Ch 6

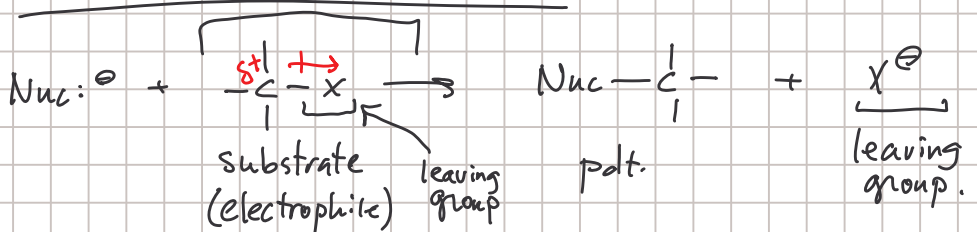
Note Title 11/4/2005

Exam 3 Monday Ch 12-13, 6

Skip sections: 12-15-BH(, 13-10, 13-12, 13-13

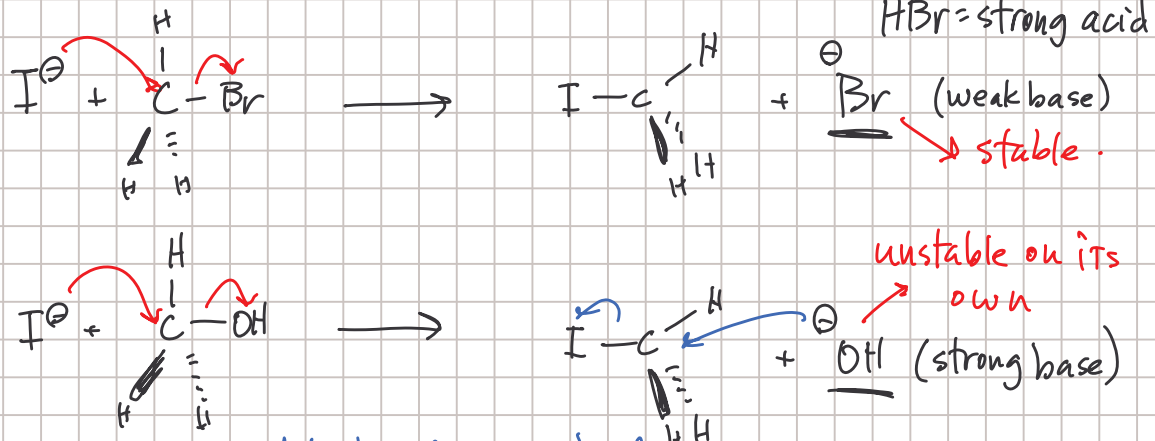
do 6-1 — 6-12

Reactivity of substrate



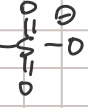
leaving group S_N2 requires a good leaving group

1. must be e⁻ withdrawing (makes C electrophile)
   halogen, O, N, S good electron-withdrawers
2. L.G. must be stable after it has left

