

M.Sc. Semester-IV
Core Course-9 (CC-9)
Synthetic Organic Chemistry



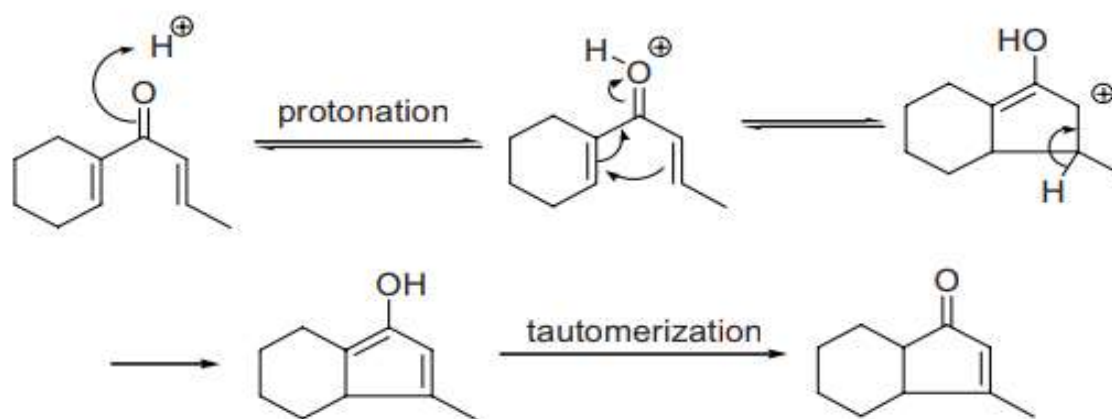
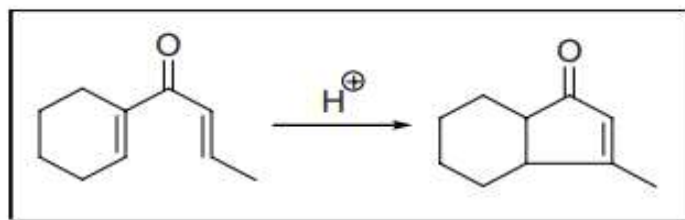
II. Pericyclic Reactions
2. Nazarov Cyclization



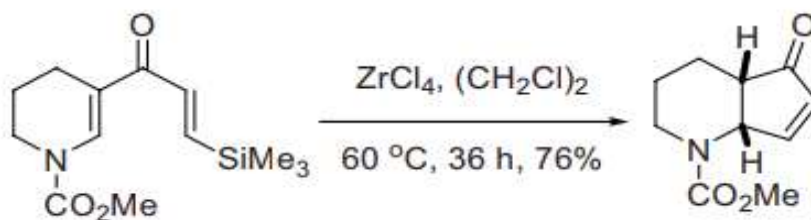
Dr. Rajeev Ranjan
University Department of Chemistry
Dr. Shyama Prasad Mukherjee University, Ranchi

Nazarov cyclization

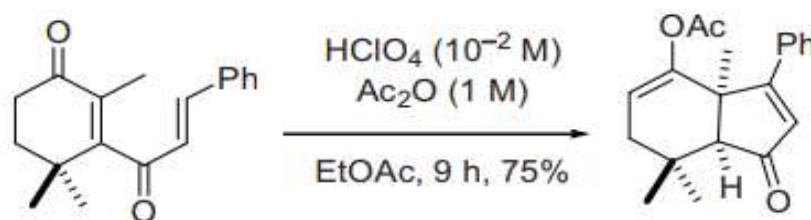
Acid-catalyzed electrocyclic formation of cyclopentenone from di-vinyl ketone.



