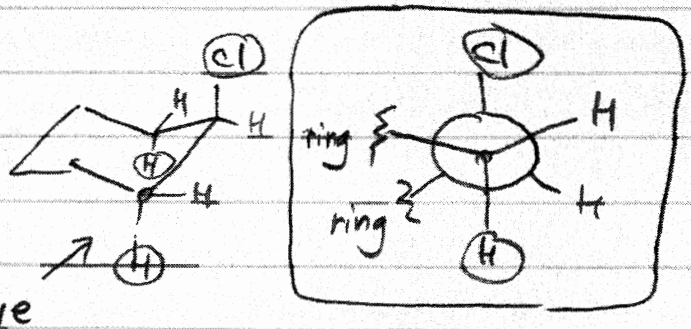


Already covered

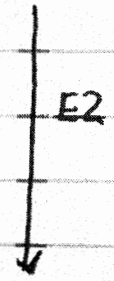
Stereospecificity of E2 rxn w/ substituted Cyclohexanes



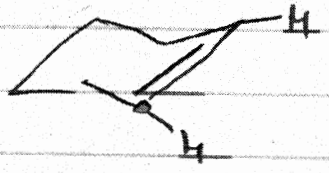




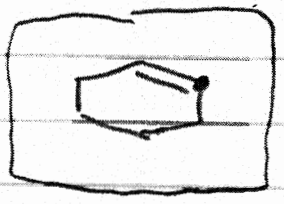
Eye



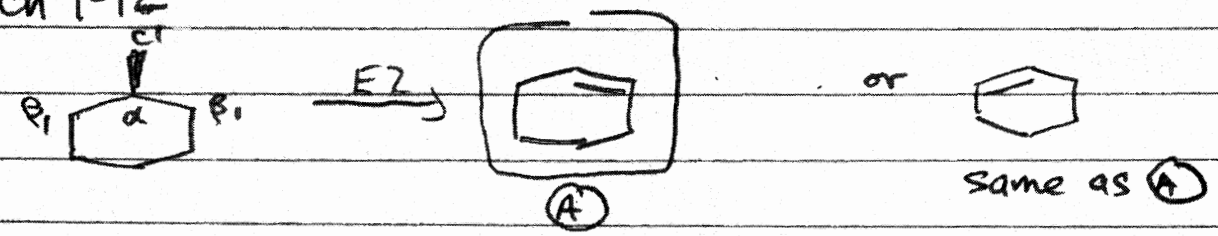
Anti-periplanar arrangement, set for E2! when Cl and H are axial



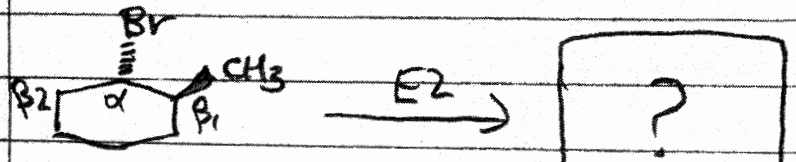
III



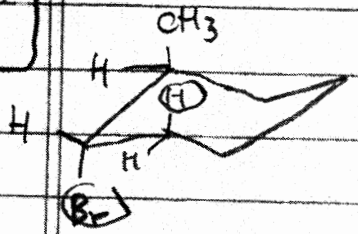
Ch 9-12



(A)



Approach 1



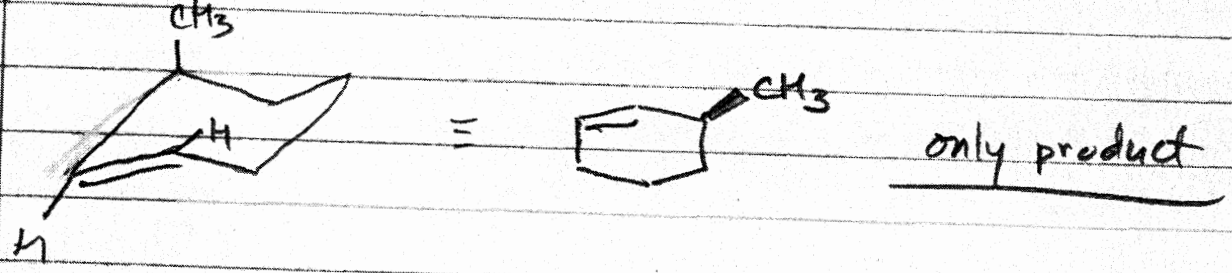
① Choose position on chair where Br (L.g.) is axial down ("down" because that is how it's draw in perspective drawing.

