

A Report on the 31st Symposium on Heteroatom Chemistry of the Chemical Society of Japan

Akihiko Ishii, Yoshiaki Sugihara, and Juzo Nakayama

Department of Chemistry, Faculty of Science, Saitama University, 255 Shimo-okubo, Sakura-ku, Saitama, Saitama 338-8570, Japan

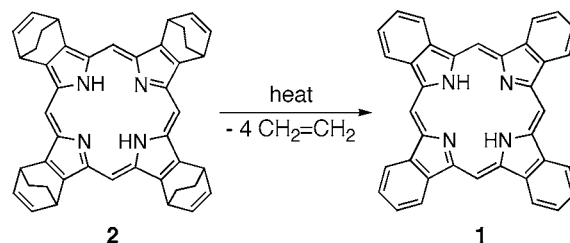
Received 16 March 2005

ABSTRACT: The 31st domestic Chemical Society of Japan Symposium on Heteroatom Chemistry was held in Wakayama during the period of December 8–10, 2004, under the management of Waro Nakanishi and Satoko Hayashi of Wakayama University. About 250 chemists from various academic institutes and industries enjoyed five plenary lectures, 40 oral presentations, and 72 poster presentations. © 2005 Wiley Periodicals, Inc. *Heteroatom Chem* 16:535–547, 2005; Published online in Wiley InterScience (www.interscience.wiley.com). DOI 10.1002/hc.20134

PLENARY LECTURES

The first plenary lecture was given by Noboru Ono (Ehime University) on “Development of Organic Thin Film Transistor Based on Fundamental Organic Chemistry.” He presented the synthesis of tetrabenzoporphyrins by a retro Diels–Alder reaction. Tetrabenzoporphyrin (**1**) was synthesized cleanly by heating the precursor **2** having fused bicyclo[2.2.2]octadiene (BCOD) rings. This strategy was extended to the syntheses of a series of highly conjugated porphyrin analogs, including thia-, dithia-, and

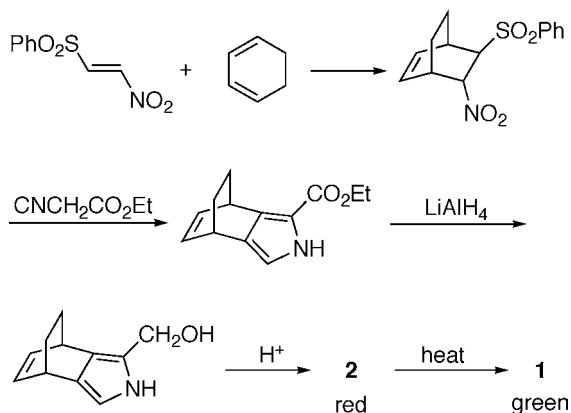
oxathiatetrabenzoporphyrins, carba-tetrabenzoporphyrins, and phthalocyanines.



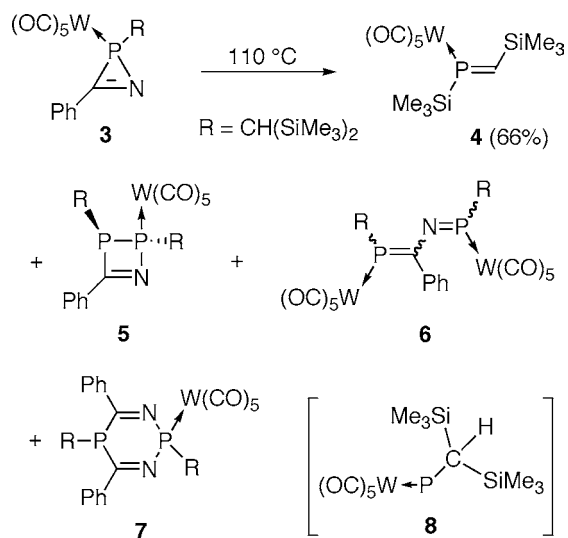
Spin coating of the BCOD-fused porphyrin precursor followed by the retro Diels–Alder reaction gave an insoluble crystalline semiconductor film of tetrabenzoporphyrin quantitatively. Field effect transistors were made up by this methods. Observed mobilities of the devices exceed 10^{-2} cm²/Vs with appropriate process and device structure.

In the last part of his lecture, he talked about serendipity on the discovery of the reaction of **2** to **1**. He had developed a new method for the preparation of porphyrins starting from nitroalkenes. Thus, compound **2** was prepared by a series of reactions starting from Diels–Alder reaction of β -sulfonylnitroethylene with cyclohexadiene. His student had found, during determination of the melting point of **2**, change of color of **2** from red to green, which became a revelation of the retro Diels–Alder reaction of **2** to **1**.

Correspondence to: Akihiko Ishii; e-mail: ishiiaiki@chem.saitama-u.ac.jp.
© 2005 Wiley Periodicals, Inc.

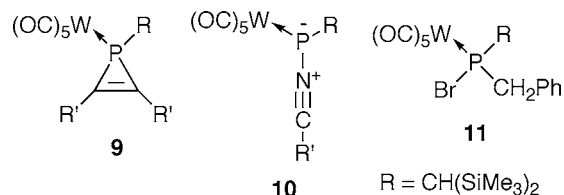


The second lecture was presented by Rainer Streubel (Rheinische Friedrich-Wilhelms-Universität Bonn, Germany) on "Phosphorus: A Carbon or a Transition-metal Copy?." He presented the generation and reactivities of an electrophilic phosphinidene complex. Thus, thermolysis of 2*H*-azaphosphirene tungsten complex **3** yielded (*E*)-1,2-bis(trimethylsilyl)phosphaethene complex **4** as the main product together with 2,3-dihydro-1,2,3-azadiphosphete complex **5**, its acyclic valence isomer **6**, and 2,5-dihydro-1,3-diaza-2,5-diphosphinine complex **7**. He proposed, based on DFT studies, that **4** was derived from the transiently formed phosphinidene complex **8** via a low-lying transition state having a five-coordinated silicon center.

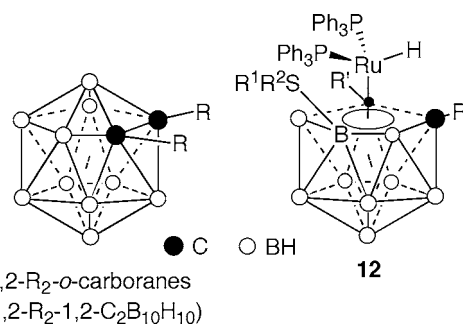


He also investigated the reactivity of transiently generated phosphinidene complex **8** toward alkenes, alkynes, carbonitriles, isonitriles, organohalides, and so on. The reaction of **8** with alkenes and alkynes gave three-membered heterocycle complexes such as **9**, while that with carbonitriles ($\text{R}'\text{CN}$) yielded nitrilium phosphanylides complexes **10**, a 1,3-dipole, as in-

termediates, trapping of which offered a new route to a wide variety of cyclic phosphorus heterocycles. The reaction of **8** with benzyl bromide produced the C-Br insertion product **11**.



