Course CHEM 343 Lecturer Gellman

Day Friday 1:20PM Date 11/4/11

Notes Taken By Patrick Total # of Pages 4

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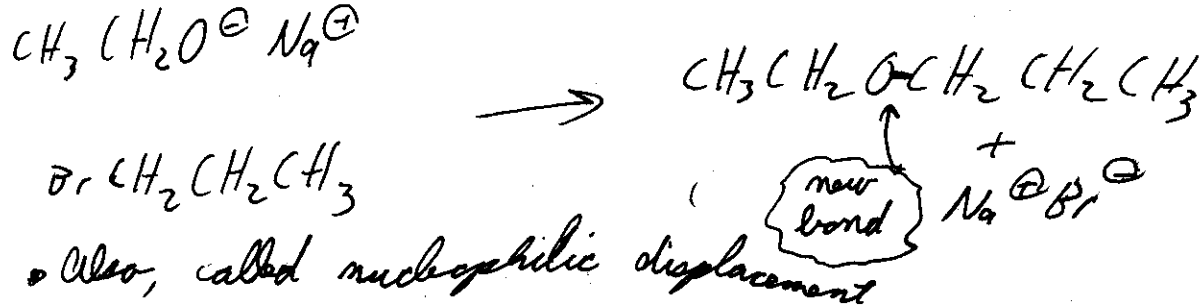
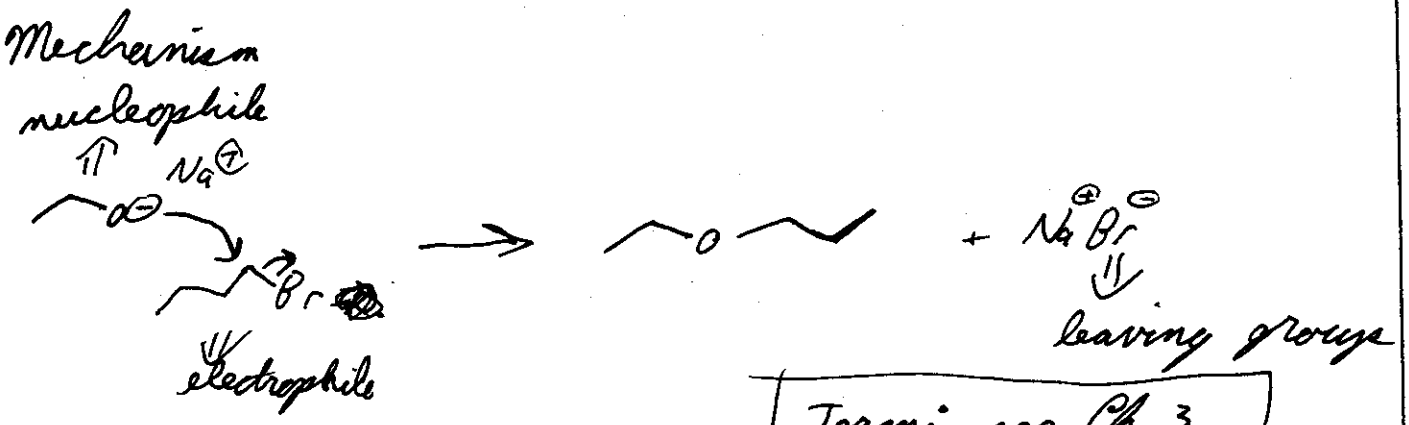
Ch 9 Substitution & Elimination Rxns of alkyl halides

Subst. Rxn Ex:



