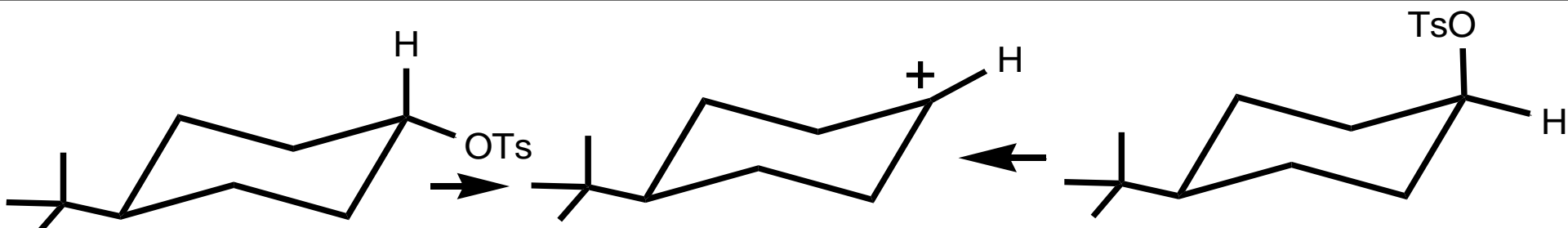


Nucleophilic substitution reaction

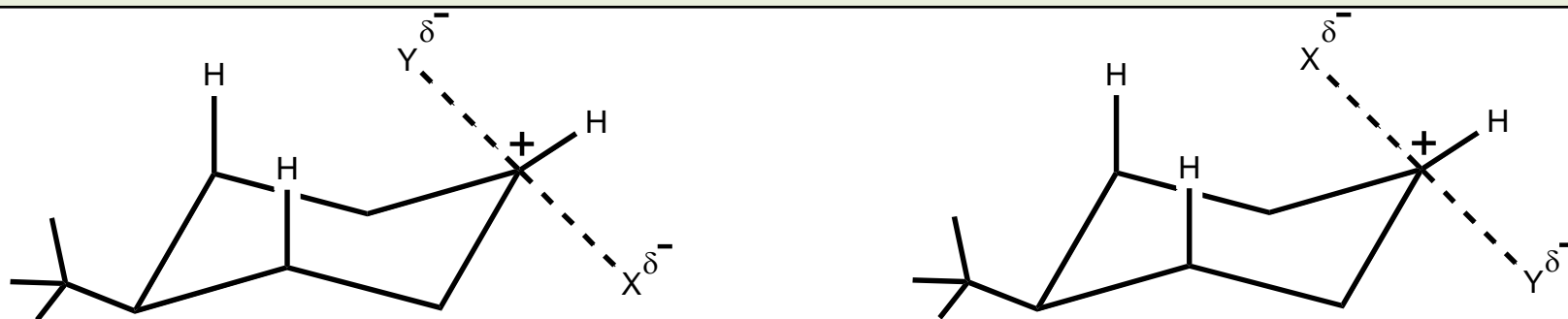
S_N1

Solvolysis (acetolysis, formolysis and ethanolysis) of the 4-t-butylcyclohexyl tosylates gives a ratio of k_{cis}/k_{trans} varying from 4.0 to 2.3 which corresponds to a free energy difference of 2.6-3.4 kJ/mole



S_N2

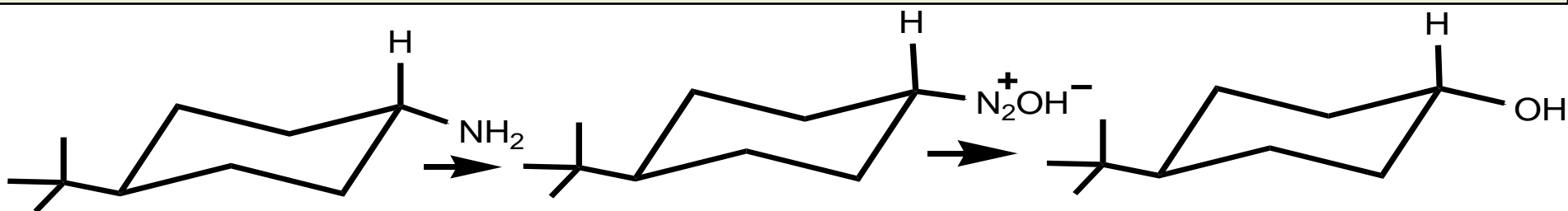
For 4-t-butylcyclohexyl bromides, the cis isomer reacts about 60 times faster than the trans isomer with sodium thiophenate ($Y = PhS^-$) in aqueous ethanol. Replacement of I by I* will be dictated by difference in ground state free energy of the reactants.



