

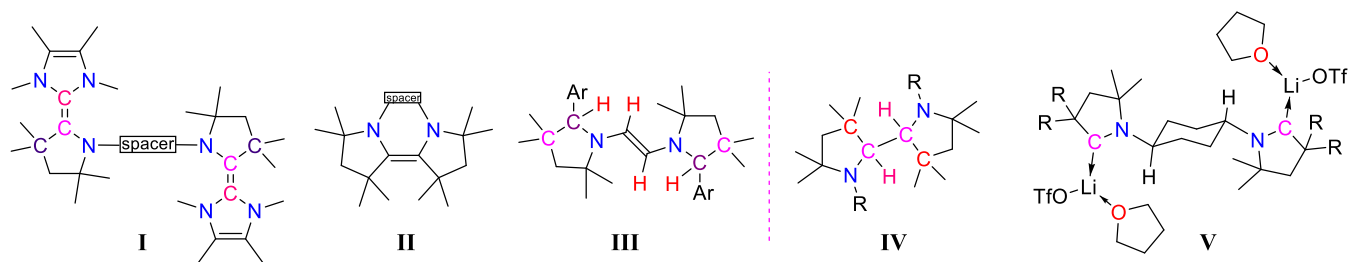
Seminar

Pyrrolinium Cation-Derived Electron Rich Compounds: Synthesis of Closed- and Open-Shell Compounds

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Electron-rich alkenes are an important class of compounds due to their exciting redox properties and applications in various fields. In this category, tetrathiafulvalene (TTF) is one of the most celebrated examples. In 1972, the first semiconductor properties of TTF-derived radical-cation was reported and then TTF derivatives have been found applications in various fields such as electrically conducting materials, charge transfer complexes, electron donor, electronic devices, materials chemistry. These applications mainly depend upon the stability of radical cations of TTF derivatives. The nitrogen analogues of TTF, namely tetraazaalkenes do not rival, because they generally do not form stable radical cations and this is the limitation in various applications. Here I will present our findings on the syntheses of electron-rich alkenes (I, II and III) and the isolation of their radical cations. Compound-I undergoes four-electron oxidation under the formation of corresponding tetra-cation. However, results from stepwise oxidation depend upon the bridging spacer. The bis-radical-cation from (I) under two-electron oxidation has been isolated and characterised when the spacer was 1,4-cyclohexyl bridge. Compounds II and III have one electron-rich alkene and therefore these exhibit two oxidation peaks in the cyclic voltammetry and these undergo two-electron oxidation under the formation of dication. The radical cations from the oxidation of (II) and (III) have been isolated. I will also present the synthesis of air stable 2,2'-bipyrrolidines (IV) in which a C(sp³)-C(sp³) single bond acting as the source of electrons. At the end, I will discuss the synthesis and reactivity of bis-CAAC (V).



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