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

Seminar

Rationally Designed Carbon-Carbon/Carbon-Nitrogen-Centred Diradicaloids and Boron-Boron-Centred Diradicals

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Open-shell compounds with second-row p-block elements boron, carbon, nitrogen, and oxygen are crucial for various applications. The synthesis of carbon-carbon-centred diradicaloids typically involves redox processes of their corresponding cationic/anionic forms or the dehydrogenation of judicious polycyclic aromatic hydrocarbons. Nitrogen-nitrogen-centred dicationic diradicaloids are also known by the oxidation of corresponding neutral form. However, the synthesis of heteronuclear carbon-nitrogen-centred diradicaloids is challenging due to the simultaneous presence of open-shell centres at similar electrochemical potentials at both carbon and nitrogen centres, often resulting in short lifetime. Boron-boron-centred diradicals are only known with considering borane radical-anion motif. We have developed a modular approach for synthesising i) carbon-carbon-centred diradicaloids under two-electron oxidation of π-conjugated bis-N-heterocyclic olefins, ii) carbon-nitrogen-centred tricationic diradicaloids by judicious choice of alkene and amine under two-electron oxidation, and iii) boron-boron-centred neutral diradicals considering NHC-stabilised boryl radical motif as boron-centred spin carrier.

Tuesday, Jul 9th 2024

16:30 Hrs (Tea / Coffee 16:15 Hrs)

Auditorium, TIFR-H