Nucleophilic substitution reaction

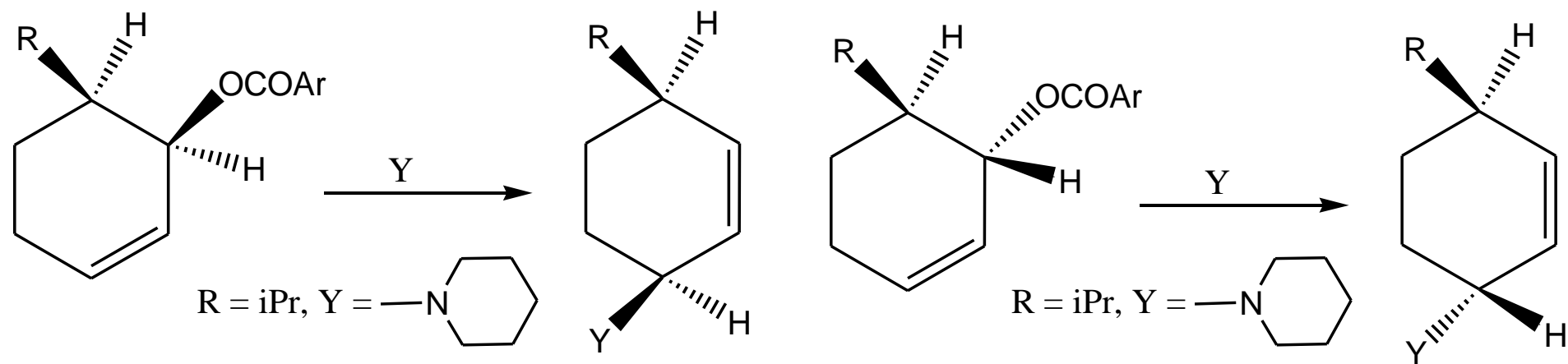
S_Ni

Mentylamine (e-NH₂) gives menthol (e-OH), carvomethylamine (e-NH₂) gives carvomethylol (e-OH) in high yield. Reaction of axial amino groups give a mixture of olefins, axial alcohols and equatorial alcohols, hence do not involve any single mechanism.