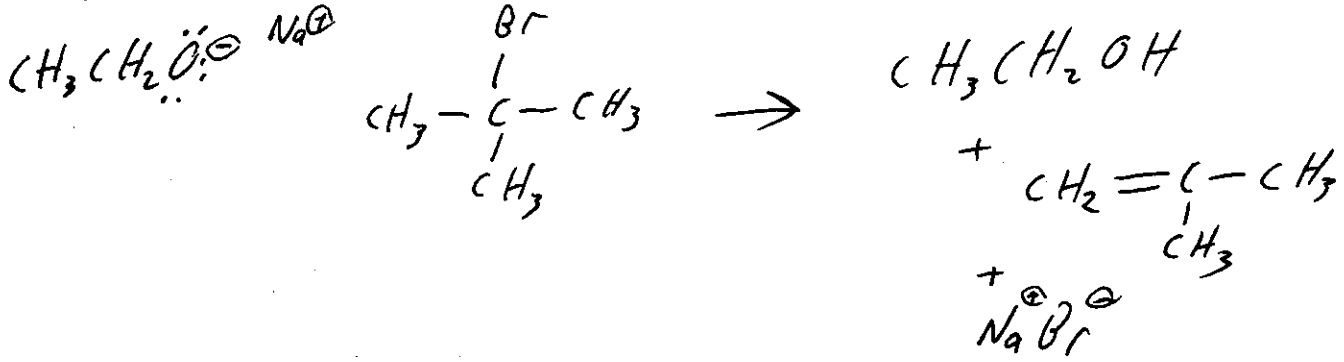
• Also, called nucleophilic displacement

Mechanism



Terms: see Ch 3

Ex of elimination



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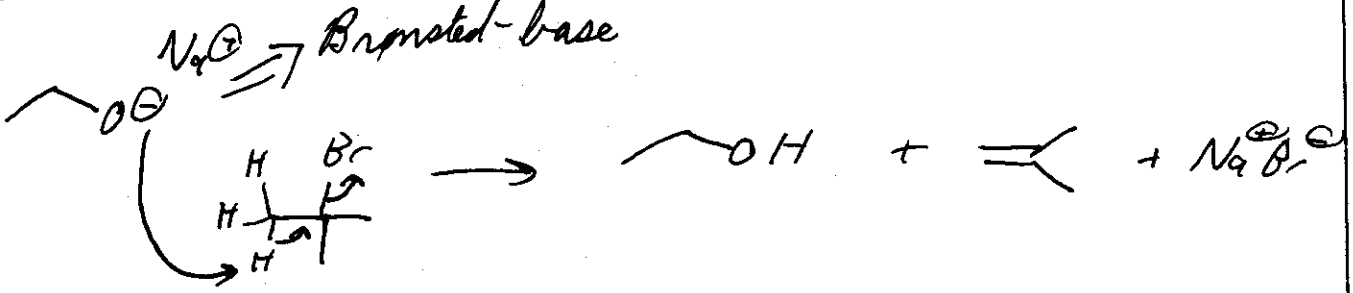
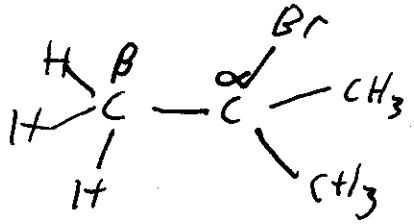
Mechanism:



Different roles possible (Brønsted base in elim or nucleophile in $N_u^{\ominus}$ displacement

Note: "β-elimination" vs "elimination" pp 378-380
to indicate relative position within molecules
key idea: Greek letters



α, β, δ

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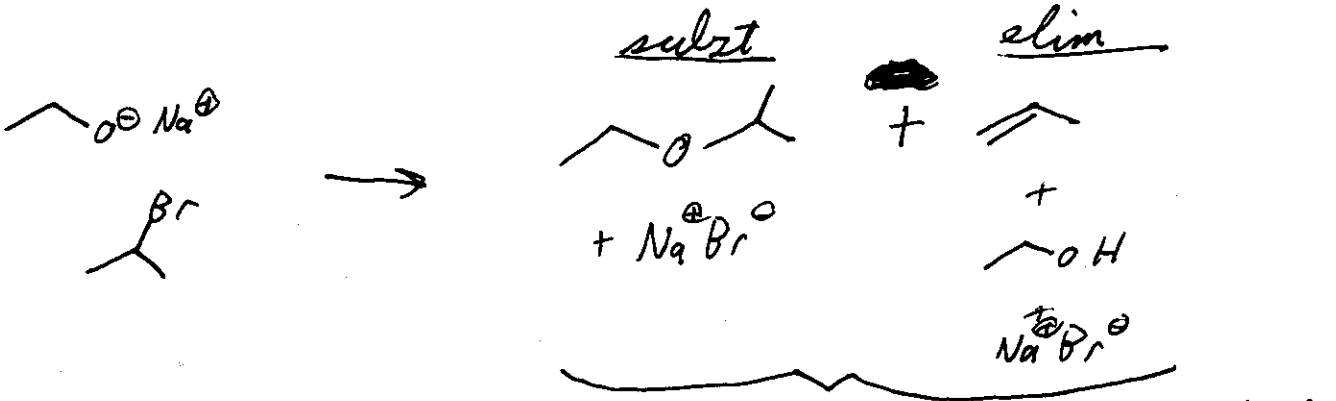
Compare / contrast

