

**B.Sc. Semester-VI
Group-A / DSE-4
Organic Synthesis**



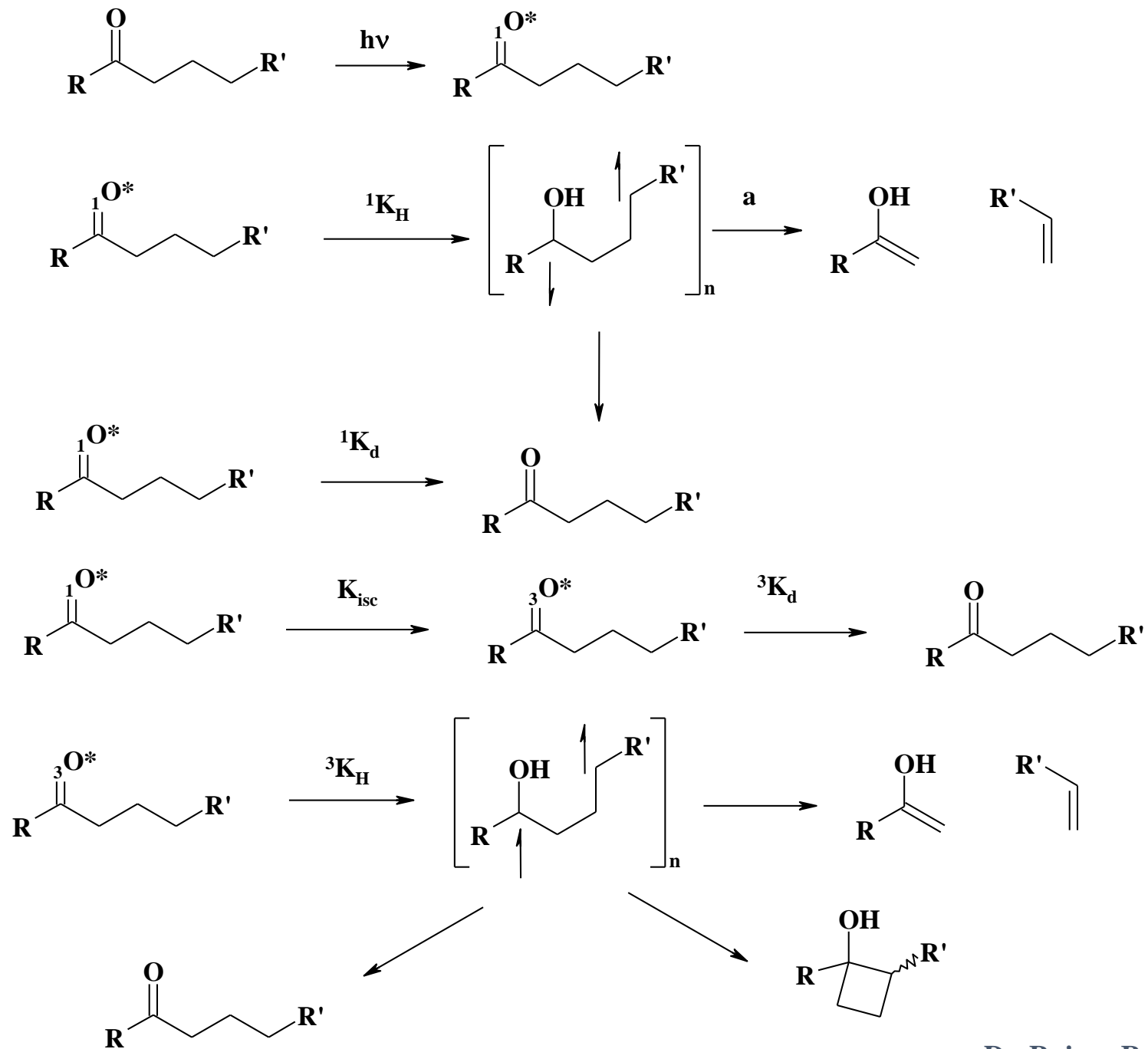
**III. Photochemistry
7. Norrish Type II Reaction**

