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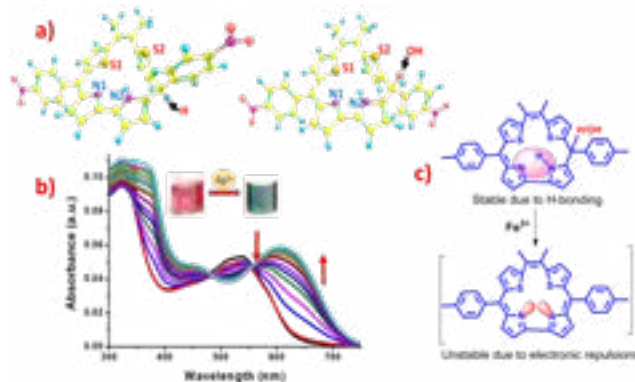
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Phlorin analogues of dithia corrphycene: Specific chemodosimetric sensors for F^{3+}

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Statement of the Problem: Porphyrins are tetrapyrrolic macrocycles and are among the most extensively studied of all ligand systems and continues to be most attractive macrocycles for the subject of intense research. The different structural isomers of porphyrin(1.1.1.1) such as porphycene, hemiporphycene, corrphycene, etc. were synthesized over the years and studied their spectroscopic, structural and coordination properties. Porphyrin isomers are unique macrocycles with rich coordination chemistry. Interestingly, except porphycenes, the other structural isomers of porphyrins such as corrphycene and hemiporphycene have not been investigated to a larger extent because of their less developed synthetic methodologies and their instability due to lower symmetry. Replacement of one or two pyrrole nitrogen(s) of porphyrins by other donor atoms such as O, S, Se and Te leads to a new porphyrin analogues referred as core-modified or heteroatom substituted porphyrins. However, the core-modification of porphyrin isomers have not been investigated except for porphycenes. Thus, it is interesting to synthesize new core-modified porphyrin isomers particularly corrphycene and hemiporphycene to study their properties and to explore their use in various applications. Here, our goal was to synthesize the first examples of dithia corrphycenes with N_2S_2 core (1) and study their spectral, electrochemical and coordination properties (Figure 1). However, our attempts led to the synthesis of the first examples of unusual and novel phlorin analogues of dithia corrphycene 2a-4a and 2b-4b (Figure 1) which were formed in one pot reaction by oxidative cyclization of tetrapyrranes in the presence of trifluoroacetic acid followed by oxidation.



Biography

Kishor Thorat (Ph.D. Chemistry) after completing M.Sc Organic Chemistry from the University of Pune in 2008, he worked for a pharmaceutical industry in India for close to two years. In 2010, he awarded CSIR Fellowship from the Govt. of India to do Ph.D. and he completed his Ph.D. from ICT Mumbai, India in 2016. During his Ph.D., he synthesized several novel BODIPY compounds and investigated their lasing efficiencies in liquid dye lasers. He also has expertise in DFT and TD-DFT computations, and estimation of NLO properties of various organic compounds. In Feb. 2016, he joined Department of Chemistry, IIT Bombay, India as an Institute Post-Doctoral Fellow and his expertise lies in the synthesis and applications of macrocyclic compounds. Presently, his research interests are synthesis and studies of various porphyrin isomers such as corrphycenes, benzisapphyrins, triphyrins, meso- BODIPYnyl homoporphyrins, etc.

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