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Report on the 28th Symposium on Heteroatom Chemistry of the Chemical Society of Japan

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ABSTRACT: *The 28th domestic Symposium on Heteroatom Chemistry of the Chemical Society of Japan was held at Saitama Culture Center in Saitama during the period of December 12–14, and about 250 chemists from various academic institutes and industries took part in the symposium. There were four plenary lectures, 44 oral presentations, and 52 poster presentations. The present article describes abstracts of the plenary lectures and graphical abstracts of oral presentations. Titles of poster presentations are also given.* © 2003 Wiley Periodicals, Inc. Heteroatom Chem 14:1–12, 2003; Published online in Wiley InterScience (www.interscience.wiley.com). DOI 10.1002/hc.10073

The 28th domestic Symposium on Heteroatom Chemistry of the Chemical Society of Japan was held at Saitama Cultural Center in Saitama during the period of December 12–14 under the management of Prof. Juzo Nakayama, one of the authors of this report, and a member of his group. Saitama is a new city that was established by the consolidation of three cities, Urawa, Yono, and Omiya, on March 1, 2001. All the participants (about 250) enjoyed 44 oral presentations and four plenary lectures for 3 days. We had two foreign plenary lecturers, Prof. Edward L. Clennan of the University of Wyoming and the Emeritus Prof. Adolf Krebs of Hamburg University. There were also two domestic lecturers, Prof. Tetsuo Otsubo of Hiroshima University and Prof. Toshiaki Yoshimura of Toyama University. We also enjoyed 52 poster presentations on the evening of the second-day. After the plenary lecture by Prof. Krebs on the morning of the third day, a memorial session for the late Prof. Shigeru Oae, who passed away on May 3, 2000, was held. He was one of the most prestigious Japanese chemists and was the father of heteroatom chemistry in Japan. At the beginning of the session, Prof. Atsuyoshi Ohno of Fukui University of Technology and the Emeritus Prof. Naoki Inamoto of the University of Tokyo shared their cherished memories of Prof. Oae with us. Prof. Naomichi Furukawa of the Foundation for Advancement of International Science spoke about Prof. Oae's outstanding contributions to heteroatom chemistry. Their speeches reminded us of Prof. Oae while he was still alive. We had 10 oral presentations and one plenary lecture by Prof. Yoshimura in this memorial session.

The first plenary lecture was given by Prof. Otsubo on "Synthesis and Utilization of Long Oligothiophenes as Molecular Wires." He described his success in the synthesis of oligothiophenes extended at intervals of 7 thiophene units from the 6-mer up to the 48-mer by a reaction sequence of the Eglinton coupling of ethynyloligothiophenes and Na_2S-induced 1,3-butadiyne cyclization (Scheme 1).

He showed that an effective conjugation system of α-conjugated thiophene oligomers extends to around 20 thiophene units in the neutral state

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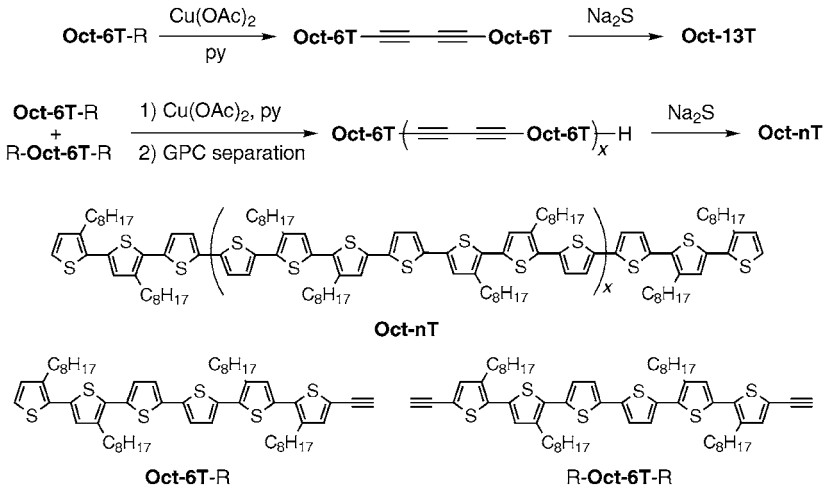
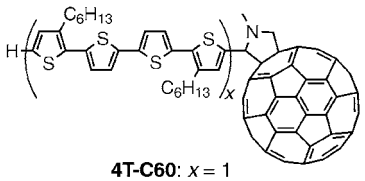


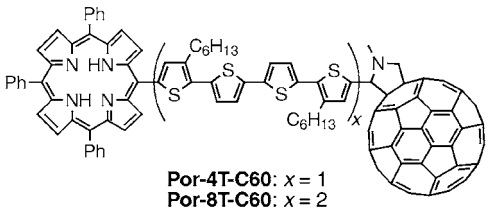
SCHEME 1 Synthesis of α-conjugated thiophene oligomers.

and to around 30 thiophene units in the oxidized state.

He next reported on the oligothiophene-based energy- and/or electron-transfer system. There is a rapid intramolecular singlet–singlet energy transfer from the oligothiophene moiety to the fullerene moiety of the nT-C60 systems. A considerable amount of the porphyrin fluorescence in Por-nT-C60 is quenched by the presence of additionally attached fullerene moieties through out the oligothiophene chain functioning as a molecular wire.

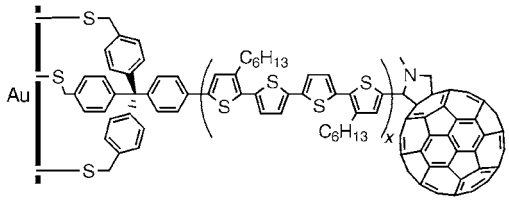


4T-C60: $x = 1$
8T-C60: $x = 2$
12T-C60: $x = 3$



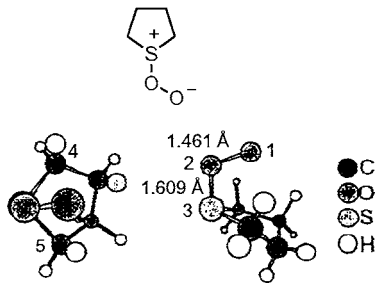
Por-4T-C60: $x = 1$
Por-8T-C60: $x = 2$
Por-12T-C60: $x = 3$

Finally, he reported on an oligothiophene-based photovoltaic device. He designed C60-nT-Anchor-S system, in which the anchoring tripod serves as a three-pointed platform on a surface of gold. Photoelectrochemical measurements indicate that the long oligothiophenes are promising as charge-carrying molecular wires as well as donor building blocks for molecular photoelectric systems.



C60-4T-Anchor-S: $x = 1$
C60-8T-Anchor-S: $x = 2$

The second lecture was presented by Prof. Clennan on "The Persulfoxide: A Key Intermediate in Sulfide Photooxidations." He discussed reactions of singlet oxygen ($^1O_2$) with an organic sulfide from a mechanistic perspective. He outlined the reactions of the persulfoxide, which is the initially formed key intermediate, based on the results of experimental and computational studies. The MP2/6-31G* geometry for the persulfoxide derived from thiolane is shown as follows.



