

Seminar Notice

*International Year of Chemistry - 2011 Seminar Series -
04*

Department of Chemistry
Pondicherry University, Puducherry – 605 014

Palladium catalyzed skeletal rearrangement of heterobicyclic olefins: A facile method towards pharmaceutically important heterocycles and cyclopentanoids

By

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Date: 13th (Tuesday) September 2011

Time: 2.30 pm

Venue: Seminar hall, Department of Chemistry, PU

Abstract

The development of efficient methods to access complex molecules with multiple stereogenic centers has become a substantial challenge in both academic research and industrial applications. One approach to this challenge is the use of catalytic transformations, which allow a rapid increase in molecular complexity from readily available starting materials to produce enantiopure compounds. Among the catalytic technologies, transition metal catalysis is an indispensable tool for the efficient and environmentally benign production of high value organic compounds. Skeletal rearrangements and catalytic C-C bond forming and ring closure processes are especially effective in generating molecular complexity in minimum number of steps, thus saving costs and reducing the amount of waste.

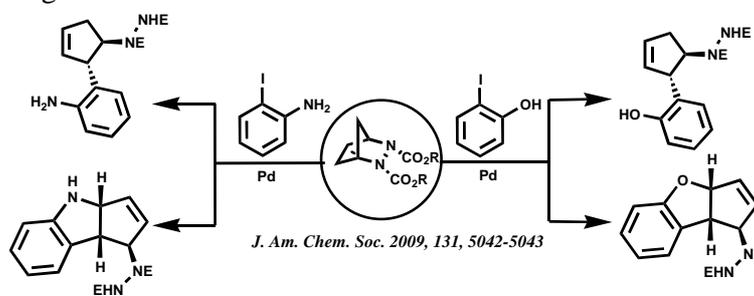


Figure 1. Catalytic tandem ring opening-ring closing reaction of heterobicyclic olefins

We undertook an investigation on the palladium catalyzed desymmetrization of simple and easily available starting materials, diazanorbornenes (heterobicyclic olefins), designed for the synthesis of pharmaceutically important heterocycles and cyclopentanoids (Figure 1). The reactivity and stereoselective transformations of 2,3-diazanorbornenes was investigated with monocentered and bicoordinated nucleophiles. Our efforts towards this line resulted in disclosing a new methodology for the stereoselective synthesis of various functionalized cyclopentanoids² and heterocycles. The results of our investigations will be discussed.

References

1. For examples, see: a) Green Chemistry Articles of Interest to the Pharmaceutical Industry. *Org. Proc. Res. Dev.* **2010**, 14, 19–29. b) Cabri, W. *Rend. Fis. Acc. Lincei* **2007**, 18, 271-280. (c) Sajisha, V. S.; Anas, S.; John, J.; Radhakrishnan, K. V. *Synlett* **2009**, 18, 2885 and references cited there in (b) John, J.; Indu, U.; Suresh E.; Radhakrishnan K. V. *J. Am. Chem. Soc.* **2009**, 131, 5042. a) John, J.; Adarsh, B.; Radhakrishnan, K. V. *Tetrahedron* **2010**, 66, 1383-1388.

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1. Education

- **MSc(Chemistry): 1992**, from *Christ College, Irinjalakuda* (Calicut University) Kerala, INDIA
- **Ph.D. (Synthetic Organic Chemistry): 1998**, University of Kerala (Regional Research Laboratory (CSIR), Trivandrum-19), Kerala, INDIA
Thesis entitled “*Novel Dipolar Cycloaddition Reactions of o-Benzoquinones and Related chemistry*” *Supervisor: Dr. G. Vijay Nair*

2. Research Experience

- **June 2002 to date**: Scientist, Organic Chemistry section, National Institute of Interdisciplinary Science and Technology-NIIST(formerly Regional Research Laboratory) (CSIR), Trivandrum, Kerala, INDIA
- **November 2000 to May 2002**: Post Doctoral Fellow, NPG Research Institute, 3540, 840 Main Campus Drive, Raleigh, NC-27606, USA. *Research Director: Prof. (Dr). Bert Fraser-Reid.*
- **May 2000-October 2000**: Post Doctoral Fellow, Molecumetics Institute, 2023 120th Avenue, Bellevue WA 98005-2199, USA. *Project Director: Prof(Dr). Michael Kahn*
- **November 1998 to October 1999**: Post Doctoral Fellow, Department of Chemistry, Tohoku University, Sendai, JAPAN *Supervisor: Prof. Yoshinori Yamamoto*
- **May 1993 to November 1998**: Research Fellow and Research Associate, Regional Research Laboratory (CSIR), Trivandrum-19, Kerala, INDIA. *Research Director: Dr. Vijay Nair*

Thesis Supervision and Guidance

Ph.Ds completed- 4

- ❖ Six (6) students completed Ph.D.

Currently supervising

- ❖ Ten (10) ongoing PhD Students
- ❖ Twenty six (26) students completed their MSc project work

Publications

- ❖ Papers published/in press in peer-reviewed international/national journals

❖ Book Chapters	02
❖ Published contributions to academic conferences	20