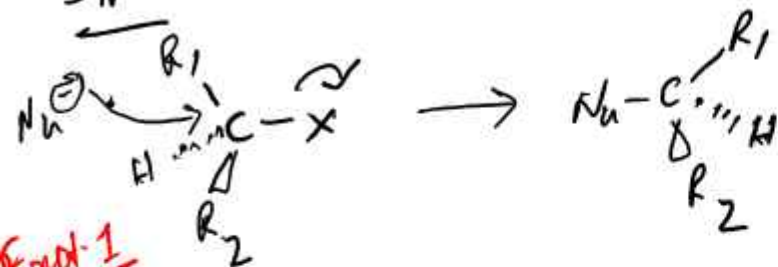


Stereochemistry of substitution reactions

S_N2 - backside attack - Walden inversion $\leftarrow \rightarrow \rightleftharpoons$



Rate of racemization
 $= 2 \times$ rate of substitution

Expt. 2

(p-TsCl)

CC1=CC=C(C=C1)S(=O)(=O)Cl

R1[C@H](R2)OH

$\rightarrow$

R1[C@H](R2)OS(=O)(=O)c1ccc(C)cc1

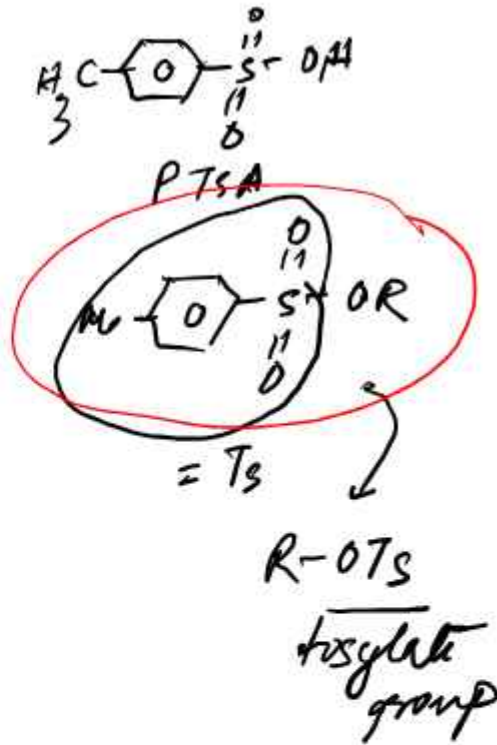
$\xrightarrow{\text{CH}_3\text{COO}^-\text{Na}^+}$ $\text{S}_\text{N}2$

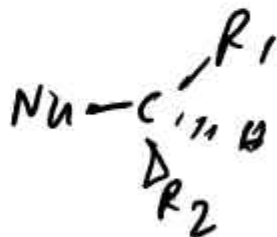
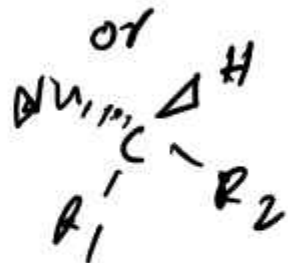
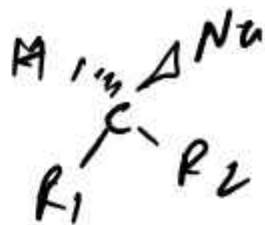
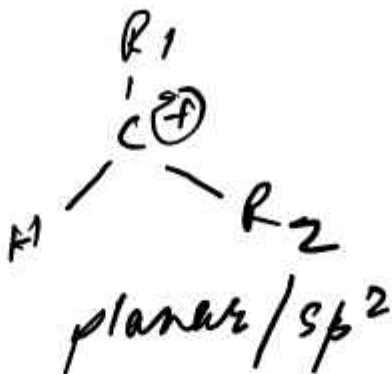
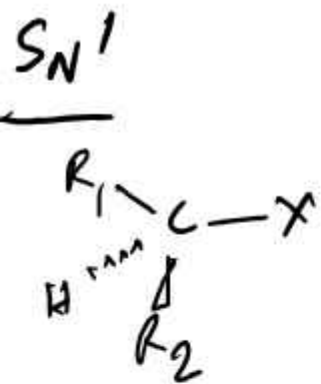
CC(=O)OC(R1)[C@H](R2)O