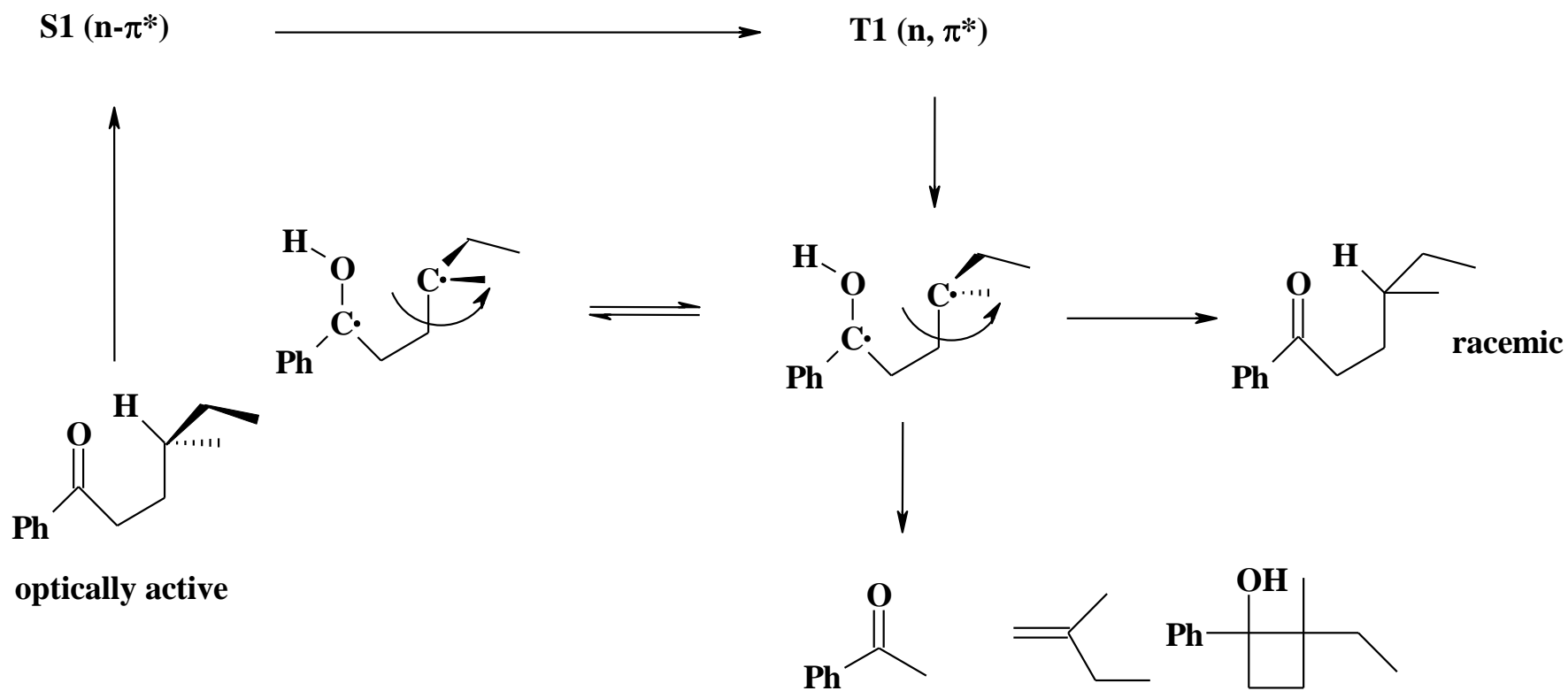


**Dr. Rajeev Ranjan
University Department of Chemistry
Dr. Shyama Prasad Mukherjee University, Ranchi**

Norrish Type II Reaction

Photoelimination of ketones: Cleavage of 1,4-biradicals formed by γ -hydrogen abstraction