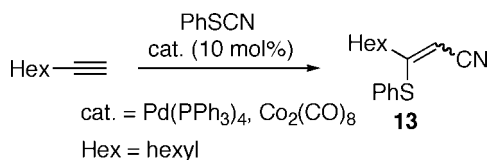
The third plenary entitled "Boron Clusters. Should the Scientific Community Pay More Attention to Them?" was delivered by Francesc Teixidor (Consejo Superior de Investigaciones Científicas, Spain). Boron clusters such as boranes and carboranes display many particular characteristics that do not find parallel in their organic counterparts. He reported on some new applications developed in his group where carboranes or metallocarboranes play a crucial role. He first showed that *o*-carborane derivatives provided the possibility to modulate the C-C distance in an almost continuous way within the same family of compounds. The C-C distance in the parent *o*-carborane ($\text{R} = \text{H}$) is 1.629 Å, longer than usual C-C single bonds. While alkyl substituents do not substantially alter the C-C distance of the parent compounds, substituents with lone pairs do it substantially; the C-C bond is elongated up to 1.858 Å in *o*-carborane [$\text{R} = \text{SCH}_2(\text{CH}_2\text{OCH}_2)_2\text{CH}_2\text{S}$]. The elongation is not simply explained by lone pair/lone pair repulsion or by the effect of electron-polarizing groups. The more plausible explanation is the transfer of electron density from the available lone pairs on the carbon substituents to the ψ^* low-lying virtual orbitals mainly distributed around the carbon atoms, producing a decrease in the C-C bond order.



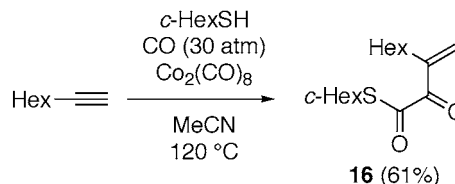
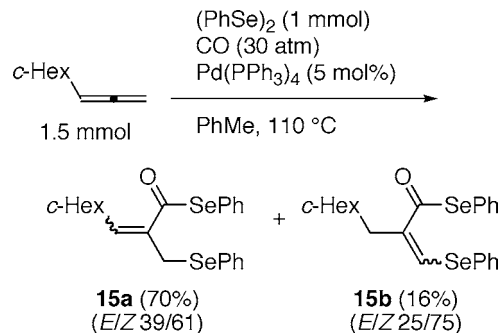
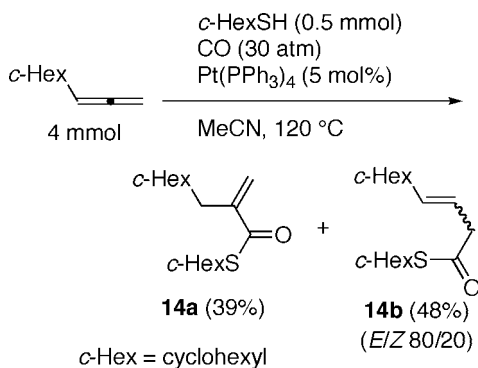
o-Carborane cage through substitution on carbon is extremely electron withdrawing, and therefore exhibits unique electronic character as a substituent. 1-(*iso*Pr₂P)-2-Me-*o*-Carborane)•I₂ has a

tetra-coordinated P atom and aligned P-I atoms. This compound provides the shortest I-I contact [3.021(1) Å] in organophosphane-diiodine chemistry and the corresponding longest P-I distance [2.5978(14) Å]. He also spoke on the chemistry of metallocarboranes [Co(C₂B₉H₁₁)₂]⁻ as a doping agent in organic conducting polymer and Ru complexes **12** as a Kharasch reaction catalyst.

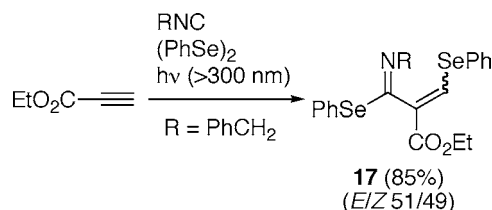
The fourth plenary lecture was given by Akiya Ogawa (Osaka Prefecture University), and the title of his presentation was "The Development of New Methods for the Selective Introduction of Heteroatom Functional Groups into Unsaturated Compounds." He developed new methods for the selective introduction of heteroatom functions, especially group 16 heteroatom functions, into unsaturated compounds based on the characteristic features of heteroatom compounds in the transition-metal-catalyzed reactions and radical reactions. In the presence of Pd(PPh₃)₄ catalyst, thiocyanates (RSCN) add to terminal acetylenes to give the corresponding cyanothiolation products (**13**) regioselectively (*E/Z* 0/100), where PhS-Pd(CN)(PPh₃)₂ has been proposed as the key intermediate. The use of Co₂(CO)₈, instead of Pd(PPh₃)₄, under CO atmosphere (30 atm) led to less regioselectivity (*E/Z* 9/91).



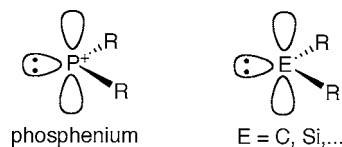
While he had developed the regioselective carbonylative thionation of terminal acetylenes with thiols and CO using rhodium and platinum catalysts, he applied this transition-metal-catalyzed carbonylative chalcogenation reaction to allenes with thiols and diselenides to synthesize thio- (**14a** and **14b**) and selenoesters (**15a** and **15b**), respectively. He also developed a novel thiolative double carbonylation of acetylenes with thiols and CO in the presence of Co₂(CO)₈ (9 mol%) to give **16**.



His last topic was radical additions of heteroatom compounds to unsaturated bonds. He presented the reaction of acetylenes with isocyanates and (PhSe)₂ under irradiation of light (>300 nm) to yield selenative imidoylation products **17** regioselectively. He mentioned that high reactivity of diselenides to carbon radicals suppressed polymerization of acetylenes.

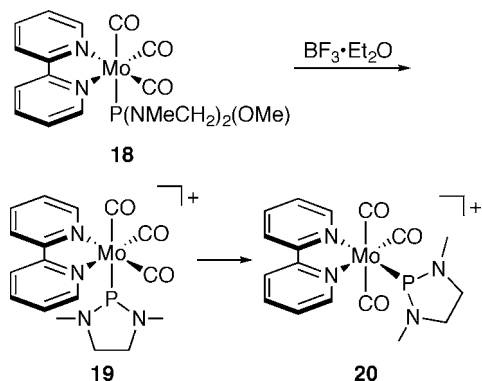


The last plenary lecture was presented by Hiroshi Nakazawa (Osaka City University) on "Chemistry of Transition Metal Complexes Bearing Phosphenium as a Ligand." Cationic phosphenium species, R₂P⁺, are electronically isologous to carbenes, silylenes, and so on. He reported the syntheses of metal (M)-phosphenium complexes, the character of the M-P bonds, and the reactivities of the complexes.

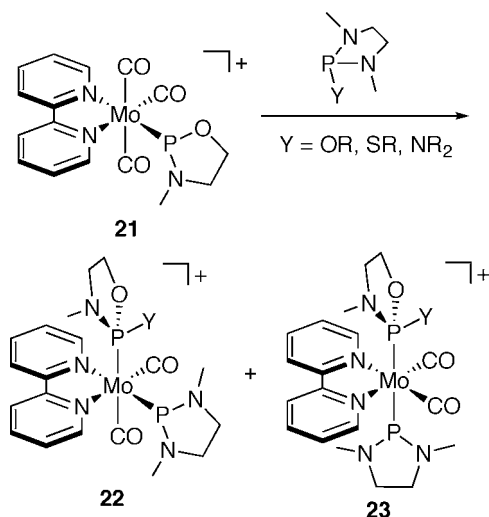


He disclosed that the reaction of a Mo complex bearing a diamino-substituted phosphite ligand (**18**) with BF₃•Et₂O yielded *fac*- (**19**) and *mer*- (**20**) cationic phosphenium complexes. *mer*-Complex **20** is more stable than *fac*-complex **19**. M-P bond

