

## 研究業績リスト

岡山理科大学 理学部化学科  
准教授 岩永 哲夫

### 1. 学術雑誌等（紀要・論文集等も含む）に発表した論文又は著書

#### 学術論文（査読あり）

- (1) Synthesis and Electronic Properties of Length-Defined 9,10-Anthrylene-Butadiynylene Oligomers  
M. Nagaoka, E. Tsurumaki, M. Nishiuchi, T. Iwanaga, S. Toyota\*  
*J. Org. Chem.* accepted.
- (2) A Saddle-shaped Macrocycle Comprising 2,5-Diphenylthiophene Units  
T. Iwanaga,\* Y. Yamada, T. Yamauchi, Y. Misaki, M. Inoue, H. Yamada  
*Chem. Lett.* in press.
- (3) Synthesis and Properties of Conjugated Macrocycles Composed of m-Diethynylene-Phenylene-Bridged Two Dibenzofuran, Dibenzothiophene and Carbazole Units  
T. Shimasaki,\* S. Okajima, R. Ishikawa, S. Kawaguchi, T. Akimoto, N. Asano, T. Iwanaga, M. Watanabe, N. Teramoto, M. Shibata\*  
*Tetrahedron*, **2018**, 74(20), 2454-2465.
- (4) Synthesis of *N,N'*-bridged azacalixarenes  
H. Takemura,\* K. Sako, T. Iwanaga, A. Tatsumi, Y. Mogami, H. Watanabe, M. Aoki, S. Yuki, Y. Hayano, M. Itaka  
*Tetrahedron*, **2018**, 74(16), 1991-2001.
- (5) Structures and Photophysical Properties of a 1,8-Anthrylene-Ethenylene Cyclic Tetramer  
M. Inoue, T. Komori, T. Iwanaga, S. Toyota\*  
*Chem. Lett.* **2017**, 46(12), 1836-1838.
- (6) Oxidation State-dependent Intramolecular Electronic Interaction of Carbazole-based Azacyclophanes with 9,10-Anthrylene Units  
T. Iwanaga,\* T. Yamauchi, S. Toyota,\* S. Suzuki, K. Okada  
*J. Org. Chem.* **2017**, 82(19), 10699-10703.
- (7) Triple and Quadruple Triptycene Gears in Rigid Macroyclic Frameworks  
S. Toyota,\* K. Kawahata, K. Sugahara, K. Wakamatsu, T. Iwanaga  
*Eur. J. Org. Chem.* **2017**, (37), 5696-5707.
- (8) An Isolable Triradical Trication of Hexaaza[1<sub>6</sub>]paracyclophane with Embedded 9,10-Anthrylenes: A Frustrated 3-Spin Systems  
R. Kurata, D. Sakamaki,\* M. Uebe, M. Kinoshita, T. Iwanaga,\* T. Matsumoto, A. Ito\*  
*Org. Lett.* **2017**, 19(16), 4371-4374.
- (9) Synthesis of 1,8-Anthracene-Ethenylene Cyclic Dimers and Related Compounds and Effects of Linkers on their Structures, Electronic Properties, and Dynamic Behavior  
M. Inoue, T. Iwanaga, S. Toyota\*  
*Asian J. Org. Chem.* **2017**, 6(5), 566-574.

