Shin-ichi Fujiwara

Professor

Chair of Department of Chemistry, Osaka Dental University
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Education

1984 B.Sc., Applied Chemistry, Osaka University, Faculty of Engineering
1986 M.Sc., Applied Chemistry, Osaka University, Graduate School of Engineering
1989 Ph.D. (Dr. of Engineering), Applied Chemistry, Osaka University, Graduate School of Engineering
Thesis Advisor: Professor Noboru Sonoda

Positions Held

Apr/1989 – Mar/1989: Assistant Professor, Department of Chemistry, Osaka Dental University
Apr/1990 – May/2006: Lecturer, Department of Chemistry, Osaka Dental University
Mar/2004 – Sep/2005: Visiting Professor, Department of Chemistry, Purdue University
Jun/2006 – Sep/2009: Associate Professor, Department of Chemistry, Osaka Dental University
Oct/2009 – present: Professor, Chair of Department of Chemistry, Osaka Dental University

Memberships

Chemical Society of Japan
Kinki Chemical Society, Japan
American Chemical Society

Major Research Interests

1. Development of new synthetic reactions utilizing characteristics of chalcogen elements.
2. Synthesis of new heterocycles containing more than two heteroatoms.
3. Generation and its synthetic utilization of unstable organic radicals.

Publications

A. Paper

1) Kambe, N.; Han, L.-B.; Fujiwara, S.; Sonoda, N. Free Radical Addition of α-Telluroesters to Alkenes. *Heteroatom Chem*. in press (Prof. Dr. Kin-ya Akiba's Special Issue).
2) Makita, Y.; Sugimoto, K.; Furuyoshi, K.; Ikeda, K.; Fujiwara, S.; Shin-ike, T.; Ogawa, A. A Zinc(II)-Induced Hemicryptophane: Facile Synthesis, Characterization, and Catalytic Activity. *Inorg*. *Chem*. **2010**, *49*, 7220-7222.
3) Fujiwara, S.; Nishiyama, A.; Okada, K.; Maeda, H.; Shin-ike, T.; Sonoda, N.; Kambe, N. Regioselectivity of Selenium-Mediated Carbonylation of Organolithium Compounds with Carbon Monoxide. *Phosphorus Sulfur Silicon Relat. Elem.* **2010**, *185* (Prof. Dr. Naomichi Furukawa's Special Issue), 1117-1123.
4) Fujiwara, S.; Toyofuku, M.; Kuniyasu, H.; Kambe, N. Transition Metal-Catalyzed Cleavage of Carbon-Selenium Bond and Addition to Alkynes and Allenes. *Pure Appl. Chem.* **2010**, *82*, 565-575.
5) Toyofuku, M.; Murase, E.; Nagai, H.; Fujiwara, S.; Shin-ike T.; Kuniyasu, H.; Kambe, N. Palladium-Catalyzed Intramolecular of Allenes Bearing a Carbamoselenoate Moiety: Regioselective Formation of α,β-Unsaturated Lactam Frameworks. *Eur*. *J*. *Org*. *Chem*. **2009**, 3141-3144.
6) Fujiwara, S.; Shimizu, Y.; Imahori, Y.; Toyofuku, M.; Shin-ike, T.; Kambe, N. A New Entry to α-Alkylidene-β-lactams by 4-exo-dig Cyclization of Carbamoyl Radicals. Tetrahedron Lett. **2009**, *50* (50th Aniversary Special Issue), 3628-3630.
7) Fujiwara, S.; Asai, A.; Makita, Y.; Kambe, N. Synthesis of Thiol Esters by the Use of Carbonyl Sulfide as a Thiocarboxylation Agent. *J. Sulfur Chem.* **2009**, *30* (Prof. Dr. Juzo Nakayama's Special Issue), 264-269.
8) Pratt, L. M.; Fujiwara, S.; Kambe, N. Structure, Bonding, and Aggregation of Selenium-Containing Organolithium Species. *Tetrahedron* **2009**, *65*, 1017-1025.
9) Toyofuku, M.; Murase, E.; Fujiwara, S.; Shin-ike T.; Kuniyasu, H.; Kambe, N. Palladium-Catalyzed Selenoacylation of Allenes Leading to the Regioselective Formation of Functionalized Allyl Selenides. *Org*. *Lett*. **2008**, *10*, 3957-3960.
10) Fujiwara, S.; Shimizu, Y.; Makita, Y.; Shin-ike, T.; Kambe, N. Free Radical Tandem Addition/Cyclization of *Te*-Phenyl *N*,*N*-Dimethylcarbamotelluroate to 1,6-Enynes. *Heterocycles* **2008**, *76* (Prof. Dr. Ryoji Noyori's Special Issue), 1577-1584.
11) Toyofuku, M.; Fujiwara, S.; Shin-ike, T.; Kuniyasu, H.; Kambe, N. Platinum-Catalyzed Intramolecular Vinylchalcogenation of Alkynes with β-Phenylchalcogeno Conjugated Amides. *J. Am. Chem. Soc*. **2008**, *130*, 10504-10505.
12) Fujiwara, S.; Asanuma, Y.; Shin-ike, T.; Kambe, N. Copper(I)-Catalyzed Highly Efficient Synthesis of Benzoselenazoles and Benzotellurazoles. *J*. *Org*. *Chem*. **2007**, *72*, 8087-8090.
13) Fujiwara, S.; Okada, K.; Shikano, Y.; Shimizu, Y.; Shin-ike, T.; Terao, J.; Kambe, N.; Sonoda, N. *N*-Carbonylation of Lithium Azaenolates of Amides, Formamides, Ureas, and Carbamates with