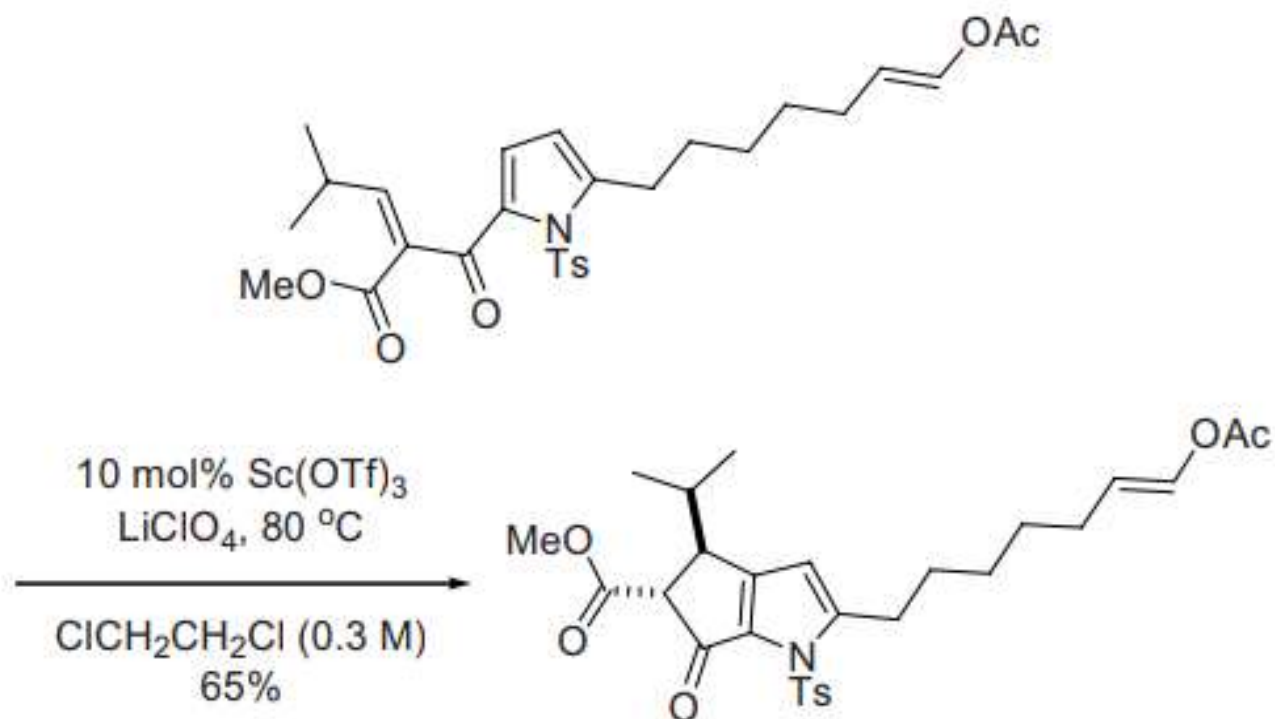
Example 1²



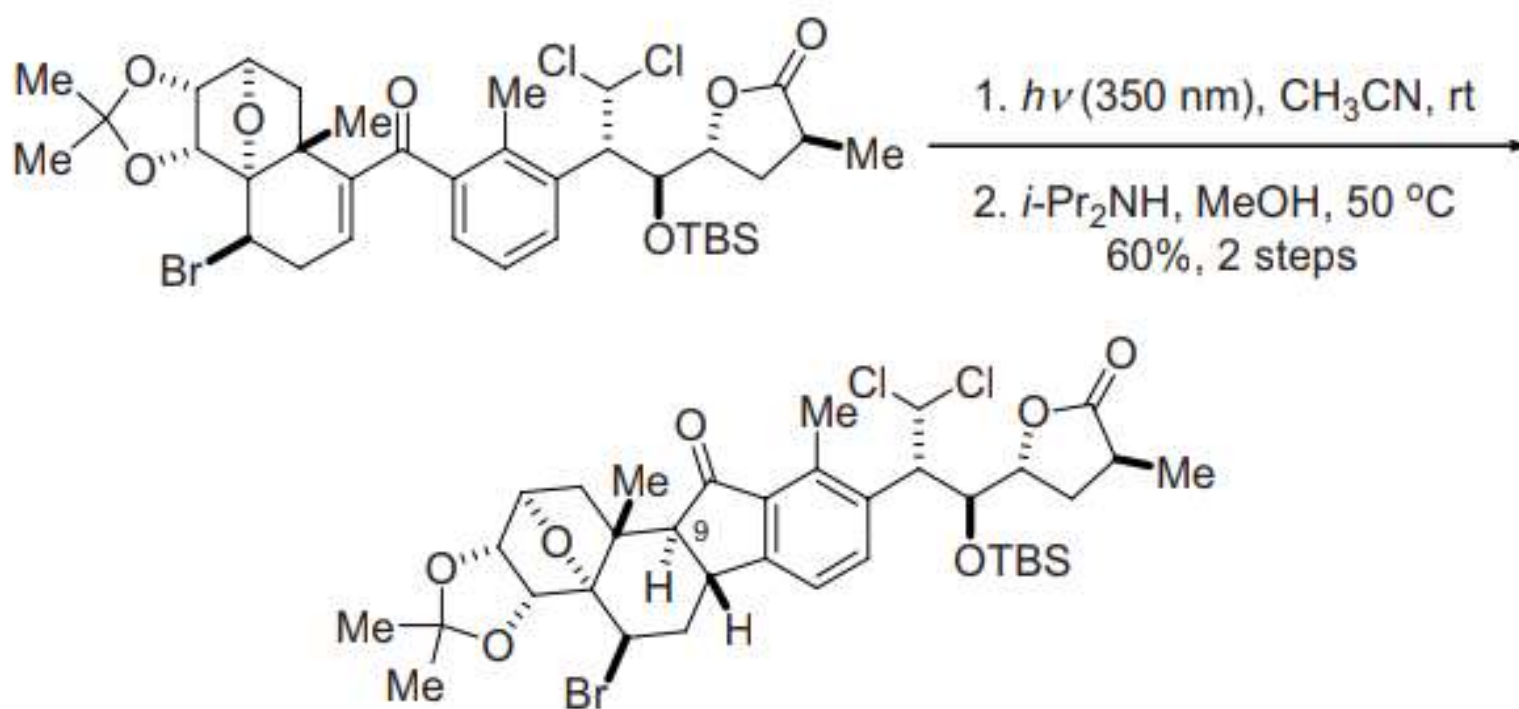
Example 2⁶



Example 4¹⁰



Example 5¹¹



References

1. Nazarov, I. N.; Torgov, I. B.; Terekhova, L. N. *Bull. Acad. Sci. (USSR)* **1942**, 200. I. N. Nazarov (1900–1957), a Soviet Union Scientist, discovered this reaction in 1942. It was said that almost as many young synthetic chemists have been lost in the pursuit of an asymmetric Nazarov cyclization as of the Bayliss–Hillman reaction.
2. Denmark, S. E.; Habermas, K. L.; Hite, G. A. *Helv. Chim. Acta* **1988**, 71, 168–194; 195–208.
3. Habermas, K. L.; Denmark, S. E.; Jones, T. K. *Org. React.* **1994**, 45, 1–158. (Review).
4. Kim, S.-H.; Cha, J. K. *Synthesis* **2000**, 2113–2116.
5. Giese, S.; West, F. G. *Tetrahedron* **2000**, 56, 10221–10228.
6. Mateos, A. F.; de la Nava, E. M. M.; González, R. R. *Tetrahedron* **2001**, 57, 1049–1057.
7. Harmata, M.; Lee, D. R. *J. Am. Chem. Soc.* **2002**, 124, 14328–14329.
8. Leclerc, E.; Tius, M. A. *Org. Lett.* **2003**, 5, 1171–1174.
9. Marcus, A. P.; Lee, A. S.; Davis, R. L.; Tantillo, D. J.; Sarpong, R. *Angew. Chem., Int. Ed.* **2008**, 47, 6379–6383.
10. Bitar, A. Y.; Frontier, A. J. *Org. Lett.* **2009**, 11, 49–52.
11. Gao, S.; Wang, Q.; Chen, C. *J. Am. Chem. Soc.* **2009**, 131, 1410–1412.

Dr. Rajeev Ranjan

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