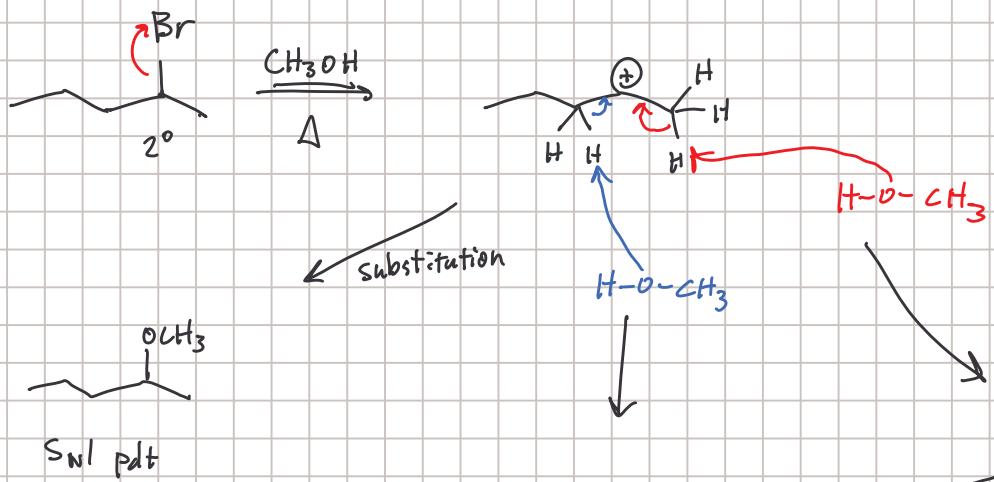
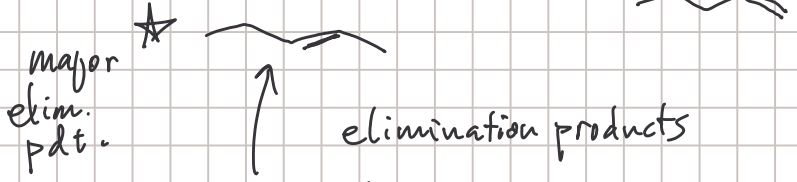
Ch 6

Note Title 11/14/2005

E1 mechanism (Elimination/ 1st order)

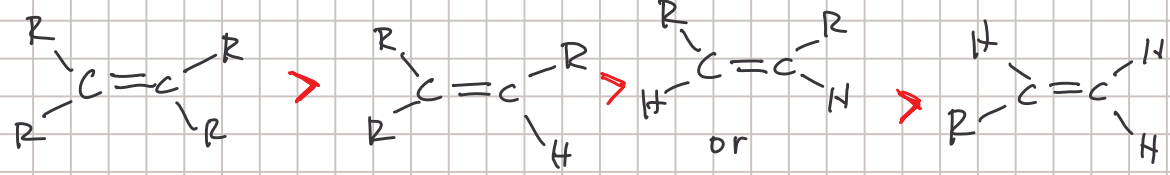


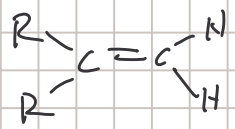


more substituted (disubstituted)

Zaitsev product

tetrasubstituted trisub. disub. monosub.





Zaitsev rule

more-substituted double bonds are more stable

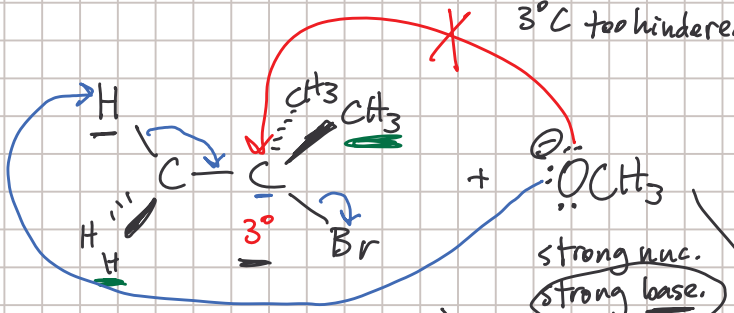
generally 1st-order conditions (weak nucleophile/base
(ionizing force - Δ $AgNO_3$

mix of S_N1 & E1 pdts.

