Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad – 500 046

Colloquium

Bio-inspired Iron complexes for sustainable C-H oxidation reactions

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In this lecture, I will discuss our recent efforts in developing homogeneous oxidation catalysts to activate the natural oxidants, hydrogen peroxide, and oxygen, for the oxidation of C-H bonds. These complexes are outstanding Cytochrome P450 peroxygenase mimics but are only about 1% the size of the enzymes. In the first part, I will discuss our recent attempts to oxidise natural products, macromolecules, and polymers in water and under solvent-free conditions using hydrogen peroxide as the terminal oxidant. The reaction rates significantly increase (up to 10^4-fold) upon transitioning from organic to aqueous solvent. This methodology has been used for the upcycling of hydrocarbon polymers and in the generation of value-added products from biomass, which represents some of the key challenges in sustainable chemistry. In the last part, I will discuss unusual reactive intermediates formed upon the interaction of the iron complex with oxygen inside a synthetic cage.

Monday, Jun 10th 2024

16:00 Hrs (Tea / Coffee 15:45 Hrs)

Auditorium, TIFR-H