Symposium on Creation of Functional Materials

2009

Program & Abstracts

Strategic Initiative A for Interdisciplinary Materials Science and

pre-Strategic Initiative for Creation of Functional Molecules,

University of Tsukuba

2009/12/3-4

Tsukuba International Congress Center

Program

December 3 (Thu)

9:10-9:15	Opening Remarks: Youiti Ootuka and Hideo Kigoshi
	Chair; Tatsuya Nabeshima
9:15-10:00	**L-01 Takeshi Akasaka** (University of Tsukuba) In-depth Understanding of pi-Electron Systems: New Vistas in Fullerene Endohedrals
10:00-10:45	**L-02 Teruo Shinmyozu** (Kyushu University) A Study on Charge Transfer Interaction Using Cyclophanes as Model Compounds
10:45-10:55	*Break*
	Chair; Hiroki Oshio
10:55-11:15	**L-03 Vladimir Lee** (University of Tsukuba) Cyclopentadienyl Anions of the Heavy Group 14 Elements: New Generation Ligands for Coordination Chemistry
11:15-12:15	**L-04 Xiao-Ming Chen** (Sun Yat-Sen University, China) Porous Coordination Polymers: Flexibility and Sorption
12:15-13:15	*Lunch*
	Chair; Takahiko Kojima
13:15-14:15	**L-05 James M. Mayer** (University of Washington, USA) Moving Protons and Electrons Together: From Organic Hydrogen Atom Transfer Reactions to Marcus Theory of Proton-Coupled Electron Transfer
14:15-15:00	**L-06 Takayuki Kawashima** (University of Tokyo) Creation of Functional Molecules Utilizing Characteristics of Boron
15:00-15:10	*Break*
	Chair; Takeshi Akasaka
15:10-15:55	**L-07 Atsuhiro Osuka** (Kyoto University) Möbius Aromatic Expanded Porphyrins
15:55-16:40	**L-08 Yousuke Yamamoto** (Hiroshima University) Synthesis and Structure of Hypervalent Carbon and Boron Compounds
16:50-18:20	Poster Session
18:30-	*Reception at "Espoir," Epochal*

December 4 (Fri)

Chair; Akira Sekiguchi

9:00-9:45 **L-09 Norio Teramae** (Tohoku University)
Molecule Recognition by Fluorophores in Combination with Abasic Site-containing Oligonucleotides

9:45-10:30 **L-10 Hideo Nagashima** (Kyushu University)
Living Polymerization by Reusable Iron-amine Catalysts: From Fundamental Chemistry to Industrial Potentials

10:30-10:40 *Break*

Chair; Takaki Kanbara

10:40-11:00 **L-11 Tsuyoshi Michinobu** (Tokyo Institute of Technology)
Click Synthesis of Donor-Acceptor Type Conjugated Polymers

11:00-12:00 **L-12 Yong-Joo Kim** (Kangnung-Wonju National University, Korea)
Chemistry of Group 10 Metal Azides: Reactivity toward Organic Unsaturated Compounds

12:00-13:00 *Lunch*

Chair; Toshiharu Teranishi

13:00-13:45 **L-13 Kazuo Takimiya** (Hiroshima University)
Design and Synthesis of New Heteroarene-Based Organic Semiconductors for Thin-Film Transistors

13:45-14:30 **L-14 Hiroshi Nishihara** (University of Tokyo)
Coordination Programming of Electron-Conducting Molecular Wires on the Surface

14:30-15:15 **L-15 Koji Kimoto** (National Institute for Materials Science)
Material Characterization with High Spatial Resolution Using Transmission Electron Microscopy and Electron Energy-loss Spectroscopy

15:15-15:25 *Break*

Chair; Junji Ichikawa

15:25-15:45 **L-16 Junpei Kuwabara** (University of Tsukuba)
Synthesis of Functional Polymer by Pd-Catalyzed C-N Coupling Reaction

15:45-16:45 **L-17 Zhenfeng Xi** (Peking University, China)
Synthesis of Pyridines, Pyrroles, and 5-Azaindoles