Perhaps the most unusual feature of the persulfoxide is the placement of the outer oxygen above the carbon framework nearly bisecting the C_4—S_3—C_5 angle. The S_3—O_2 bond length in thiolane persulfoxide

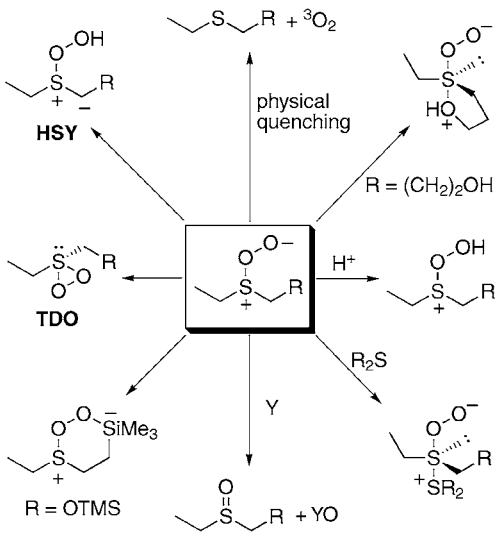
(1.609 Å) is considerably longer than the 1.51 Å S—O bond length found in dimethyl sulfoxide, indicative of a weak S—O bond. The O_1—O_2 bond length in thiolane persulfoxide (1.461 Å), however, is very similar to that of the 1.47 Å O—O bond length in hydrogen peroxide.

Reactions of the persulfoxide intermediate with electrophiles and nucleophiles were discussed as well as its intramolecular interconversions to thiadioxiranes (TDO) and hydroperoxy sulfonium ylides (HSY) (Scheme 2).

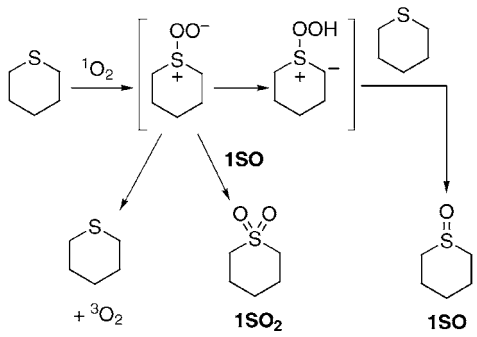
Finally, he provided a brief report on the very recent examination of sulfide photooxidation in a zeolite. He also reported photooxidation of sulfides in Methylene-Blue-doped zeolite Y (Scheme 3). The sulfoxide and the sulfone are formed during photooxidations of pentamethylene sulfide in both the zeolite and in a homogeneous solution (CH_3CN). The sulfone/sulfoxide (**1SO/1SO$_2$**) ratio and its sensitivity to the concentration of pentamethylene sulfide are much greater in the zeolite than in CH_3CN.

The third plenary lecture was entitled "[3+2] Cycloadditions of 1,3-Diheteroallenes—Generation of Carbenes by Addition Reactions," delivered by Prof. Krebs. In an attempt to develop an understanding of the factors governing the [3+2]cycloaddition of heteroallenes to alkynes or alkenes, he carried out both theoretical calculations and experiments of the reactions in which the heteroatoms X and Y were varied (Scheme 4).

Theoretical calculations showed that the reactions with acetylene were exothermic, with the exception of X = Y = O. The calculations also suggest that these reactions are concerted, with the reaction energies decreasing in the order O > S ≈ Se > PH > NR, and that the activation energies decrease in the order O > NR > S > Se > PH.



SCHEME 2 Reactions of persulfoxide intermediate.

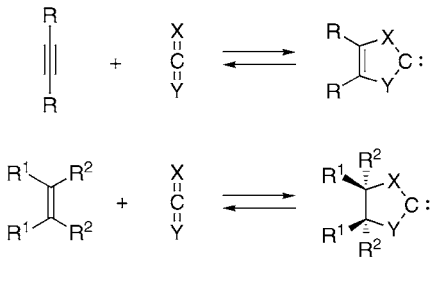


SCHEME 3 Photooxidation of sulfide in a zeolite.

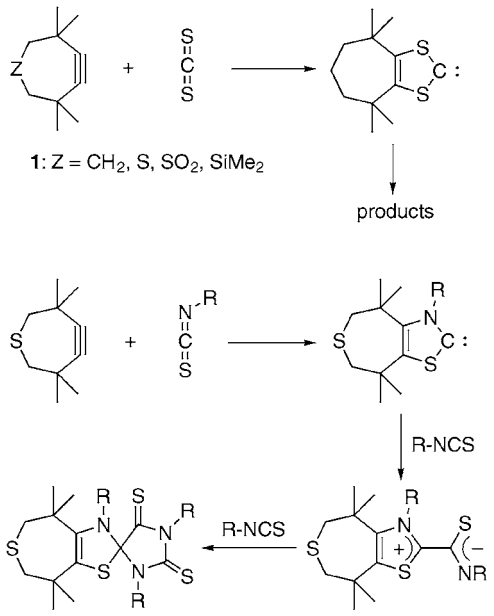
While alkynes carrying electron-withdrawing substituents add CS_2 at high temperatures and high pressure, the strained 7-membered cycloalkynes **1** add CS_2 smoothly at room temperature or even below 0°C (Scheme 5). Thiacycloheptyne **1** (Z = S) also reacts with methyl- and phenylisothiocyanates to yield 1:3 adducts (**1** (Z = S)/RNCS), but only at higher temperatures than those required in the case of CS_2. These experimental results are in harmony with those of the calculated activation energies for the addition of isothiocyanates,which fall between those of the CS_2 and R—N=C=N—R reactions.

The last plenary lecture was given by Prof. Yoshimura. The title of his presentation was "Synthesis and Reactions of Organic Thiazynes." The interest of his research group has recently been focused on the chemistry of thiazynes that are unusual compounds bearing a S≡N bond and three ligands on the sulfur atom. Several types of thiazynes were prepared by reaction of fluorodiphenylthiazyne with a variety of nucleophiles as shown in Scheme 6.

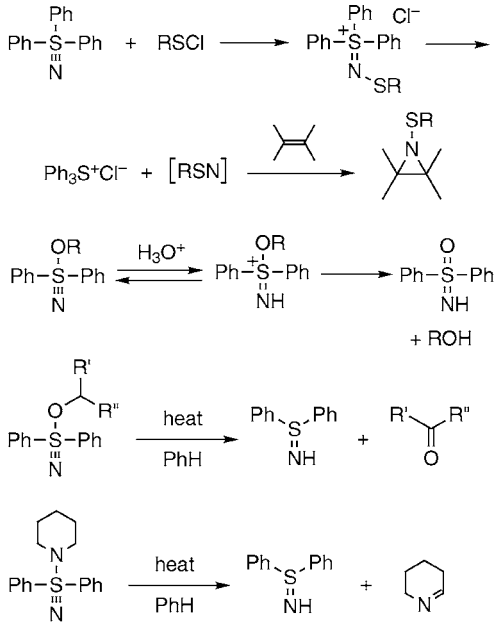
Thiazynes have a tetrahedral structure and their S—N bond lengths are 1.41–1.47 Å. The S—N stretching vibration absorbs in the range of 1260–1360 cm^{-1}. These findings suggest that the S—N bond of thiazynes has a higher bond order than that of sulfilimines, sulfoximines, and sulfonediimines, but



SCHEME 4 [3+2]Cycloaddions of 1,3-diheteroallenes.