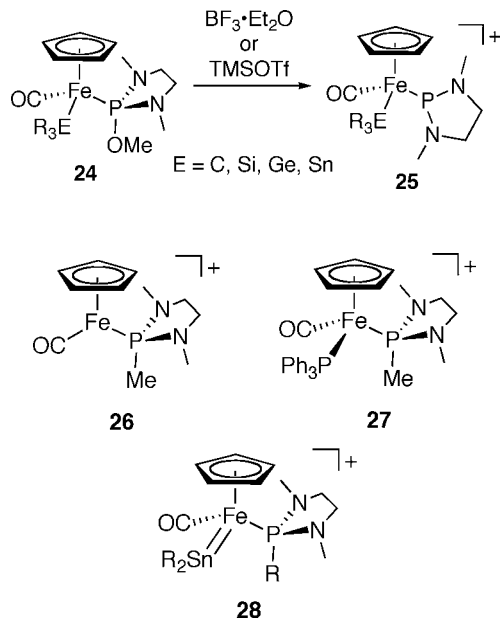
lengths in metal–phosphenium complexes are in a range of 2.018–2.254 Å, and the values are shorter by 10% than those of M–P bonds in metal–trivalent phosphorus complexes (2.40–2.57 Å), indicative of double-bond character of the M–P bond in metal–phosphenium complexes.



Another phosphenium complex **21** reacted with $P(NMeCH_2)_2Y$ ($Y = OR, SR, NR_2$) to give complexes **22** and **23**. He proposed a mechanism involving a CO/ $P(NMeCH_2)_2Y$ exchange followed by a migration of Y and isomerization. When Y was Me or Ph, the corresponding migration did not take place.



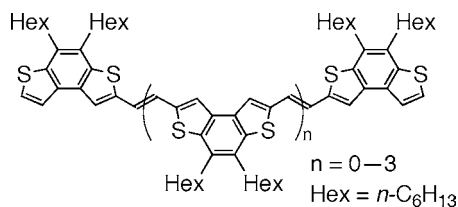
He also investigated the reaction of iron complex **24** with $BF_3 \cdot Et_2O$ or TMSOTf to give phosphenium complex **25** as an intermediate. The subsequent reaction of **25** depends on E. In the case of methyl ($R_3E = Me$), 1,2-migration of the methyl to the phosphenium phosphorus atom took place to give **26**, which was converted to stable **27** by treatment with PPh_3 . In contrast, the phosphenium salt **25** was stable when $E = Si$ and Ge , and, in the case of $E = Sn$, one alkyl group (R) on R_3Sn migrated from Sn to the phosphenium phosphorus atom (1,3-migration) to give stanylene complex **28**.



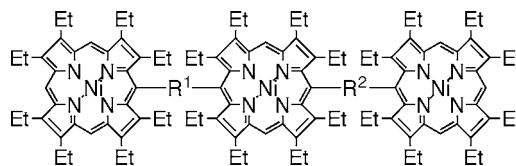
In addition to these stimulating plenary lectures, oral and poster presentations were given, where we had animated discussions. The topic and authors are listed below.

ORAL PRESENTATIONS

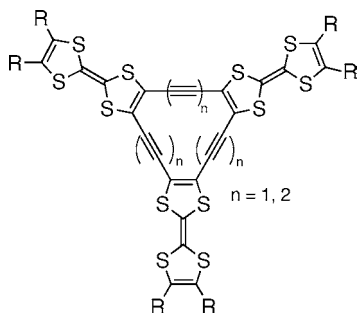
O-01 “Synthesis and Optical Properties of Fluorescent Materials Derived From Tricyclic Heterocycles” by Y. Nishide, H. Osuga, and K. Tanaka (Wakayama University)



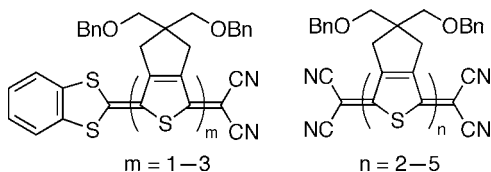
O-02 “Synthesis and Properties of Octaethylporphyrin Oligomers Connected with Diacetylene, Ethylene, and Vinylene Linkages” by A. Naoe, M. Sato, T. Maeda, K. Mori, N. Hayashi, and H. Higuchi (Toyama University)



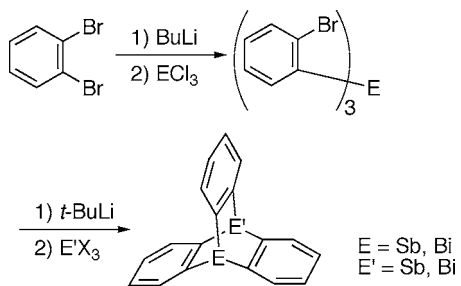
O-03 “Synthesis and Multifunctionalities of Conjugated Macrocycles Annulated with TTF Units” by H. Enozawa, M. Hasegawa, Y. Miyake, and M. Iyoda (Tokyo Metropolitan University)



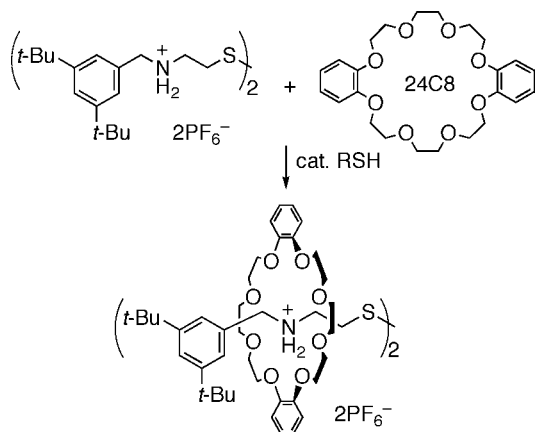
O-04 "Preparation and Properties of Substituted Thienoquinoid Compounds as Near Infrared Pigments" by T. Takahashi, K. Matsuoka, K. Takimiya, T. Otsubo, and Y. Aso (Hiroshima University and Osaka University)



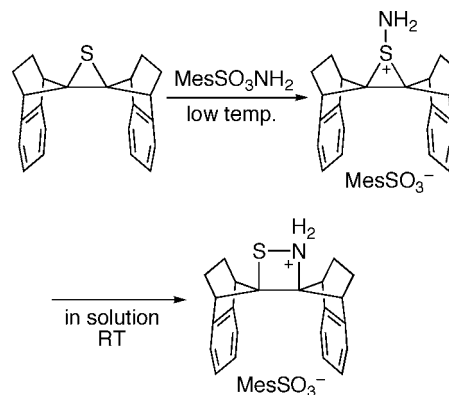
O-05 "Synthesis and Oxidations of 9,10-Distibatriptycene and 9,10-Dibismatriptycene" by Y. Uchiyama, Y. Fujii, and G. Yamamoto (Kitasato University)



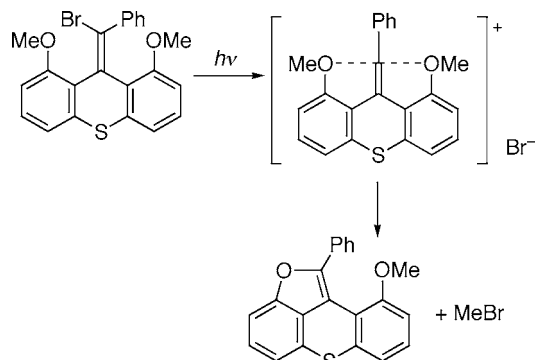
O-06 "Synthesis and Reaction of Rotaxane Bearing Axle Component Containing Central Disulfide Moiety" by T. Oku, Y. Furusho, and T. Takata (Tokyo Institute of Technology)