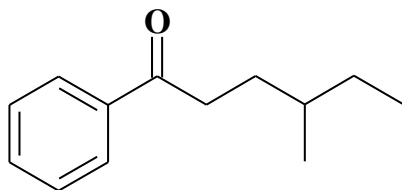
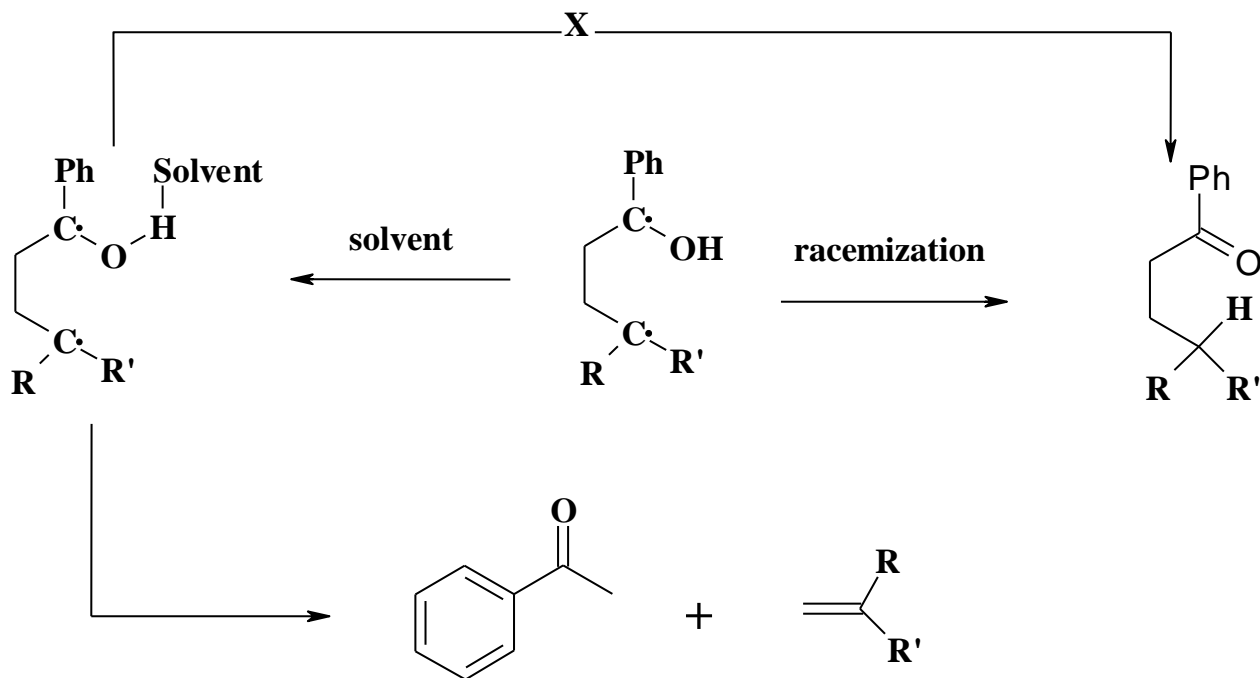