SCHEME 5 [3 + 2]Cycloaddions with seven-membered cycloalkynes.



SCHEME 7 Reactions of thiazynes.

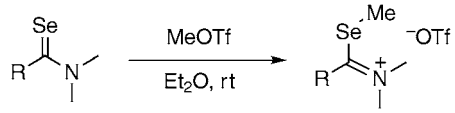
that the S—N bond order is considered to be smaller than 3, and the fairly strong basicity of thiazynes is due to the polar character of the S—N bond.

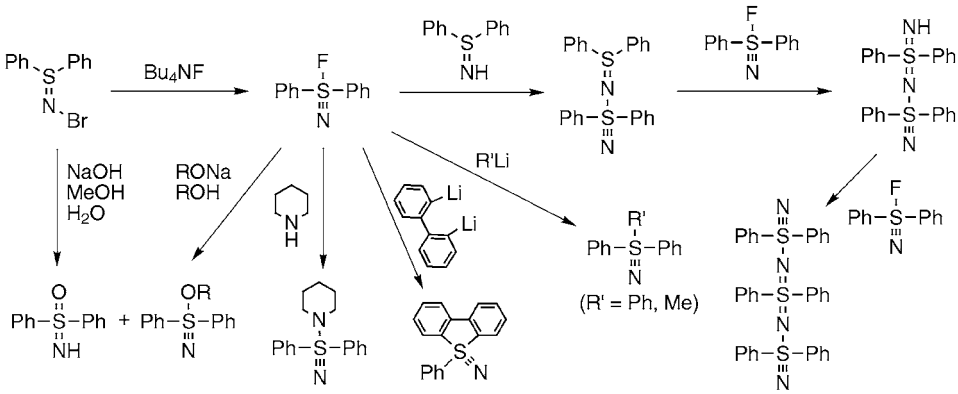
He also described the reactivity of thiazynes (Scheme 7). *N*-Sulfenylation of triphenylthiazyne resulted in the cleavage of the S≡N bond to give triphenylsulfonium chloride and the corresponding sulfenylnitrene that can be trapped by olefins to afford the corresponding aziridines. Acid-catalyzed hydrolysis of alkoxythiazynes proceeded through an initial equilibrium protonation, followed by an alkyl-O bond cleavage to give sulfoximine and an alcohol. In the pyrolysis of alkoxy- and aminothiazynes, a concerted E*i* mechanism is operative to give the corresponding sulfilimine and elimination product. These high reactivities of thiazynes are attributed to the activation of the three single bonds around the sulfur atom by a negative hyperconjugation in which the nitrogen lone-pair moves to the three σ*-orbitals of the sulfur–carbon and sulfur–heteroatom bonds.

In addition to these plenary lectures, many oral and poster presentations were given. The topics and authors are listed below:

Oral Presentations

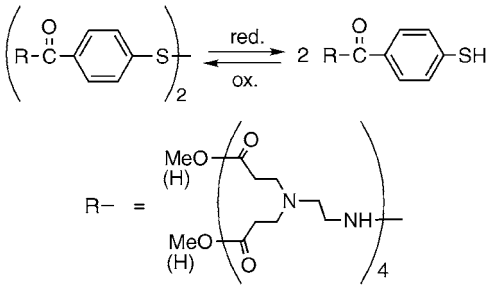
O01. "Selenoiminium Salts: Synthesis, Structure, and Reactivity" by Y. Mutoh, T. Murai, and S. Kato (Gifu University).



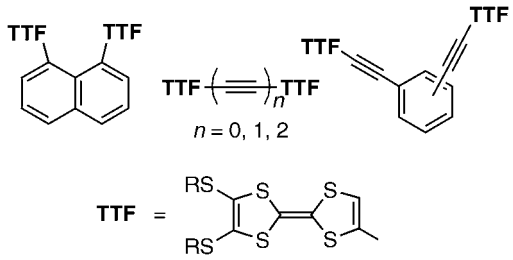


SCHEME 6 Preparations of thiazynes.

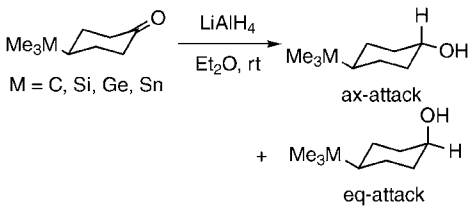
O02. "Synthesis and Characterization of a Poly (amide amine) Dendrimer Having Diphenyl Disulfide at the Core" by Y. Takaguchi, T. Shinjyo, K. Hamada, J. Motoyoshiya, and H. Aoyama (Shinshu University).



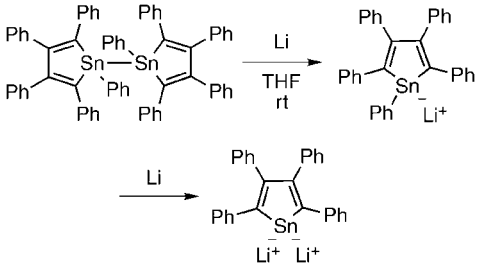
O03. "The Intra- and Intermolecular Heteroatom Interactions in TTF Dimers" by M. Hasegawa, J. Takano, K. Hara, Y. Kuwatani, and M. Iyoda (Tokyo Metropolitan University).



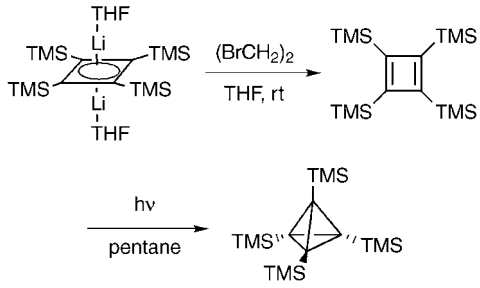
O04. "Origin of π-Facial Diastereoselection in the Hydride Reduction of 4-MMe$_3$-Cyclohexanones (M = C, Si, Ge, Sn)" by S. Tomoda, D. Kaneno, M. Kira, K. Takeuchi, I. Fujii, and H. Sakurai (The University of Tokyo and Tohoku University).



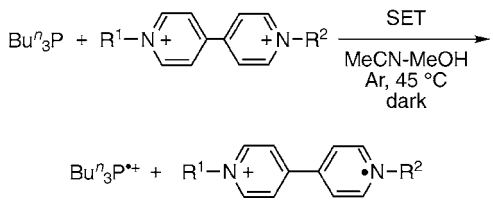
O05. "Synthesis and Reaction of a Stannole Anion" by R. Haga, M. Saito, and M. Yoshioka (Saitama University).



