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## Electrochromic devices with a metallo-supramolecular polymer film

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Metallo-supramolecular polymers are synthesized by the complexation of metal ions with ditopic ligands. They are expected to show unique electro- and photo-chemical properties based on the metal-ligand or metal-metal interaction. Here I report electrochromic properties of metallo-supramolecular polymers and the device fabrication. Fe(II)- and Ru(II)-based metallo-supramolecular polymers have specific colors (blue and red, respectively) based on the metal-to-ligand charge transfer (MLCT) absorption. The polymer films were formed by spin- or spray-coating of the polymer solution. Interestingly, color of the polymer films disappeared by electrochemical oxidation of Fe(II) ions to Fe(III) in an electrolyte solution because of the disappearance of the MLCT absorption. On the contrary the original color was recovered when the opposite voltage was applied to the polymer film. Electrochromic display devices with the metallo-supramolecular polymer film were successfully fabricated using a gel electrolyte. Cu-based polymers, which were obtained by the complexation of Cu(II) ions with bis(phenanthroline)s showed electrochromic change between green and colorless. Metallo-supramolecular polymers with both Fe and Ru ions showed multicolor electrochromic behavior by changing the applied potential due to the different redox potential of Fe and Ru ions.

### Biography

Masayoshi Higuchi has completed his PhD from Osaka University in 1998. He is the group leader of Electronic Functional Materials Group, NIMS. In addition, he is the project leader of JST-CREST. He received The Chemical Society of Japan Award for Young Scientists (2003), The Young Scientists' Prize, Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan (2006), and German Innovation Award "The Gottfried Wagener Prize" (2011).

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