Yang cyclization

cleavage

hydrogen reversal

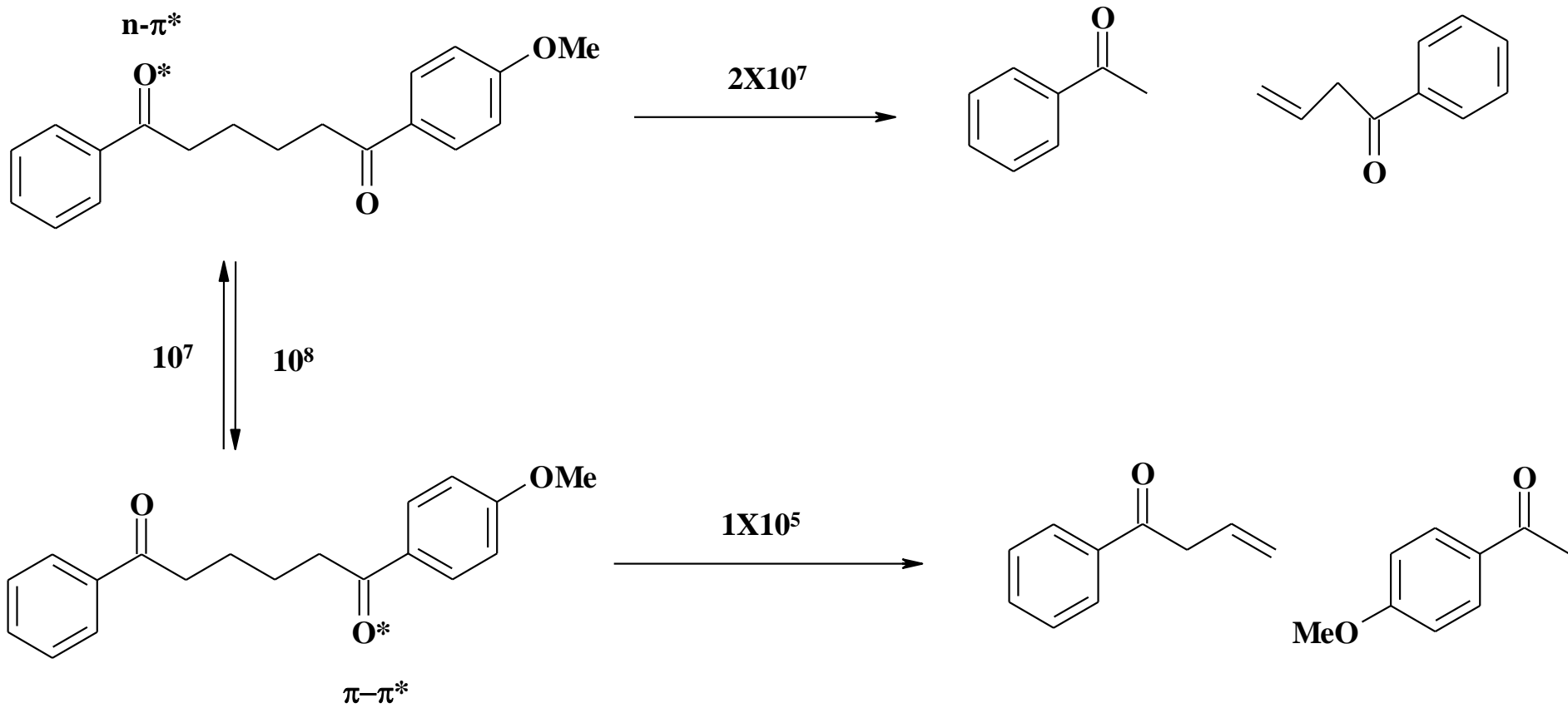
Solvent effect



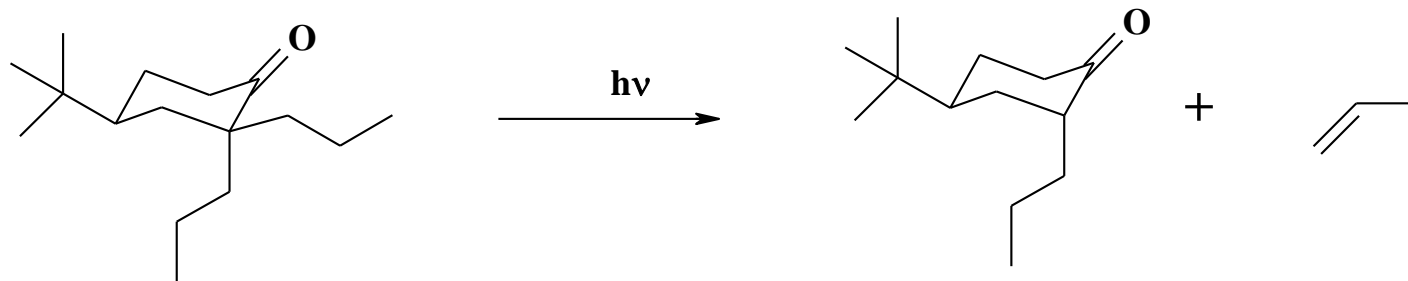
valerophenone

racemization is suppressed in H-bonding solvent such as t-BuOH

With H-bonding solvent conformational change of bi-radical occurs hence influence the decay process.

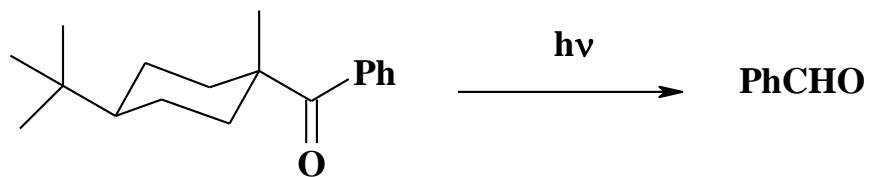
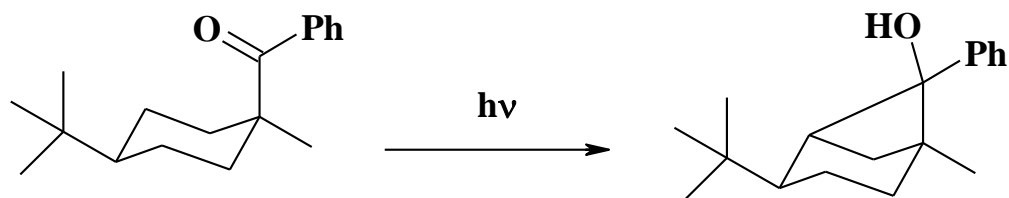


