1. Main Research Results

Synthesis of functionalized molecules and macromolecules, control of nano structure of polymer materials, and creation of novel function of polymer were widely studied.

Continued work:
(1) design and synthesis of topological gels
Novel synthetic method for poly(crown ether) was developed utilizing the characteristics of rotaxane. To avoid the accidental penetration of the propagation end into crown ether cavity leading to gelation, initial polymerization of wheel component of crown ether-based [2]rotaxane was followed by elimination of the axle moiety to give poly(crown ether) without any gelled material.

(2) design and synthesis of high performance polymers
Design and synthesis of high performance polymers having 9,9-diarylfluorene moieties in the main chain. Diarylfluorene is characterized by its cardo structure affecting polymer solubility, thermal stability, optical properties. New monomer 9,9-diaryl-9-silaefluorene was developed and applied to polyester which showed high refractive index and low birefringence in addition to high solubility and thermal stability.

New work:
(3) design and synthesis of stable artificial helical polymers
Designing of helical molecules having large cavity of which size is freely controlled was studied and novel helical polymers were prepared.

(4) main chain structure of polyacetylene main chain and its dynamic change
Polyacetylene having rotaxane side chains was prepared and its main chain structure was studied mainly based on the results of Raman spectra characteristic of cis and trans main chain structures. Dynamic change from cis to trans was observed.

2. List of Publication

<Original Paper>


3) Main Chain-Type Polyrotaxane with Controlled Ratio of Rotaxanated Units, Toshikazu Takata, Yasuhiro Kohsaka, Gen-ichi Konishi, Chem. Lett., 36[2], 292 ~ 293 (2007)


5) Solvent-Free Synthesis of Unmodified Cyclodextrin-Based Pseudopolyrotaxane and


20) Fine Dispersion of Carbon Black in Fluorene-Based Resin, Shin-ichi Kawasaki, Masahiro Yamada, Kana Kobori, Fengzhe Jin, Toshikazu Takata, Polymer Composites, in press


<Review>


<Book>


3. Invited Lectureship in International Meeting


4. Patent

4-1. Patent: 11 applications

5. Award

5-1. Yasuhiro Kohsaka, Student, Research Grant of Rikogaku Shinkokai (Jan. 26, 2008)

5-2. Yasuhito Koyama, Assistant Professor, Research Plan Award of the Society of Synthetic Organic Chemistry, Japan (Fuji Film Co. Ltd., Feb. 20, 2008)

6. International Collaboration

None

7. Others

7-1. Organizing Committee Member of International Meeting: 3 Meetings
7-2. International Advisory Member of International Meeting: 1 Meeting