

## 研究期間全年度 研究業績

久保孝史（大阪大学大学院理学研究科、A03班 計画班員）

### 1 . 発表論文等（査読付き論文，著書，総説等の発表状況）

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Hirao, Y., Kubo, T., 15th International Symposium on Novel Aromatic Compounds (ISNA-15), Howard civil service international house, Taipei, Taiwan, 2013/7/28-8/2 (ポスター発表)
- (43) Synthesis, Structures and Properties of Three-Dimensional Oligothiophene Cages  
Adachi, K., Kubo, T., 15th International Symposium on Novel Aromatic Compounds (ISNA-15), Howard civil service international house, Taipei, Taiwan, 2013/7/28-8/2 (ポスター発表)
- (44) Construction of one-dimensional chain composed of organic radicals by utilizing electrostatic interaction,  
Uchida, K., Kubo, T., 15th International Symposium on Novel Aromatic Compounds (ISNA-15), Howard civil service international house, Taipei, Taiwan (ポスター発表)
- (45) Synthetic Study of Stabler Fluorenyl Radical Substituted with Anthracene,  
Tian, Yi., Kubo, T., 15th International Symposium on Novel Aromatic Compounds (ISNA-15), Howard civil service international house, Taipei, Taiwan, 2013/7/28-8/2 (ポスター発表)
- (46) Synthesis and Properties of Chiral Tetraarylmethane Derivatives  
Matsumoto, K.; Inagaki, T.; Miki, K.; Tanaka, R.; Hirao, Y.; Kurata, H.; Kubo, T. The 15th Asian Chemical Congress (15ACC), Resorts World Sentosa, Singapore, 2013.8.19-23 (口頭発表)
- (47) Exploring Anti-ferromagnetic State On Zigzag Edges Of Polycyclic Aromatic Hydrocarbons  
Konishi, A.; Hirao, Y.; Kurata, H.; Kubo, T., 15th Asian Chemical Congress (15ACC), Resorts World Sentosa, Singapore, 2013.8.19–8.23 (招待講演)
- (48) Multiple Overcrowded Aromatic Enes  
Kubo, T., 第16回日韓有機化学シンポジウム, 秋保リゾートホテルクレセント, 2013.9.27–9.30 (招待講演)

(49) Syntheses and Physical Properties of Singlet Biradical PAHs

Kubo, T., The 7th Japanese-Russian International Workshop on Open Shell Compounds and Molecular Spin Devices, Awaji Yumebutai International Conference Center, 2013.11.17–20 (招待講演)

(50) Cyclization of anthracene oligomers using Scholl reaction

Konishi, A.; Hirao, Y.; Kurata, H.; Kubo, T., The 8th International Symposium on Integrated Synthesis (ISIS-8), Todaiji Temple Cultural Center, Nara, 2013.11.29–12.1 (ポスター発表)

### 3 . 特許

特になし

### 4 . 学会・シンポジウム等の開催状況

- (1) Diradicals and Multiradicals: Theory and Experiment, Namur, Belgium, 2009.7.27–28 (久保孝史, co-organizer)
- (2) International Conference of Computational Methods in Sciences and Engineering 2009; Open-Shell Molecules, Graphenes and Conjugated Molecules, Rhodes, Greece, 2009.9.30–10.2 (久保孝史, co-organizer)
- (3) The 2010 International Chemical Congress of Pacific Basin Societies (Pacifichem 2010): Designed pi-Electronic Systems: Synthesis, Properties, Theory and Function (#29), Honolulu, Hawaii, USA, 2010.12.15–20, Michael Haley (chief organizer), Takashi Kubo (co-organizer), Graham Bodwell (co-organizer), Yoshito Tobe (co-organizer)
- (4) 平成 24 年度 大阪大学「物質・材料科学研究推進機構」講演会, 大阪大学豊中キャンパス, 2013.3.4 (久保孝史, chief organizer).

### 5 . 受賞等

- (1) 小西彬仁 (修士 2 年)  
ポスター賞 第 41 回構造有機化学若手の会, 2009.8.5–7
- (2) 青葉充哉 (修士 1 年)  
ポスター賞, 第 41 回構造有機化学若手の会, 2009.8.5–7
- (3) 猪口大輔 (博士 2 年)  
Young Researcher Poster Award International Conference on Science and Technology of Synthetic Metals 2010 (ICSM 2010), 2010. 7.6
- (4) 小西彬仁 (博士 1 年)  
ポスター賞 第 42 回構造有機若手の会, 2010.8.8

- (5) 青葉充哉 ( 修士 2 年 )  
ポスター賞 第 42 回構造有機若手の会、2010.8.8
- (6) 齋藤 徹 ( 修士 1 年 )  
ポスター賞 第 42 回構造有機若手の会、2010.8.8
- (7) 石田 恵 ( 修士 1 年 )  
ポスター賞 第 4 回有機 シンポジウム、2010.11.19
- (8) 小西彬仁 ( 博士 2 年 )  
ポスター賞 第 22 回基礎有機化学討論会、2011.9.21–23
- (9) 兒玉拓也 ( 学部 4 年 )  
東京化成工業賞 第 2 回サイエンス・インカレ、2013.3.2–3
- (10) 小西彬仁 ( 博士 3 年 )  
ポスター賞 8th Handai Nanoscience and Nanotechnology International Symposium、  
2012.12.11
- (11) 内田一幸 ( 修士 2 年 )  
優秀研究発表賞 ( ポスターセッション )、第 32 回有機合成若手セミナー「明日の  
有機合成を担う人のために」、2012.11.22
- (12) 小西彬仁 ( 博士 3 年 )  
ポスター賞 第 2 回 CSJ フェスタ、2012.10.16
- (13) 内田一幸 ( 博士 1 年 )  
ポスター賞 第 24 回基礎有機化学討論会、2013.9.5–7
- (14) 兒玉拓也 ( 修士 1 年 )  
ポスター賞 第 7 回有機  $\pi$  電子系シンポジウム、2013.12.13–14