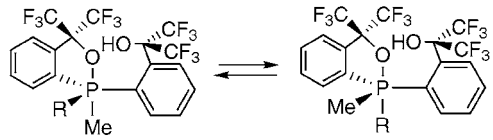
O06. "Synthesis and Reactivity of Silyl-Substituted Cyclobutadiene" by M. Tanaka, T. Matsuo, and A. Sekiguchi (University of Tsukuba).



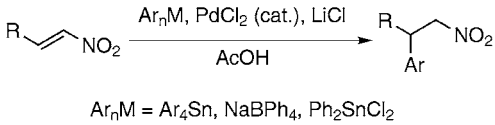
O07. "Single Electron Transfer from Trivalent Phosphorus Compounds to Bipyridinium Salts. Kinetic Examination" by S. Yasui, K. Itoh, and A. Ohno (Tezukayama College, Kyoto University, and Fukui University of Technology).



O08. "Relative Apicophilicity of Carbon Substituents of the Pentacoordinate Phosphorus Compound" by S. Matsukawa, S. Furuta, Y. Yamamoto, and K.-y. Akiba (Hiroshima University and Waseda University).

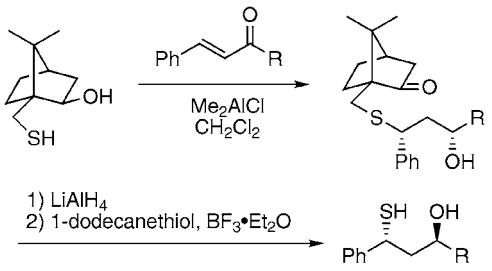


O09. "Palladium(II)-Catalyzed Michael-Type Hydroarylation to Nitroalkenes Using Aryltin Compounds and Sodium Tetraphenylborate" by T. Ohe and S. Uemura (Kyoto University).

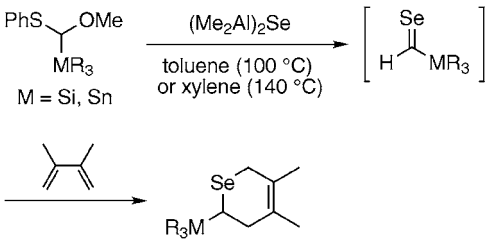


O10. "Tandem Michael-MPV Reaction: Development of Asymmetric Synthesis of Optically Active 1,3-Mercapto Alcohols from α,β-Unsaturated Ketones" by K. Nishide, M. Ozeki, H. Shiraki, H. Kunishige, and M. Node (Kyoto

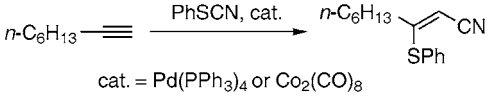
Pharmaceutical University).



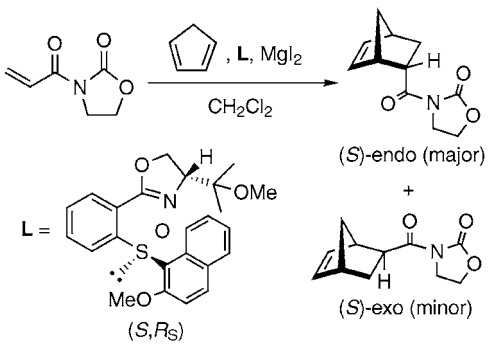
O11. "Synthesis and Reactions of Selenocarbonylsilanes or Selenocarbonylstannanes" by S. Terasaki, M. Segi, and T. Nakajima (Kanazawa University).



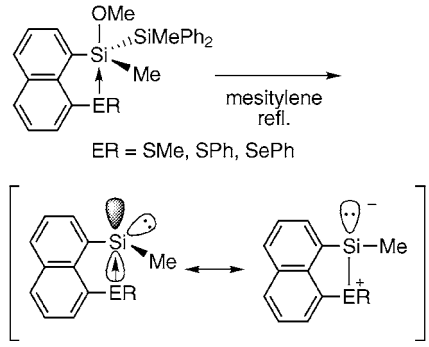
O12. "Highly Selective Thiocyanation of Acetylenes Catalyzed by Transition-Metal Complexes" by A. Ogawa, J. Kawakami, and N. Sonoda (Nara Women's University, Osaka University, and Kansai University).



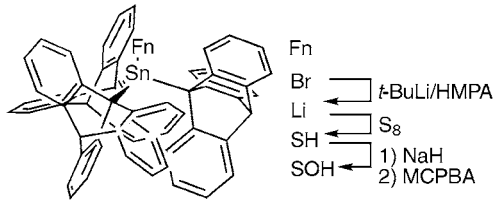
O13. "Participation of Chiral Organosulfur Functionality in Organometal-Catalyzed Reactions: Catalytic Asymmetric Cycloadditions" by K. Watanabe, I. Abe, M. Koseki, T. Hirasawa, and K. Hiroi (Tohoku Pharmaceutical University).



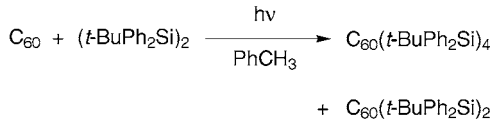
O14. "Generation and Reactivity of Chalcogen-Coordinate Silylenes" by A. Toshimitsu, T. Saeki, and K. Tamao (Kyoto University).



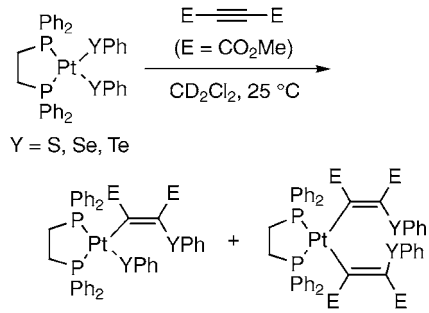
O15. "Synthesis of Group 16 Element Compounds Having Sterically Protecting Tris(9-triptycyl)stannyl Group" by M. Minoura, K. Mouri, and G. Yamamoto (Kitazato University).



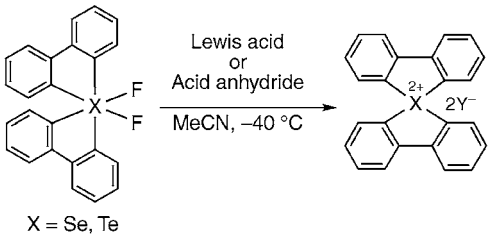
O16. "Synthesis and Characterization of Silylfullerene" by T. Wakahara, G. M. A. Rahman, A. Han, Y. Maeda, T. Akasaka, K. Kobayashi, S. Nagase, M. Kako, and Y. Nakadaira (Niigata University, University of Tsukuba, Tokyo Metropolitan University, Institute for Molecular Science, and The University of Electro-Communications).



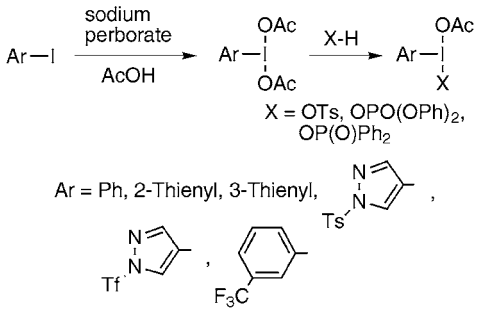
O17. "Insertion of DMAD into Pt–Te Bond" by M. Inoue, H. Kuniyasu, K. Sugoh, H. Kurosawa, and N. Kambe (Osaka University).