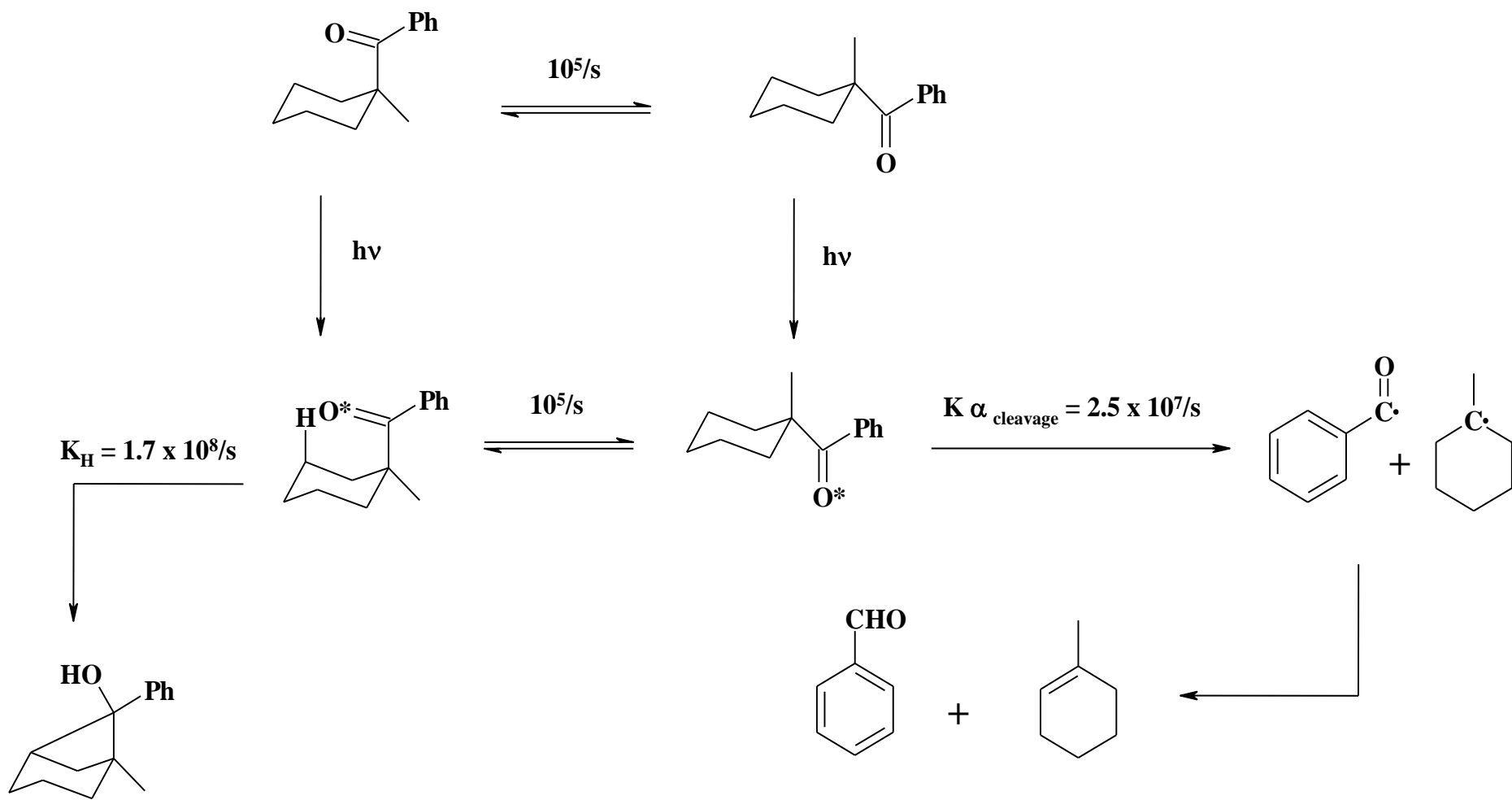
Conformational effects

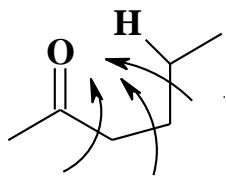


trans-4-tert butyl-2,2-di-n-propyl cyclohexanone

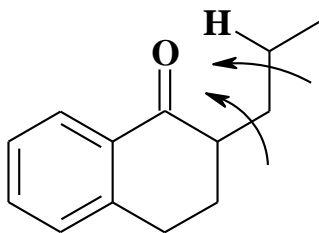
$h\nu$
no -further reaction



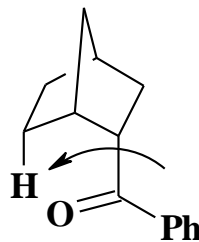




1.3×10^8



6×10^8



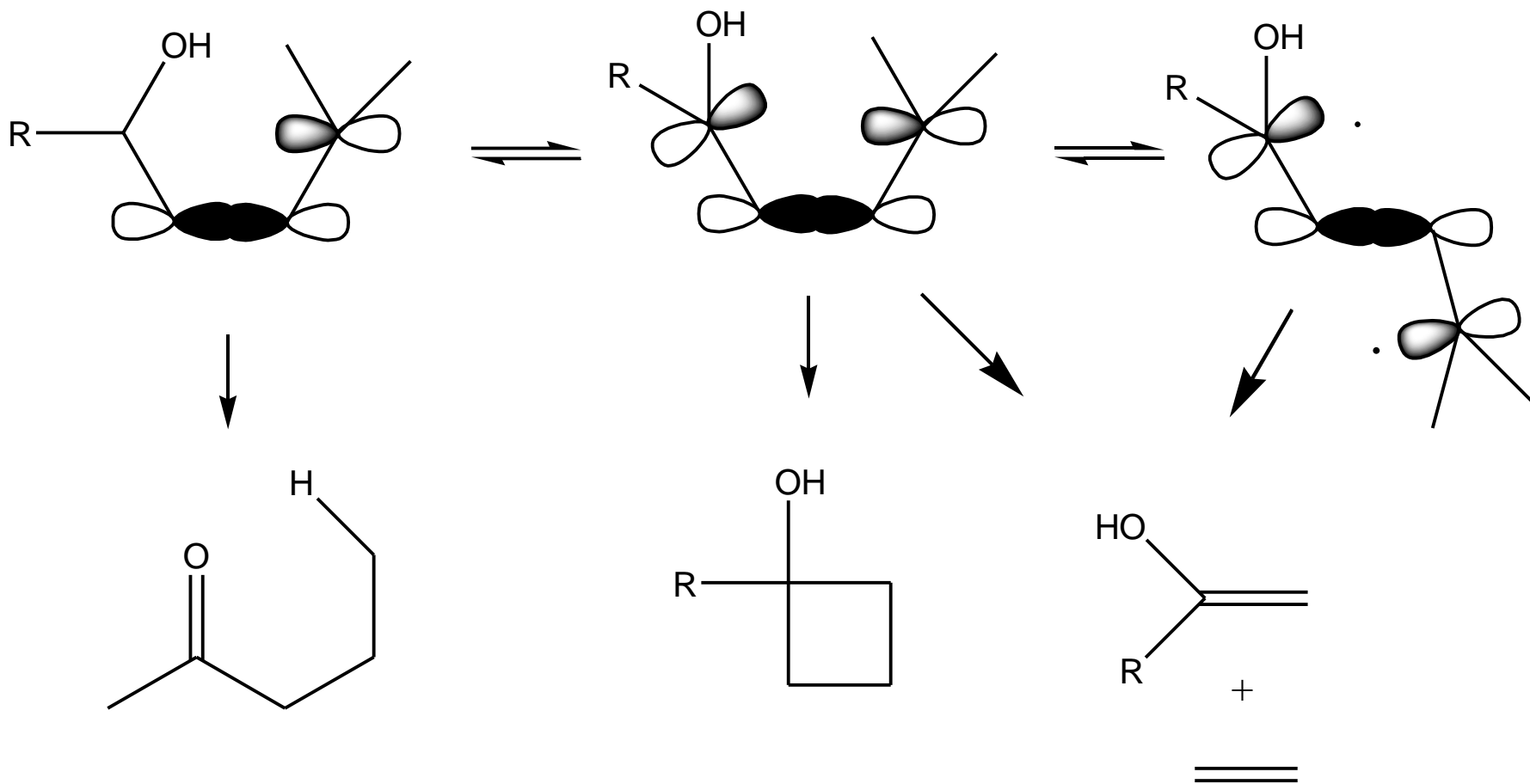
