

Curriculum Vitae

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Current Appointments

PostDoc, MEXT Project of Integrated Research on Chemical Synthesis, Nagoya University

Date/Place of Birth

June 28, 1987 / Bengbu, Anhui, China

Citizenship

Chinese

Education

B.S. in Chemistry, July 2009 (Anhui Agriculture University)

M.S. in Chemistry, July 2011 (Prof. Aiwen Lei, Wuhan University)

Ph.D. in Chemistry, July 2014 (Prof. Aiwen Lei, Wuhan University)

Visiting Student, Sept. 2011~Nov. 2011 (Prof. Kenichiro Itami, Nagoya University)

Original Papers

- [7] Palladium Catalysed β -Selective Oxidative Heck Reaction of an Electron-rich Olefin
Lingkui Meng, Chao Liu, Wei Zhang, Chao Zhou, Aiwen Lei
Chem. Commun. **2014**, 50, 1110-1112.
- [6] Palladium-catalysed Aerobic Oxidative Heck-type Alkenylation of Csp³-H for Pyrrole Synthesis
Lingkui Meng, Kun Wu, Chao Liu, Aiwen Lei
Chem. Commun. **2013**, 49, 5853-5855.
- [5] Trifluoromethanesulfonic Acid Catalyzed Synergetic Oxidative/[3+2] Cyclization of Quinones with Olefins
Lingkui Meng, Guanghui Zhang, Chao Liu, Kun Wu, Aiwen Lei
Angew. Chem., Int. Ed. **2013**, 52, 10195-10198.
- [4] C-H Alkenylation of Azoles with Enols and Esters by Nickel Catalysis
Lingkui Meng, Yuko Kamada, Kei Muto, Junichiro Yamaguchi, Kenichiro Itami
Angew. Chem., Int. Ed. **2013**, 52, 10048-10051.
- [3] Nickel-Catalyzed Heck-Type Alkenylation of Secondary and Tertiary α -Carbonyl Alkyl Bromides
Chao Liu, Shan Tang, Dong Liu, Jiwen Yuan, Liwei Zheng, Lingkui Meng, Aiwen Lei
Angew. Chem., Int. Ed. **2012**, 51, 3638-3641.
- [2] Palladium-Catalyzed Aerobic Oxidative Direct Esterification of Alcohols
Chao Liu, Jing Wang, Lingkui Meng, Yi Deng, Yao Li, Aiwen Lei
Angew. Chem., Int. Ed. **2011**, 50, 5144-5148.
- [1] Zinc Chloride Enhanced Arylations of Secondary Benzyl Trifluoroacetates in the Presence of β -Hydrogen Atoms.
Hui Duan, Lingkui Meng, Denghui Bao, Heng Zhang, Yao Li, Aiwen Lei
Angew. Chem., Int. Ed. **2010**, 49, 6387-6390.

Presentation

- (3) Lingkui Meng, Yasutomo Segawa, Kenichiro Itami
“Formation of thiophene-fused π -system from diarylacetylenes via C–H cleavage”
The 5th International Conference on MEXT Project of Integrated Research on Chemical Synthesis, Nagoya, Japan, 2015 (Poster)

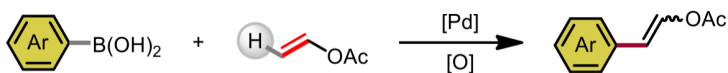
- (2) Lingkui Meng, Yasutomo Segawa, Kenichiro Itami
“Formation of thiophene-fused π -system from diarylacetylenes via C–H cleavage”
The 42nd Symposium on Main Group Element Chemistry, Nagoya, Japan, 2015 (Poster)

- (1) Lingkui Meng, Chan Yu and Aiwen Lei
“Transformation of Vinylic C-H & C-O Bond to C-C bond via Pd(II) Catalysis”
International IUPAC Conference on Organometallic Chemistry Directed Towards Organic Synthesis (OMCOS-16), Shanghai, China, July, 2011 (Poster)

My past research focused on the simple and efficient synthesis of important and useful frameworks from olefins with C–B/C–H bonds. Transition-metal-catalyzed or transition-metal-free coupling and cyclization reactions have been successfully achieved. The three highlights of my achievements are shown here.

1. Palladium-Catalyzed β -Selective Oxidative Heck Reaction of an Electron-Rich Olefin

Heck reaction is one of the most important tools for constructing aryl-substituted alkenes.

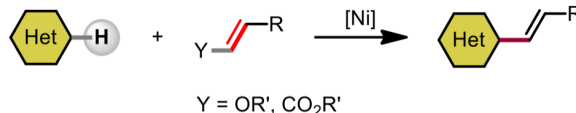


Chem. Commun., 2014, 50, 1110-1112.

Electron-deficient olefins applied in Heck reactions generally generate high regio-selective, generating linear β -selective products, whereas with electron-rich olefins, the Heck reaction generally yields a mixture of α - and β -arylated regio-isomers. Recently much effort has been made to obtain high regio-selectivity with α -arylated electron-rich olefins. However, few reports have focused on establishing the β -selective arylation of electron rich olefins. This work provided a breakthrough in this area and the first β -selective oxidative Heck reaction between arylboronic acid and vinyl acetate was achieved.