② Determine if β carbons are different (i.e. unique)

③ Determine if β-C have β-H

④ If β-H can it be axial and anti to the Br (or L.g.)?

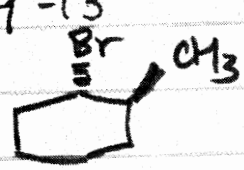
⑤ If anti AND axial E2 can occur there



only product

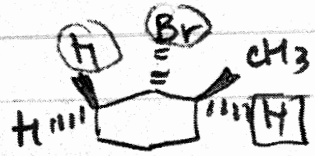
Approach 2

Ch 9 - 13



E2 → ?

① Draw β-H on wedged (▬) or dashed (≡) bond



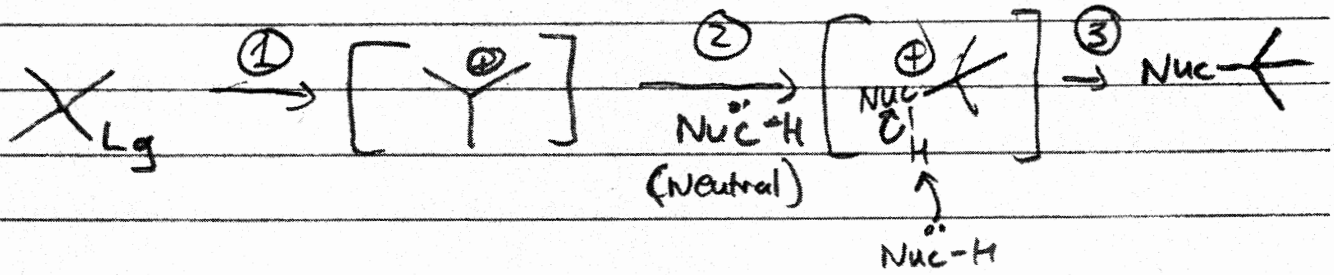
② Note: (Br) and circled (H) are on opposite sides of the ring -- they are "anti"/trans

the (Br) and boxed [H] are on same side of ring -- they are "syn"/cis and ∴ cannot be E2 eliminated

ONLY (Br) and (H) can be eliminated via E2

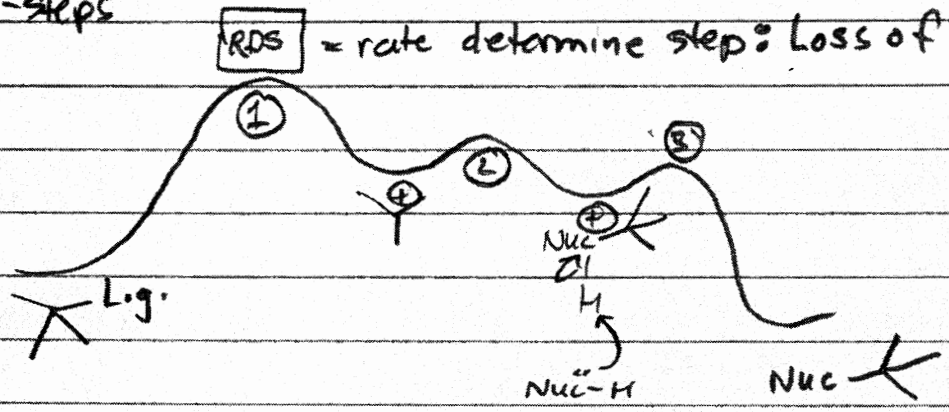
Ch 9 - 14

Sn1 (unimolecular) nucleophilic substitution



3-steps

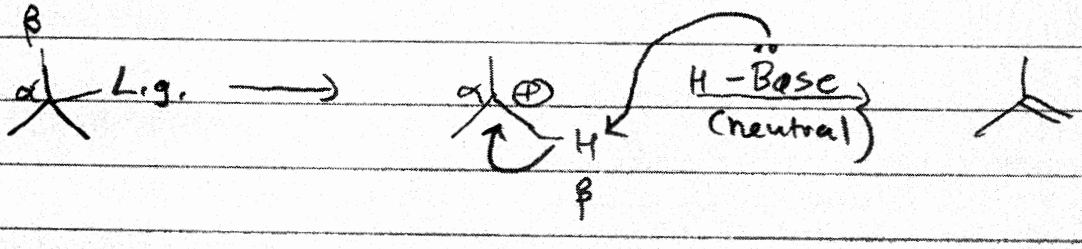
RDS = rate determine step: Loss of L.g.