16:45-16:50 Closing Remarks: Hideo Kigoshi

Poster Program

P-01 **Synthesis and Cation Recognition of Macrocyclic Salen-type Complex**
Shunjin Piao, Fumihiko Utsuno, Shigehisa Akine, and Tatsuya Nabeshima
Univ. of Tsukuba

P-02 **Functions of Molecular Clefts Bearing Inert Terpyridine Platinum Complexes**
Yuki Hasegawa, Masaki Yamamura, Robert Trokowski, and Tatsuya Nabeshima
Univ. of Tsukuba

P-03 **Synthesis and Cation Recognition of Chiral Pseudomacrocyclic Terpyridine Metallohost**
Futoshi Sato, Masaki Yamamura, and Tatsuya Nabeshima
Univ. of Tsukuba

P-04 **Synthesis and Cation Recognition Ability of Oligodipyrrin BF_2 Complexes by the B–F•••Cation Interaction**
Naoya Sakamoto, Chusaku Ikeda, and Tatsuya Nabeshima
Univ. of Tsukuba

P-05 **Spontaneous Enrichment of One-handed Helix by Dissolution of Pseudoracemic Crystal of a Helical Metal Complex**
Sayaka Hotate, Shigehisa Akine, and Tatsuya Nabeshima
Univ. of Tsukuba

P-06 **Synthesis and Properties of Heteronuclear Trisaloph Complexes**
Masao Sasaki, Masaki Yamamura, and Tatsuya Nabeshima
Univ. of Tsukuba

P-07 **Synthesis of Helical Metal Complex Using Oligo(bipyridine-phenol) Ligands**
Hiroki Nagumo, Shigehisa Akine, and Tatsuya Nabeshima
Univ. of Tsukuba

P-08 **Synthesis and Cation Recogniton of Aluminum Complex of N_2O_4-type Dipyrrin**
Manami Daicho, Naoya Sakamoto, Chusaku Ikeda, and Tatsuya Nabeshima
Univ. of Tsukuba

P-09 **Synthesis and Ion Recognition of Dipyridylbipyrimidine Ligand Bearing Anion Recognition Moieties**
Yui Togawa, Masaki Yamamura, and Tatsuya Nabeshima
Univ. of Tsukuba

P-10 **Structure–Activity Relationships of Glaziovianin A**
Akiyuki Ikedo, Ichiro Hayakawa, Sayaka Kazami, Takeo Usui, and Hideo Kigoshi
Univ. of Tsukuba, RIKEN Advanced Science Institute, Saitama Univ.

P-11 **Study on the Target Proteins of an Antitumor Macrolide Aplyronine A**
Yuichiro Hirayama, Miyuki Sugiyama, Yuki Saito, Masaki Kita, and Hideo Kigoshi
Univ. of Tsukuba

P-12 **Total Synthesis of Auripyrones A and B by Using a Novel Diastereoselective Aldol-type Reaction of a γ-Pyrone**
Takuma Takemura, Emi Fukasawa, Yuta Ebihara, Natsuki Sato, Takayasu Nakamura, Tetsuya Sengoku, Kiyotake Suenaga, Ichiro Hayakawa, and Hideo Kigoshi
Univ. of Tsukuba

P-13 **Synthetic Studies on Mycalolide B, an Actin-depolymerizing Marine Macrolide**
Tomoya Ishitsuka, Yuzo Mogi, Hidekazu Watanabe, Masaki Kita, and Hideo Kigoshi
Univ. of Tsukuba

P-14 **Synthetic Studies on a Hybrid Compound of Aplyronine A and Mycalolide B**
Kenichi Kobayashi, Yusuke Fujii, Shinichi Kobayashi, Ichiro Hayakawa, and Hideo Kigoshi
Univ. of Tsukuba

P-15 **Reactivity of Disilyne toward Hydroborane: Synthesis, Structure, and Properties of Boryl-substituted Disilene**
Katsuhiko Takeuchi, Masaaki Ichinohe, and Akira Sekiguchi
Univ. of Tsukuba

P-16 **A Novel Digermene, $R_2Ge=GeR_2$ (R=SiMetBu$_2$): Synthesis, Structure and Unusual Reactivity**
Kiera McNeice, Vladimir Ya. Lee, and Akira Sekiguchi
Univ. of Tsukuba