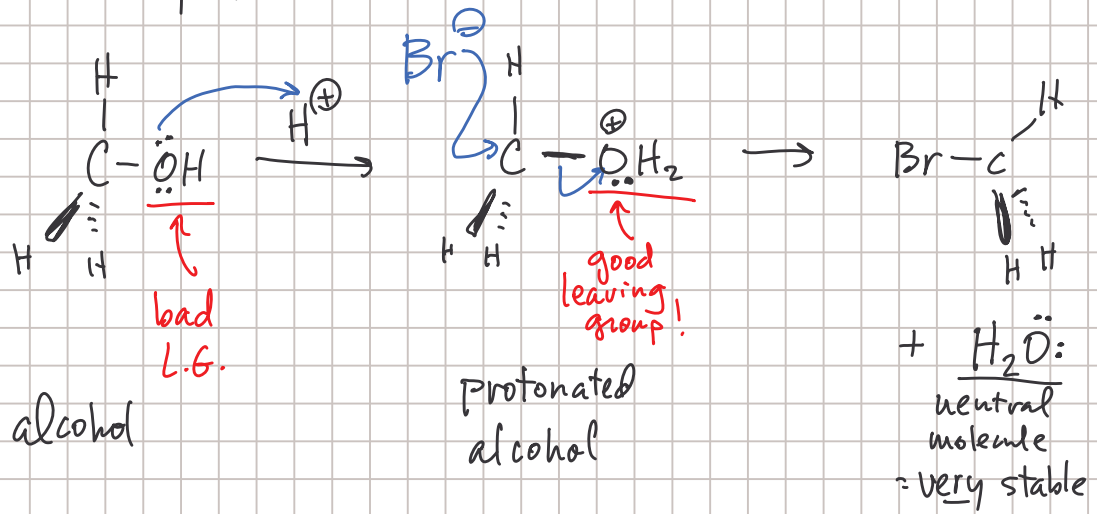


★ hydroxide is a bad leaving group

conjugates of strong acids make best leaving groups

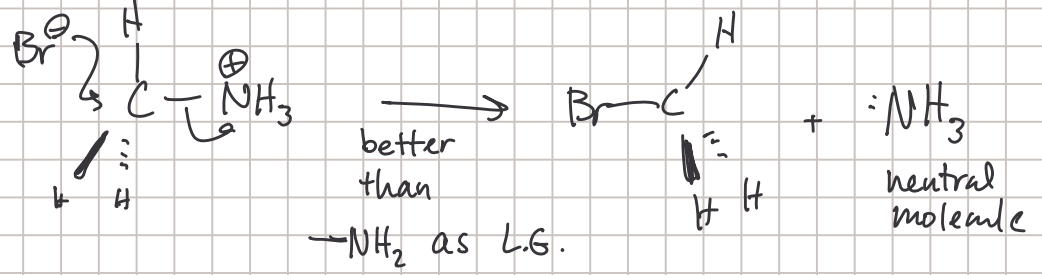
$Br^⊖$, $I^⊖$, $Cl^⊖$, 

3. neutral molecules are even better leaving groups!