Carbon Monoxide and Selenium. *J. Org. Chem.* **2007**, *72*, 273-276.

14) Kambe, N.; Inoue, T.; Takeda, T.; Fujiwara, S.; Sonoda, N. Genearation of Carbamoyl- and Thiocarbamoyllithium Synthons Having a Hydrogen(s) or an Aryl Group on the Nitrogen and Their Trapping with Carbonyl Electrophiles. *J. Am. Chem. Soc.* **2006**, *128*, 12650-12651.

15) Kuniyasu, H.; Kato, T.; Asano, S.; Ye, J.-H.; Ohmori, T.; Morita, M.; Hiraike, H.; Fujiwara, S.; Terao, J.; Kurosawa, H.; Kambe, N. Pd-Catalyzed Thiocarbamoylation of Terminal Alkynes with Sulfenamide and Carbon Monoxide. *Tetrahedron Lett.* **2006**, *47*, 1141-1144.

16) Kuniyasu, H.; Yamashita, F.; Hirai, T. Ye, J.-H.; Fujiwara, S.; Kambe, N. Platinum-Catalyzed Reaction of Alkynes with ArI (Ar = aryl, and thienyl) and Ar'SM (M = Na, K, and Sn(Bu-*n*)$_3$): Three- vs Two-Component Cross-Coupling Reaction. *Organometallics* **2006**, *25*, 566-570.

17) Toyofuku, M.; Fujiwara, S.; Shin-ike T.; Kuniyasu, H.; Kambe, N. Palladium-catalyzed Intramolecular Selenocarbamoylation of Alkynes with Carbamoselenoates: Formation of α-Alkylidene-β-lactam Framework. *J. Am. Chem. Soc.* **2005**, *127*, 9706-9707..

18) Kambe, N.; Nishiyama, A.; Fujiwara, S.; Shin-ike, T.; Sonoda, N. Carbonylation of Lithium Enolates of Esters and Carboxiamides with Selenium and Carbon Monoxide. *Phosphorous Sulfur Silicon Relat. Elem.* **2005**, 1001-1005.