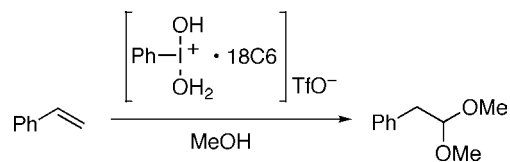
O-07 "Syntheses and Properties of Novel *N*-Tosyl Thiirane 1-Imides and *S*-Aminothiiranium Salts" by Y. Sugihara, R. Ohtsu, A. Kobiki, H. Okada, and J. Nakayama



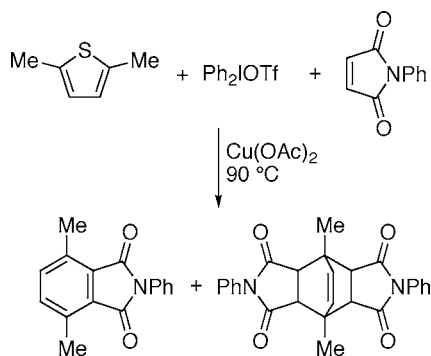
O-08 "Construction of a Novel Tridentate Ligand Derived from Thioxanthone Bearing an Oxygen Atom at 1,8-Positions: Attempted Synthesis of Hypervalent Hexacoordinated Carbon Compounds and a Transition State Model of Vinylic S_N2 Reaction" by T. Yamaguchi, Y. Yamamoto, K.-y. Akiba, Y. Fujiwara, and Y. Tanimoto (Hiroshima University and Waseda University)



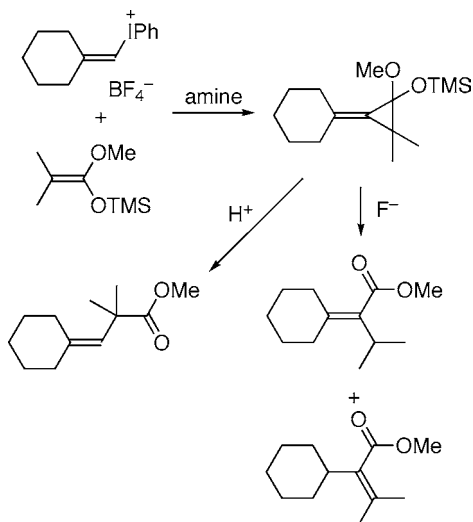
O-09 "Synthesis and Reaction of Iodosylbenzene Monomer Complexes" by K. Miyamoto, Y. Yokota, and M. Ochiai (University of Tokushima)



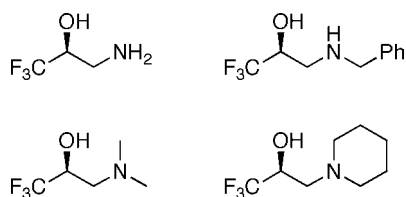
O-10 "Phenylation Reaction of Thiophenes with Diphenyliodonium Salts" by T. Kitamura, B.-X. Zhang, T. Nuka, Y. Fujiwara, and T. Yamaji (Saga University and Kyushu University)



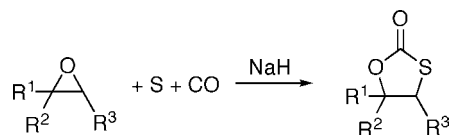
O-11 “Reaction of Vinyl Iodonium Salts with Ketene Silyl Acetals and Selective Ring-Opening Reactions of the Cyclopropane Products” by M. Fujita, K. Fujiwara, and T. Okuyama (University of Hyogo)



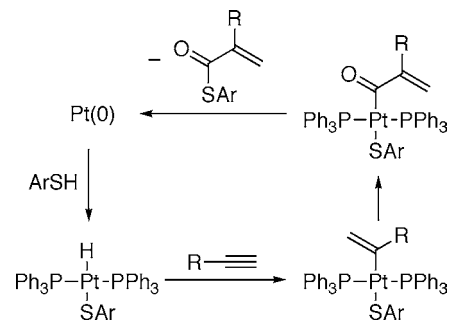
O-12 “Hydrogen-Bonding Systems Supported by Trifluoromethyl Group” by T. Katagiri, S. Takahashi, Y. Fujiwara, Y. Manabe, and K. Uneyama (Okayama University)



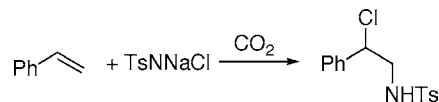
O-13 “A New Method for the Synthesis of 1,3-Oxathiolan-2-ones by the Reaction of Epoxides with Carbon Monoxide and Sulfur” by C. Katahira, Y. Nishiyama, and N. Sonoda (Kansai University)



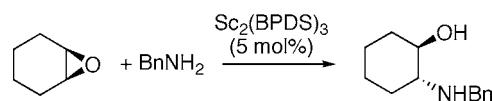
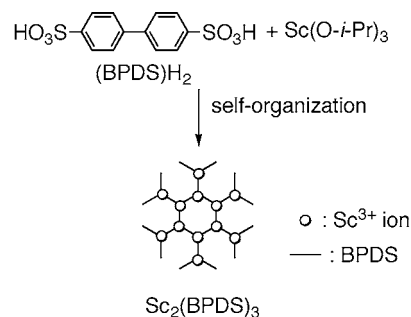
O-14 “Reaction Pathways Leading to the Pt-Catalyzed Hydrothiolation, Hydrothiocarboxylation, and Dimerization-bisthiolation of Terminal Alkyne” by S. Asano, H. Kuniyasu, and N. Kambe (Osaka University)



O-15 “Carbon Dioxide Promoted Addition Reaction of Chloramine-T to Olefins” by S. Minakata, Y. Yoneda, Y. Oderaotoshi, and M. Komatsu (Osaka University)

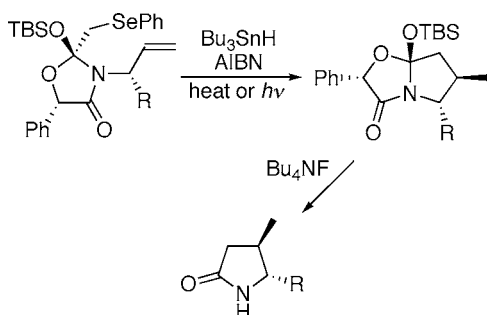


O-16 “Development of Novel Rare Earth Organosulfonates and Organophosphates: As a Lewis Acid Catalyst” by S. Suzuki, S. Ishida, T. Hayano, H. Furuno, and J. Inanaga (Kyushu University)

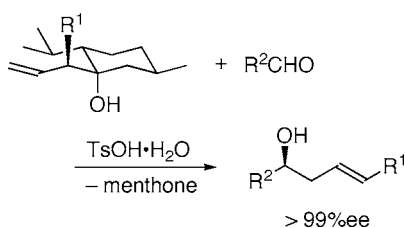


O-17 “Synthesis of Medium-Sized Heterocyclic Compounds Using Oxyoxazolidinone Structure”

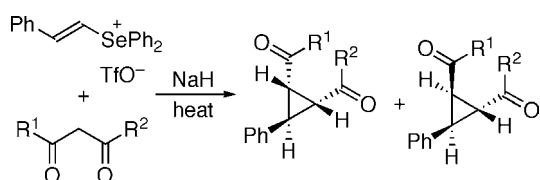
by K. Tanaka and A. Kamimura (Yamaguchi University)



