

Colloquium

Exploring New Facets of Organic Synthesis: From Metal to Metal-Free Catalysis

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The present talk will consist of three modern topics of interest. Many topics such as organic, inorganic, organometallic, computational and physical organic chemistry will be highlighted during the presentation. Synthesis and characterization of organometallic species as well as organic molecules will be highlighted in the first part. Herein, it will be presented on the catalytic generation of silicon based copper-(I) reagents from silicon pronucleophiles. The reactivity and selectivity of two organometallic species such as $(\text{PhMe}_2\text{Si})_2\text{Zn}$ and $\text{PhMe}_2\text{Si-Bpin}$ will also be discussed. The synthetic application of the methodologies and the synthesis of new materials will be highlighted. The second part of the talk will be focused on the development of a mild and robust direct C–H functionalization strategy to the synthesis of axially chiral biaryls at ambient temperature with catalytic amount of $\text{Pd}(\text{OAc})_2$. Such an efficient and stereoselective transformation occurs through an original dynamic kinetic resolution pathway enabling the conversion of diastereomeric mixtures of nonprefunctionalized substrates into atropisomerically pure, highly substituted biaryl scaffolds. The main feature of this transformation is the use of an enantiopure sulfoxide as both chiral auxiliary and traceless directing group. The third part of the talk will consist of metal-free processes. In this part, a facile transformation of furans into silicon functionalized synthetic intermediates, by tris-(pentafluorophenyl)borane-catalyzed cascade hydrosilylation processes under transition metal-free conditions will be discussed. In addition, mechanistic studies with synthetic applications will be presented in detail. Finally, the scope and full mechanistic studies of $\text{B}(\text{C}_6\text{F}_5)_3$ -catalyzed ring-closing of alkene precursors to small molecules with hydrosilane will be highlighted.

Thursday, Jul 26th 2018

4:00 PM (Tea/Coffee at 3:30 PM)

Auditorium, TIFR-H