Green and Sustainable Chemistry:

Synthetic strategy, catalysis and applications

(Under MHRD Scheme: Global Initiative on Academic Network)

January 25th to January 30th, 2016 at Dr. Harisingh Gour Vishwavidyalaya, Sagar (M.P.)

Overview

Rapid world's population and industrial growth causes global environmental problems. Pollution choked many of the world's waterways and acid rain deteriorated forest health. Some chemicals in common use were suspected of causing or directly linked to human cancer and other adverse human and environmental health outcomes. In addition to the rapidly expanding demands on the world's finite resources, a byproduct of increasing productivity is the production of unwanted chemicals, which are often harmful. It is clear that increasing productivity without reducing pollutants has serious consequences for the earth. Chemists have major responsibility to design processes that reduce or eliminate the production of unwanted or hazardous chemicals.

The concept of green and sustainable chemistry is a relatively new idea, which developed in the business and regulatory communities as a natural evolution of pollution prevention initiatives. Green chemistry creates a new direction for chemistry and engineering by asking chemists and engineers to design chemicals, chemical processes and commercial products in a way that, at the very least, avoids the creation of toxics and waste materials. Sustainable chemistry is a scientific concept that seeks to improve the efficiency with which natural resources are used to meet human needs for chemical products and services. It encompasses the design, manufacture and use of efficient, effective, safe and more environmentally benign chemicals and processes. We can develop chemical processes and earth-friendly products that will prevent pollution, use smaller amounts of energy and reduce demand of natural resources through the practice of green chemistry. It will maintain economic growth and opportunities while providing affordable products and services to a growing world population.

This course has been framed to understand the basic concept of "*Green and Sustainable Chemistry*" by delivering a series of lectures, tutorials and assignments. The participant will learn about the various aspects of green asymmetric synthesis, catalysis, solvent free reactions, alternative solvents, new technological tools, and new chemical processes for green synthesis. The case studies of few reactions will be shared to encourage and motivate the participants towards future scope in the basic research and development.

Module	**Green and Sustainable Chemistry (Synthetic strategy, catalysis and applications): 25th Jan – 30th Jan 2016**
You Should Attend If…	▪ You are a U.G., P.G., Ph.D. student, postdoctoral fellow interested to learn the fundamental concept and applications of green and sustainable chemistry. ▪ Faculty members, scientists from academic/research institution working in the area of organic synthesis, asymmetric catalysis, natural product and pharmaceutical products synthesis through green chemistry. ▪ Industrial participant interested in the area of green chemistry based chemical synthesis, catalysis, and drug design.
Fees	The participation fees for taking the course is as follows: **Participants from abroad : US $200,** **Participants from Industry: INR 5000.00** **Faculty from Academic Institutions/Research Organizations: INR 2000.00** **Students*: INR 1000.00** * The course fee will be made half for SC/ST students. The above fee includes all instructional materials for tutorials and assignments, laboratory equipment usage charges. The participants will be provided with accommodation on payment basis.

Teaching Faculty

Prof. Takashi Ohshima is a Professor and Vice-Dean of Graduate School of Pharmaceutical Sciences and Greenpharma Research Center for System Drug Discovery at Kyushu University. Dr. Ohshima received his Ph D. degree from The University of Tokyo in 1996 under the direction of Professor Masakatsu Shibasaki. After two years as a postdoctoral fellow at The Scripps Research Institute with Professor K. C. Nicolaou (1997-1999), he returned to Japan and joined Professor Shibasaki's group in The University of Tokyo as an assistant professor. He was appointed as Associate Professor of Osaka University in 2005. In 2010, he was promoted a full professor of Kyushu University. Dr. Ohshima received several awards including JSPS Research Fellow (1993–1996), Fujisawa Award in Synthetic Organic Chemistry (2001), The Pharmaceutical Society of Japan Award for Young Scientists (2004), Invited Professor, Université Louis Pasteur, Strasbourg France (2007), The Japanese Society for Process Chemistry Award for Excellence (2008), 9th Green Sustainable Chemistry Award with MEXT Award (2010), Asian Core Program Lectureship Award (China) (2012), Asian Core Program Lectureship Award (Korea) (2013), The Pharmaceutical Society of Japan Award for Divisional Scientific Promotions (2014), and The Japanese Society for Process Chemistry Award for Excellence (2014). He has written approximately 100 original articles, 30 reviews or books, and 15 issued or pending patents worldwide. His current research interests include asymmetric catalysis, natural product synthesis, green and sustainable chemistry.

Dr. Kalpataru Das is an Assistant Professor of Dr. Harisingh Gour University, Sagar (M.P.). He received his Ph.D. degree in 2008 under the guidance of Prof. Manas K Ghorai from Indian Institute of Technology Kanpur, India. He did Postdoctoral research work in the group of Professor Michael Schmittel at University of Siegen, Germany (2008-2009) and later worked as a GCOE Post-Doctoral researcher under the guidance of Professor Kazushi Mashima and Professor Takashi Ohshima at Graduate School of Engineering Science, Osaka University, Japan (2009-2011). His current research interests include development of new methodologies in organic synthesis, asymmetric catalysis, green chemistry, and synthesis of bioactive molecules.

Course Co-ordinator

Dr. Kalpataru Das
Department of Chemistry
Dr. Harisingh Gour Vishwavidyalaya
Sagar – 470 003 (M.P.), India
Phone: 07582-264530
Mobile: 9993862530, 9407265521
E-mail: kalpatarud@gmail.com
http://www.dhsgsu.ac.in

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