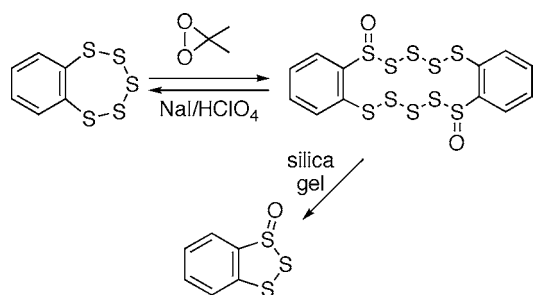
O-18 “Synthesis of α -Adducts Homoallylic Alcohol from Alk-2-enylation of Aldehydes by Allyl-Transfer Reaction” by S. Siddiqi, T. Souda, T. Koba, K. Kataoka, and J. Nokami (Okayama University of Science)



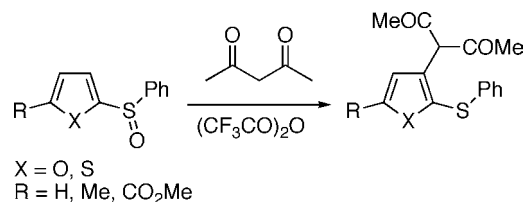
O-19 “The Formation of Cyclopropane Derivatives through Tandem Michael–Favorskii-Type Reaction Using an Alkenylselenonium Salt” by S.-i. Watanabe, I. Nakayama, and T. Kataoka (Gifu Pharmaceutical University)



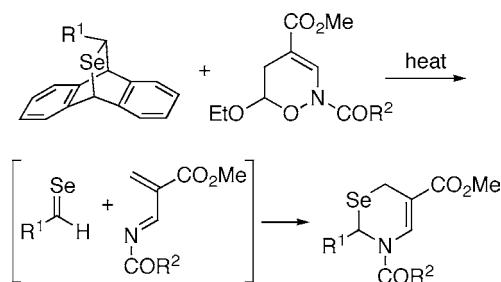
O-20 “Structure and Properties of Novel Macrocyclic Polysulfide Derived from Benzopentathiepin” by R. Sato, Y. Chiba, S. Nakajo, and S. Ogawa (Iwate University)



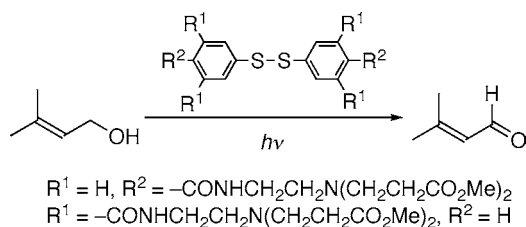
O-21 “Highly Regioselective, Nucleophilic Carbon–Carbon Bond Forming Reactions on π -Sufficient Heteroaromatics Initiated by Pummerer-Type Reaction” by N. Kawashita, Y. Wada, H. Satoh, K. Kakiguchi, I. Kuriwaki, S. Akai, and Y. Kita (Osaka University)



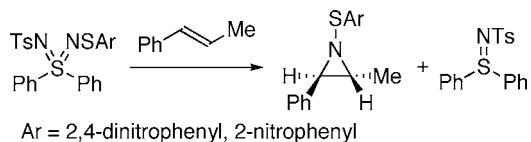
O-22 “[4 + 2] Cycloaddition Reaction of Selenoaldehydes with Azadienes” by Y. Endo, M. Honda, and M. Segi (Kanazawa University)



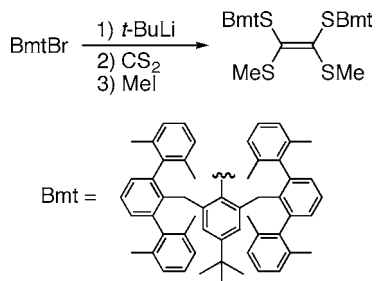
O-23 “Photooxidation of Allyl Alcohols Using Diphenyl Disulfide Derivatives” by T. Tsuboi, Y. Takaguchi, Y. Yanagimoto, and S. Tsuboi (Okayama University)



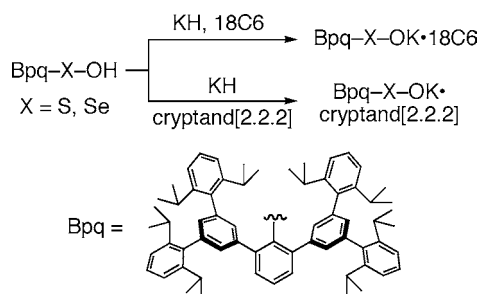
O-24 “Convenient Generation and Properties of Sulfenylnitrenes” by T. Yoshimura, T. Fujie, and T. Fujii (Toyama University and Nihon University)



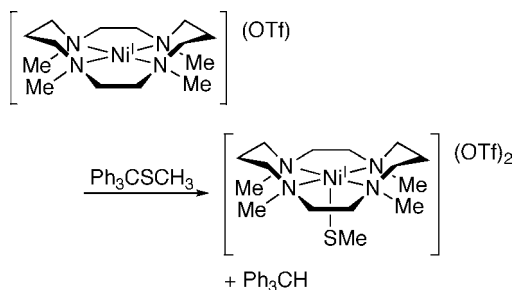
O-25 “Thiophilic Reactions of a Bulky Aryllithium with Carbon Disulfide: Formation and Reactivity of a Dithiocarbene Anion” by K. Mogi, K. Takenaka, and R. Okazaki (Japan Women’s University)



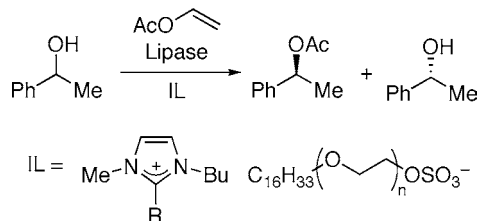
O-26 “Syntheses, Structures, and Reactions of Chalcogenenate Anions Bearing a Bowl-Type Steric Protection Group” by K. Shimada, K. Goto, T. Kawashima, K. Ishimura, N. Takagi, and S. Nagase (The University of Tokyo and Institute for Molecular Science)



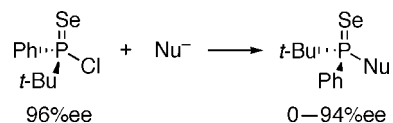
O-27 “Ni(I) Complexes Having N4 Cyclic Ligand Aiming at Methyl Coenzyme M Reductase Model” by T. Matsumoto, J.-i. Nishigaki, and K. Tatsumi (Nagoya University)



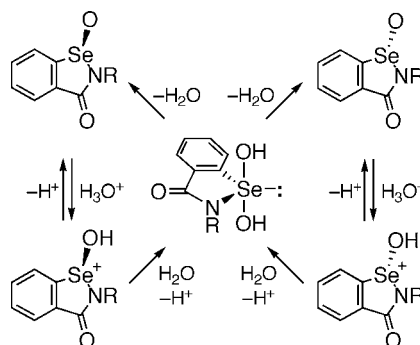
O-28 “Enhanced Enantioselectivity and Stabilization of an Enzyme Using Novel Ionic Liquids” by T. Itoh, H. S. Hui, Y. Matsushita, S. Wada, and S. Hayase (Tottori University)



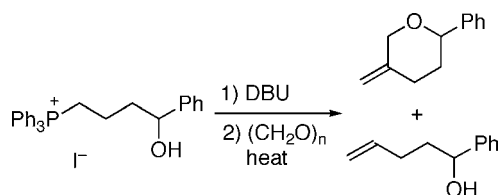
O-29 “Synthesis and Reaction of Optically Active *P*-Chiral Phosphinoselenoic Chlorides” by T. Kimura and T. Murai (Gifu University)