19) Asanuma, Y.; Fujiwara, S.; Shin-ike, T.; Kambe, N. Selenoimidoylation of Alcohols with Selenium and Isocyanides and Its Application to the Synthesis of Selenium-Containing Heterocycles. *J. Org. Chem.* **2004**, *69*, 4845-4848.

20) Fujiwara, S.; Nishiyama, A.; Shin-ike, T.; Kambe, N.; Sonoda, N. Carbonylation of Lithium Enolates with Carbon Monoxide Mediated by Selenium *Org. Lett.* **2004**, *6*, 453-455.

21) Fujiwara, S.; Shikano, Y; Shin-ike, T; Kambe, N; Sonoda, N. Stereoselective Synthesis of New Selenium-Containing Heterocycles by Cyclocarbonylation of Aminoalkynes with Carbon Monoxide and Selenium. *J. Org. Chem.* **2002**, *67*, 6275-6278.

22) Fujiwara, S.; Shimizu, Y; Shin-ike, T; Kambe, N. Photoinduced Group Transfer Radical Addition of Carbamotelluroates to Acetylenes. *Org. Lett.* **2001**, *3*, 2085-2088.

23) Fujiwara, S.; Matsuya, T.; Maeda, H.; Shin-ike, T; Kambe, N.; Sonoda, N. Imidoyl Radicals as Synthons of Unstable Acyl Radicals. *J. Org. Chem.* **2001**, *66*, 2183-2185.

24) *Fujiwara, S.*; Maeda, H; Matsuya, T; Shin-ike, T; Kambe, N; Sonoda, N. Imidoylation of Acidic Hydrocarbons with Selenium and Isocyanides. A New Synthetic Method of Selenoimidates. *J. Org. Chem.* **2000**, *65*, 5022-5025.

25) Fujiwara, S.; Matsuya, T; Maeda, H; Shin-ike, T; Kambe, N; Sonoda, N. Selenium-Assisted One-Pot Synthesis of Carbodiimides from Isocyanides and Primary Amines. *Synlett* **1999**, 75-76.

26) Fujiwara, S.; Asai, A.; Shin-ike, T.; Kambe, N.; Sonoda, N. A New Synthesis of Selenol Esters via Carbophilic Addition of Organocopper Reagents to Carbonyl Selenide. *J. Org. Chem.* **1998**, *63*, 1724-1726.

27) Maeda, H.; Kambe, N.; Sonoda, N.; Fujiwara, S.; Shin-ike, T. Synthesis of 1,3-Selenazoles and 2-Imidazolin-5-selones from Isoselenocyanates and Isocyanides.*Tetrahedron* **1997**, *53*,

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28) Maeda, H.; Matsuya, T.; Kambe, N.; Sonoda, N.; Fujiwara, S.; Shin-ike, T. A New Synthesis of Isoselenoureas by Imidoylation of Amines with Selenium and Isocyanides. *Tetrahedron* **1997**, *53*, 12159-12166.

29) Maeda, H.; Nishiyama, A.; Fujiwara, S.; Shin-ike, T.; Kambe, N.; Sonoda, N. Synthesis of Selenol Esters via Selenium-Assisted Carbonylation of 2-Arylpropionitriles with Carbon Monoxide. *Synthesis* **1997**, *27*, 342-346.

30) Fujiwara, S.; Shin-ike, T.; Kambe, N.; Sonoda, N. Selenium-catalyzed Synthesis of Cyclic Thionecarbamates from Hydroxy Isocyanides and Sulfur. *Phosphorus Sulfur Silicon* **1997**, *120/12*1, 335-336.

31) Maeda, H.; Fujiwara, S.; Shin-ike, T.; Kambe, N.; Sonoda, N. Carbonylation of Acidic Hydrocarbons with Selenium and Carbon Monoxide. A Novel Method for Synthesis of Selenol Esters. *J. Am. Chem. Soc.* **1996**, *118*, 8160-8161.

