

3rd International Conference on
PAST AND PRESENT RESEARCH SYSTEMS OF GREEN CHEMISTRY
September 19-21, 2016 Las Vegas, USA

Design and development of catalysts for the synthesis of fine chemicals

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Catalysis is a highly demanding technology for sustainable society and drives innovation in many other fields. Today over 90% of all industrial chemicals are produced with the aid of catalysts. World catalyst demand is forecast to grow to \$24.1 billion through 2018 and presently it is around 16.3 billion dollars. The catalysis of organic reactions by homogeneous and heterogeneous catalysts remains a vibrant field of scientific inquiry. Our research group is devoted to developing innovative green processes for the synthesis of fine chemicals employing catalysts that achieve highest possible atom economy. Over the years, our studies have led to cutting edge technologies that meet stringent environmental specifications in pollution abatement. We have made significant contributions towards the development of various novel solid acid/bases, homogeneous/heterogeneous catalysts, nanomaterial based catalysts for alkylation, acylation, nitration, bromination, hydrogenation and oxidation reactions. Hydroxyapatite (HA) is a hydrated calcium phosphate material, which is an important biomaterial because of its similarity to the mineral component of mammalian bone. We have utilized these materials and their metal exchanged materials as catalysts for C-C and C-N coupling reactions. Similarly, hydrotalcites, anionic clays have been exchanged with different metal ions and successfully applied in a number of organic transformations for example: Osmium exchanged hydrotalcites in asymmetric dihydroxylation; palladium exchanged catalysts for Heck-, Suzuki-, Sonogashira-, Stille type coupling reactions and C-C coupling reactions. In the talk, I will present a brief description of the details of the some of the reactions and also the processes demonstrated to industries.

Biography

Lakshmi Kantam Mannepalii has completed her PhD from Kurukshetra University, India. She was the Former Director of the Indian Institute of Chemical Technology, Hyderabad, a premier scientific research organization and presently serving as a Professor of Green Chemistry at ICT, Mumbai. She has published more than 320 papers in reputed journals and serving as an Editorial Board Member of the *Chemical Record* and *Journal of Chemical Sciences*. She has received several prestigious awards and honors including Fellow of National Academy of Sciences (FNASc), 2008; Fellow of Indian National Academy of Sciences (FNA), 2014 and Eminent Scientist Award-Catalysis Society of India, 2015 for her overall scientific achievements in the area of catalysis.

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