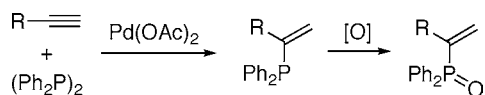
O-30 “Optical Resolution and Stereochemistry of Seleninamides” by Y. Nakashima, T. Shimizu, K. Hirabayashi, and N. Kamigata (Tokyo Metropolitan University)



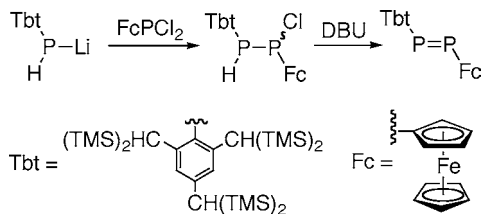
O-31 “Synthesis of Furans and Benzofurans from Phosphonium Ylides” by O. Sakai, S. Fukunaga, Y. Hirose, K. Shioji, and K. Okuma (Fukuoka University)



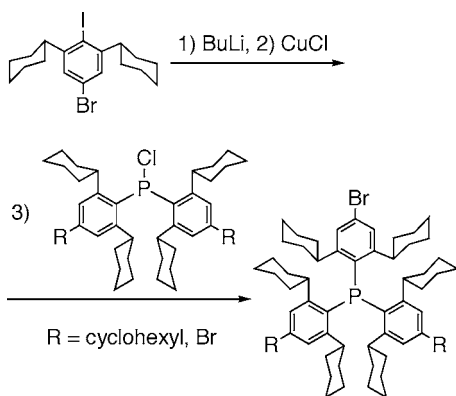
O-32 “The Development of Transition-Metal-Catalyzed Reaction Systems of Tetraphenyl-diphosphine” by S. Nagata, I. Kamiya, M. Matsumoto, and A. Ogawa (Nara Women’s University and Osaka Prefecture University)



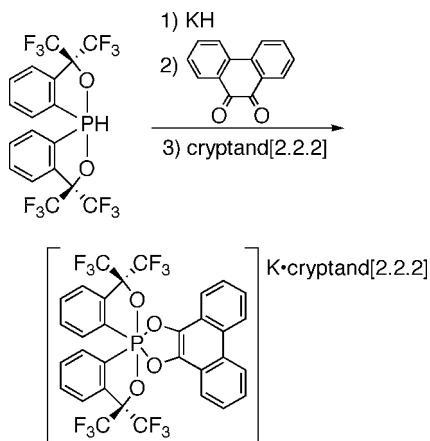
O-33 “Synthesis, Structure, and Properties of a Kinetically Stabilized Ferrocenyl Diphosphene” by N. Nagahora, T. Sasamori, N. Takeda, and N. Tokitoh (Kyoto University)



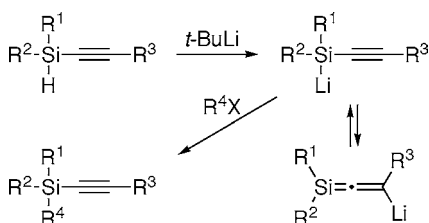
O-34 "Syntheses and Reactions of Crowded Triarylphosphines Carrying Novel Bulky *p*-Bromoaryl Groups" by M. Izawa, K. Kato, K. Sutoh, S. Sasaki, and M. Yoshifuji (Tohoku University)



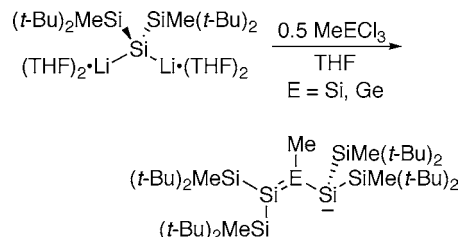
O-35 "Valence Expansion of Phosphoranide Anion(IV) to Phosphate Anion(VI) by Cycloaddition" by K. Sena, K. Shibuya, H. Sasaki, M. Tada, T. Shibata, and K.-y. Akiba (Waseda University)



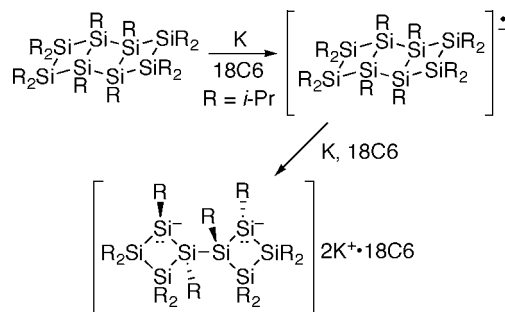
O-36 "Preparation and Structure of Ethynylsilyl-lithium" by K. Sakamoto, T. Kadowaki, C. Kabuto, and M. Kira (Tohoku University)



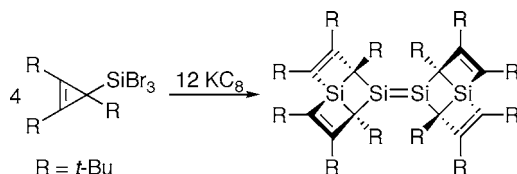
O-37 "Synthesis and Properties of Novel Allyl Anions Consisting of Heavier Group 14 Elements" by N. Nakata and A. Sekiguchi (University of Tsukuba)



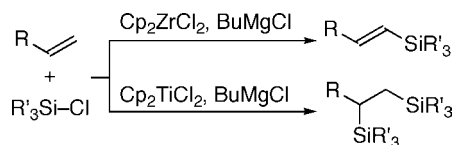
O-38 "Formation and Structures of the Dianion Species of a Cyclotetrasilane and a Ladder Polysilane" by S. Kyushin, H. Kawai, Y. Ueta, R. Tanaka, and H. Matsumoto (Gunma University)



O-39 "Preparation, Structure, and Properties of a Stable, Lattice-Framework Disilene" by S. Tsutsui, E. Kwon, H. Tanaka, S. Matsumoto, and K. Sakamoto (RIKEN and Tohoku University)



O-40 "Regioselective Silylation of Olefins and Dienes Using Chlorosilanes in the Presence of Transition Metal Catalysts" by J. Terao, K. Torii, A. Oda, and N. Kambe (Osaka University)



POSTER PRESENTATIONS

P-01 "Synthesis and Properties of Poly[7]heterohelicenes" by Y. Kimura, H. Osuga, and K. Tanaka (Wakayama University)

P-02 "Synthesis and Optical Properties of Benzodithiophene Oligomers" by Y. Inagaki, H. Osuga, and K. Tanaka (Wakayama University)

P-03 "Synthesis of Emission Materials Consisting of Benzo[1,2-*b*:4,3-*b'*]dithiophene and π -Deficient Heterocyclic Aromatics" by H. Nishimura, H. Osuga, and K. Tanaka (Wakayama University)

P-04 "Studies on the Synthesis and Properties of 4,5-Diethynyltetrathiafulvalene Derivatives" by K.-i. Tokuyama, H. Enozawa, K. Hara, Y. Miyake, Y. Kuwatani, and M. Iyoda (Tokyo Metropolitan University)

P-05 "Conducting Properties and Crystal Structures of Tetracyanoazulenequinodimethane-Tetrathiotetracene Complexes" by T. Kuramochi, M. Sato, O. Sato, T. Shirahata, and K. Takahashi (Saitama University, RIKEN, and Tohoku University)

P-06 "Synthesis and Properties of Phosphorus-Bridged Bithiophenes and Their π -Conjugated Derivatives" by Y. Ie, T. Kaneda, M. Fujitsuka, S. Tojo, T. Majima, and Y. Aso (Osaka University and CREST)

P-07 "Synthesis and Characteristics of the Novel Long Oligothiophenes-Substituted Multi-fullerene" by N. Negishi, Y. Aso, K. Takimiya, T. Otsubo, and Y. Harima (Osaka University, CREST, and Hiroshima University)

P-08 "Construction of Supramolecular Complex with Endohedral Metallofullerene" by T. Tsuchiya, K. Sato, T. Wakahara, Y. Maeda, T. Akasaka, K. Kobayashi, S. Nagase, T. Kato, and K. Yamaguchi (University of Tsukuba, Tokyo Gakugei University, Institute of Molecular Science, Josai University, and Tokushima Bunri University)

P-09 "Synthesis of Silacyclopropane Adducts of C₆₀" by T. Nakahodo, S. Sugitani, T. Wakahara, T. Tsuchiya, T. Akasaka, M. Kako, Y. Maeda, O. Itoh, K. Kobayashi, and S. Nagase (University of Tsukuba, The University of Electro-Communications, Tokyo Gakugei University, Tohoku University, and Institute for Molecular Science)

P-10 "Preparation of Phthalocyanines with Eight Benzylchalcogeno Substituents from 5,6-Dibromo-4,7-diethylbenzo[1,2,3]trichalcogenoles" by T. Kimura, A. Yomogita, T. Matsutani, T.