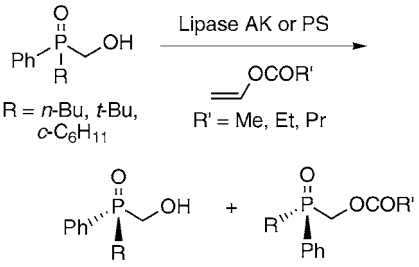
O18. "First Synthesis and Reactivities of Organoselenuranyl and Telluranyl Dication Compounds" by S. Sato, T. Ueminami, T. Yamashita, H. Arakawa, T. Tanaka, E. Horn, and N. Furukawa (University of Tsukuba).



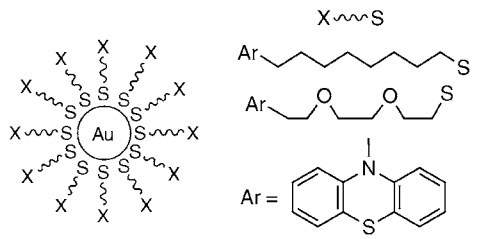
O19. "Preparation and Reactivity of Organohypervalent Iodine Compounds Bearing Heteroaromatics" by T. Nabana and H. Togo (Chiba University).



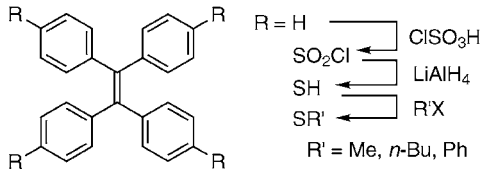
O20. "Synthesis of Optically Active P-Chiral Phosphorus Compounds" by K. Shioji, Y. Ueno, Y. Kurauchi, and K. Okuma (Fukuoka University).



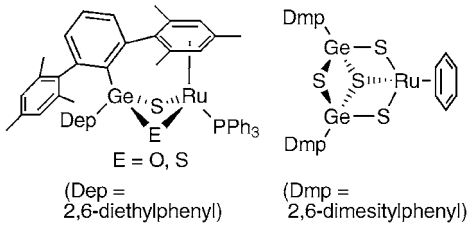
O21. "Self-Assembly of Nanoscale Gold Particles Modified by Thiol Monolayers" by T. Goto and H. Fujihara (Kinki University).



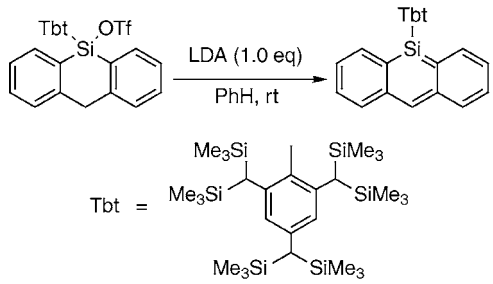
O22. "Synthesis and Characterization of Functionalized Molecule from 1,1,2,2-Tetrakis(4-mercaptophenyl)ethene Having Divergent Thiols" by R. Sato, S. Tsumurai, K. Kimura, S. Nakajo, and S. Ogawa (Iwate University).



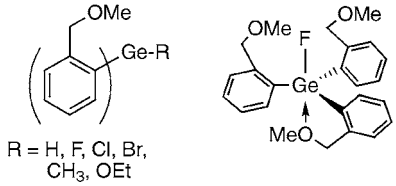
O23. "Synthesis and Reactivity of Germanium-Ruthenium Clusters Bridged by Chalcogen Atoms" by T. Matsumoto, Y. Matsui, Y. Nakaya, and K. Tatsumi (Nagoya University).



O24. "Structure and Reactivity of a Kinetically Stabilized 9-Silaanthracene" by A. Shinohara, N. Takeda, N. Tokitoh, and Y. Furukawa (Kyoto University and Waseda University).

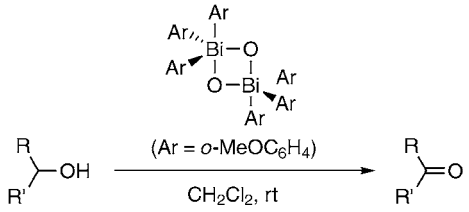


O25. "Synthesis and Hypercoordination of Some Triarylgermanes" by Y. Sugiyama, T. Matsumoto, M. Nishikawa, K. Tanaka, and Y. Takeuchi (Kanagawa University).

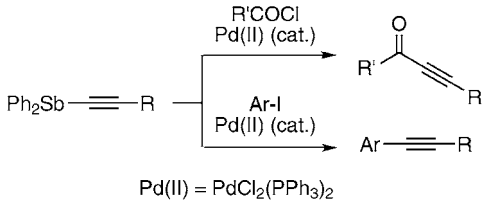


O26. "Synthesis of Triarylbismuthane Oxides and Their Uses in Oxidation Reactions" by Y.

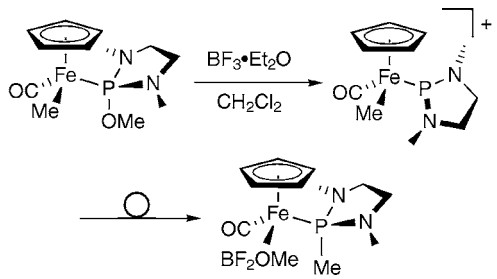
Matano and H. Nomura (Kyoto University).



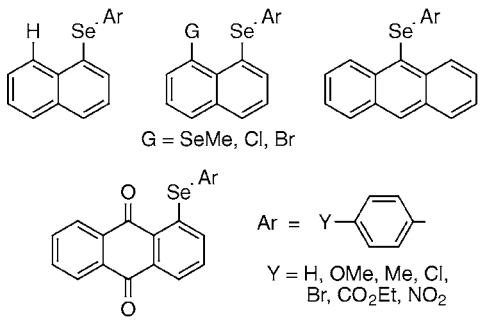
O27. "Palladium Catalyzed Cross-Coupling Reactions between Ethynylstibanes and Organic Halides" by N. Kakusawa, Y. Tobiyasu, K. Yamaguchi, and J. Kurita (Hokuriku University and Chiba University).



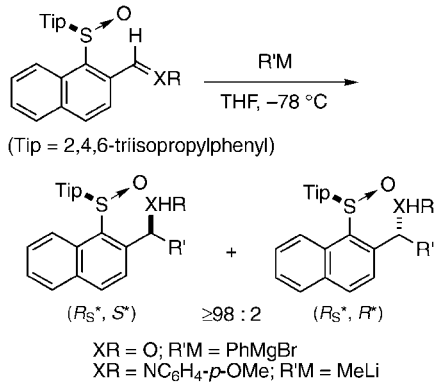
O28. "Consideration of Migration Exhibited by Group 8 Transition Metal Complexes with a Phosphenium Ligand" by H. Nakazawa and K. Miyoshi (Hiroshima University).