2. Nickel-Catalyzed C–H Alkenylation of Azoles with Enols and Esters

Direct C–H alkenylation has received growing interest as an emerging tool for constructing alkenylated arenes and particularly alkenylated heteroarenes, these

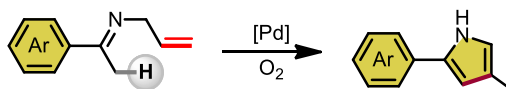


Angew Chem, Int Ed, 2013, 52, 10048-10051.

are the predominant motifs in biologically active natural products, pharmaceuticals and organic materials. This work provided two new C–H alkenylations of azoles that are uniquely catalyzed by Ni-dcype. C–H/C–O alkenylation using enol derivatives and decarbonylative C–H alkenylation using α,β -unsaturated esters. The C–H/C–O alkenylation of heteroarenes is rare, and the decarbonylative C–H alkenylation was reported for the first time. This novel azole alkenylation reaction was successfully applied to the convergent formal synthesis of siphonazole B.

3. Palladium-Catalyzed Aerobic Oxidative Heck-type Alkenylation of Csp³–H for Pyrrole Synthesis

Palladium-catalyzed Heck reaction and oxidative Heck reaction have been widely explored and developed as efficient alkenylation methods. Attention has mostly been focused on



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the alkenylation of sp^2 carbons. However, the alkenylation of sp^3 carbons has been rarely reported, especially the direct alkenylation of Csp³-H bonds. In this work, we demonstrated the first palladium-catalyzed intramolecular alkenylation reaction of a Csp³-H bond to form pyrrole derivatives using molecular oxygen, which is green and low-cost, as the oxidant. This transformation provides an efficient and practical method for the synthesis of pyrrole derivatives.

Thiophene-fused π -systems have been widely studied as organic semiconductors for organic field-effect transistors. Although there are a number of methods for thienannulation, two functional groups are necessary in order to fuse a thiophene ring to polycyclic aromatic hydrocarbons (PAHs). The aim of this work is the development of simple thienannulation of PAHs through C–H cleavage.

Preliminary Results

I discovered simple thienannulation of arylethynyl-substituted PAH with sulfur (S_8) through *ortho*-C–H cleavage. When a mixture

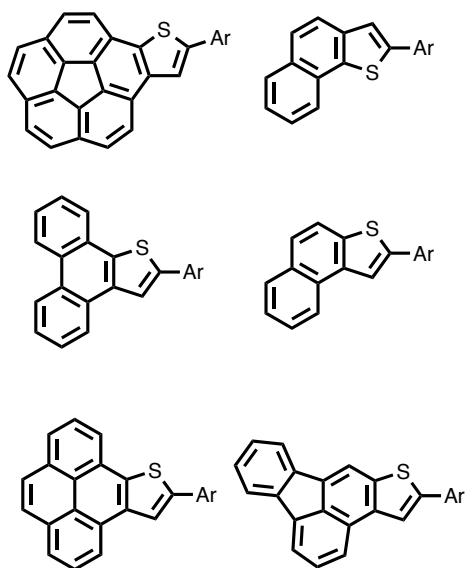


of arylethynylphenanthrene and sulfur in DMF was heated at 140 °C for 24 h, the corresponding thiophene-fused PAH was obtained in high yield. Use of DMF as a solvent is found to be critical for achieving high product yield. Other polar solvents such as DMA or DMSO gave lower yields. Less polar solvents such as 1,4-dioxane and mesitylene were ineffective.

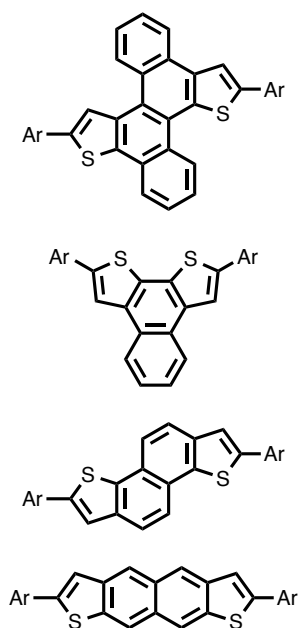
Future Plans

In future, I will explore the substrate scope and synthetic application of the thienannulation of PAHs to various thiophene-fused PAHs. Structures of desired products from mono-, di-, tri- and penta-thienannulation of arylethynyl- substituted PAHs are shown in following figure.

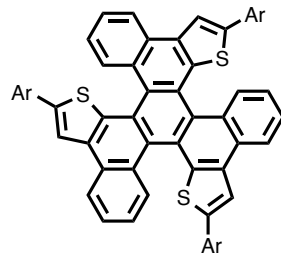
Mono-Thienannulation



Di-Thienannulation



Tri-Thienannulation



Penta-Thienannulation