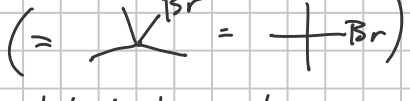
E2 mechanism

2nd-order elimination

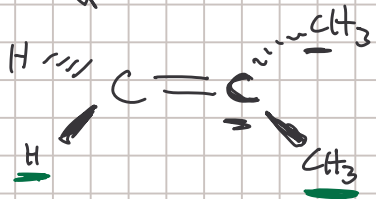
3° C too hindered for S_N2- attack



a concerted mechanism (like S_N2)



t-butyl bromide



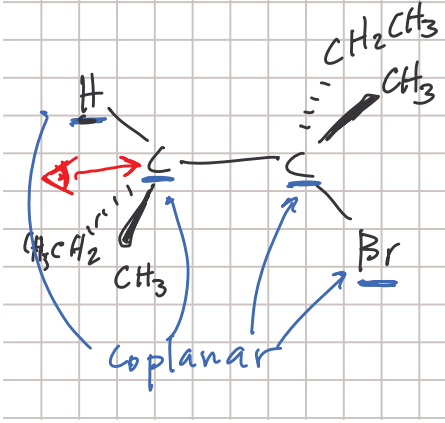
E2 mechanism simultaneously:

1. strong base attacks H adj. to L.G.
2. C-H e⁻'s become C=C electrons
3. leaving group is pushed out

- Substrate: 3° > 2° > 1° alkyl halides
  (b/c of product stability)

- Zaitsev product usu. predominates (most-substituted double bond is most stable)

- **Stereochemistry of E2** Concerted mechanism has specific stereochemical/conformational requirements



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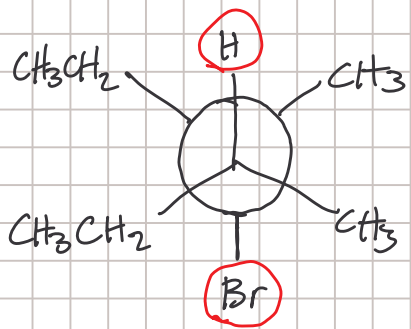
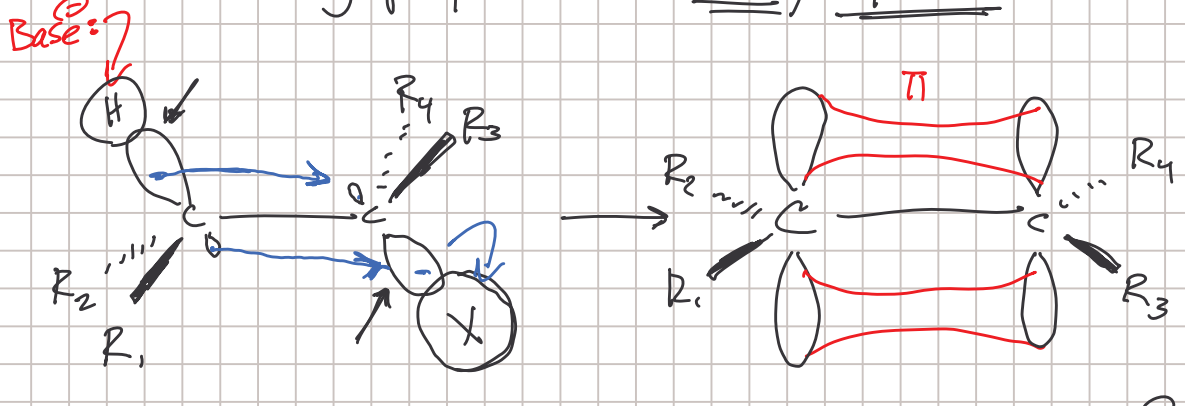