## 6 . 新聞報道等

- (1) **Selected by the Editorial Board of SYNFACTS** (*Synfacts* **2010**, *11*, 1238)  
Synthesis and Characterization of Teranthene: A Singlet Biradical Polycyclic Aromatic Hydrocarbon Having Kekulé Structures  
Konishi, A.; Hirao, Y.; Nakano, M.; Shimizu, A.; Botek, E.; Champagne, B.\*; Shiomi, D.; Sato, K.; Takui, T.; Matsumoto, K.; Kurata, H.; Kubo, T.\* *J. Am. Chem. Soc.* **2010**, *132*, 11021–11023.
- (2) **Selected by the Editorial Board of SYNFACTS** (*Synfacts* **2010**, *5*, 0530)  
Synthesis and Identification of a Trimethylenemethane Derivative p-Extended with Three pyridinyl Radicals  
Matsumoto, K.; Inokuchi, D.; Hirao, Y.; Kurata, H.; Sato, K.; Takui, T.; Kubo, T. *Org. Lett.* **2010**, *12*, 836–839.

- (3) **Highlighted by Prof. Christoph Lambert in ANGEW. CHEM. INT. ED.** (*Angew. Chem. Int. Ed.* **2011**, *50*, 1756–1758)

Synthesis and Characterization of Teranthene: A Singlet Biradical Polycyclic Aromatic Hydrocarbon Having Kekulé Structures

Konishi, A.; Hirao, Y.; Nakano, M.; Shimizu, A.; Botek, E.; Champagne, B.\*; Shiomi, D.; Sato, K.; Takui, T.; Matsumoto, K.; Kurata, H.; Kubo, T.\* *J. Am. Chem. Soc.* **2010**, *132*, 11021–11023

- (4) **Selected by the Editorial Board of SYNFACTS** (*Synfacts* **2011**, *12*, 1304)

Synthesis, Crystal Structure, and Physical Properties of Sterically Unprotected Hydrocarbon Radicals

Kubo, T.\*; Katada, Y.; Shimizu, A.; Hirao, Y.\*; Sato, K.; Takui, T.; Uruichi, M.; Yakushi, K.; Haddon, R. C.\* *J. Am. Chem. Soc.* **2011**, *133*, 14240-14243.

## 7. 国民との科学・技術対話

- (1) 一般市民 15 名を対象とした授業（サイエンスカフェ）を 2012 年 3 月 3 日に大阪大学総合博物館で行った。講師は久保孝史。講義時間は 90 分。アンケート有で評価点（良 5 点～悪 1 点）は、5 点が 9 名、4 点が 6 名。
- (2) 2012 年 7 月 28 日に兵庫県立宝塚北高等学校の高校生 40 名に対し、JST の事業「サイエンス・パートナーシップ・プロジェクト(SPP)」で久保が主講師を、平尾が副講師を務めた。企画名は、色素増感太陽電池の実験を通じて考える環境問題。アンケートの実施を行ったところ、高校生には非常に好評だった。
- (3) 2013 年 7 月 26, 27 日に兵庫県立宝塚北高等学校の高校生 40 名に対し、JST の事業「サイエンス・パートナーシップ・プロジェクト(SPP)」で久保が主講師を、平尾が副講師を務めた。企画名は、太陽電池と熱電変換の実験を通じて考えるエネルギー問題。アンケートの実施を行ったところ、高校生には非常に好評だった。

## 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：物質・材料研究機構ナノ有機センター，三木一司グループ（A01 班，公募班員）
- 共同研究内容：フロー系二光子吸収を用いた芳香族縮環反応の開発
- 共同研究成果：サンプルを提供し、反応条件を検討した。

- (2) 共同研究先：物質・材料研究機構ナノ有機センター，三木一司グループ（A01 班，公募班員）

派遣人員（派遣）：小西彬仁（博士 2 年）

派遣期間（派遣）：2011.10.16–29

共同研究内容：フロー系二光子吸収を用いた芳香族縮環反応の開発

共同研究成果：種々の条件検討をおこなったが、縮環反応に適した条件を見つけることができなかった。

- (3) 共同研究先：物質・材料研究機構ナノ有機センター，三木一司グループ（A01 班，公募班員）

共同研究内容：フロー系二光子吸収を用いた芳香族縮環反応の開発

共同研究成果：縮環反応に適した条件は未だ見つかっていない。

## 9 . その他特記事項

- (1) 共同機器測定依頼（2013 年 11 月）

サンプル依頼先：大阪大学大学院基礎工学研究科、戸部研究室（A03 班、計画班員）依頼内容：新学術領域研究により大阪大学に導入した走査型トンネル顕微鏡（STM）で、プロペラ型分子のグラファイト基盤上での二次元分子配列を観察

- (2) 企業との共同研究（2013 年 8 月）

共同研究先：出光興産

共同研究内容：新学術領域研究で新反応の開発に成功したプロペラ型分子の発光特性の評価