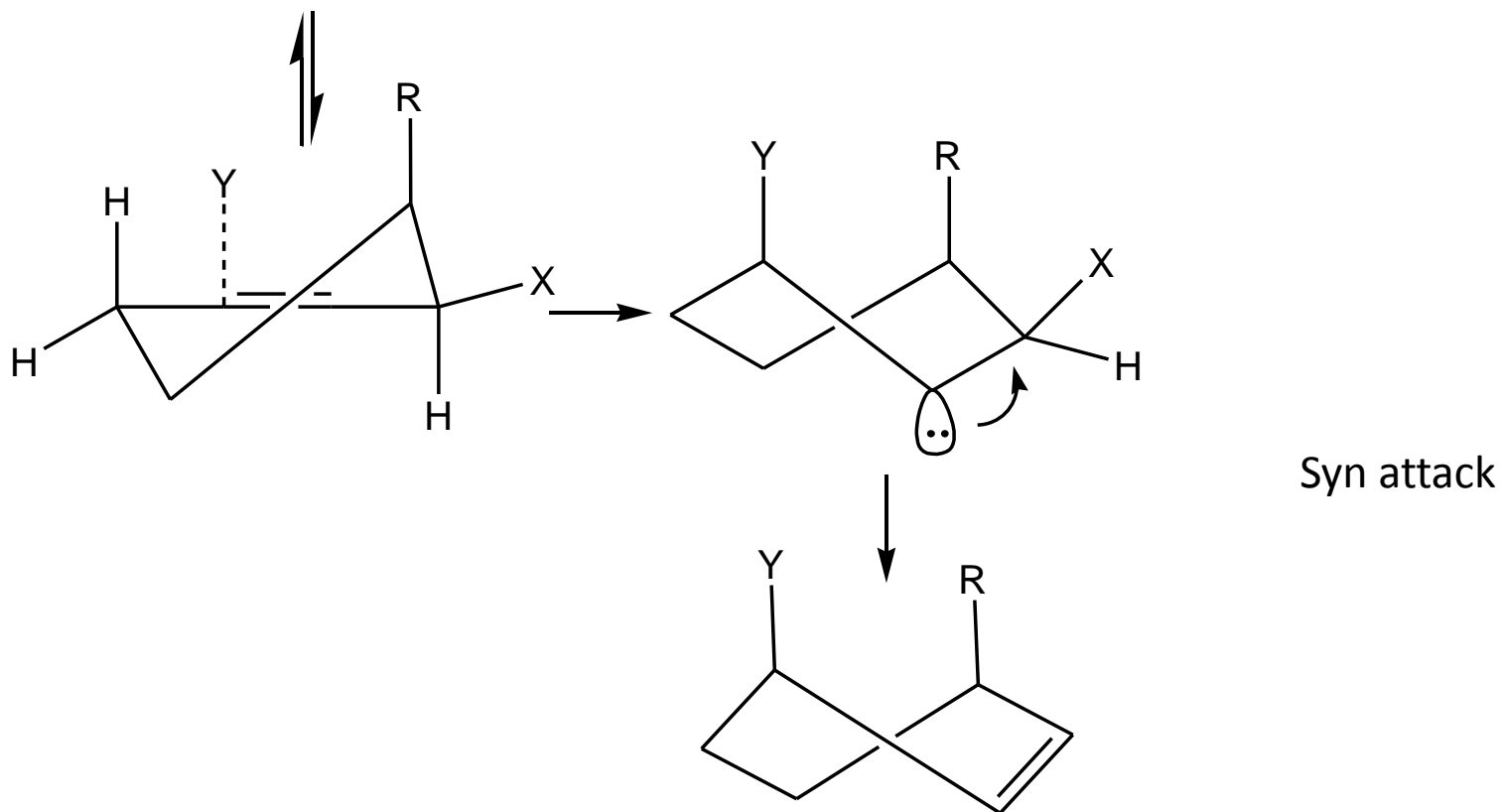
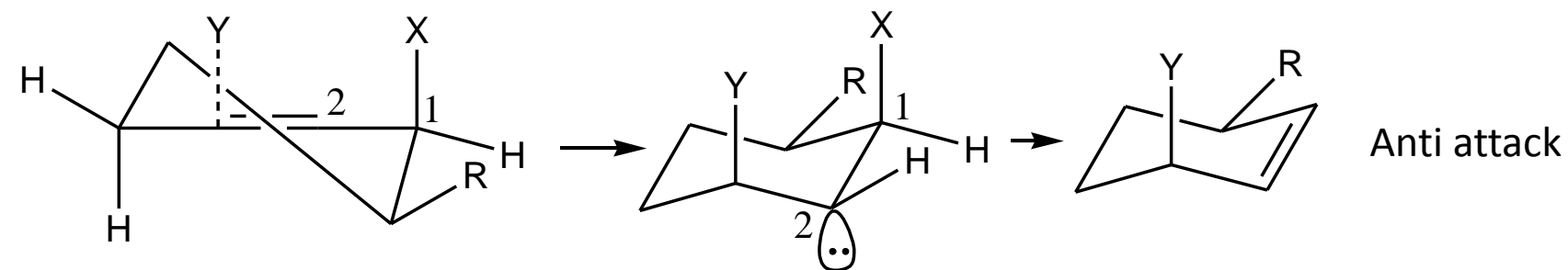
S_N2'

6-alkyl-2-cyclohexenyl mesitoates react with piperidine stereospecifically, the cis isomer giving the cis and the trans isomer giving the trans.



