

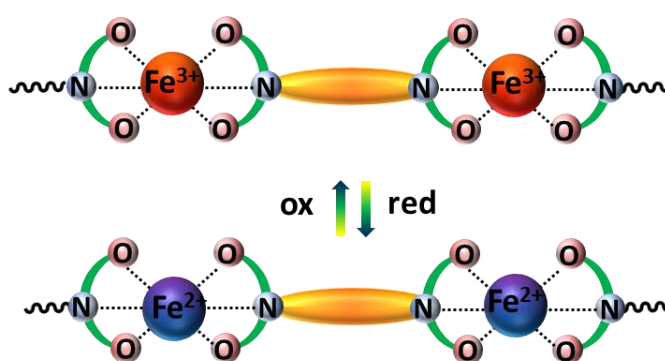
Design and Synthesis of Metallo-Supramolecular Polymer for Electrochromic Smart Window Application

(¹Electronic Functional Macromolecules Group, Research Center for Functional Materials, National Institute for Materials Science (NIMS)) ○Susmita Roy,¹ Masayoshi Higuchi¹

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Research on smart-electrochromic (EC) materials is currently focused heavily on cathodically colored electrochromic materials (ECMs), which generally reveal transparent-to-dark electrochromism to limit solar-irradiation transfer inside the building and so aid in reducing building energy usage.¹ Metallo-supramolecular polymers (MSPs) are the newest category of ECMs, composed of organic multitopic chelating ligands and metals, exhibit excellent EC behavior over other reported ECMs with respect to different EC property parameters. In most of the reported MSPs, the metal centres have the general [NNN-NNN] coordination environment, responsible for intense coloration at normal state due to strong MLCT transition and exhibiting dark-to-transparent EC on successive redox reaction.² However, the reverse transparent-to-dark EC phenomenon is essential but rarely reported. Therefore, we have designed a new Fe(III)-based MSP containing [ONO-ONO] backbone, which is transparent in the general state, displaying the dark EC on reduction of metal centre.

In this regard, first, we prepare the ditopic ligand with [ONO-ONO] backbone followed by coordination with Fe(III) metal salt to get final polymer as shown in the scheme. The ligand and polymer, are both characterized by NMR and mass. The detailed synthetic procedure, characterization, spectrochemical and electrochemical behavior will be shown in our presentation.



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