

Preparation of Water-Soluble Chiral Ladder-like Polysilsesquioxanes and Their Chiral Induction Behavior into Dye Compounds

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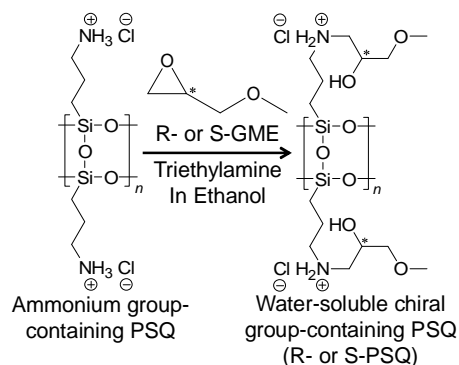
Abstract

Hybrids formed by noncovalent interactions between photofunctional compounds and chiral molecules have attracted considerable attention because of their potential application in circularly polarized luminescent materials. However, there have been few reports regarding hybridization using inorganic compounds such as siloxane-based materials as chiral inductors. So far, we have reported the preparation of ladder-like polysilsesquioxanes (PSQs) containing chiral and ammonium side-chain groups and the investigation of their chiral induction behavior into dye compounds¹. However, these PSQs were insoluble in water.

In this study, therefore, we prepared water-soluble ladder-like PSQs containing chiral groups by reaction of PSQ containing ammonium groups² with chiral glycidyl methyl ethers (GMEs). In addition, it was found that the chirality was induced from the chiral PSQs into dye compound in water.

References

1. Y. Kaneko et al., *J. Mater. Chem.*, 2009, 19, 7106.; *J. Mater. Chem.*, 2011, 21, 16638.; *J. Nanosci. Nanotechnol.*, 2013, 13, 3074.
2. Y. Kaneko et al., *Chem. Mater.*, 2004, 16, 3417.; *Int. J. Polym. Sci.*, 2012, 684278.



Scheme 1. Preparation of water-soluble ladder-like PSQs containing chiral groups (R- and S-PSQs).