Overview

The application of the organic chemistry of transition metals is fundamental to the manufacturing of both bulk chemicals and fine chemicals, including new materials. The importance of this topic has been repeatedly recognized by the Nobel Foundation from 1912 to 2010. In this course, students will first be introduced to the basic structural and reactivity principles of the transition metals. This will be followed by a survey of the different classes of compounds and how they are and their reactions can be employed in synthesis. In the main part of the course, the focus will be on the synthesis of complex molecules and fine chemicals, with especial relevance to the pharmaceutical industry. The application of this chemistry to bulk chemicals will also be discussed.

Objectives

At the end of the course, the students will be able to understand the structures and reactions of transition metal and how they differ from the chemistry of main group metals. They will be able to demonstrate this understanding by drawing mechanisms for both catalytic and stoichiometric reactions. The students will appreciate the limitations of current chemistry. They will also be able to propose syntheses of organic molecules using the chemistry of transition metals, both in catalytic and stoichiometric processes. The students will be able to describe how the application of this chemistry differs between the fine chemicals and bulk chemical industries.

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<th>Modules</th>
<th>Module A: Fundamental Principles and Concepts</th>
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<td>Module B: Catalytic Reactions using $\eta^1$-complexes</td>
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<td>Module C: Beyond $\eta^1$-Coordination: Discovery and Application</td>
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<td>June 26 - July 01, 2017</td>
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<td>Number of participants for the course will be limited to fifty.</td>
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You Should Attend If...

- Executives, engineers and researchers from manufacturing, service and government organizations including R&D laboratories.
- Students at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic institutions and technical institutions.
- You are a student or faculty from academic institution interested in learning about "Transition Metals in Organic Synthesis".

Fees

The participation fees for taking the course is as follows:

- Participants from abroad: US $300
- Participants from Industry: INR 5000
- Participants from Govt. Organizations: INR 2500

Discounted price will be offered to Bachelors and Masters Degree students.

The above fee includes all instructional materials and assignments and 24 hr free internet facility. The participants will be provided with accommodation on payment basis.
The Faculty

Roderick Bates received his PhD at Imperial College, London with Professor Steven Ley, using organoiron complexes for organic synthesis. After a postdoctoral stint at Colorado State University with Professor L. S. Hegedus working on chromium carbenes, he moved to the University of North Texas as an Assistant Professor. That is where he first taught transition metal chemistry. He is currently an Associate Professor of Chemistry at Nanyang Technological University in Singapore. His principle research interest is in the use of transition metals in organic synthesis, and stereocentrol in natural product synthesis. He has worked on applications of palladium, ruthenium, gold, silver, rhodium and platinum among other metals. His group has synthesized more than twenty natural products. His book *Organic Synthesis using Transition Metals* (2nd Ed.) was published by Wiley in April 2012. He has also contributed chapters to *Comprehensive Organometallic Chemistry* (Elsevier) and *Hydroformylation for Organic Synthesis* (Springer). He is a multiple winner of NTU’s Teaching Excellence Award and is the Chair of NTU’s Teaching Excellence Academy, tasked with promoting quality and innovation in teaching at the University. He is active in exploring how to use online methods to enhance teaching, both in lecture courses and laboratory courses, as well as through a MOOC.

Deepak Salunke received his PhD at Organic Chemistry Division of CSIR-National Chemical Laboratory (NCL), Pune with Dr. Vandana Pore and Dr. Braja Gopal Hazra, and worked on the synthesis of steroidal conjugates. He also worked on a Indo-French Sandwich Thesis program at ICSN-CNRS France with Dr. Robert H. Dodd. After his PhD, he worked at the Advinus Therapeutics Pvt. Ltd. in a discovery working group involving several metal catalyzed reactions. Later he moved to NCTU Taiwan to work at the combinatorial chemistry laboratory of Prof. Chung-Ming Sun. After spending one year at NCTU, Dr. Salunke moved to Department of Medicinal Chemistry at the University of Kansas (KU), Lawrence, USA and then promoted as Assistant Research Professor at Higuchi Biosciences Centre at KU. Before joining at the Panjab University, Chandigarh he worked as a Team Leader at the SAI Life Sciences Pvt. Ltd. Pune. Dr. Deepak Salunke is engaged in research involving design, synthesis and Structure-Activity Relationships (SAR) of novel pharmaceutically interesting scaffolds. Combinatorial parallel synthesis as well as diversity-oriented synthesis of organic small molecules and to develop innovative methodologies for important organic transformations. He has recently been awarded a travel grant by NCTU to deliver a lecture series at Taiwan and also delivered several invited talks at National and International conferences.

Course Co-ordinator

Dr. Deepak B. Salunke
Phone: +91-8195968252
E-mail: salunke@pu.ac.in

http://www.gian.iitkgp.ac.in/GREGN