

平成22年度 研究業績

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1. 発表論文等 (査読付き論文, 著書, 総説等の発表状況)

- (1) C–C Bond-Forming Click Synthesis of Rotaxanes Exploiting Nitrile *N*-Oxide  
Matsumura, T.; Ishiwari, F.; Koyama, Y.\*; Takata, T.\*, *Org. Lett.* **2010**, *12*, 3828-3831.
- (2) An Efficient Synthetic Entry to Rotaxane Utilizing Reversible Cleavage of Aromatic Disulfide Bond  
Yoshii, T.; Kohsaka, Y.; Moriyama, T.; Suzuki, T.; Koyama, Y.; Takata, T.\* *Supramol. Chem.* **2010**, *22*, 1029-0478.
- (3) Synthesis of Main Chain-Type Polyrotaxanes by New Click Polymerization Using Homoditopic Nitrile *N*-Oxides *via* Rotaxanation-Polymerization Protocol  
Lee, Y.-G.; Koyama, Y.; Yonekawa, M.; Takata, T.\*, *Macromolecules* **2010**, *43*, 4070-4080. [Selected as Cover Page Picture]
- (4) Synthesis of acetylene-functionalized [2]rotaxane monomers directed toward side chain-type polyrotaxanes  
Nakazono, K.; Fukasawa, K.; Sato, T.; Koyama, Y.; Takata, T.\*, *Polym. J.* **2010**, *42*, 208-215. [Selected as Cover Page Picture]
- (5) High-Yield One-Pot Synthesis of Permethylated  $\alpha$ -Cyclodextrin-based Polyrotaxane in Hydrocarbon Solvent through an Efficient Heterogeneous Reaction  
Nakazono, K.; Takashima, T.; Arai, T.; Koyama, Y.; Takata, T.\*, *Macromolecules* **2010**, *43*, 691-696.
- (6) Successive Catalytic Reactions Specific to Pd-Based Rotaxane Complexes as a Result of Wheel Translation along the Axle  
Miyagawa, N.; Watanabe, M.; Matsuyama, T.; Koyama, Y.; Moriuchi, T.; Hirao, T.; Furusho, Y.; Takata, T.\*, *Chem. Commun.* **2010**, *46*, 1920-1922. [Introduced by *Synfacts* **2010**]
- (7) Neutralization of *sec*-Ammonium Group Unusually Stabilized by the “Rotaxane Effect”: Synthesis, Structure, and Dynamic Nature of a “Free” *sec*-Amine/Crown Ether-Type Rotaxane  
Nakazono, K.; Takata, T.\* *Chem. A Eur. J.* **2010**, *16*, 13783–13794.
- (8) Thiazolium-Tethering Rotaxane-Catalyzed Asymmetric Benzoin Condensation: Unique Asymmetric Field Constructed by the Cooperation of Rotaxane Components  
Tachibana, Y. Kihara, N.; Nakazono, K.; Takata, T.\* *Phosphorus, Sulfur and Silicon and the Related Elements*, **2010**, *185*, 1182–1205.

- (9) Selective Transformation of a Crown Ether/*sec*-Ammonium Salt-Type Rotaxane to *N*-Alkylated Rotaxanes  
Suzuki, S.; Nakazono, K.; Takata, T.\* *Org. Lett.* **2010**, *12*, 712–715.
- (10) Photoinduced electron transfer processes of fullerene rotaxanes containing various electron-donors  
Sandanayaka, A. S. D.; Sasabe, H.; Takata, T.\*; Ito, O.\* *J. Photochemistry and Photobiology, C: Photochemistry Reviews*, **2011**, *11*, 73–92.
- (11) Axle Length Effect on Photoinduced Electron Transfer in Triad Rotaxane with Porphyrin, [60]Fullerene, and Triphenylamine  
Sandanayaka, A. S. D.; Sasabe, H.; Araki, Y.; Kihara, N.; Furusho, Y.; Takata, T.\*; Ito, O.\*, *J. Phys. Chem. A*, **2010**, *114*, 5242–5250. [Selected as Cover Page Picture]