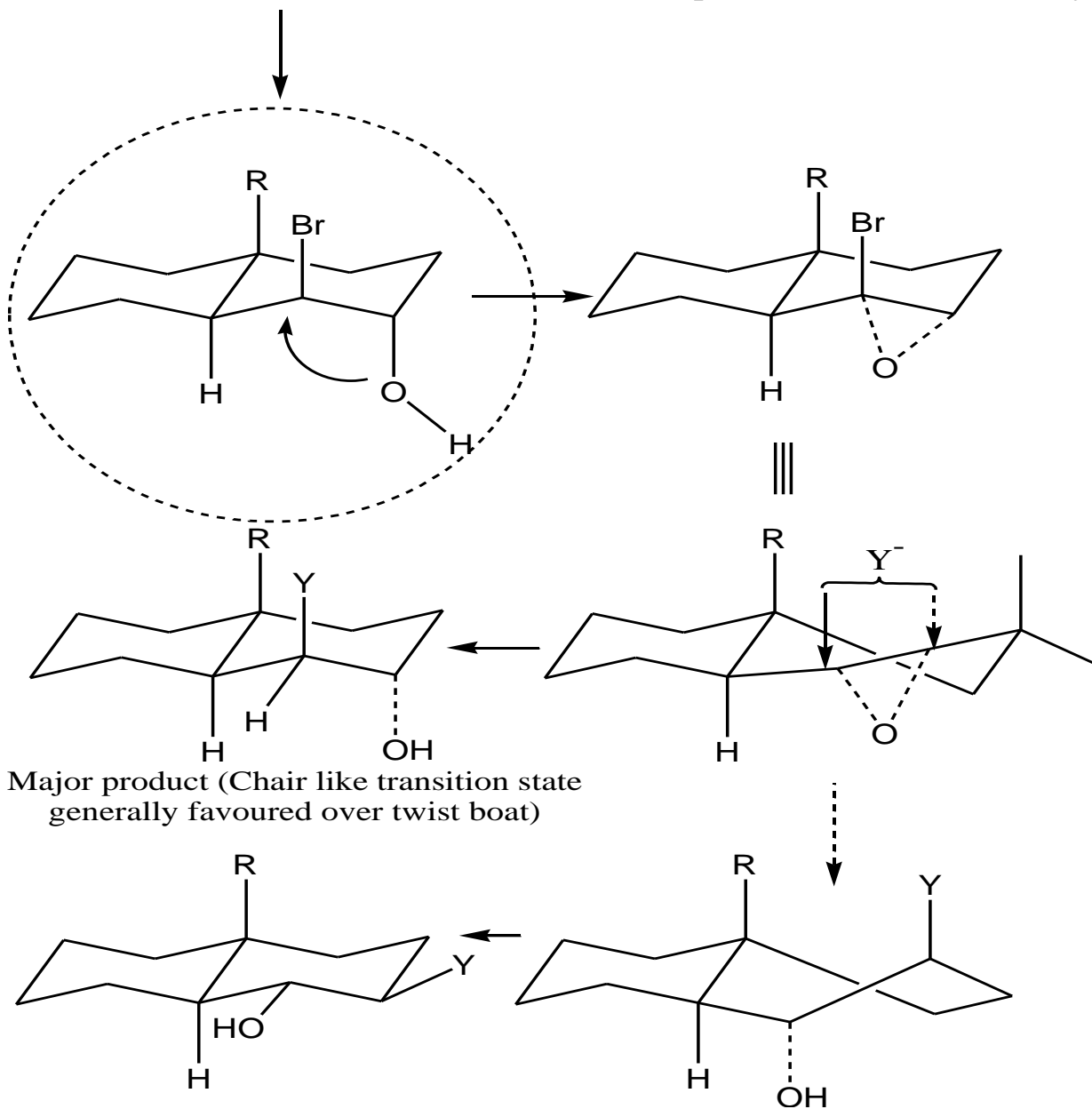
Nucleophilic substitution reaction

S_N2'