- (10) Synthetic study and structure of cage-type cyclophane C<sub>36</sub>H<sub>36</sub>S<sub>6</sub>  
 H. Takemura,\* M. Nagaoka, C. Kawasaki, K. Tokumoto, N. Tobita, Y. Takano, T. Iwanaga, *Tetrahedron Lett.* **2017**, 58(11), 1066-1070.
- (11) Synthesis, structures, and properties of 2,5-dianthrylthiophene derivatives  
 S. Toyota,\* M. Nishiuchi, T. Iwata, T. Yamauchi, T. Iwanaga, M. Hasegawa, *Can. J. Chem.* **2017**, 95(3), 286-291.
- (12) Synthesis of 1,2-Bis(2-aryl -1H-indol-3-yl)ethynes via 5-Exo-digonal Double Cyclization Reactions of 1,4-Bis(2-isocyanophenyl)buta-1,3-diyne with Aryl Grignard Reagents  
 R. Ishikawa, R. Iwasawa, Y. Takiyama, T. Yamauchi, T. Iwanaga, M. Takezaki, M. Watanabe, N. Teramoto, T. Shimasaki,\* M. Shibata,\* *J. Org. Chem.* **2017**, 82(1), 652-663.
- (13) Intramolecular Charge-Transfer Interaction of Donor–Acceptor–Donor Arrays Based on Anthracene Bisimide  
T. Iwanaga,\* M. Ogawa, T. Yamauchi, S. Toyota\*  
*J. Org. Chem.* **2016**, 81(10), 4076-4080.
- (14) Macroyclic 2,7-Anthrylene Oligomers  
 Y. Yamamoto, K. Wakamatsu, T. Iwanaga, H. Sato, S. Toyota\*  
*Chem. Asian J.* **2016**, 11(9), 1370-1375.
- (15) Synthesis of Fluorocalix[4]arene and Estimation of Intramolecular C-F···HO Hydrogen Bond  
 H. Takemura,\* M. Inagaki, Y. Hirata, T. Iwanaga, *J. Fluorine Chem.* **2016**, 182, 1-6.
- (16) Enantiopure 5,5'-Bitetracene  
 S. Toyota,\* R. Miyaji, Y. Yamamoto, M. Inoue, K. Wakamatsu, T. Iwanaga, *Eur. J. Org. Chem.* **2015**, (35), 7648-7651.
- (17) Efficient Synthesis and Electronic Spectra of Unsymmetrical 5,12-Diethynyltetracene Derivatives.  
T. Iwanaga,\* Y. Yamamoto, K. Nishioka, S. Toyota\*  
*Synthesis*, **2015**, 47(24), 3997-4007.
- (18) Structures, Dynamic Behavior, and Spectroscopic Properties of 1,8-Anthrylene-Ethenylene Cyclic Dimers and Their Substituent Effect.  
 M. Inoue, T. Iwanaga, S. Toyota\*  
*Bull. Chem. Soc. Jpn.* **2015**, 88(11), 1591-1602.
- (19) Cramping an alkyl group by rigid macrocyclic framework  
 S. Toyota,\* T. Oki, M. Inoue, K. Wakamatsu, T. Iwanaga  
*Chem. Lett.* **2015**, 44(7), 978-980.
- (20) On-Surface Chirality of Self-Assembled Molecular Network of Fan-Blade-Shaped Anthracene-Acetylene Macrocycles with a Long Alkyl Chain  
 T. Tsuya, K. Iritani, K. Tahara, Y. Tobe, T. Iwanaga, S. Toyota\*  
*Chem. Eur. J.* **2015**, 21(14), 5520-5527.
- (21) Chemistry of Anthracene–Acetylene Oligomers XXIV. Theoretical Evaluation of Molecular Strain and Interactions in Anthracene-Acetylene Cyclic Oligomers by Homodesmotic Reaction Method