P-17 **Disilaallyllithium: Interconversion of η_3-Allyllithium and η_1-Coordination to a Silyllithium Fragment**
Hiroaki Tanaka, Shigeyoshi Inoue, Masaaki Ichinohe, and Akira Sekiguchi
Univ. of Tsukuba

P-18 **Tetrahedrane and Cyclobutadiene: Valence Bond Isomerization of Tetrahedrane with σ-π Conjugation**
Yusuke Inagaki, Masaaki Nakamoto, and Akira Sekiguchi
Univ. of Tsukuba

P-19 **Influence of Structural Change around the Heme Active Site of *Hydrogenobacter thermophilus* Cytochrome c_{552} on Its Thermostability and Redox Potential**
Kiyofumi Irie, Shin-ichi Mikami, Naoki Watanabe, Naoya Shinohara, Akihiro Sugimoto, Hulin Tai, Shigenori Nagatomo, and Yasuhiko Yamamoto
Univ. of Tsukuba

P-20 **Heme Fe^{3+}–N-terminal Amino Group Coordination Bond in Denatured Cytochrome c that Strongly Affect the Overall Protein Stability**
Hulin Tai, Naoki Watanabe, Akihiro Sugimoto, Shin-ichi Mikami, Kiyofumi Irie, Naoya Shinohara, Shigenori Nagatomo,, Toratane Munegumi, and Yasuhiko Yamamoto
Univ. of Tsukuba, Oyama Natl. Coll. of Tech.

P-21 **Relationship between Oxygen Affinity of Myoglobin and the Electron Density of Heme Fe Atom in the Protein**
Tomokazu Shibata, Hulin Tai; Shigenori Nagatomo, Kenji Morihashi, Akihiro Suzuki,

and Yasuhiko Yamamoto
Univ. of Tsukuba, Nagaoka Natl. Coll. of Technology

P-22 **Control of Redox Potential of *Pseudomonas aeruginosa* Cytochrome c_{551} through Altering p*K*a of Heme 17-Propionic Acid Side Chain**
Shin-ichi Mikami, Hulin Tai, Kiyofumi Irie, Shigenori Nagatomo, and Yasuhiko Yamamoto
Univ. of Tsukuba

P-23 **Application of Transition Metal Complexes to Cathode Active Materials of Rechargeable Lithium ion Batteries**
Yuko Iida, Masayuki Nihei, Masaharu Satoh, Jun Wada, and Hiroki Oshio
Univ. of Tsukuba, Murata Manufacturing Co., Nippon Kasei Chemical Co.

P-24 **Structures and Physical Properties of Fe(II) Complexes Coordinated by Pyridine Ligands with a Triphenylamine Moiety**
Emiko Oshiro, Kiyotaka Mitsumoto, Hiroyuki Nishikawa, and Hiroki Oshio
Univ. of Tsukuba, Univ. of Ibaraki

P-25 **Multiple Bistability in a Multi-component Material of $[Fe(dpp)_2][Ni(mnt)_2]_2 \cdot MeNO_2$**
Hirotaka Tahira, Masayuki Nihei, and Hiroki Oshio,
Univ. of Tsukuba

P-26 **Thermal Charge-transfer-induced Spin Transition in Cyanide-bridged Molecular Squares in Solution**
Kento Nakazawa, Nihei Masayuki, Sekine Yoshihiro, and Oshio Hiroki
Univ. of Tsukuba

P-27 **Construction of Conglomerates Composed of a Saddle-Distorted Metalloporphyrin and Heteropolyoxometarates**
Atsutoshi Yokoyama, Kei Ohkubo, Takahiko Kojima, and Shunichi Fukuzumi
Osaka Univ., SORST(JST), Univ. of Tsukuba

P-28 **Structure and Reactivity of Mononuclear Side-on Copper(II)-superoxo Complex with a Bulky Hydrotris(pyrazolyl)borate Ligand**
Itaru Samusawa, Kiyoshi Fujisawa, and Takahiko Kojima
Univ. of Tsukuba

P-29 **Differential Reactivity of Copper(II) Complexes with 1,2-Diphenylhydrazine: Formation Diazene Complex or Tetrazene Compound**
Masaki Sugiyama, Kiyoshi Fujisawa, Tomoya Ishizuka, and Takahiko Kojima
Univ. of Tsukuba

P-30 **Influence of Intramolecular Hydrogen Bond on Redox Behavior and Solvato-thermochromism of Ni(II) and Co(II) Thiolato Complexes**
Tetsuya Mitsui, Kiyoshi Fujisawa, Taka-aki Okamura, Tomoya Ishizuka, and Takahiko Kojima
Univ. of Tsukuba, Osaka Univ.

