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

Seminar

Design of Advanced Metalated Porous-Organic-Polymer (POP) for Heterogeneous Catalysis

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Porous-Organic-Polymers (POPs) recently attracted special attention of many researchers because of their low-cost simple synthesis method, high chemical and thermal stability, low skeleton density, controllable compositions, powerful confinement effects and high surface area with tunable pore-size distribution. The self-complementary balanced characteristic features, with the co-existence of both covalent bonds (i.e., structural stability) and open metal sites (i.e., single-site catalysis) on these new emerging materials i.e. Metalated Porous-Organic-Polymer (M-POPs) could be accomplished to bridge the gap between MOFs & POPs based on the elucidation and evolution of novel catalytic networks. The aim is to fundamentally understand how reactants, intermediates, and reaction products come into customised contact with the various catalysts involved. Our research group played a pioneering role to explore new synthetic strategies for the design and development of new robust highly cross-linked POPs by employing template-free one-pot oxidative polymerization, Friedel-Crafts alkylation, Friedel-Crafts acylation, ternary co-polymerization, gelation strategy which has provided a new dimension to various catalytic applications including biomass conversion, bio-fuel upgrading, photocatalytic CO_2 reduction to renewable fuels etc., thereby addressing the current scientific and technological challenges and opportunities observed in various domains of catalysis. Further, with the elucidation of in-situ spectroscopic characterisation techniques, we have established catalyst structure-activity relationship and formulated molecular level reaction mechanistic pathway with the involvement of specific key surface reaction intermediates.

Friday, June 16th 2023

4:00 PM (Tea / Coffee 03.45 PM)

Auditorium, TIFR-H