$CH_3OH + NaBr \rightarrow$ No Reaction

$CH_3OH + HBr \rightarrow CH_3Br + H_2O$

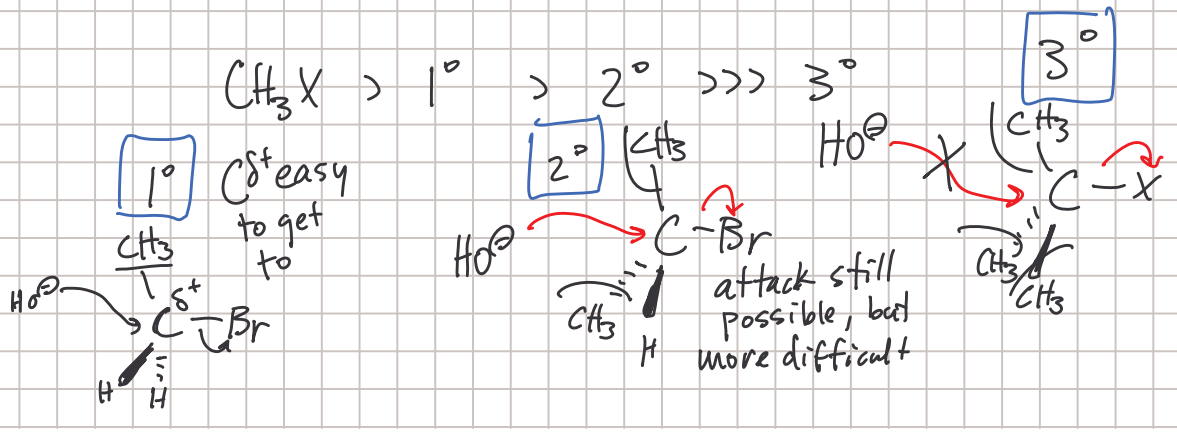


Steric effects of substrate

for S_N2 reaction on alkyl halide

rate of reaction fastest for CH_3X

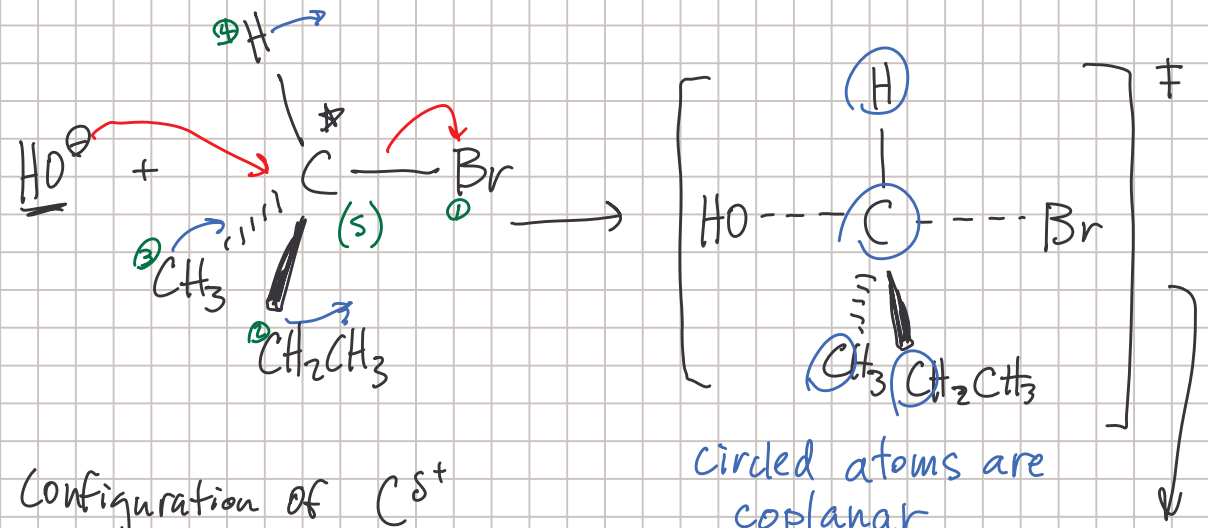
$CH_3X > 1^\circ > 2^\circ >>> 3^\circ$



for 3° alkyl halide, nucleophilic attack is impossible because $C^{\delta+}$ is too crowded.

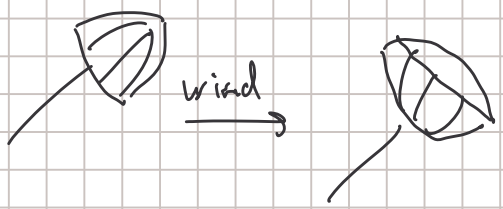
★ S_N2 on 3° alkyl halide is impossible!

