

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

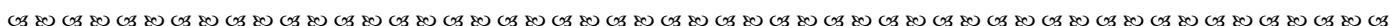
Speaker: Prof. Hiroyuki Nakamura
Institute of Innovative Research
Tokyo Institute of Technology
Japan

Title: Identification and Modification of Target
Proteins using Small Molecules with Light

Date: May 3, 2016 (Tuesday)

Time: 2:30 p.m.

Venue: L1
Science Centre





Revised

*The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series*

Speaker: Prof. Hiroyuki Nakamura
Institute of Innovative Research
Tokyo Institute of Technology
Japan

Title: Development of Boron delivery Nano
Vehicles for Neutron Capture Therapy of
Cancers

Date: May 4, 2016 (Wednesday)

Time: 9:30 a.m.

Venue: L3
Science Centre



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Contact Person:
Prof. Zuwei Xie



*The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series*

Speaker: Prof. Hung-Wing Li
Department of Chemistry
Hong Kong Baptist University

Title: Detection of Disease Biomarkers by
Fluorescence Imaging

Date: May 13, 2016 (Friday)

Time: 10:30 a.m.

Venue: L3
Science Centre



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*Contact Person:
Prof. Bo Zheng*



The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Prof. Dr. Detlef Bahnemann
Institut fuer Technische Chemie
University of Hannover
Germany

Title: Green Photocatalytic Organic Synthesis:
Cyclization & N-Alkylation of Nitroaromatic
Compounds

Date: May 18, 2016 (Wednesday)

Time: 11:30 a.m.

Venue: L2
Science Centre





*The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series*

Speaker: Prof. Masayuki Inoue
Graduate School of Pharmaceutical Sciences
The University of Tokyo

Title: Radical-based Approach for Synthesis of
Complex Natural Products

Date: May 23, 2016 (Monday)

Time: 10:30 a.m.

Venue: L2
Science Centre



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*Contact Person:
Prof. Henry N.C. Wong*



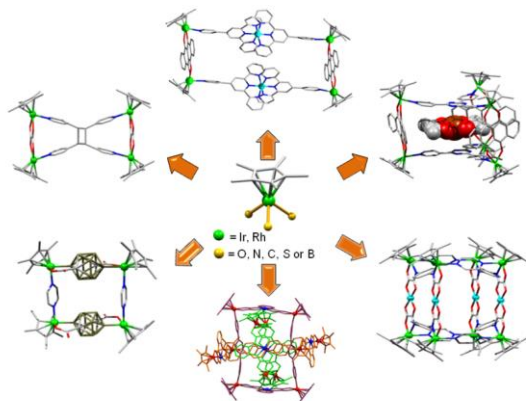
The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Prof. Guo-Xin Jin
Department of Chemistry
Fudan University

Title: Organometallic Macrocycles, Cages and Their Application

<< Abstract >>

The construction of new inorganic and organometallic macrocycles and cages with interesting structural features and technologically useful functions have been topics of intense study with considerable potential.¹ One of the chief motivating factors to growth in this field is the development of new, functional and tunable donor building blocks that can bridge transition metals. Ideal building blocks should be easily accessible, exhibit high affinities toward transition metals, and possess facial coordination sites can undergo exchange reactions with various ligands. Half-sandwich transition metal complexes (Cp^*M , $\text{Cp}^* = \eta^5\text{-C}_5\text{Me}_5$) are useful model compounds in which one hemisphere of the coordination shell is blocked by the voluminous Cp^* rings. In the protected space below the Cp^* ligands, various bidentate or tridentate ligands can be accommodated.



Motivated by interest in supramolecular chemistry with organometallic half-sandwich complexes, we have initiated a new approach for preparing organometallic macrocycles via C-H and B-H activations with Terephthalate and dicarboxylate carborane.² We report herein an efficient method for synthesizing molecular macrocycles of half-sandwich iridium and rhodium complexes via C-H and B-H activation directed multicomponent self-assembly under mild condition.³

1) a). Y.-F. Han, W.-G. Jia, W.-B. Yu, G.-X. Jin, *Chem. Soc. Rev.*, **2009**, 3419; b). Y.-F. Han, G.-X. Jin, *Chem. Soc. Rev.*, **2014**, **43**, 2799; c). Y.-F. Han, G.-X. Jin, *Accounts of Chemical Research* **2014**, *47*, 3571; d). H. Li, Z.-J. Yao, D. Liu and G.-X. Jin, *Coord. Chem. Rev.*, **2015**, 293–294, 139.