Newman projection

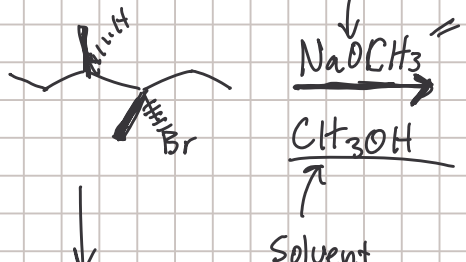
anti conformation of H & Br

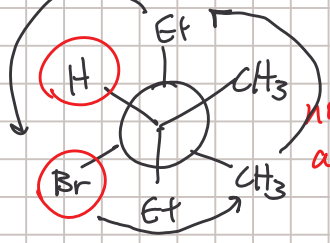
→ H ⊕ leaving group must be anti / coplanar



C-H & C-X bonds
are anti-coplanar

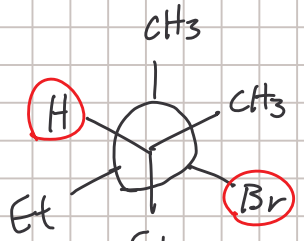
nuc/base = strong base = 2nd order



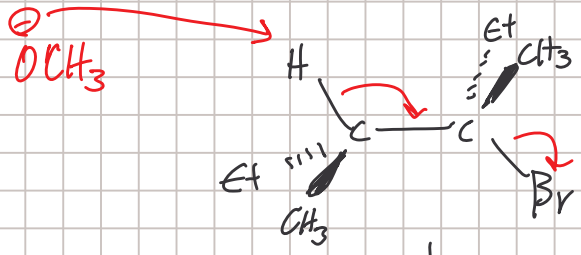


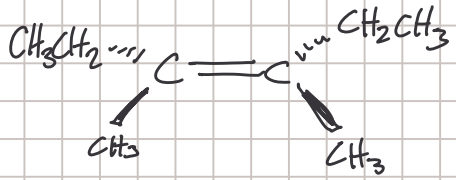
not anti-coplanar as drawn

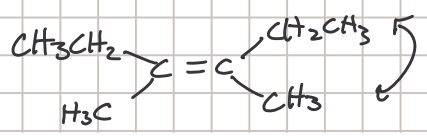
rotate →

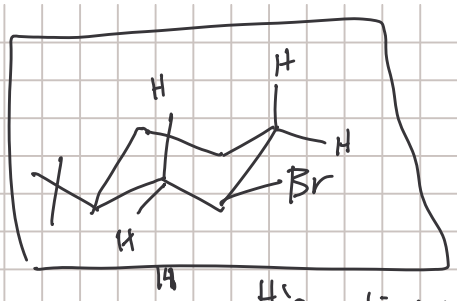


anti-coplanar!



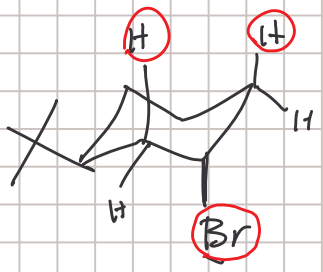


E2 product → = 

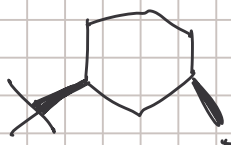


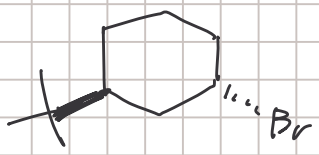
H's anti-coplanar to Br?

vs



2 anti-coplanar H's





$CH_3CH_2O^{\ominus}$

$CH_3CH_2O^{\ominus}$

which reacts faster by E2?