$\xrightarrow{\text{H}_3\text{O}^+}$ (hydrolysis)

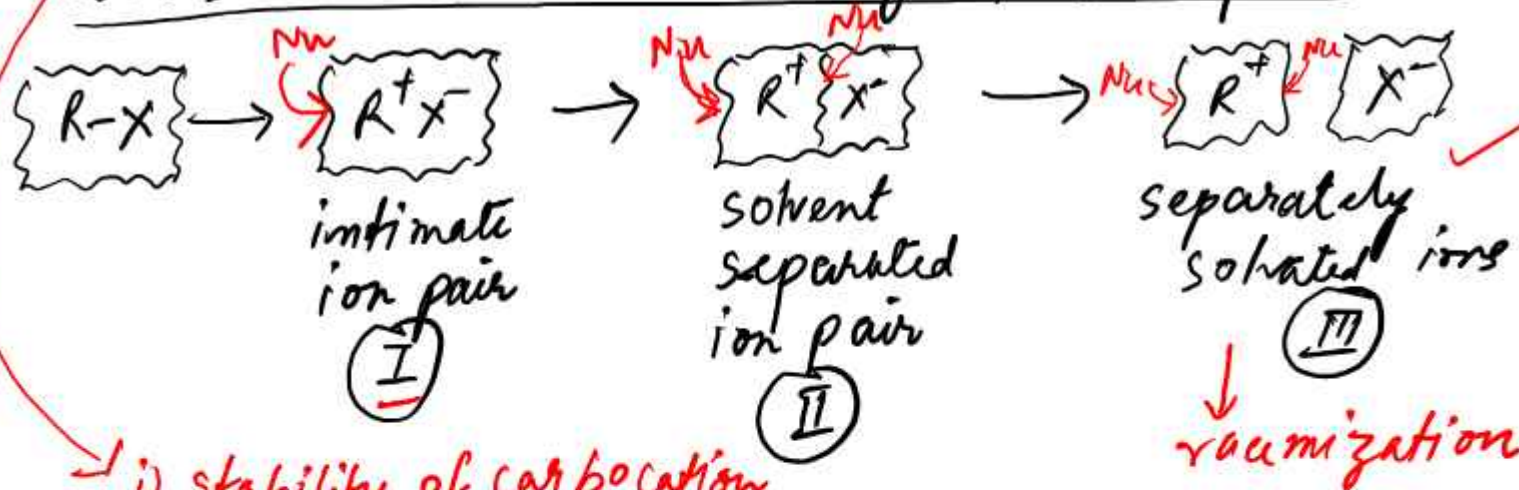
CC(=O)O

OC(R1)[C@H](R2)O





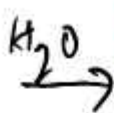
Factors on which stereochemistry of S_N1 depends -



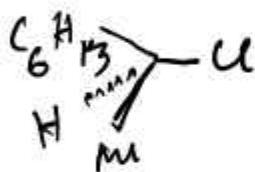
- i) stability of carbocation
- ii) strength of Nu
- iii) leaving group

Examples

①

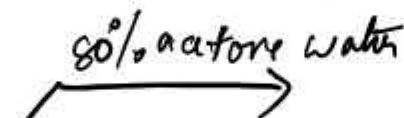


Solvolysis
↓
Solvent = Me
→ 98% racemization

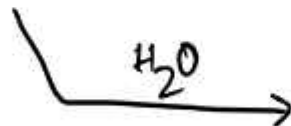


→ 34% "

②



98% racemization



80% "

ii) R-X