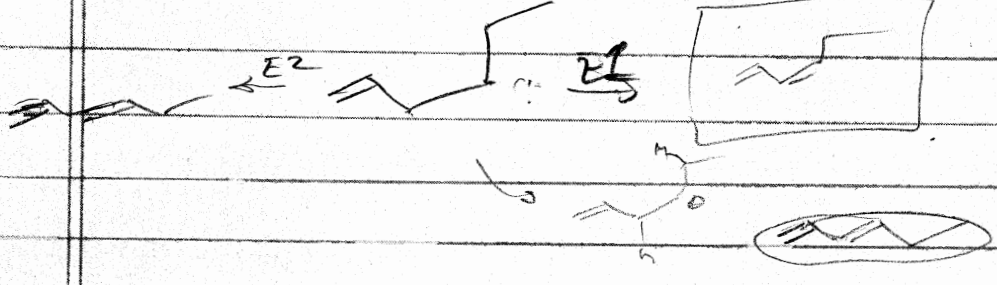


E① is very similar to Sn1 mechanism

(unimolecular)

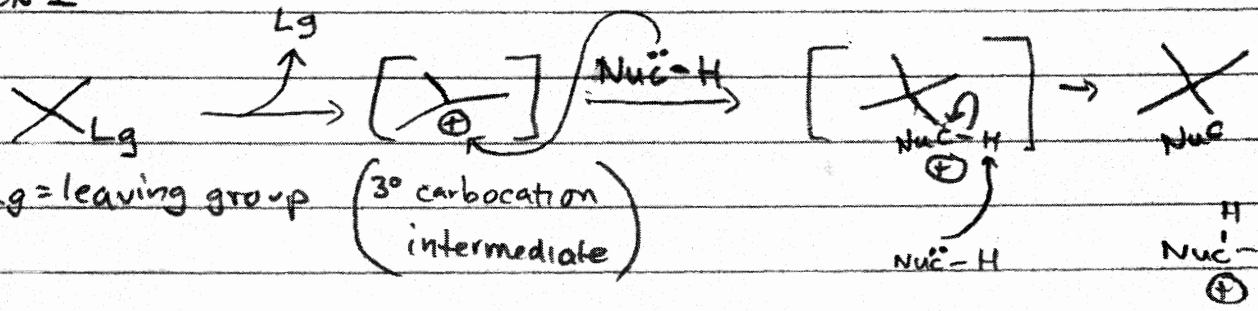
→ Elimination

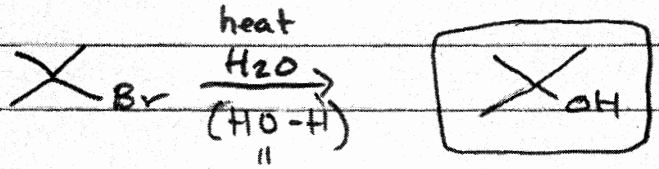




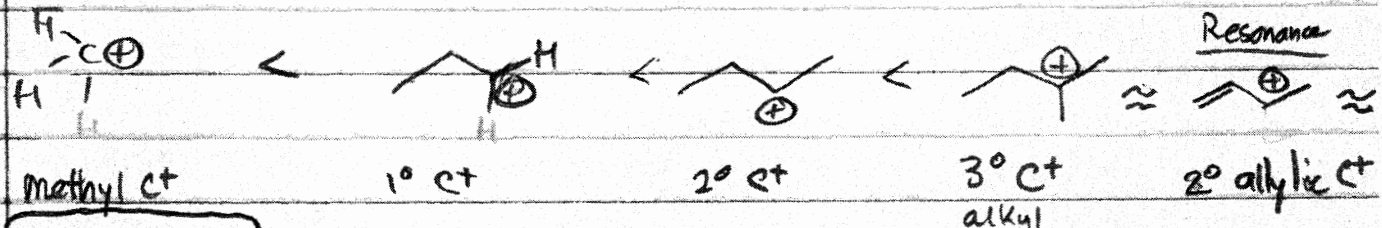
Ch 9 - 15

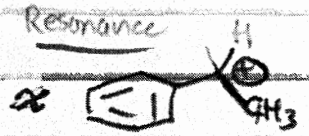
SN1





Carbocation Stability

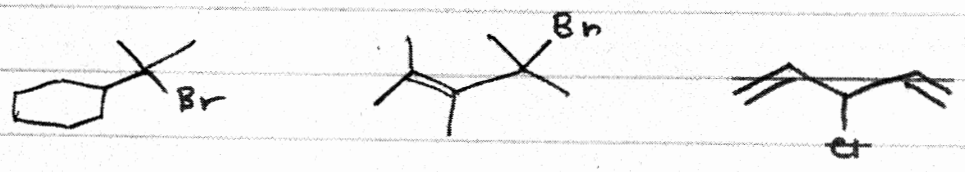




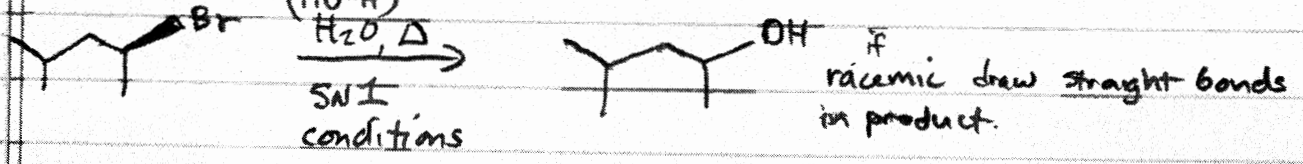
Since SN1 reactions form C+, SN1 rxn rates favor the formation of stable C⊕, such as 3°C⊕, allylic C⊕, benzylic C⊕

Ch 9 - 16

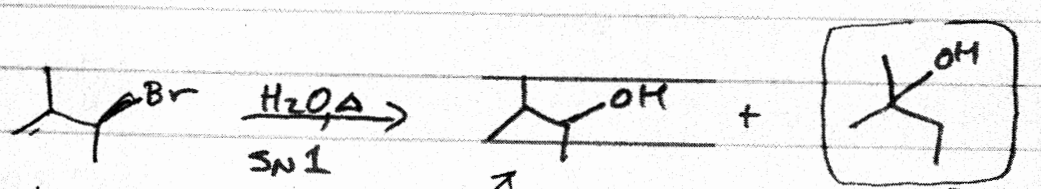
Draw the carbocation made after the L.g. leaves.