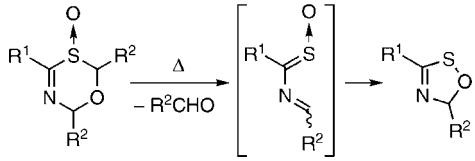
O29. "Are the ^{77}Se NMR Chemical Shifts Really Applicable to the Structural Questions in 1-(Arylselanyl)naphthalenes in Solution? Experimental and Theoretical Aspect" by D. Shimizu, S. Hayashi, and W. Nakanishi (Wakayama University).



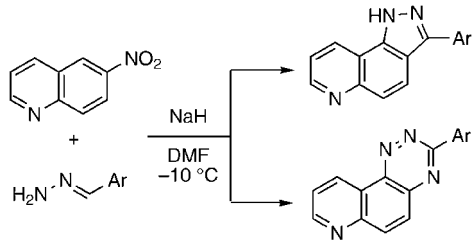
O30. "New Diastereoselective Reaction Using the Rotational Barrier around the C–S Bond Axis" by H. Yasuda, S. Nakamura, and T. Toru (Nagoya Institute of Technology).



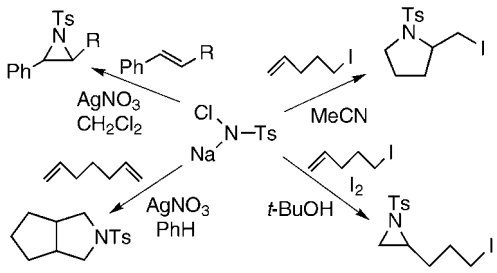
O31. "Generation of Novel Heterodienes *via* Thermal Cycloreversion of 6*H*-1,3,5-Oxathiazine *S*-Oxides" by K. Shimada, I. M. Rafiqul, M. Sato, S. Aoyagi, and Y. Takikawa (Iwate University).



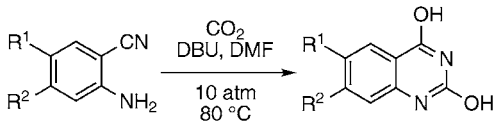
O32. "One-Pot Synthesis of Polycyclic Aza-Arenes through the Nucleophilic Substitution of a Hydrogen in Nitroarenes with Various Ambident Nucleophiles. Synthesis and Mechanistic Considerations" by K. Uehata and H. Suzuki (Kwansei Gakuin University).



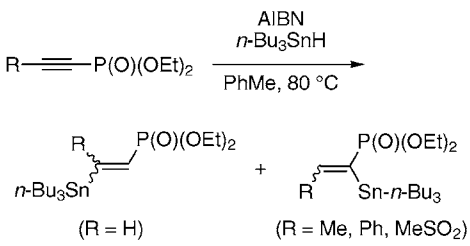
O33. "Heterocyclic Synthesis Using Chloramine-T as a Nitrogen Source" by S. Minakata, D. Kano, R. Fukuoka, Y. Inda, and M. Komatsu (Osaka University).



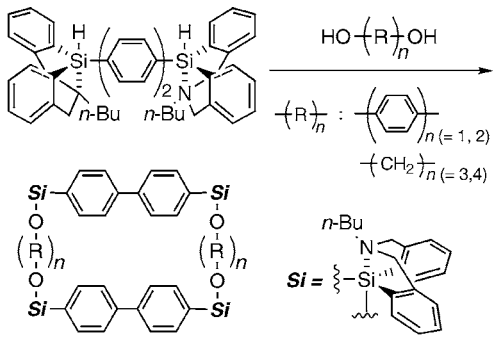
O34. "Synthesis of Quinazolines Using Carbon Dioxide (or Carbon Monoxide with Sulfur) under Mild Conditions" by T. Mizuno (Osaka Municipal Technical Research Institute).



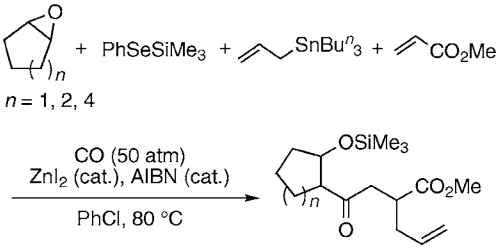
O35. "Synthetic Applications of α-Phosphonovinyl Radical" by H. Takeno, A. Miyamoto, T. Ageno, T. Okauchi, and T. Minami (Kyushu Institute of Technology).



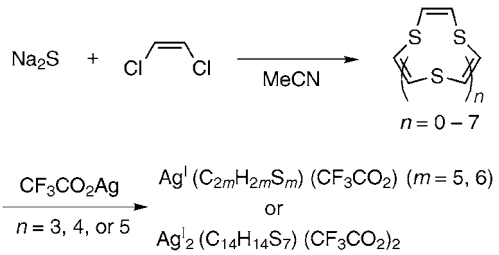
O36. "Synthesis of Novel Supramolecules Containing Highly Coordinate Silicon Atoms" by K. Saruhashi, K. Goto, and T. Kawashima (The University of Tokyo).



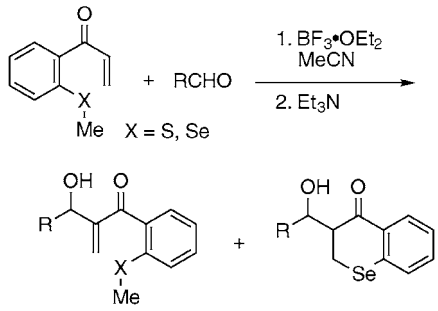
O37. "Multi-Component Coupling Reaction Accompanying Ring-Opening of Epoxides with Phenyl Trimethylsilyl Selenide" by H. Hamaguchi, Y. Nishiyama, and N. Sonoda (Kansai University).



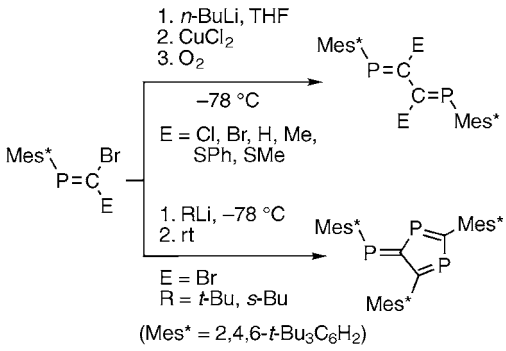
O38. "Synthesis and Properties of Unsaturated Thiacrown Ethers" by T. Tsuchiya, T. Shimizu, and N. Kamigata (Tokyo Metropolitan University).



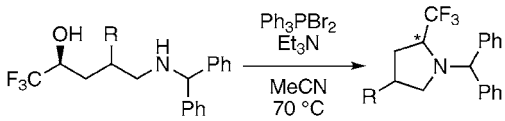
O39. "Development of Tandem Michael-Aldol Reactions Triggered by the Intramolecular Michael Addition of a Chalcogenide Group to an Enone Moiety" by T. Kataoka, H. Kinoshita, S. Kinoshita, and T. Iwamura (Gifu Pharmaceutical University).



