

Sun-Shading Effect of Electrochromic Smart Window Using Metallo-Supramolecular Polymer

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Electrochromic (EC) smart window has received much attention as new window that contributes reduction of energy consumption on air-conditioning of the room because of the effective sun-shading. We reported metallo-supramolecular polymers, which were synthesized by complexation of metal ions and organic ditopic ligands, showed excellent EC properties.^{1,2} In addition, we found a suitable counter material to reduce the driving voltage down to 0.8 V in the EC device (ECD).³ In this presentation we report fabrication and installation of ECDs toward the smart window application, and the sun-shading effect.

Fe(II)-based metallo-supramolecular polymer (polyFe), synthesized by 1:1 complexation of Fe(II) acetate and bis(terpyridyl)benzene, was used for the fabrication of ECDs. PolyFe showed the color changes between purple and colorless by the electrochemical redox. We fabricated ECDs with 10 × 10 cm size and installed EC smart window composed of the tiled ECDs on existing window (Fig. 1). We also investigated the sunlight- and heat-preventing effects of the ECD (10 × 10 cm) outdoor in summer.

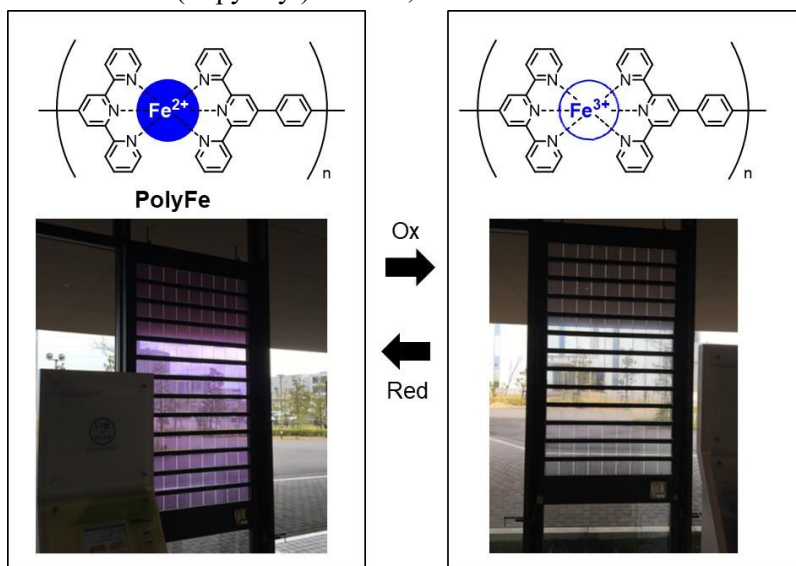


Fig. 1. EC smart window using polyFe, which has been installed at Kawasaki LiSE, Kanagawa, Japan.

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1) M. Higuchi, D. G. Kurth, *Chem. Rec.*, **2007**, 7, 203. 2) F. Han, M. Higuchi, D. G. Kurth, *J. Am. Chem. Soc.*, **2008**, 130, 2073. 3) H.-C. Lu, M. Higuchi *et al.*, *ACS Appl. Electron. Mater.*, **2021**, 3, 2123.