- 1° vs 3° → elimination
  ↓
  substitution

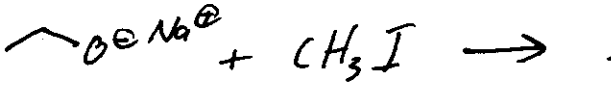
Both processes can occur in some cases (like 2°)



mixture of subst + elim products

Use of Rxn rates to learn about mechanism

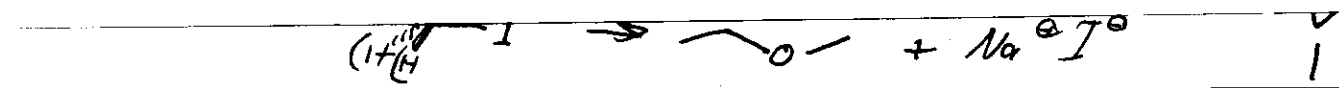
⇒ closer look at substitution



Vary concentrations of reactants → rate law

rxn rate = k [CH3CH2ONa][CH3I]; k = proportionality constant ("rate constant")

- based on this rate law... rxn overall is "second order" (2 molecules used)
- rxn is first order in CH3CH2ONa + first order in CH3I (2nd order)
- This type of rxn refers to S_N2 (Substitution Nucleophilic)
- From the rate law, we can deduce that both CH3CH2ONa + CH3I are involved in the rate determining transition state



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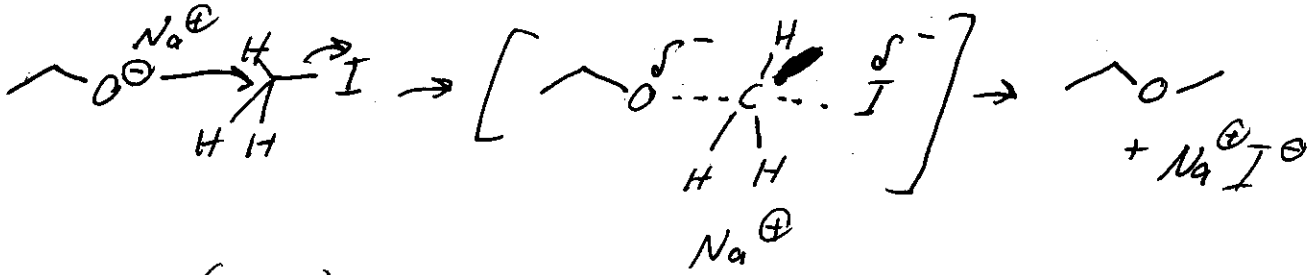
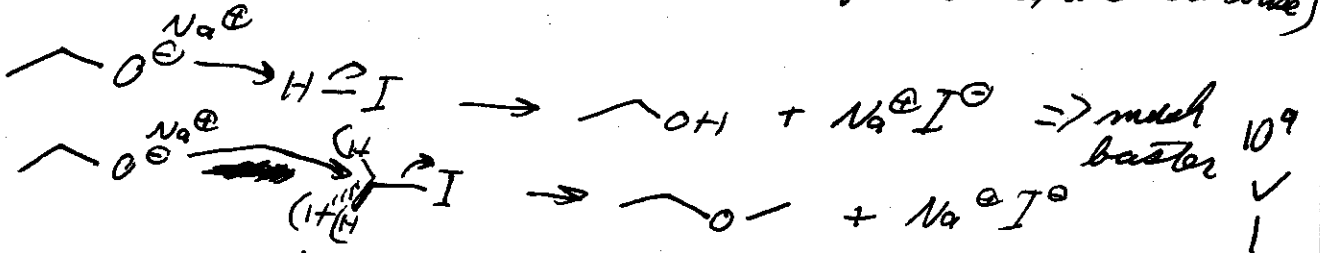
This rate law is consistent w/ the previous mechanism



Recall (Ch 3): analogy between displacement at C ⊖ proton transfer (Bronsted acid-base)



steric hinderance ("H" signifies steric interaction)