P-31 **Synthesis of Tetranuclear Iridium(III) Complexes with a Flavin Analogue as**

Bridging Ligands Showing Unique Structures and Properties
Yuji Inui, Soushi Miyazaki, Motoo Shiro, Takahiko Kojima, and Shunichi Fukuzumi
Univ. of Tsukuba, Osaka Univ., SORST(JST), Rigaku Corp.

P-32 Transfer Hydrogenation of Ketones by a Trinuclear Ruthenium(II) Complex Involving Two Converged Reactive Sites
Yuichi Yano, Tomoya Ishizuka, Takahiko Kojima, and Shunichi Fukuzumi
Univ. of Tsukuba, Osaka Univ.

P-33 Synthesis and Properties of Paramagnetic Metallofullerene/Electron Donor Dyad
Tatsuya Tanaka, Takahiro Tsuchiya, Takeshi Akasaka, Naomi Mizorogi, and Shigeru Nagase
TARA Center, Univ. of Tsukuba; Institute of Molecular Science

P-34 Anisotropic Magnetic Behavior of Anionic Ce@C_{82} Carbene Adducts
Yuta Takano, Michio Yamada, Zdenek Slanina, Naomi Mizorogi, Midori O. Ishitsuka, Takeshi Akasaka, and Shigeru Nagase
TARA Center, Univ. of Tsukuba; Institute of Molecular Science

P-35 Two Step Regioselective Exohedral Functionalization of Endohedral Metallofullerene La@C_{82}
Satoru Sato, Yutaka Maeda, Koji Inada, Hidefumi Nikawa, Michio Yamada, Naomi Mizorogi, Tadashi Hasegawa, Takahiro Tsuchiya, Takeshi Akasaka, Tatsuhisa Kato, Zdenek Slanina, and Shigeru Nagase
TARA Center, Univ. of Tsukuba; Tokyo Gakugei Univ.; Josai Univ.; Institute of Molecular Science

P-36 Synthesis and Characterization of Stable [4+2] Derivatives of La@C_{82}
Yuki Nagashima, Yuta Takano, Satoru Sato, Naomi Mizorogi, Zdenek Slanina, Takeshi Akasaka, Shigeru Nagase, and Nazario Martin
TARA Center, Univ. of Tsukuba; Institute of Molecular Science; Complutense Univ. of Madrid

P-37 Chemical Modification of La_2@C_{80} with Silacyclopropane
Mari Minowa; Michio Yamada, Takahiro Tsuchiya, Naomi Mizorogi, Zdenek Slanina, Takeshi Akasaka, Masahiro Kako, and Shigeru Nagase
TARA center, Univ. of Tsukuba; Univ. of Electro-Communications; Institute of Molecular Science

P-38 Structure of Y@C_{82} and Anisotropic Reactivity of Cage Carbons Dictated by the Internal Yttrium Atom
Xing Lu, Hidefumi Nikawa, Takahiro Tsuchiya, Takeshi Akasaka, Zdenek Slanina, and Shigeru Nagase,
TARA Centre, Univ. of Tsukuba; Institute of Molecular Science

P-39 Structural Determination of Scandium-Carbide Endofullerene Sc_2C_2@C_{80}
Hiroki Kurihara, Yuko Yamazaki, Hidefumi Nikawa, Naomi Mizorogi, Takahiro Tsuchiya, Shigeru Nagase; and Takeshi Akasaka
TARA Centre, Univ. of Tsukuba; Institute of Molecular Science

P-40 Synthesis and Characterization of Novel Electron Donor-acceptor Conjugated

Molecules Based on C_{60} and exTTF
Azusa Iwano, Lai Feng, Yuta Takano, Takeshi Akasaka, and Nazario Martin
TARA center, Univ. of Tsukuba; *Univ. Complutense of Madrid*