Suzuki, I. Tanaka, Y. Takaguchi, T. Wakahara, and T. Akasaka (Iwate University, Okayama University, and University of Tsukuba)

P-11 "Syntheses and Properties of Metal Porphyrins Bearing Phosphoranide Ligand" by K. Kajiyama, K. Sawano, and T. Miyamoto (Kitasato University)

P-12 "Synthesis of Novel Crown-Vinamidine Hybrid Compounds and Investigation of Their Physical Properties" by T. Matsuyama and A. Kamimura (Yamaguchi University)

P-13 "Functionalization of Naphto[1,8-cd]-[1,2]dithiole 1,1-dioxide for a Development of New Electrochemical Organic Materials" by S. Takeya, T. Ishida, and A. Kamimura (Yamaguchi University)

P-14 "One-Step Synthesis of 3-Cyanoquinolines through the Scraup Reaction of 1,3,3-Tributoxy-2-cyanopropene and Their Derivatization for Development of New Functional Molecules" by Y. Nagata, H. Okamoto, and A. Kamimura (Yamaguchi University)

P-15 "Electronic States of Anion and Cation Radicals of Aromatic 1,2-Dithiin" by A. Izawa, H. Tani, N. Azuma, and N. Ono (Ehime University)

P-16 "Substituent Effect on the ⁷⁷Se NMR Chemical Shifts in *m*- and *p*-Substituted Benzyl Methyl Selenides, Together with the Contribution of Se---C_i Nonbonded Interactions" by S. Hayashi, W. Nakanishi, Y. Yamakawa, and Y. Kusuyama (Wakayama University)

P-17 "Analysis of NMR Chemical Shifts Based on Each Molecular Orbital (4): ⁷⁷Se NMR Chemical Shifts of Selenuranes, Together with the Contribution of 3c-4e" by T. Nakamoto, S. Hayashi, W. Nakanishi, and M. Hada (Wakayama University and Tokyo Metropolitan University)

P-18 "Hydrogen-Bonding Abilities of the Nitrogen Atom Array on Poly(ethynylpyridine)s" by H. Abe, M. Waki, N. Masuda, H. Machiguchi, and M. Inouye (Toyama Medical and Pharmaceutical University and JST)

P-19 "Effects of Intra- and Intermolecular Hydrogen Bonds on the Molecular and Electronic Structure of Phenoxide Derivatives" by K. Sato, N. Hayashi, H. Higuchi, and T. Sato (Toyama University and Kyoto University)

P-20 "Synthesis and Crystal Structures of Bis(pyridiniopropyl)benzene Derivatives: Selective Appearance of Non-Covalent Interactions" by K. Tsutsui, T.-a. Koizumi, and K. Tanaka (Institute for Molecular Science and CREST)

- P-21 "Nonbonded Interactions between Chalcogen Atoms of the Different Kinds" by M. Uegaito, S. Hayashi, W. Nakanishi, T. Sasamori, and N. Tokitoh (Wakayama University and Kyoto University)
- P-22 "Nonbonded Interactions between Halogen Atoms: Examination Based on Model Calculations" by S. Morinaka, M. Uegaito, S. Hayashi, and W. Nakanishi (Wakayama University)
- P-23 "Structures of 1-(8-GC₁₀H₆)ZZ(C₁₀H₆G-8')-1' (Z = S, Se; G = H, Cl): Contribution of 4c-6e to the Structures" by H. Taguchi, S. Hayashi, W. Nakanishi, T. Sasamori, and N. Tokitoh (Wakayama University and Kyoto University)
- P-24 "Factors to Control the Structures of 1-(Arylseleninyl)naphthalenes" by H. Wada, T. Ueno, S. Hayashi, and W. Nakanishi (Wakayama University)
- P-25 "Synthesis and Structures of Novel Boryl Tellurides via Boryl Triflates" by A. Kawachi, H. Yakushijin, and Y. Yamamoto (Hiroshima University)
- P-26 "Synthesis of a Novel Tridentate Ligand Precursor Bearing Two Coordinating Sulfur Atom and Application to Synthesis of Hypervalent Main Group Element Compounds" by D. Saito, T. Masui, and Y. Yamamoto (Hiroshima University)
- P-27 "Development of a New Efficient Synthetic Method of Spherand" by T. Kashiwaba, S. Sasaki, and Y. Yamamoto (Hiroshima University)
- P-28 "Synthesis and Structure of 16 π Oxidized Octaalkyltetraphenylporphyrins" by M. Kodama, S.-y. Furuta, M. Horie, and Y. Yamamoto (Hiroshima University)
- P-29 "Synthesis and Application of a Novel Tridentate Ligand Oriented to Prohibit Berry Pseudorotation" by H. Yamamichi, S. Matsukawa, and Y. Yamamoto (Hiroshima University)
- P-30 "Synthesis and Isomerization of *O*-Equatorial Unstable Pentacoordinate Spirophosphoranes Bearing a Modified Martin Ligand (*o*-C₆H₄(Li)C(C₂F₅)₂OLi)" by X. Jiang, K.-i. Kakuda, K. Sena, K.-y. Akiba, and Y. Yamamoto (Hiroshima University and Waseda University)
- P-31 "Synthesis of Secondary Amines Bearing Bulky Substituents and Their Reactions with Disulfur Dichloride" by K. Sakamoto, K. Takenaka, and R. Okazaki (Japan Women's University)
- P-32 "Attempts at the Stabilization of *O*-Thionitroso Compound" by K. Takenaka and R. Okazaki (Japan Women's University)
- P-33 "Synthesis of 9-Stannaphenanthrene Utilizing Kinetic Stabilization" by Y. Mizuhata, N. Takeda, T. Sasamori, and N. Tokitoh (Kyoto University)
- P-34 "Elucidation of the Intrinsic Nature of Doubly Bonded Compounds of Heavier Group 15 Elements" by E. Mieda, T. Sasamori, N. Takeda, and N. Tokitoh (Kyoto University)
- P-35 "Synthesis and Properties of Novel Germaaromatic Compounds Kinetically Stabilized Bearing Bulky Substituents" by W. Hoshino, N. Nakata, T. Sasamori, N. Takeda, and N. Tokitoh (Kyoto University)
- P-36 "Preparation, Structures, and Reactions of Novel Sterically Protected Phosphaalenes and Their Dimers" by S. Sekiguchi, M. Freytag, S. Ito, and M. Yoshifuji (Tohoku University)
- P-37 "Syntheses of 1,3-Diphospholes" by A. Nakamura, K. Toyota, and M. Yoshifuji (Tohoku University)
- P-38 "Synthetic Study of Cyclic π Electron System from Diphosphorylacetylene" by K. Adachi, K. Kato, Y. Tanabe, S. Sasaki, and M. Yoshifuji (Tohoku University)
- P-39 "Syntheses and Structures of Organoboron Compounds Bearing an Azo Group" by J. Yoshino, N. Kano, and T. Kawashima (The University of Tokyo)
- P-40 "Study of Syntheses of Novel Molecular Capsules by Taking Advantage of Pentacoordinate Silicon" by A. Yoshida, K. Goto, and T. Kawashima (The University of Tokyo)
- P-41 "Synthesis and Photoisomerization of Azobenzenes Bearing a Phosphorus Substituent" by M. Yamamura, N. Kano, and T. Kawashima (The University of Tokyo)
- P-42 "Synthesis of a Series of Silicon-Group 16 Elements Doubly Bonded Compounds Using Stable Dialkylsilylene and Their Properties" by K. Sato, S. Ishida, T. Iwamoto, C. Kabuto, and M. Kira (Tohoku University)
- P-43 "Synthesis and Structure of Cyclotrisilylium Ion" by M. Igarashi, M. Ichinohe, and A. Sekiguchi (University of Tsukuba)
- P-44 "Synthesis of the First Group 4 Metal Silylene Complexes" by T. Fujita, N. Nakata, Y. Kabe, and A. Sekiguchi (University of Tsukuba)
- P-45 "Synthesis and Reactivity of a Stable Silyl-Substituted Silylene" by T. Honda, M. Ichinohe, and A. Sekiguchi (University of Tsukuba)