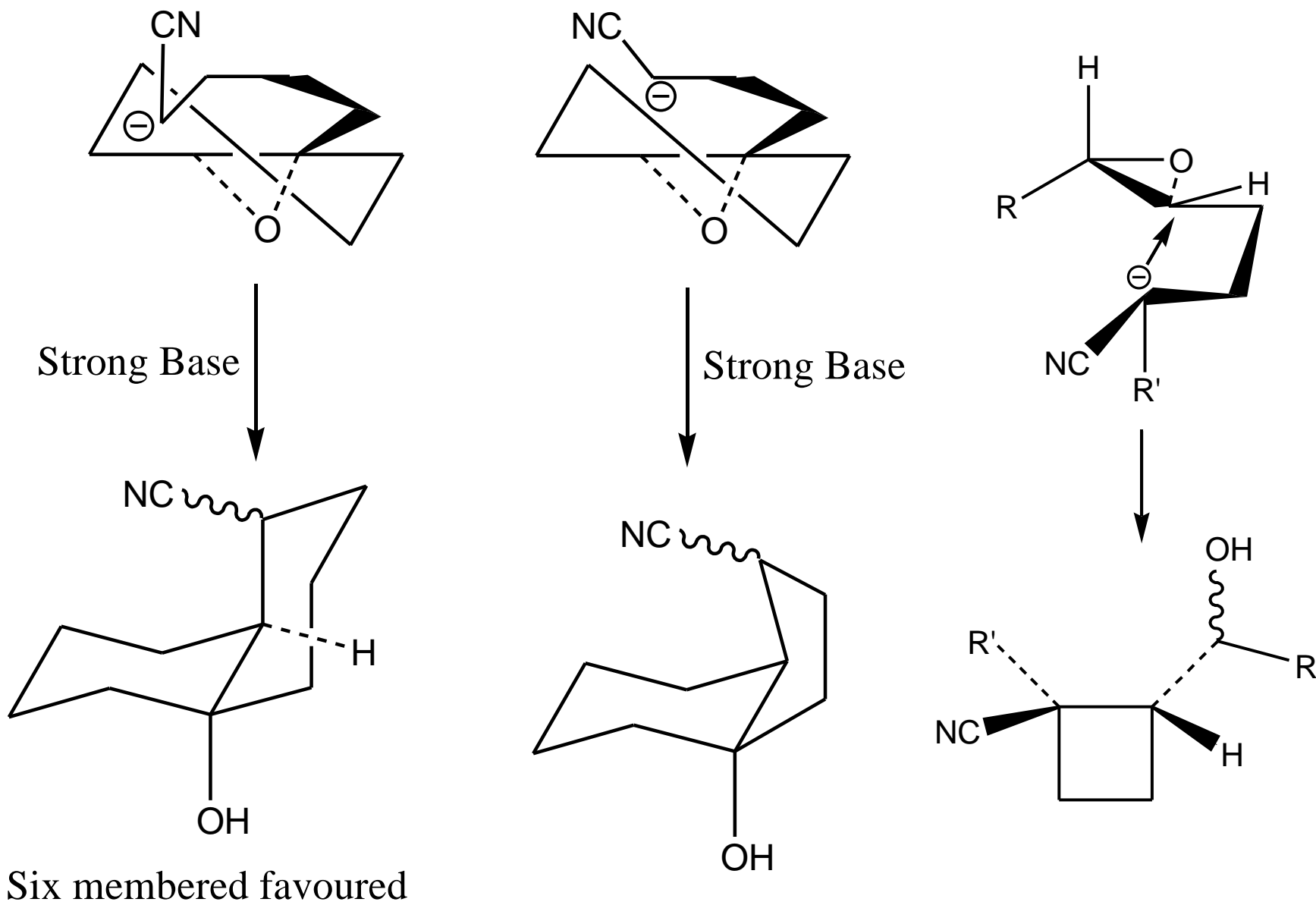


Formation and cleavage of epoxide ring

Trans-1- β -bromo-2 α -hydroxydecalin converted smoothly to the epoxide while 1
1 α -2 β -isomer (where both Br and OH are equatorial) reacts extremely slowly



Formation and cleavage of epoxide ring



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