P-41 **Chemical Modification of Missing Endohedral Metallofullerene**
Tsuyoshi Ito, Hidefumi Nikawa, Hidenori Kuga, Tsukasa Takahashi, Takeshi Akasaka, Takahiro Tsuchiya, Zdenek Slanina, Naomi Mizorogi, and Shigeru Nagase
TARA Centre, Univ. of Tsukuba; Institute of Molecular Science

P-42 **Synthesis and Properties of An Endohedral Metallofullerene Ligand**
Ryo Aoyama, Takahiro Tsuchiya, and Takeshi Akasaka
TARA Centre, Univ. of Tsukuba

P-43 **Synthesis of New Pincer Iridium Complexes having Benzothiazole Group**
Tomomi Namekawa, Junpei Kuwabara, and Takaki Kanbara,
Tsukuba Research Center for Interdisciplinary Materials Science (TIMS), Univ. of Tsukuba

P-44 **Aerobic Oxidation of 2-Substituted Imidazolines Promoted by Cyclometalated Ruthenium Catalyst**
Ayako Taketoshi, Akitsu Tsujimoto, Shusaku Maeda, Take-aki Koizumi, and Takaki Kanbara
Tsukuba Research Center for Interdisciplinary Materials Science (TIMS), Univ. of Tsukuba: Tokyo Institute of Technology

P-45 **Synthesis and Electrochemical Properties of Pt Complexes with a Benzenediamide Ligand**
Take-aki Koizumi and Kazunori Fukuju
Tokyo Institute of Technology

P-46 **Dimensional Crossover and Anisotropic Josephson-vortex Dynamics in a Layered Organic Superconductor**
Hiroaki Koga, Syuma Yasuzuka, Yasuhisa Yamamura, Kazuya Saito, Shinya Uji, Hidetaka Satsukawa, Motoi Kimata, Taichi Terashima, Hiroki Akutsu, and Jun-ichi Yamada
Univ. of Tsukuba, NIMS, Univ. of Hyogo

P-47 **Backflow-induced Asymmetric Annihilation of a Disclination Pair in a Nematic Liquid Crystal under Electric Field**
Takuya Yanagimachi, Syuma Yasuzuka, Yasuhisa Yamamura, and Kazuya Saito
Univ. of Tsukuba

P-48 **Synthesis and Characterization of Phthalocyanine-protected Au Nanoparticles**
Hikaru Sekine, Masayuki Kanehara, and Toshiharu Teranishi
Univ. of Tsukuba

P-49 **Enhancement of Photocatalytic Activity of $(Ga_{1-x}Zn_x)(N_{1-x}O_x)$ by Loading Manganese Oxide Nanoparticle as a Cocatalyst**
Taizo Yoshinaga, Takahiro Ikeda, Anke Xion, Masayuki Kanehara, Kazuhiko Maeda, Kazunari Domen, and Toshiharu Teranishi
Univ. of Tsukuba, Univ. of Tokyo

P-50 **Designed Synthesis of Monodisperse Pd/Pt Core/Shell Nanoparticles**
Ryota Sato, Satoshi Nagao, Toshihiro Ikai, Masayuki Kanehara, and Toshiharu Teranishi
Univ. of Tsukuba, Toyota Motor Co.

P-51 **Direct Observation of Plasmon Hybridization Modes in Individual Gold Nanoparticle Dimers**
Hiromu Kobori, Miharu Eguchi, Masayuki Kanehara, Shanjr Gwo, and Toshiharu Teranishi
Univ. of Tsukuba, National Tsing-Hua. Univ.