7×10^9

K_H

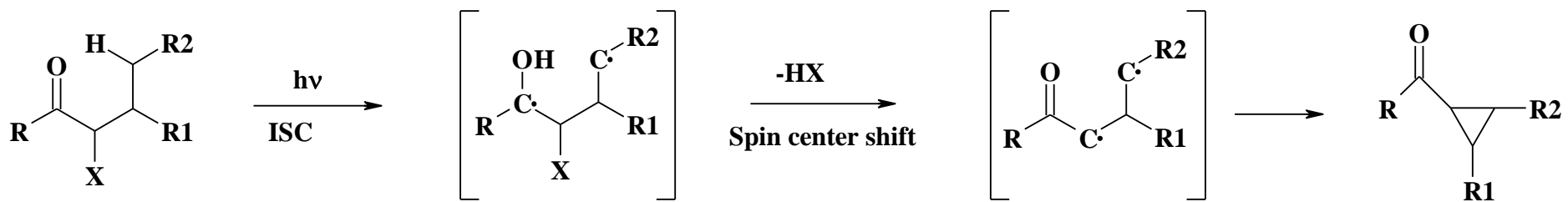
Restriction of conformational freedom plays important role

#The mobility of participating molecules (carbonyl compound and hydrogen donor) is severely restricted at the TS during intermolecular hydrogen abstraction process.

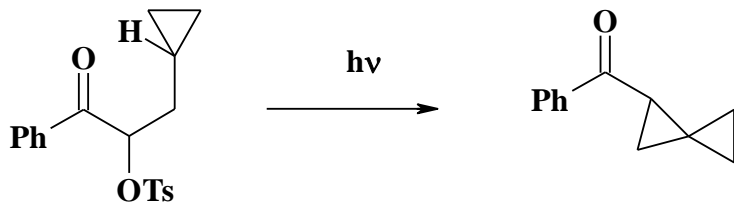