## 2. 学会発表等（国内外の招待講演および国際会議での発表状況）

- (1) Cyclodextrin Oligomer for Supramolecular Cross-Linker Producing Quickly Thermo-Responsive Hydrogel  
Arai, T.; Takata, T. 15th International Cyclodextrin Symposium, Viena, Austria, 2010.5.9-12
- (2) Recyclable and Thermo-responsive Polymers Possessing Mechanical Crosslinks  
Takata, T., 2nd International Symposium on Polymer Materials Science and Technology, Harbin Engineering University, Harbin, China, 2010.5.31-6.4（招待講演）.
- (3) Recyclable Polymers and Thermo-Responsive Polymers Derived from Topological Cross-Links  
Takata, T., Hokkaido University Graduate School of Science Seminar, Sapporo, 2010.6.30-7.4（招待講演）.
- (4) New “Click Chemistry” Using Nitrile *N*-Oxide, Japan-Taiwan Bilateral Meeting  
Takata, T. Hokkaido University, Sapporo, 2010.6.30-7.4（招待講演）.
- (5) One-Handed Helices Controlled by Rotaxane Chirality  
Takata, T.; Ishiwari, F. Chirality 2010 (ISCD-22), Sapporo, 2010.7.12-15（招待講演）.
- (6) 空間連結を基盤とする触媒系の設計と分子モーター，高分子合成への応用  
高田十志和，新学術領域「集積反応化学」第1回成果報告会，京都大学，京都，2010.7.18-19（依頼講演）.
- (7) ロタキサンスイッチで制御するヘリックス誘起  
Ishiwari, F.; Takata, T. 日本化学会関東支部会，筑波大学，つくば，2010.8.30-31（招待講演）.

- (8) 分子不斉とその動的特性に基づくらせん性制御  
高田十志和, 高分子討論会, 北海道大学, 札幌, 2010.9.15-17 (依頼講演) .
- (9) Synthesis, Structure Control, and Application of Stable and Dynamic Helical Polymers  
Takata, T. Materials Department Seminar, Gwangju Institute of Science and Technology, Gwangju, Korea, 2010.10.6 (招待講演) .
- (10) Thermo-responsive Hydro Gels Possessing Mechanical Crosslinks  
Takata, T. The Polymer Society of Korea, Daegu, Korea, 2010.10.7-8 (招待講演) .
- (11) Synthesis and Application of Interlocked Molecules and Their Polymers  
Takata, T. Open Seminar of TIT and Tingshua University Program, Tingshua University, Beijing, China, 2010.11.2 (招待講演) .
- (12) Chemistry of Macromolecular Self-Assembly: Synthesis and Application of Cyclodextrin-based Polyrotaxanes  
Takata, T. Chemistry Department Seminar, Tingshua University, Beijing, China, 2010.11.3 (招待講演) .
- (13) 超分子ゲル, 化学ゲルの合成, 機能, 物性  
高田十志和, 東京理科大学特別講義, 東京, 2010.11.10 (招待講義) .
- (14) 架橋点可動型ポリマーネットワーク  
高田十志和, エポキシ樹脂技術協会講演会, 工学院大学, 東京, 2010.11.16. (招待講演) .
- (15) 高速相転移・高速応答ヒドロゲル—ロタキサン架橋の効果—  
高田十志和, 第171回ゴム技術シンポジウム, 東京電業会館, 東京, 2011.3.8 (招待講演) .
- (16) トポロジカル結合が作り出す空間の機能とその制御—緩やかな束縛系の役割—  
高田十志和, 日本化学会春季年会, 神奈川大学, 横浜, 2011.3.26-29 (ATP 招待講演) .

### 3. 特許

ポリ擬ロタキサンの製造方法, 架橋体の製造方法及びポリマーの回収方法  
国立大学法人東京工業大学+株式会社ブリヂストン, 八子貫之, 高坂泰弘, 高田十志和  
特開 2010-209301

#### 4. 学会・シンポジウム等の開催状況

- (1) 第11回リング・チューブ超分子研究会シンポジウム, 東京工業大学, 2011.3.10-11  
(高田十志和, 領域代表).

#### 5. 受賞等

- (1) 高田十志和 (A03 班, 公募班員)  
文部科学大臣表彰 (科学技術部門), 文部科学省, 2010.04.20
- (2) 高田十志和 (A03 班, 公募班員)  
化学技術賞 日本化学会, 2011.03.27

#### 6. 新聞報道等

- (1) *Synfacts* **2010**, 647.  
Successive Catalytic Reactions Specific to Pd-Based Rotaxane Complexes as a Result of Wheel Translation along the Axle  
Miyagawa, N.; Watanabe, M.; Matsuyama, T.; Koyama, Y.; Moriuchi, T.; Hirao, T.; Furusho, Y.; Takata, T.\*, *Chem. Commun.* **2010**, 46, 1920-1922.

#### 7. 領域内の共同研究の準備・実施状況とその成果

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#### 8. その他特記事項

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