- S. Toyota,\* K. Wakamatsu, T. Kawakami, T. Iwanaga  
*Bull. Chem. Soc. Jpn.* **2015**, 88(2), 283-291.
- (22) Synthesis and Properties of Extended  $\pi$ -Conjugated Compounds with 9,10-Bis(phenylethynyl)anthracene Units  
 S. Toyota,\* S. Karashima, T. Iwanaga  
*Bull. Chem. Soc. Jpn.* **2015**, 88(1), 192-199.
- (23) Synthesis of 2,9-Diethynylanthracene Derivatives  
 S. Toyota,\* T. Kawakami, T. Iwanaga  
*Synthesis* **2014**, 46(12), 1667-1673.
- (24) Synthesis and properties of novel crown ether-annelated 4',5'-diaza-9'-(1,3-dithiole-2-ylidene)-fluorenes and their ruthenium(II) complexes  
 K. Sako,\* T. Kakehi, S. Nakano, H. Oku, X. F. Shen, T. Iwanaga, M. Yoshikawa, K. Sugahara, S. Toyota, H. Takemura, T. Shinmyozu, M. Shiotsuka, H. Tatemitsu  
*Tetrahedron Lett.* **2014**, 55(3), 749-752.
- (25) Introduction of an Arylethynyl Group onto Anthracene Bisimide Core for Molecular Design of New  $\pi$ -Conjugated Compounds  
T. Iwanaga, R. Tanaka, S. Toyota\*  
*Chem. Lett.* **2014**, 43(1), 105-107.
- (26) Nonplanar and Dynamic Structures of 1,8-Anthrylene–Ethenylene Cyclic Dimers  
 M. Inoue, T. Iwanaga, S. Toyota\*  
*Chem. Lett.* **2013**, 42(12), 1499-1501.
- (27) Chemistry of Anthracene–Acetylene Oligomers XXIII. Molecular Structures and Stereochemistry of Anthracene–Diacetylene Cyclic Dimers Having Two Intraannular Alkoxy Groups  
 S. Toyota,\* T. Tsuya, T. Iwanaga  
*Bull. Chem. Soc. Jpn.* **2013**, 86(11), 1309-1316.
- (28) Chemistry of Anthracene–Acetylene Oligomers XXII. Strained and Fluxional Macroyclic Framework of Anthracene–Diacetylene Cyclic Pentamers  
 M. Yoshikawa, S. Imigi, K. Wakamatsu, T. Iwanaga, S. Toyota\*  
*Chem. Lett.* **2013**, 42(5), 559-561.
- (29) Efficient Synthesis of 9,10-Bis(phenylethynyl)anthracene Derivatives by Integrated Sonogashira Coupling and Double-Elimination Reaction  
 S. Toyota,\* D. Mamiya, R. Yoshida, R. Tanaka, T. Iwanaga, A. Orita, J. Otera  
*Synthesis*, **2013**, 45(8), 1060-1068.
- (30) Chemistry of Anthracene–Acetylene Oligomers XXI. Structures and Stereochemistry of Chiral Anthracene–Acetylene Dimers with an Intraannular Alkoxy Group.  
 T. Tsuya, T. Iwanaga, S. Toyota\*  
*Bull. Chem. Soc. Jpn.* **2013**, 86(1), 138-145.
- (31) Tolanophane Revisited – Resolution and Racemization Mechanism of a Twisted Chiral Aromatic Compound  
 S. Toyota,\* K. Kawai, T. Iwanaga, K. Wakamatsu  
*Eur. J. Org. Chem.* **2012**, (29), 5679-5684. (Cover Picture)

- (32) Chemistry of Anthracene–Acetylene Oligomers. XX. Synthesis, Structures, and Self-Association of Anthracene–Anthraquinone Cyclic Compounds with Ethynylene Linkers  
T. Iwanaga, K. Miyamoto, K. Tahara, K. Inukai, S. Okuhata, Y. Tobe, S. Toyota\*  
*Chem. Asian J.* **2012**, 7(5), 935–943.
- (33) Synthesis and redox properties of π-conjugated 4,5-diazafluorene derivatives incorporating 9-cyanomethylene moiety as an electron acceptor.  
K. Sako,\* Y. Mugishima, T. Iwanaga, S. Toyota, H. Takemura, M. Watanabe, T. Shinmyozu, M. Shiotsuka, H. Tatemitsu,  
*Tetrahedron Lett.* **2011**, 52(44), 5865–5868.
- (34) Introduction of Two Anthracene Moieties into Perylenebis(dicarboximide) Core by Suzuki-Miyaura Coupling toward Construction of Donor-Acceptor-Donor Arrays.  
T. Iwanaga, H. Ida, M. Takezaki, S. Toyota\*  
*Chem. Lett.* **2011**, 40(9), 970–971.
- (35) Chemistry of Anthracene-Acetylene Oligomers XIX. Construction of Higher 1,8-Anthrylene-Alkynylene Macrocycles: Synthesis, Structures, and Conformational Analysis of Cyclic Hexamer and Dodecamer.  
S. Toyota,\* H. Harada, H. Miyahara, T. Kawakami, K. Wakamatsu, T. Iwanaga  
*Bull. Chem. Soc. Jpn.* **2011**, 84(8), 829–838.
- (36) Chemistry of Anthracene-Acetylene Oligomers. XVIII. Construction and Structures of Belt-Shaped Macroyclic Oligomers with Anthracene Units and Acetylene Linkers and Resolution of Chiral Derivatives.  
T. Ishikawa, T. Iwanaga, S. Toyota,\* M. Yamasaki  
*Bull. Chem. Soc. Jpn.* **2011**, 84(7), 729–740.
- (37) Synthesis of Azacalixarenes through Dihydrobenzoxazine Derivatives of Phenols.  
H. Takemura,\* A. Takahashi, H. Suga, M. Fukuda, T. Iwanaga  
*Eur. J. Org. Chem.* **2011**, (17), 3171–3177.
- (38) Structures and Conformational Analysis of 1,8-Bis(9-trptycylethynyl)anthracene and Its Derivatives as Prototypes of Molecular Spur Gears.  
S. Toyota,\* T. Shimizu, T. Iwanaga, K. Wakamatsu  
*Chem. Lett.* **2011**, 40(3), 312–314.
- (39) Facile Synthesis of 3-(Succinimid-3-yl)-2-oxo-2,3-dihydroimidazo[1,2-a]pyridine Derivatives by Sequential Intra- and Intermolecular Michael Reactions between 2-Aminopyridines and Maleimides.  
T. Shimo,\* T. Itoh, Y. Araki, T. Iwanaga, T. Shinmyozu, K. Somekawa  
*Heterocycles*, **2011**, 83(1), 47–55.
- (40) Molecular Tubes and Capsules, Part 6: Formation of Nanoporous Fibers by the Self-Assembly of Pyromellitic Diimide-Based Macrocycle.  
T. Nakagaki, A. Harano, Y. Fuchigami, E. Tanaka, S. Kidoaki, T. Okuda, T. Iwanaga, K. Goto, T. Shinmyozu\*  
*Angew. Chem. Int. Ed.* **2010**, 49(50), 9676–9679.
- (41) Chemistry of Anthracene–Acetylene Oligomers. XVII. Synthesis, structure, and dynamic behavior of 1,8-anthrylene pentamers and hexamers with acetylene linkers.