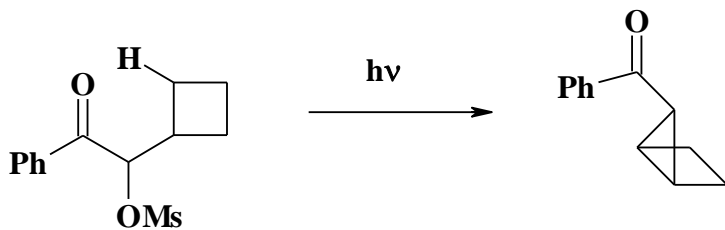
the more freezing in bond rotation is higher the rate of H abstraction



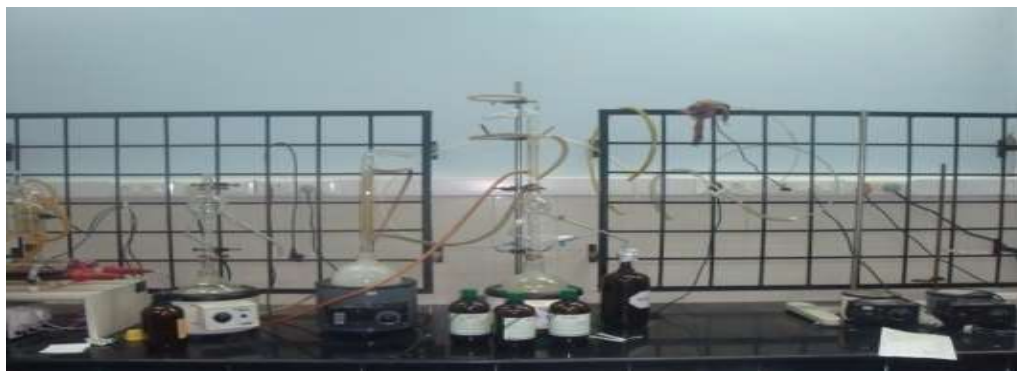
1,4 diradicals as intermediates in γ -hydrogen abstraction



X = OAc, OTs, OMs, ONO₂



Thank You



Dr. Rajeev Ranjan
University Department of Chemistry
Dr. Shyama Prasad Mukherjee University, Ranchi