

平成23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) Syntheses, molecular structures, and biological activities of 1- and 2-(2'-deoxy-D-ribofuranosyl)cyclohepta[*d*][1,2,3]triazol-6(1*H*)-ones and 1-(2'-deoxy-D-ribofuranosyl)cyclohepta[*b*]pyrrol-8(1*H*)-ones  
T. Nakazawa, T. Ohmae, M. Fujimuro, M. Ito, T. Nishinaga, M. Iyoda. *Tetrahedron* in press.
- (2) Sterically congested pyrrole-fused tetrathiafulvalene decamers as highly conductive amorphous molecular materials  
M. Takase, N. Yoshida, T. Narita, T. Fujio, T. Nishinaga, M. Iyoda. *RSC Advances* in press.
- (3) Face-to-Face Arranged Dimeric Tetrathiafulvalenes and Their Cation Radical and Dication Species as Models of Mixed Valence and  $\pi$ -Dimer States  
M. Hasegawa, K. Daigoku, K. Hashimoto, H. Nishikawa, M. Iyoda. *Bull. Chem. Soc. Jpn.* **2012**, *85*, 51-60.
- (4) Gold nanoparticle-templated assembly of oligothiophenes: preparation and film properties  
K. Saitou, R. Nishiyabu, M. Iyoda, Y. Kubo. *Tetrahedron* **2011**, *67*, 9685-9689.
- (5) Synthesis and structural, electronic, optical and FET properties of thiophene-pyrrole mixed hexamers end-capped with phenyl and pentafluorophenyl groups  
T. Nishinaga, T. Miyata, M. Tateno, M. Koizumi, M. Takase, M. Iyoda, N. Kobayashi, Y. Kunugi. *J. Mater. Chem.* **2011**, *21*, 14959-14966.
- (6) Star-Shaped Pyrrole-Fused Tetrathiafulvalene Oligomers: Synthesis and Redox, Self-Assembling, and Conductive Properties  
M. Takase, N. Yoshida, T. Nishinaga, M. Iyoda. *Org. Lett.* **2011**, *13*(15), 3896-3899.
- (7) Structural, Optical, and Electronic Properties of a Series of 3,4-Propylenedioxythiophene Oligomers in Neutral and Various Oxidation States  
C. Lin, T. Endo, M. Takase, M. Iyoda, T. Nishinaga. *J. Am. Chem. Soc.* **2011**, *133*(29), 11339-11350.
- (8) Synthesis and Nanostructures of Cyclic Triphenylene Trimers Having Long Alkyl and Alkoxy Side Chains  
Y. Hanai, M. J. Rahman, J. Yamakawa, M. Takase, T. Nishinaga, M. Hasegawa, K. Kamada, M. Iyoda. *Chem. Asian J.* **2011**, *6* (11), 2940-2945.

- (9) Nano-Sized to Giant Conjugated Macrocycles: New Concepts and Versatile Applications  
Iyoda, M.; Yamakawa, J.; Rahman, M. J. *Angew. Chem. Int. Ed.* **2011**, 50, 10522-10553.
- (10) Probing Coherence in Synthetic Cyclic Light-Harvesting Pigments  
Donehue, J. E.; Varnavski, O. P.; Cemborski, R.; Iyoda, M.; Goodson III, T. *J. Am. Chem. Soc.* **2011**, 133, 4819-4828.
- (11) Self-assembly and nanostructure formation of amphiphilic 4,5-bis(2-pyridylethynyl)-tetrathiafulvalenes  
Isomura, E.; Nishinaga, T.; Iyoda, M. *Supramolecular Chem.* **2011**, 23(3-4), 304-309.
- (12) McMurry Coupling of Diformyldithienylacetylene: Synthesis of [24]-, [36]-, and [48]annulenes Composed of Thiophene, Acetylene, and Ethylene Units  
Iyoda, M.; Huang, P.; Nishiuchi, T.; Takase, M.; Nishinaga, T. *Heterocycles* **2011**, 82(2), 1143-1149.