If resonance structure stablizes ⊕ charge, draw 1 resonance structure



S_N1 (Nuc-H) (HO-H)



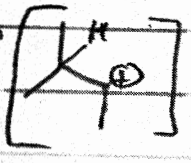
if racemic draw straight bonds in product.



How?

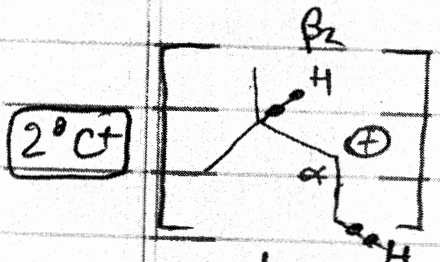
① Draw ⊕ S_N1

Direct HOH attack



② Identify ⊕ substitution

1°, 2°, 3° ?



2° C⊕

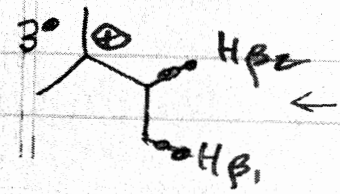
Ⓐ The ⊕ is α C I.D. unique C_β.

Ⓑ Does C_β have a CH_3 or H attached?

Ⓒ Move $:CH_3$ or :H w/ both e⁻ to form new bond where ⊕ is

Ⓓ Is New ⊕ more stable than original ⊕? If yes, migration is possible.

H_{β_2} migrath



3° C⊕ more stable

← results from H_{β_2} migration