Ru(II)メタロ超分子ポリマーと層状無機-イミダゾリン共有結合体との複合化によるエレクトロクロミック特性向上

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Improved Electrochromic Properties of a Composite of Ru(II)-based Metallo-supramolecular Polymer with Layered Inorganic-imidazoline Covalently Bonded Hybrid

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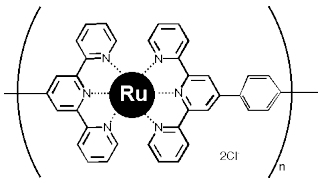
Much effort has been carried out for preparing polymer/inorganic nanocomposites to improve properties of the polymers.[1)] Metallo-supramolecular polymers (MSPs) have attracted much attention as electrochromic (EC) materials. MSPs demonstrate absorption in the visible region because of the metal-to-ligand charge transfer (MLCT) from the metal ion center to the organic ligand. The MLCT is controlled *via* electrochemical redox of the metal ions.[2)] They have previously reported MSP/clay nanocomposites and their improved EC properties.[3)] In this study we aimed to improve the EC properties of MSP by combining MSP with a "layered inorganic-imidazoline covalently bonding hybrids (LIIm)" in which the imidazolyl group is located between and covalently bonding with the inorganic layers. [4)]

We prepared a Ru(II)-based MSP/LIIm nanocomposite. The prepared composite was characterized by ultraviolet-visible spectroscopy (UV-vis), cyclic voltammetry (CV), *in-situ* spectro-electrochemical measurement and so on. The composite exhibit improved coloration efficiency.

Keywords : Metallo-supramolecular Polymer, layered material, electrochromism, coloration efficiency, ruthenium



Scheme. Ru(II)-based MSP (polyRu)

高分子と無機化合物との複合化は、光学特性等の向上が期待され興味深い[1)]。しかし、エレクトロクロミック（EC）ポリマーの複合体の研究例は未だ多くはない。メタロ超分子ポリマー(MSP)は金属から有機リガンドへの電荷移動吸収（MLCT）を制御することで EC 特性が発現する[2)]。粘土鉱物との複合化による EC 特性の向上が報告されている[3)]。本研究では、層状の無機部分とイミダゾリン基が共有結合で一体化した層状無機-イミダゾリン共有結合体（LIIm）[4)]と MSP を複合化することで、MSP の EC 特性向上を目指した。

金属イオンがルテニウムの MSP（**polyRu**, **Scheme**)と LIIm の複合体を調製した。複合体を紫外・可視分光法、サイクリックボルタンメトリー、*in-situ* 電気化学-分光測定等で評価した。複合化により着色効率等の EC 特性が向上した。

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