P-52 **Size Tuning of PVP-protected Rh Nanoparticles by Polyol Synthesis**
Takahiro Ikeda, Taizo Yoshinaga, Masayuki Kanehara, and Toshiharu Teranishi
Univ. of Tsukuba

P-53 **Synthesis and Characterization of ZnS/Au Heterostructured Nanoparticles**
Naoko Onigata, Masayuki Kanehara, and Toshiharu Teranishi
Univ. of Tsukuba

P-54 **Synthesis of Small Gold Nanoparticles Protected by Thiolated Porphyrins**
Daisuke Tanaka, Masayuki Kanehara, and Toshiharu Teranishi
Univ. of Tsukuba

P-55 **Development of micro-SQUID Magnetometer for Investigation of Single-Molecule Magnets**
Masamichi Saitoh, Hiroshi Ebina, Hiroki Oshio, and Youiti Ootuka
Univ. of Tsukuba

P-56 **Nucleophilic 5-*endo-trig* Cyclizations of Fluoro Alkenes via Metalloenamides**
Masahiro Hattori, Masahiro Ikeda, and Junji Ichikawa
Univ. of Tsukuba

P-57 **Fluorophenanthrene Synthesis via Palladium (II)-Catalyzed Electrophilic Cyclization of 1,1-Difluoro-1-alkenes**
Toshiyuki Morikawa, Hiroyuki Tanabe, Kohei Fuchibe, and Junji Ichikawa
Univ. of Tsukuba

P-58 **Synthesis of 1,1-Difluoro-1-alkenes via Three-Component Coupling Reaction of 1,1-Difluoroallenes**
Mikiko Ueda, Ken Oh, Kohei Fuchibe, and Junji Ichikawa,
Univ. of Tsukuba

P-59 **Transition Metal-Catalyzed Fluoroindole Synthesis via Electrophilic Activation of 1,1-Difluoro-1-alkenes**
Shigeyuki Yamashita, Hiroyuki Tanabe, and Junji Ichikawa,
Univ. of Tsukuba

P-60 **Selective Hydrogenation of Aryl Nitro Compounds by Platinum-Silica as a Catalyst**
Yasumasa Takenaka, Takahiro Kiyosu, Jun-Chul Choi, Toshiyasu Sakakura, and

Hiroyuki Yasuda
National Institute of Advanced Industrial Science and Technology (AIST)

P-61 DFT Study on Enzymatic Activity in HIV-1 Reverse Transcriptase
Kazuhiro Kuranoo and Kenji Morihashi,
Univ. of Tsukuba

P-62 Constrained Density Functional Study on Intramolecular Electron Transfer
Tomofumi Ogawa, Yasuyo Shimodo, and Kenji Morihashi,
Univ. of Tsukuba

P-63 Photoinduced Electron Transfer Reaction of Anthracene–Guanine Compounds in the Excited State
Koki Shimamura, Yoshinobu Nishimura, and Tatsuo Arai
Univ. of Tsukuba

P-64 Photochemical Properties of Olefinic Compounds with a Pyrrole and a Quinoxaline Ring
Kentaro Kudo and Tatsuo Arai
Univ. of Tsukuba

P-65 Photochemical and Photophysical Properties of Diphenylbutadiene Dendrimers
Yousuke Miura and Tatsuo Arai
Univ. of Tsukuba

P-66 Synthesis and Photochemistry of Ionic Liquid Derivatives Capable of Photoisomerization
Hiroyasu Tamura, Yoshihiro Shinohara, and Tatsuo Arai
Univ. of Tsukuba

P-67 A Novel Fluorescent Dye That Emits Green-yellow Fluorescence Useful for Live-cell Imaging
Naoko Senda, Yoshihiro Miwa, Junko Tanaka, Atsuya Momotake, and Tatsuo Arai
Univ. of Tsukuba

P-68 Macroscopic Mechanical Control of Molecular Function
Soichiro Ogi, Kazunori Sugiyasu, and Masayuki Takeuchi
Univ. of Tsukuba, NIMS

P-69 Metal-Ion Assembly in Novel Organic Modules with a Cyclic or Cage Structure
Ryo Shomura and Masayoshi Higuchi
Univ. of Tsukuba, NIMS

P-70 Photo- and Electro-chromic properties of Organic-Metallic Hybrid Polymers with Azo Groups
Toshihiro Hayashi and Masayoshi Higuchi
Univ. of Tsukuba, NIMS

P-71 Conjugation of Organic-Metallic Hybrid Polymers and DNA for application to DDS
Jinghua Li and Masayoshi Higuchi

Univ. of Tsukuba, NIMS