

## *From the Guest Editors .....*

Catalyst is a key factor for sustainability and profitability of chemical production with more than 80% of chemical processes utilizing catalysts. About 20% of the economies of the developed nations rely directly or indirectly on catalytic processes. Many commodity chemicals we use in our daily lives would not be available without the use of catalysts. The value of products generated using catalysts amounts to US \$500-2,500 billion per year. The global market for catalysts reached \$6.7 billion in 2012 and is projected to touch \$14.22 billion in 2019. Catalysts are used in four major areas, namely, environmental protection (35%), chemicals (23%), oil processing in refineries (22%), and polymers (20%). Commensurate with the developments taking place globally, India also has taken an active part in the development of new technologies using novel catalysts. This activity, which was earlier limited to a few public institutes like CSIR laboratories and IITs, has now proliferated into various universities in the public and private domain including established engineering colleges. The main emphasis has been on the development of catalysts for enviro-friendly technologies related to environment protection, fine chemicals synthesis and biomass utilization. Considerable efforts have also been made towards development of novel materials. In order to consolidate these efforts and give a thrust to future developments, exchange of ideas and collaborations between the institutes within India and abroad are necessary. It is in this perspective that the CSIR-Indian Institute of Chemical Technology (CSIR-IICT), Hyderabad, India, organized the 21<sup>st</sup> National Symposium on Catalysis during 11-13 February 2013.

This special issue of the *Indian Journal of Chemistry, Section A*, entitled “*Catalysis for Efficient Production of Chemicals*” addresses the present day scientific challenges and technological demands of the industry. The special issue contains 21 selected and peer reviewed articles, which were presented at the symposium. The articles cover catalysis for energy sector, environmental sector, biomass transformations and fine chemical synthesis, in addition to preparation of mesoporous /nanomaterials.

The applications of catalysts for the generation of syngas by dry reforming (Sai Prasad *et al.*) and partial oxidation (Rajaram Bal *et al.*) discuss the progress made in the energy sector. The production of hydrogen from methanol-water mixture by using photocatalysts is presented by Durga Kumari *et al.* Another contribution (Venkat Rao *et al.*) highlights the advantage of coupling of catalytic endothermic ethylbenzene dehydrogenation with exothermic nitrobenzene hydrogenation to achieve thermal balance.

The contributions relating to the environmental sector deal with the application of Pd catalysts for CO oxidation at low temperatures in presence of ozone (Keshav Soni *et al.*), iron hydroxyphosphate supported Pt catalysts for preferential oxidation of CO present in reformat gas mixture at low temperatures (Padmasri *et al.*), utilization of CO<sub>2</sub> as a soft oxidant in the ethylbenzene dehydrogenation in enhancing styrene yields over Mo/COK-12 catalysts (Rama Rao *et al.*), utilization of manganese nodules available in Indian Ocean as an effective oxidative catalyst for the decolourization of azo dyes ( Parida *et al.*), and, the beneficial role of addition of FeO<sub>x</sub>/Al<sub>2</sub>O<sub>3</sub> catalyst to a plasma reactor in increasing the degradation efficiency and mineralization of the dye (Subrahmanyam *et al.*).

Hydrogenolysis of glycerol over Ru/TiO<sub>2</sub> catalysts (Chary *et al.*), etherification of glycerol over Y-zeolite supported 12-tungstophosphoric acid catalysts (Lingaiah *et al.*) and the generation of hydrogen by a new process called glycerol tri-reforming (Sai Prasad *et al.*) discuss the issues related to biomass transformation.

Fine chemical synthesis is dealt with by the articles on hydrogenation of nitrobenzene to aniline over noble metal catalysts supported on calcium hydroxyphosphate (Venugopal *et al.*), isophorone to dihydroisophorone over Pd/SBA-15 catalysts (David Raju *et al.*), dehydrogenation of n-butanol to butyraldehyde over Cu/MgO catalysts (Veerasomaiah *et al.*), application of microwave irradiation for the nitration of alkylaromatics over triflamide anchored SBA-15 catalyst (Mukkanti *et al.*) and application of hexadentate Schiff base ligands with bivalent metal complexes for the allylic and benzylic group oxidations (Jagannatha Swamy *et al.*).

Two contributions discuss the synthesis and characterization of materials, i. e., indium doped ZnO nano particles (Jeevanandam *et al.* ) and Pt/iron hydroxyphosphates (Padmasri *et al.*). Two other contributions relate to Cr<sub>2</sub>O<sub>3</sub>/Carbon derived from CRMIL101 and Fe catalysts supported on mesoporous material (Srinivasu *et al.*).

The Guest Editors thank all the authors for their contributions and the reviewers for their valuable comments which helped in improving the quality of the manuscripts. We also thank Ms Geeta Mahadevan, Editor, *Indian Journal of Chemistry, Section A* and her team for bringing out this special issue.

*M Lakshmi Kantam  
P S Sai Prasad  
B Mahipal Reddy  
K S Rama Rao*