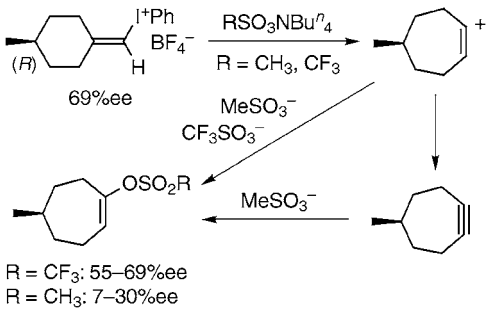
O40. "Some Conjugated Systems Constituted by the P=C Component: 1,4-Diphosphabuta-1,3-dienes and a 1,3,6-Triphosphafulvene" by S. Ito, H. Sugiyama, S. Kimura, and M. Yoshifuji (Tohoku University).



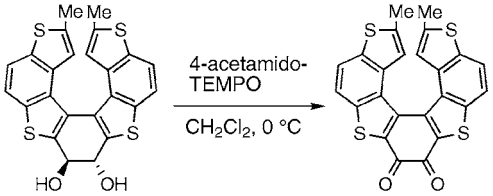
O41. "Nucleophilic Substitution on α-Carbon to Trifluoromethyl Group: Preparation of 5-Membered Ring" by T. Katagiri, H. Yamashita, and K. Uneyama (Okayama University).



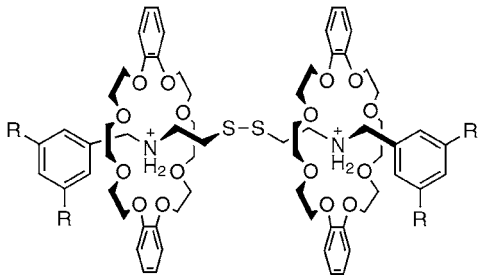
O42. "Reaction of Sulfonates with Cyclohexylideneemethyl Iodonium Salt: 7-Membered Cyclic Acetylene as Intermediate" by T. Okuyama, Y. Sakanishi, and M. Fujita (Himeji Institute of Technology).



O43. "Synthesis of Helical *o*-Quinone, Novel Functionalized [7]Thiaheterohelicenes" by N. Hiraoka, H. Osuga, and K. Tanaka (Wakayama University).



O44. "Synthesis of Supramolecular System by Utilizing Characteristic Feature of Disulfide Bond" by T. Takata, T. Oku, Y. Furusho (Osaka Prefecture University).



Poster Presentations

P01. "Structure and Reactivities of Group 14 Element-Chalcogenides (Photolysis of Si-Tellurium Compounds)" by M. Endo, M. Oba, K. Nishiyama, W. Ando, S. A. Kumar, and A. Ouchi (Tokai University and National Institute of Advanced Industrial Science and Technology).

P02. "Synthesis and Reactivity of Thiophenes Fused with Rigid Bicyclic Ring" by H. Uno, T. Hoshi, Y. Katsuyama, and N. Ono (Ehime University).

P03. "The Horner–Wadsworth–Emmons Reaction of Aromatic Bisphosphonates and Chemiluminescence by Autoxidation of Bisphosphonoanthracene" by J. Nakamura, Q. Zhang, J. Motoyoshiya, Y. Takaguchi, and H. Aoyama (Shinshu University).

P04. "Oxidation of Cyclic Polysulfides and Decomposition of the Oxides" by H. Oshida, K. Matsumoto, A. Ishii, and J. Nakayama (Saitama University).

P05. "Synthesis of Novel Bowl-Shaped Polycyclic Sulfur-Containing Heteroaromatics by Flash Vacuum Pyrolysis and Their Properties" by K. Takano, H. Teramoto, K. Imamura, Y. Aso, K. Takimiya, T. Otsubo, and Y. Harima (Hiroshima University).

P06. "Novel Synthesis of Nitrogen Containing Heterocycles Using Allenylthioketenes" by S. Aoyagi, K. Shimada, and Y. Takikawa (Iwate University).

P07. "Synthesis, Structure and Reactions of 1,3-Disilabicyclobutane" by D. Yin, T. Iwamoto, C. Kabuto, and M. Kira (Tohoku University).

P08. "Reactions of Kinetically Stabilized 2-Germanaphthalene with Elemental Chalcogens" by N. Nakata, N. Takeda, and N. Tokitoh (Kyoto University).

P09. "Synthesis and Structure of a Pd(II) Complex Having a 2,6-Bipyridylphenyl Tridentate Ligand" by Y. Saeki, H. Taji, Y. Yamamoto, and K.-y. Akiba (Hiroshima University and Waseda University).

P10. "Reactions of Activated Thioaldehyde with Carbon Nucleophiles" by S. Takeuchi, K. Takenaka, and R. Okazaki (Japan Women's University).

P11. "Reaction of 9,9′-Bibenzonorbornenylidene Episulfides with Chloramine T: Synthesis of 1,2-Thiazetidines and Isolation of Intermediary Episulfilimines" by Y. Aoyama, Y. Sugihara, and J. Nakayama (Saitama University).

P12. "Syntheses of Phosphoranido Complexes of Rhodium(III) and Iridium(III) Porphyrins" by K. Kajiyama, T. Oka, and T. Miyamoto (Kitasato University).

P13. "Recognition of Ammonium Ions by Interconvertible Hosts Bearing Thiol Groups or a Disulfide Moiety" by D. Nishida and T. Nabeshima (University of Tsukuba).

P14. "Syntheses and Characterizations of the *trans*-Bis(phosphoranido) Platinum(II) Complexes" by I. Sato, K. Kajiyama, and T. Miyamoto (Kitasato University).

P15. "Synthesis and Reactions of [4+4] Type Dimer of 3,4-Di-*tert*-butylthiophene 1-Oxide" by J. Takayama, Y. Sugihara, A. Ishii, and J. Nakayama (Saitama University).

P16. "Preparation of *S*-Fluorothiazynes by the Reaction of *N*-Unsubstituted Sulfilimines with SELECTFLUOR" by T. Yoshimura, S. Asai, and T. Fujii (Toyama University).

P17. "Novel Property and Reactivity of Ditelluroxanes and Attempt to the Synthesis of a Diselenoxane" by K. Kobayashi and N. Furukawa (Shizuoka University and Foundation for Advancement of International Science).

P18. "Preparation and Reactions of Bulky Ethynylphosphines" by K. Nishide, S. Ito, and M. Yoshifuji (Tohoku University).

P19. "Synthesis and Reactivities of Iminosulfonium Salt" by T. Fujii, T. Sato, and T. Yoshimura (Toyama University).

P20. "Reactivity of Silylene Bearing Bulky Silyl-Substituents" by T. Tanaka, M. Ichinohe, A. Sekiguchi, and K. Akiyama (University of Tsukuba and Tohoku University).

P21. "Oxidative Radical Cyclization of α-Methylthio Amides with Mn(III)/Cu(II)" by S. Chikaoka, A. Toyao, T. Okitsu, Y. Takeda, O. Tamura, and H. Ishibashi (Kanazawa University).