- S. Toyota,\* T. Kawakami, R. Shinnishi, R. Sugiki, S. Suzuki, T. Iwanaga  
*Org. Biomol. Chem.* **2010**, *8*, 4997-5006.
- (42) Synthesis and spectroscopic study of phenylene-(poly)ethynlenes substituted by amino or amino/cyano groups at terminal(s): electronic effect of cyano group on charge-transfer excitation of acetylenic  $\pi$ -systems.  
 J.-K. Fang, D.-L. An, K. Wakamatsu, T. Ishikawa, T. Iwanaga, S. Toyota, S.-i. Akita, D. Matsuo, A. Orita,\* J. Otera\*  
*Tetrahedron*, **2010**, *66*(29), 5479–5485.
- (43) Chemistry of Anthracene–Acetylene Oligomers. XVI. Influence of Conformation of 9,10-Anthrylene Rotors on Structures and Self-association Properties of Macrocyclic Arylene-Alkynylene Oligomers.  
 K. Miyamoto, T. Iwanaga, S. Toyota\*  
*Chem. Lett.* **2010**, *39*(3), 288-290.
- (44) Chemistry of Anthracene–Acetylene Oligomers. XV. Synthesis, Structures, and Dynamic Behavior of Chiral Anthrylene–Ethynylene Cyclic Tetramers and Related Derivatives and Resolution of Enantiomers.  
 T. Ishikawa, T. Shimasaki, H. Akashi, T. Iwanaga, S. Toyota,\* M. Yamasaki,  
*Bull. Chem. Soc. Jpn.*, **2010**, *83*(3), 220-232.
- (45) Synthesis and Spectroscopic Study of Diphenylamino-substituted Phenylene-(poly)ethynlenes: Remarkable Effect of Acetylenic Conjugated Modes.  
 J.-K. Fang, D.-L. An, K. Wakamatsu, T. Ishikawa, T. Iwanaga, S. Toyota, D. Matsuo, A. Orita,\* J. Otera\*  
*Tetrahedron Lett.* **2010**, *51*(6), 917-920.
- (46) Chemistry of Anthracene–Acetylene Oligomers. XIV. Convenient Synthesis of Anthrylethyne by Double Elimination Reaction from Aldehydes and Sulfones.  
 S. Toyota,\* R. Azami, T. Iwanaga, D. Matsuo, A. Orita, J. Otera,  
*Bull. Chem. Soc. Jpn.* **2009**, *82*(10), 1287-1291.
- (47) The intramolecular C-F···HO hydrogen bond of 2-fluorophenyldiphenylmethanol.  
 H. Takemura,\* M. Kaneko, K. Sako, T. Iwanaga,  
*New J. Chem.* **2009**, *33*(10), 2004-2006.
- (48) Chemistry of Anthracene–Acetylene Oligomers. XIII. Synthesis, Structures, and Spectroscopic Properties of All Possible 1,8-Anthrylene Cyclic Tetramers with Acetylene and Diacetylene Linkers.  
 S. Toyota,\* H. Miyahara, M. Goichi, S. Yamasaki, T. Iwanaga  
*Bull. Chem. Soc. Jpn.* **2009**, *82*(8), 931-945.
- (49) C-F···HO hydrogen bond in 8-fluoro-4-methyl-1-naphthol.  
 H. Takemura,\* R. Ueda, T. Iwanaga  
*J. Fluorine Chem.* **2009**, *130*(7), 684-688.
- (50) Synthesis and spectroscopic study of silacyclyne-substituted phenyleneethynlenes.  
 G. Mao, A. Orita,\* D. Matsuo, T. Hirate, T. Iwanaga, S. Toyota, J. Otera\*  
*Tetrahedron Lett.* **2009**, *50*(24), 2860-2864.