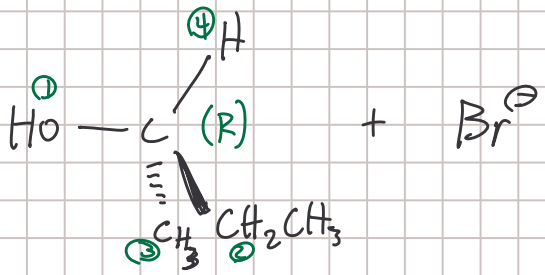
Stereochemistry of S_N2 reaction

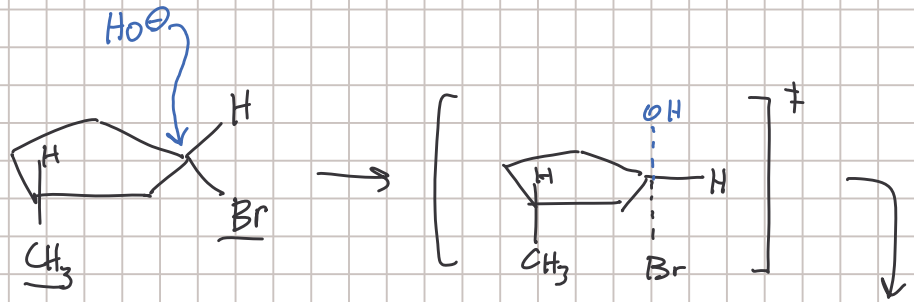


circled atoms are coplanar

Configuration of $C^{\delta+}$ has been inverted

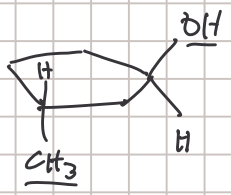




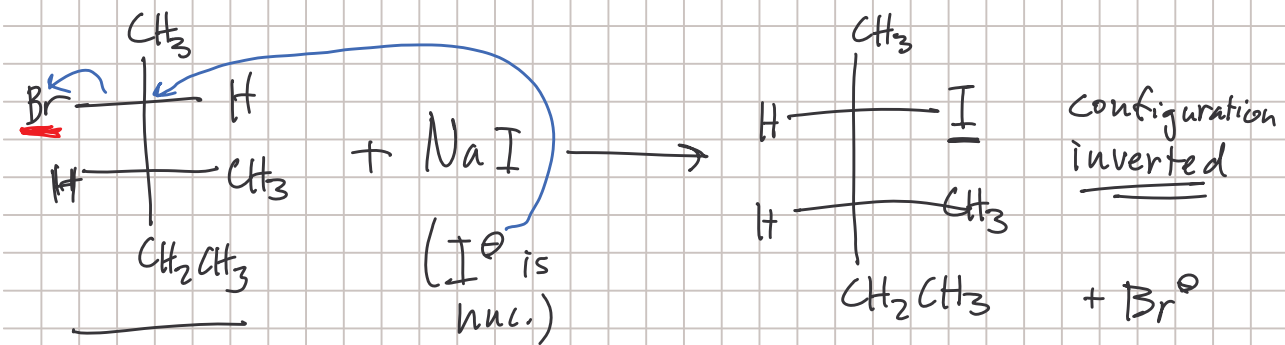


CH_3 & Br are cis on ring

planar transition state



OH & CH_3 are trans on ring

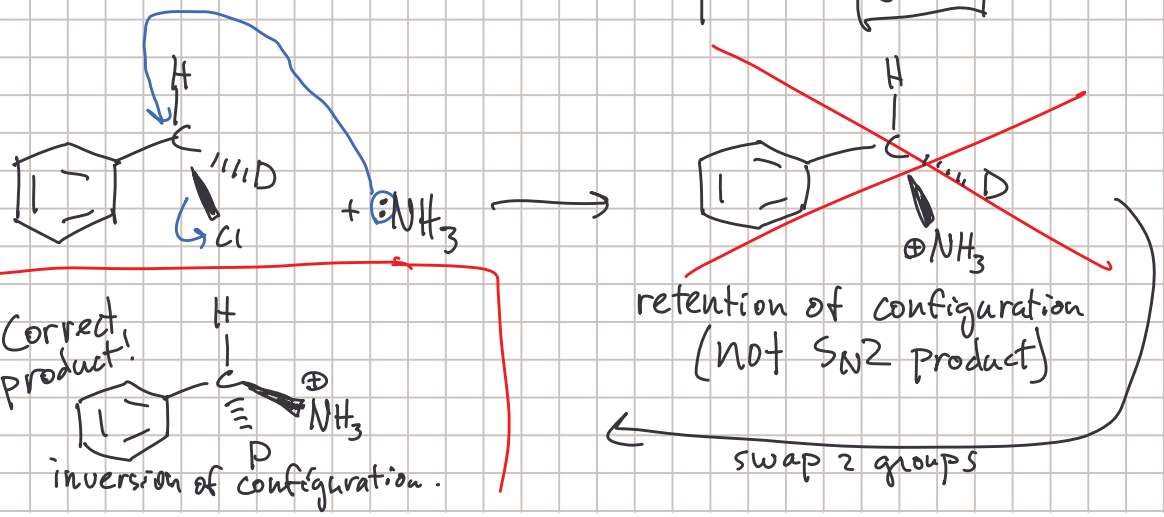


configuration inverted

R & S are only names

it's possible for configuration to be inverted without the R/S letter changing

problem 6-21 in book



S_N2

- nucleophilic
- 2nd-order

- strong nuc.
- good leaving group
- uncrowded $C^{\delta+}$
- stereochemistry is inverted