

Masayoshi Tabata and Yasuteru Mawatari

Muroran Institute of Technology, Japan

**Polymer-Biopolymer Chemistry**

March 18-19, 2019 | Amsterdam, Netherlands

EMERGING STRETCHED AND CONTACTED HELICES AND ITS STIMULI INDUCED MUTUAL CONVERSION OF SUBSTITUTED POLYACETYLENES PREPARED WITH AN ORGANO-RHODIUM CATALYST

We have revealed that monosubstituted polyacetylenes (SPA)s which were prepared with a $[\text{Rh}(\text{norbornadiene})\text{Cl}]_2$ in the presence of amine or alcohol as co-catalyst have highly stereoregular main-chains with helical *cis-cisoid* and/or *cis-transoid* structures which have various helical pitches depending on the side chain structure (Fig. 1). The SPAs with a relative small side chain like an aliphatic group generate a *contracted cis-cisoid* helix structure and in contrast in the case of a *stretched* is created. Furthermore, in the case of aromatic side chains, an interesting mutual conversion between the *contracted* and *stretched* helices was induced by an external stimulus, i.e., heat treatment, solvent vapor, and soak insolvent, accompanied with a drastic colour change in the solid state. The *cis-transoid* and *cis-cisoid* helices constructed from the aliphatic polyacetylene ester main chain in solution showed an interesting *accordion-like helix oscillation*, HELIOS between their helices where restricted rotations around the O-C bond in the ester side-chain are dynamically synchronized.

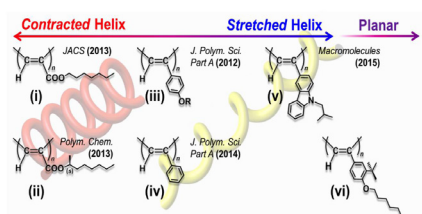


Figure 1: Relationships between helical main chain structures and stretched and contracted helices

Biography

Masayoshi Tabata has completed his PhD from Hokkaido University, Japan and Postdoctoral studies from UK and Sweden. After that, he became an Assistant Professor and Associated Professor at Hokkaido University, and Professor of Muroran Institute of Technology, Japan. Moreover, he also became a Senior Research Director at AIST, Tsukuba, Japan, and Guest Professor at Paris University in France.

tabata@mmm.muroran-it.ac.jp