- (51) Chemistry of Anthracene–Acetylene Oligomers. XII. Enantiopure 1,8-Anthrylene Dimer with Acetylene Linkers and an Intraannular Alkyl Group.  
 S. Toyota,\* H. Onishi, K. Wakamatsu, T. Iwanaga  
*Chem. Lett.* **2009**, 38(4), 350-351.
- (52) Molecular Structure of Chlorocycloheptane in Inclusion Compound with 9,9'-Bianthryl and Gelation during Crystallization.  
 S. Toyota,\* Y. Okamoto, T. Ishikawa, T. Iwanaga, M. Yamada  
*Bull. Chem. Soc. Jpn.* **2009**, 82(2), 182-186.
- (53) Chemistry of Anthracene–Acetylene Oligomers. XI. Stereogenic Motif Consisting of Rigid Ring and Intraannular Chains: Isolation and Structures of Stereoisomers of 9-Alkyl-1,8-anthrylene-butadiynylene Cyclic Dimers.  
 S. Toyota,\* H. Onishi, Y. Kawai, T. Morimoto, H. Miyahara, T. Iwanaga, K. Wakamatsu  
*Org. Lett.* **2009**, 11(2), 321-324.
- (54) Chemistry of Anthracene–Acetylene Oligomers. X. Synthesis, Structures, and Properties of 1,8-Anthrylene–Alkynylene Cyclic Trimers.  
 S. Toyota,\* H. Miyahara, M. Goichi, K. Wakamatsu, T. Iwanaga  
*Bull. Chem. Soc. Jpn.* **2008**, 81(9), 1147–1157.
- (55) Formation of 4-hydroxy-3-(oxan-3-yl)coumarin from photochemical reaction between 4-hydroxycoumarin and 3,4-dihydro-2H-pyran and MO analysis.  
 T. Shimo,\* K. Sato, W. Wang, T. Obata, T. Iwanaga, T. Shinmyozu, K. Somekawa  
*Bull. Chem. Soc. Jpn.* **2008**, 81(7), 894-896.
- (56) Synthesis, Structure, and Transannular  $\pi$ - $\pi$  Interaction of Three- and Four-Layered [3.3]Paracyclophanes. (Multilayered [3.3]Cyclophanes, Part 2)  
 M. Shibahara, M. Watanabe, T. Iwanaga, T. Matsumoto, K. Ideta, T. Shinmyozu\*  
*J. Org. Chem.* **2008**, 73(12), 4433-4442.
- (57) Molecular folding screen: folding and unfolding of 1,8-anthrylene-ethynylene oligomers by photochemical cycloaddition and thermal cycloreversion.  
 S. Toyota,\* M. Kuga, A. Takatsu, M. Goichi, T. Iwanaga  
*Chem. Commun.* **2008**, (11), 1323-1325.
- (58) New  $\pi$ -Conjugated System with a Rigid Framework of 1,8-Anthrylene-Ethynylene Cyclic Dimer and Its Monoanthraquinone Analogue.  
 S. Toyota, \*M. Kurokawa, M. Araki, K. Nakamura, T. Iwanaga  
*Org. Lett.* **2007**, 9(18), 3655-3658.
- (59) Efficient 2-Amino-2-yhiazolin-4-ones or 2-Iminothiazolidin Formation from Thioureas and Maleimides under Solvent-free Conditions.  
 T. Shimo,\* Y. Matsuda, T. Iwanaga, T. Shinmyozu, K. Somekawa,  
*Heterocycles*, **2007**, 71, 1053-1058.
- (60) Synthesis, Structural, and Transannular  $\pi$ - $\pi$  Interaction of Multilayered [3.3]Metacyclophanes. (Multilayered [3.3]Cyclophanes, Part 1)  
 M. Shibahara, M. Watanabe, T. Iwanaga, K. Ideta, T. Shinmyozu\*  
*J. Org. Chem.* **2007**, 72(8), 2865-2877.