P-46 "Synthesis of Organotin Compounds Having Ethenoanthracene Groups" by M. Kaneko, M. Minoura, and G. Yamamoto (Kitasato University)

P-47 "Reactivity of Three-Membered Carbene Complexes Bearing a Phosphorus Substituent with Phosphorus Compounds" by H. Nakazawa (Osaka City University)

P-48 "Double Phosphinylation of Propargylic Alcohols: A Novel Synthetic Route to 1,2-Bis(diphenylphosphino)ethane Derivatives" by M. D. Milton, Y. Nishibayashi, and S. Uemura (Kyoto University)

P-49 "Highly Efficient Cross-Coupling Reaction of Ethynylstibanes with Aryl Halides under Microwave Irradiation" by N. Kakusawa and J. Kurita (Hokuriku University)

P-50 "Halogenation of Azulenylbismuthanes" by A. F. M. Mustafizur Rahman, K. Kurotobi, T. Murafuji, Y. Sugihara, and N. Azuma (Yamaguchi University and Ehime University)

P-51 "Alcohol Oxidation with Hypervalent Organobismuth Oxidants: Studies on the Chemoselectivity" by Y. Matano, T. Iwata, and H. Imahori (Kyoto University)

P-52 "Synthesis and Guest Binding Behavior of Palladium(II) Complexes Possessing Thiacyclopentadiene Pincer Ligands" by T. Nabeshima, S. Akine, and D. Nishida (University of Tsukuba)

P-53 "Synthesis of Benzo[*b*]thiophene Derivatives by Retro Diels–Alder Reaction" by S. Iwashina, T. Ishikawa, H. Uno, and N. Ono (Ehime University)

P-54 "Synthesis and Properties of Macrocyclic Compounds Containing Sulfur Atoms Derived from *o*-Terphenyl" by R. Sato, G. Hamasaka, S. Nakajo, and S. Ogawa (Iwate University)

P-55 "Synthesis and Properties of Chalcogenoiminium Salts" by Y. Mutoh and T. Murai (Gifu University)

P-56 "Preparation of 4-Methylenecyclobutenones from Alkynyl Propargyl Sulfides and Synthetic Application as Precursors of Allenylketenes" by S. Aoyagi, K. Kikuchi, K. Shimada, and Y. Takikawa (Iwate University)

P-57 "Reactions of 7,8-Dithiabicyclo[4.2.1]nona-2,4-diene 7-*exo*-Oxide and Related Compounds with Metal Complexes" by S. Kashiura, Y.-i. Hayashi, and A. Ishii (Saitama University)

P-58 "Formation of 3-Tosyl-2-(tosylmethyl)quinoline Derivatives in the Reaction of 2-(Arylamino)ketene Dithioacetal S, S-Dioxides with Iodine" by S. Matsumoto and K. Ogura (Chiba University)

P-59 "Syntheses and Reactivities of Benzo- and Dibenzothiophene Sulfilimine Derivatives" by W. Kawashima, A. Tatami, T. Fujita, and H. Morita (Toyama University)

P-60 "Transition Metal Catalyzed Synthesis of Unsymmetrical Aryl Sulfide by Cross-Coupling of Aryl Halide with Disulfide Compounds" by N. Taniguchi and T. Onami (Fukushima Medical University)

P-61 "Ring-Transformation of 1-Benzoselenopyrylium Salts into 1,3-Benzoselenazepines" by H. Sashida, H. Minamida, and S. Nakabayashi (Hokuriku University)

P-62 "Selenium-Catalyzed Reaction of Disulfide with Carbon Monoxide" by K. Inazawa, Y. Nishiyama, and N. Sonoda (Kansai University)

P-63 "Palladium-Catalyzed Selenocarbonylation of Alkynes with *Se*-Phenyl Carbamoselenoate and Its Application to the Synthesis of β -Lactams Having Selenomethylidene Functionalities at the α -Position" by M. Toyofuku, S.-i. Fujiwara, T. Shin-ike, and N. Kambe (Osaka University and Osaka Dental University)

P-64 "Synthesis of Water-Soluble Selenoxides and Their Characterization as Oxidizing Agents" by M. Yoneda and M. Iwaoka (Tokai University)

P-65 "Optical Resolution and Stereochemistry of Chalcogen Oxide Possessing Lewis-Base Moiety" by T. Soma, T. Shimizu, K. Hirabayashi, and N. Kamigata (Tokyo Metropolitan University)

P-66 "Synthesis and Reactions of Optically Active Fluoro- λ^6 -sulfanenitrile" by T. Yoshimura, R. Kadota, and T. Fujii (Toyama University)

P-67 "Asymmetric Carboselenenylation Reaction of Olefins" by K. Okamoto, Y. Nishibayashi, and A. Toshimitsu (Kyoto University)

P-68 "Synthesis of γ -Hydroxy- α , β -unsaturated Esters by Sulfinyl-Knoevenagel Reaction of α -Arylsulfinylacetate with Aldehydes" by T. Kawatani, K. Kataoka, Y. Yamasita, and J. Nokami (Okayama University of Science)

P-69 "Enantioselective Reactions of α -Thio and α -Seleno Carbanions" by L. Wang, T. Ogura, Y. Ito, S. Nakamura, and T. Toru (Nagoya Institute of Technology)

P-70 "Preparation and Structures of the Naphthalene Compounds Jointed by the Se–C \equiv C–Se Unit" by T. Nakai, S. Hayashi, and W. Nakanishi (Wakayama University)

P-71 "Structures and Thermolysis of the Naphthalene Selenoxides" by A. Furuta, S. Hayashi, and W. Nakanishi (Wakayama University)

P-72 "Sonogashira Coupling Reaction between Ynamines and Aryl Halides" by K. Yamane, T. Okuno, and W. Nakanishi (Wakayama University)

We look forward to the 32nd Symposium on Heteroatom Chemistry to be held in December

4–6, 2005, in Tsukuba and to be organized by Takeshi Akasaka of University of Tsukuba. We hope that many chemists from various academic institutes and industries will participate in this Symposium.