[著書]

- (1) 可溶性置換基をもつ3,4-ジオキシチオフェンオリゴマーの合成と基礎物性  
西長亨、伊與田正彦「PEDOT の材料物性とデバイス応用」監修 奥崎秀憲典、サイエンス&テクノロジー、2012, pp 24-30.
- (2) Conjugated Molecular Belts Based on 3-D Benzannulene Systems  
Iyoda, M.; Kuwatani, Y.; Nishinaga, T.; Takase, M.; Nishiuchi, T. In *Fragments of Fullerenes and Carbon Nanotubes: Designed Synthesis, Unusual Reactions, and Coordination Chemistry*, Eds. Petrukhina, M. A.; Scott, L. T., Wiley-VCH, 2012, pp 311-342.

[和文雑誌]

- (1) 有機巨大環状化合物の合成と機能  
伊與田正彦、OM ニュース、**2012** (1), 10-15.
- (2) 導電性超分子ナノ集積体の構築と機能  
長谷川真土、伊與田正彦、ファインケミカル、**2011**, 40(3), 29-35.

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) Synthesis of Macrocyclic Oligothiophene 4n-mers and Photochromism of 8-mer  
Shimizu, H.; Haque, T.; Tabata, C.; Takase, M.; Nishinaga, T.; Nomura, K.; Iyoda, M.  
International Symposium on Nano Science and Functional Materials: Post-symposium of International Symposium on Catalysis and Fine Chemicals 2011 (C&FC2011), 2011. 12. 10 (ポスター発表).

- (2) Synthesis of Macrocyclic Pentadecaphenylene and its Functional Properties  
Rahman, M. J.; Shimizu, H.; Iyoda, M. International Symposium on Nano Science and Functional Materials: Post-symposium of International Symposium on Catalysis and Fine Chemicals 2011 (C&FC2011), 2011. 12. 10 (ポスター発表).
- (3) Self-Organization of Nano-Sized to Giant Conjugated Macrocycles: Synthesis and Functional Properties  
Iyoda, M. BIT's 1st Annual World Congress on Nano-S&T (Nano-S&T 2011), Dalian, China, 2011. 10. 23-26 (招待講演).
- (4) Nano-Sized to Giant Conjugated Macrocycles: Synthesis and Versatile Applications  
Iyoda, M., the Seventh International Symposium on Integrated Synthesis (ISIS-7), Kobe, Japan, 2011. 10. 9-10 (招待講演).
- (5) Conducting Supramolecular Nanofibers and Nanorods  
Iyoda, M. The International Symposium on Carbon Electronics (ISCE) & The STINT Summer School 2011, Seoul National University, Seoul, Korea, 2011. 5. 9-14 (招待講演).
- (6) 有機巨大環状化合物の合成と機能  
伊與田正彦、近畿化学協会有機金属部会平成23年度第一回例会、大阪、平成23年4月15日 (招待講演).

### 3. 特許

無し

### 4. 学会・シンポジウム等の開催状況

無し

### 5. 受賞等

- (1) 伊與田正彦 (公募班員)  
日本化学会学術賞 第92回日本化学会年会、2012.3.26
- (2) 長谷川真士 (北里大学理学部助教)、伊與田正彦 (公募班員)  
Face-to-Face Arranged Dimeric Tetrathiafulvalenes and Their Cation Radical and Dication Species as Models of Mixed Valence and p-Dimer States, *Bull. Chem. Soc. Jpn.* **2012**, 85 (1), 51-60.  
BCSJ 賞受賞

## 6. 新聞報道等

無し

## 7. 国民との科学・技術対話

第一回 CSJ 化学フェスタ（日本化学会、平成 23 年 11 月 13 日－15 日、早稲田大学）の組織委員として、公開プログラム、公開講座の立案、実施を行った。

## 8. 領域内の共同研究の準備・実施状況とその成果

### (1) 共同研究先：大阪大学，戸部研究室（A03 班）

共同研究内容：走査型トンネル顕微鏡(STM)を用いた  $\pi$  拡張大環状オリゴチオフェンの観察

共同研究成果：論文作成中

### (1) M. Takase, N. Yoshida, T. Nishinaga, M. Iyoda, Star-Shaped Pyrrole-Fused Tetrathiafulvalene Oligomers: Synthesis and Redox, Self-Assembling, and Conductive Properties, *Org. Lett.* **2011**, 13(15), 3896-3899 が *Synfacts* **2011**, No. 10, 1068 で紹介された。