32) Maeda, H.; Kambe, N.; Sonoda, N.; Fujiwara, S.; Shin-ike, T. Reactions of 2,6-Xylylisoselenocyanate with Organolithium Compounds. *Tetrahedron* **1996**, *52*, 12165-12176.

33) Fujiwara, S.; Shin-ike, T.; Okada, K.; Aoki, M.; Kambe, N.; Sonoda, N. A Marvelous Catalysis of Tellurium in the Formation of Isothiocyanates from Isocyanides and Sulfur. *Tetrahedron Lett*. **1992**, *33*, 7021-7024.

34) Fujiwara, S.; Shin-ike, T.; Sonoda, N.; Aoki, M.; Okada, K.; Miyoshi, N.; Kambe, N. Novel Selenium Catalyzed Synthesis of Isothiocyanates from Isocyanides and Elemental Sulfur. *Tetrahedron Lett*. **1991**, *32*, 3503-3506.

35) Sekiguchi, M.; Ogawa, A.; Fujiwara, S.; Ryu, I.; Kambe, N.; Sonoda, N. A Novel Deselenation in the Reaction of Selenoamides with Organolithium Reagents. *Chem. Lett*. **1990**, 2053-2056.

36) Sekiguchi, M.; Ogawa, A.; Fujiwara, S.; Ryu, I.; Kambe, N.; Sonoda, N. A Novel Selenium-containing Heterocycle. Lewis Acid-assisted Reaction of Selenoamides with Aldehydes Leading to 6*H*-1,3,5-Oxaselenazines. *Chem. Lett*. **1990**, 913-916.

37) Hiiro, T.; Atarashi, Y.; Kambe, N.; Fujiwara, S.; Ogawa, A.; Ryu, I.; Sonoda, N. Lithium-tellurium Exchange Reaction. A Convenient Method for Generation of Heteroatom-substituted Methyllithium. *Organometallics* **1990**, *9*, 1355-1357.

38) Hiiro, T.; Mogami, T.; Kambe, N.; Fujiwara, S.; Sonoda, N. Carbamoyllithiums. A Novel Method for Generation by Lithium-tellurium Exchange Reaction. *Synth. Commun*. **1990**, *20*, 703-711.

39) Fujiwara, S.; Miyoshi, N.; Ogawa, A.; Kambe, N.; Sonoda, N. A Mechanistic Study of the Selenium-catalysed Carbonylation of Secondary Amines with Carbon Monoxide. *J. Phys. Org. Chem*. **1989**, *2*, 359-362.

40) Fujiwara, S.; Ogawa, A.; Kambe, N.; Ryu, I.; Sonoda, N. Biscarbamoyl Diselenides as a Carbamoylating Reagent. A Convenient Method for the Preparation of ω-Haloalkyl Carbamates from Cyclic Ethers. *Chem. Lett*. **1988**, 1805-1806.

41) Fujiwara, S.; Ogawa, A.; Kambe, N.; Ryu, I.; Sonoda, N. Biscarbamoyl Diselenides as New Carbamoylating Reagents. Lewis Acid Promoted Carbamoylation of Aromatic Compounds. *Tetrahedron Lett*.**1988**, *29*, 6121-6124.

B. Book

1) Fujiwara, S.; Kambe, N.; Sonoda, N. "Synthesis and Reactions of Carbonyl Selenide and Isoselenocyanates." In: Back T. G., ed. "*Organoselenium Chemistry: A Practical Use*", Oxford University Press, **1999**, 223-240.
2) Fujiwara, S.; Kambe, N. "Thio-, Seleno-, and Tellro-Carboxylic Acid Esters" In: Kato S., ed. "*Toppics in Current Chemistry: Chalcogen Carboxylic Acid Derivatives*", Springer, **2005**, *251*, 87-141.
3) Fujiwara, S.; Toyofuku, M. "Product Class 7: Acyclic Dialkyl Sulfides (R-S-R)" In: Kambe, N. ed "Science of Synthesis", Verlag, Stuttgart, **2007**, *39*, 469-500.