

PhD Open Seminar

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Topic of Seminar: Catalytic Asymmetric Mukaiyama-Michael and Direct Vinylogous Michael Addition Reactions

Date: 27.11.2015

Time: 16:00 hours

Venue: AB2-401

Abstract

In the past decade, due to the continuous increasing demand for the optically active compounds, asymmetric synthesis has become a field of central importance in organic synthesis. Michael and Mukaiyama-Michael reactions are the most fundamental and potential chemical tools for C-C bond forming reactions in organic chemistry. In past few years, considerable attention has been paid for the development of asymmetric version of both Michael and Mukaiyama-Michael reactions.

In this context, during my doctoral studies, a highly enantioselective Mukaiyama-Michael addition of silyl enol ethers to 2-enoylpyridine *N*-oxides catalyzed by PYBOX-Zn(II) complex has been developed to afford enantioenriched 1,5-dicarbonyl compounds. The scope of the methodology has also been applied for the synthesis of synthetically useful enantioenriched 3,4-dihydro- α -pyrone. In addition to this, we for the first time explored the scope of 2-enoylpyridine *N*-oxides towards organocatalysis by describing the asymmetric direct vinylogous Michael addition of α,α -dicyanoalkenes to 2-enoyl pyridine *N*-oxides catalyzed by bifunctional thio-urea to afford enantioenriched unsaturated 1,7-dicarbonyl compounds. The seminar highlights the desymmetrization strategy to furnish enantioenriched highly functionalized methylenecyclohexane derivatives with multiple stereocenters.

References:

1. **Rout, S.**; Ray, S. K.; Singh, V. K. *Org. Biomol. Chem.* **2013**, *11*, 4537
2. Ray, S. K.; **Rout, S.**; Singh, V. K. *Org. Biomol. Chem.* **2013**, *11*, 2414
3. **Rout, S.**; Ray, S. K.; Unhale, R. A.; Singh, V. K. *Org. Lett.* **2014**, *16*, 5568
4. **Rout, S.**; Singh, V. K. (Manuscript under preparation)