- (61) Bis(1,3-Dithiol-2-ylidene)-[3.3]paracyclophanes; orthogonal intramolecular charge transfer interaction.  
 K. Sako,\* Y. Mase, Y. Kato, T. Iwanaga, T. Shinmyozu, H. Takemura, M. Ito, K. Sasaki, H. Tatemitsu  
*Tetrahedron Lett.* **2006**, 47(51), 9151-9154.
- (62) C-F···Rb<sup>+</sup> Interaction in a Fluorinated Cage Compound Complex.  
 H. Takemura,\* T. Iwanaga, T. Shinmyozu  
*Tetrahedron Lett.* **2006**, 47(50), 8989-8991.
- (63) Solid-state photocycloaddition of 6,6'-dimethyl-4,4'-polymethylenedioxy-di-2-pyrone to benzophenone.  
 W. Wang, T. Shimo,\* T. Shinmyozu, T. Iwanaga, K. Somekawa  
*Heterocycles*, **2006**, 68(7), 1381-1392.
- (64) Cyclophanes within Cyclophanes: The Synthesis of a Pyromellitic Diimide-Based Macrocycles as a Structural Unit in a Molecular Tube and Its Inclusion Phenomena.  
T. Iwanaga, R. Nakamoto, M. Yasutake, H. Takemura, K. Sako, T. Shinmyozu\*  
*Angew. Chem. Int. Ed.* **2006**, 45(22), 3643-3647.
- (65) Absolute Configuration and Chiroptical Properties of an Enantiopure [5-Chloro-2-(dimethylaminomethyl)phenyl]phenylborane derivatives.  
 S. Toyota,\* F. Ito, T. Yamamoto, H. Akashi, T. Iwanaga  
*Bull. Chem. Soc. Jpn.* **2006**, 79(5), 796-798.
- (66) Preferred head-to-tail adduct in solid-state [2+2] photodimerization of 2-pyrone-5-carboxylic acid.  
 T. Shimo,\* M. Matsushita, W. Wang, T. Iwanaga, T. Shinmyozu, K. Somekawa  
*Analytical Sciences: X-ray Structure Analysis Online*, **2005**, 21(11), x169-x170.
- (67) Structure and C-H···π interaction in DMF inclusion complexes of homoazacalix[4]arenes.  
 H. Takemura,\* T. Iwanaga, T. Shinmyozu  
*Tetrahedron Lett.* **2005**, 46(39), 6687-6690.
- (68) A comparison of coordination ability of hetero atoms: a Li<sup>+</sup> and Na<sup>+</sup> selective pyridinophane-based cryptand.  
 H. Takemura,\* H. Nakamichi, R. Nogita, T. Iwanaga, M. Yasutake, T. Shinmyozu,  
*Tetrahedron Lett.* **2003**, 44(27), 5087-5089.

## 著書

- (1) Three-Dimensional Aromatic Networks  
 S. Toyota, T. Iwanaga,  
*Top. Curr. Chem.* **2014**, 350, 111-140. (DOI:10.1007/128\_2012\_358)
- (2) 76. 水素雰囲気下での蘭頭反応  
 84. 二重脱離反応によるアルキン合成  
 豊田真司・岩永哲夫  
 使える！有機合成反応241実践ガイド, 丸岡啓二他編著, 東京化学同人, 東京, **2010**, Part1, 152-153, 168-169.

(3) Product Class 19: Naphthalene, Anthracene, 9H-Fluorene and Other Acenes

S. Toyota, T. Iwanaga,

Science of Synthesis: Houben-Weyl methods of molecular transformation, Vol 45b Aromatic Ring Assemblies, Polycyclic Aromatic Hydrocarbons, and Conjugated Polyenes, ed. J. S. Siegel, Y. Tobe, George Thieme Verlag KG, Stuttgart, **2009**, 45.19, 745–854.

## 2. 解説、総説

(1) Planar Anthracene-Acetylene Frameworks as Stereogenic Motif

S. Toyota, H. Ikeda, T. Iwanaga,

*ChemPlusChem*, **2017**, 82(7), 957-966. (Minireview)

(2) エチニルアントラセン誘導体の効率合成とオリゴマー合成への応用

豊田真司, 岩永哲夫,

有機合成化学協会誌, **2015**, 73(4), 328-338.