INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE
2A&B, Raja S.C. Mullick Road, Jadavpur, Kolkata-700032, India

Seminar Notice

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School of Applied & Interdisciplinary Sciences

Speaker: Prof. Christopher Bielawski, Department of Chemistry, Ulsan National Institute of Science and Technology (UNIST), Ulsan 44919, Republic of Korea

Title: Externally Controlled Chemistry: New Methods for Stimulating Chemical Reactions from Afar
Date: 8th August 2018
Venue: C.V.Raman Hall
Time: 12:00noon

Abstract: This presentation will describe our recent efforts on using various types of stimuli to remotely control chemical transformations, particularly polymerization reactions. Our activities were rooted in the design and deployment of photo- or redox-switchable N-heterocyclic carbenes(NHCs). Depending on their oxidation state or structure, the NHCs were found to display different spectroscopic signatures as well as chemical reactivities. Such features facilitated “on demand” ring-opening polymerizations (ROPs) as well as fine control over the sizes and properties of the resultant polymers. The NHCs were also successfully ligated to a variety of transition metals and used to catalyze ring-opening metathesis polymerizations (ROMPs). In some cases, the intrinsic monomer selectivities of certain polymerization catalysts were found to be dependent on the state of the NHC ligand which enabled us to synthesize unique types of copolymers. A series of computational studies revealed how steric and electronic effects separately influence the transition states adopted by each form of the catalyst and provided activation energies that were in good agreement with the relative reaction rate constants that were measured by experiment. The presentation will conclude with some perspectives on using various stimuli to remotely control a broad range of synthetic transformation.

All are cordially invited to attend the seminar