P22. "Synthesis and Properties of [7]Thiaheterohelicene with Phenolic Hydroxyl Functions" by K. Tanaka, H. Osuga, and E. Kondo (Wakayama University).

P23. "Synthetic Transformations to Unsaturated Compounds Using Homopropargylic Selenide Derivatives" by Y. Nishino, M. Segi, and T. Nakajima (Kanazawa University).

P24. "Desulfurization of Thiocarbonyl Compounds by Using Silver Salts" by I. Shibuya, Y. Gama, and M. Shimizu (National Institute of Advanced Industrial Science and Technology).

P25. "Mechanistic Study on Ring-Opening Reaction of Thiiranium Ion Intermediates Generated from Diaryl Disulfides and Alkenes in the Presence of Silver Acetate" by J. Tateiwa, S. Iizuka, and H. Takeuchi (Kobe University).

P26. "Syntheses, Structures and Thermolyses of Tetracoodinated 1,2λ^4-Thiazetidines" by Y. Daicho, N. Kano, and T. Kawashima (The University of Tokyo).

P27. "Syntheses and Reactions of Isoxazolyliodonium Salts" by Y. Mansei, Y. Fujiwara, and T. Kitamura (Kyushu University).

P28. "Acid-Catalyzed Reaction Behavior of Cyclopropylcarbinols Substituted by a Heteroatom Group at the 1-Position" by T. Nishizawa, T. Mita, M. Honda, M. Segi, and T. Nakajima (Kanazawa University).

P29. "Nonbonded O–O Interactions in Naphthalene 1,8-Positions: Role of the Interactions in the Structures of 1,8-Bis(oxy)naphthalenes" by D. Shimizu, N. Itoh, K. Takada, S. Hayashi, and W. Nakanishi (Wakayama University).

P30. "Synthesis and Reactions of a Thioselenenic Acid" by A. Tawata, A. Furukawa, A. Ishii, and J. Nakayama (Saitama University).

P31. "Vibrational Spectra of the Neutral and Charged Species of 2,5‴"-Dimethylquinquethiophene and [2.2]Quinquethiophenophane" by S. Ebana, A. Sakamoto, and M. Tasumi (Saitama University).

P32. "Migration Reaction of Tosyl Group in the Cyclization of 1-(3-Indolyl)-4-methylthio-2-tosyl-1,3-butadienes" by S. Matsumoto, T. Kishimoto, and K. Ogura (Chiba University).

P33. "The Substituent Effect in the Aryl Migration of 1-Aryl-1-benzothiophenium Salts" by T. Nuka, B.-X. Zhang, Y. Fujiwara, and T. Kitamura (Kyushu University).

P34. "Synthesis and Characterization of Poly(amide amine) Dendrimer Having Disulfide Bond at the Core" by Y. Takaguchi, T. Shinjo, K. Hamada, J. Motoyoshiya, and H. Aoyama (Shinshu University).

P35. "Synthesis and Reactivity of Bromo(β-hydroxyalkyl)stiboranes" by Y. Uchiyama, N. Kano, and T. Kawashima (The University of Tokyo).

P36. "Novel Synthesis of 2,3-Diphosphono-1,3-butadiene and Its Synthetic Application" by H. Fujimoto, T. Okauchi, and T. Minami (Kyushu Institute of Technology).

P37. "Syntheses and Reactivities of Hexavalent Organotellurium Compounds Having Both Aromatic and Aliphatic Ligands, $Ar_{6-n}TeMe_n$ ($n = 1$–4)" by M. Miyasato, M. Minoura, K.-y. Akiba, and Y. Yamamoto (Hiroshima University, Kitasato University, and Waseda University).

P38. "Synthesis and Reactivities of Thianthrene "Dimer" Derivatives" by H. Morita, Y. Oida, T. Nakajima, T. Ariga, and T. Iwasawa (Toyama University).

P39. "Synthesis and Properties of Sterically Crowded Triarylphosphine Possessing 4-Ferrocenyl-2,6-diisopropylphenyl Substituent"

by K. Sutoh, F. Murakami, S. Sasaki, and M. Yoshifuji (Tohoku University).

P40. "Synthesis, Structure and Properties of Tetrathiafulvalenylferrocenes" by K. Ugawa, N. Otani, T. Takano, Y. Kuwatani, M. Yoshida, and M. Iyoda (Tokyo Metropolitan University).

P41. "Synthesis and Structure of a Novel Heterocyclic Compound Bearing a Pentacoodinate Germanium and an HMPA Moiety" by S. Goto, N. Kano, and T. Kawashima (The University of Tokyo).

P42. "Synthesis and Properties of Diphosphines Possessing Bulky Substituents" by F. Murakami, S. Sasaki, and M. Yoshifuji (Tohoku University).

P43. "Synthesis and Molecular Structure of Sb-Chiral Organoantimony Compounds Bearing Nitrogen Group" by S. Yasuike, S. Okajima, J. Kurita, K. Yamaguchi, and H. Seki (Hokuriku University and Chiba University).

P44. "On the Factors to Determine the Structures of 1-(*p*-Substituted phenoxy)naphthalenes" by K. Takada, N. Itoh, H. Matsumoto, S. Hayashi, and W. Nakanishi (Wakayama University).

P45. "Synthesis and Structure of Hypervalent 5-Coordinate Main Group Element Compounds" by M. Yamashita, Y. Yamamoto, and K.-y. Akiba (Hiroshima University and Waseda University).

P46. "Synthesis and Properties of Hexadehydro [12]annulenes Fused by Tetrathiafulvalenes" by K. Hara, Y. Kuwatani, and M. Iyoda (Tokyo Metropolitan University).

P47. "Synthesis and Reaction of Bistriptycylsilylene" by M. Nakamoto and A. Sekiguchi (University of Tsukuba).

P48. "Formation and Ring-Expansion of Thiirene 1-Imides" by Y. Ono, Y. Sugihara, A. Ishii, and J. Nakayama (Saitama University).

P49. "Synthesis of Thiolate Complexes Bearing Novel Steric Protection Groups" by Y. Takahashi, K. Goto, and T. Kawashima (The University of Tokyo).

P50. "Synthetic Research of 1-Selenanaphthalenes and 1-Telluranaphthalenes" by M. Yoshida and H. Sashida (Hokuriku University).

P51. "Synthesis of Benzothiopyrans *via* Cycloaddition of 2,2′-Dithiobisbenzaldehyde Promoted by Iodine" by T. Horikoshi, Y. Matsuda, T. Otani, and T. Saito (Science University of Tokyo).

P52. "Reaction of Dithiirane 1-Oxides with Lawesson's Reagent" by R. Yamashita, M. Saito, A. Ishii, and J. Nakayama (Saitama University).

We look forward to the 29th Symposium on Heteroatom Chemistry to be held in December of 2002 in Hiroshima and to be organized by Prof. Tetsuo Otsubo of Hiroshima University. We hope that many chemists from various academic institutes and industries will participate in this Symposium.