2) a) S.-L. Huang, Y.-J. Lin, T. S. A. Hor, G.-X. Jin, *J. Am. Chem. Soc.*, **2013**, *135*, 8125; b) T. Wu, L.-H. Weng, G.-X. Jin, *ChemComm*, **2012**, 4435; c). Y. F. Han, W. G. Jia, Y. J. Lin, G. X. Jin, *Angew. Chem. Int. Ed.*, **2009**, *48*, 6234; d). S.-L. Huang, Y.-J. Lin, Z.-H. Li, G.-X. Jin, *Angew. Chem. Int. Ed.*, **2014**, *53*, 11218; e). L. Zhang, Y.-J. Lin, Z. Li, G.-X. Jin, *J. Am. Chem. Soc.*, **2015**, *137*, 13670.

3) a). Z.-J. Yao, W.-B. Yu, Y.-J. Lin, S.-L. Huang, G.-X. Jin, *J. Am. Chem. Soc.*, **2014**, *136*, 2825; b). H. Li, Y.-F. Han, Y.-J. Lin, G.-X. Jin, *J. Am. Chem. Soc.*, **2014**, *136*, 2982; c). Y.-F. Han, L. Zhang, L.-H. Weng and G.-X. Jin, *J. Am. Chem. Soc.*, **2014**, *136*, 14608; d). Y.-Y. Zhang, X.-Y. Shen, L.-H. Weng, G.-X. Jin, *J. Am. Chem. Soc.*, **2014**, *136*, 1552.

Date: May 23, 2016 (Monday)

Time: 3:30 p.m.

Venue: L2, Science Centre



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Contact Person:
Prof. Zuwei Xie

**Revised**

The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Prof. Kazushi Mashima
Department of Chemistry
Osaka University

Title: C-H Activation and Functionalization by Y, Hf, and Ir Catalysts

<< Abstract >>

C-H bond activation followed by functionalization play key roles on constructing C-C bond formations. In this contribution, three reactions are demonstrated. One is the a novel oxidant-free cross dehydrogenative coupling reaction of 2,6-lutidine and internal alkynes leading to five-membered carbocyclic compounds by non-metallocene cationic hafnium alkyl complexes. Based on mechanistic studies of the coupling reaction, the reaction begins from the C(sp³)-H bond activation via s-bond metathesis, and the coordinatively unsaturated hafnium center mediates further insertion, migration, and b-H elimination reactions giving five-membered carbocycles from readily available substrates. The second one is polymerization of 2-vinylpyridine, in which end-capping functional groups were incorporated to poly(2-vinylpyridine)s by initial introduction of the functional groups on yttrium catalysts through C-H bond activation of heteroaromatics and internal alkynes to the yttrium center *via* an alkylttrium-mediated s-bond metathesis reaction. In addition, Ir-carbene complexes serve as catalysts for C-H silylation reactions, and its mechanism where carbene ligands acted as hemilabile ligands is reported.

- (1) 2,2'-Bipyridyl Formation from 2-Arylpyridines through Bimetallic Dyttrium Intermediate.
Yu Shibata, Haruki Nagae, Raphaël Rochat, Hayato Tsurugi, Kazushi Mashima, *Chem. Sci.*, **6**, 5394-5399 (2015).
- (2) Dehydrogenative C-C Bond Formation of 2-Arylpyridines through Bimetallic Dyttrium Intermediate.
Yu Shibata, Haruki Nagae, Shiki Sumiya, Raphaël Rochat, Hayato Tsurugi, and Kazushi Mashima, submitted (2015).
- (3) Aminomethylation Reaction of *ortho*-Pyridyl C-H Bonds Catalyzed by Group 3 Metal Triamido Complexes.
Haruki Nagae, Yu Shibata, Hayato Tsurugi, and Kazushi Mashima, *J. Am. Chem. Soc.*, **137**, 640-643 (2015).
- (4) Hemilabile *N*-Xylyl-*N'*-methylperimidine Carbene Iridium Complexes as Catalysts for C-H Activation and Dehydrogenative Silylation: Dual Role of *N*-Xylyl Moiety for *ortho*-C-H Bond Activation and Reductive Bond Cleavage.
Gyeongshin Choi, Hayato Tsurugi, and Kazushi Mashima, *J. Am. Chem. Soc.*, **135**, 13149-13161 (2013).
- (5) End-functionalized Polymerization of 2-Vinylpyridine through Initial C-H Bond Activation of *N*-Heteroaromatics and Internal Alkynes by Yttrium Ene-diamido Complexes.
H. Kaneko, H. Nagae, H. Tsurugi, and K. Mashima, *J. Am. Chem. Soc.*, **133**, 19626-19629 (2011).
- (6) Oxidant-Free Dehydrogenative Coupling of Internal Alkynes and 2-Alkylpyridine via Double C-H Activations by Alkylhafnium Complexes.
H. Tsurugi, K. Yamamoto, and K. Mashima, *J. Am. Chem. Soc.*, **133**, 732-735 (2011).

Date: May 31, 2016 (Tuesday)

Time: 4:30 p.m.

Venue: L3, Science Centre



ALL ARE WELCOME

Contact Person:
Prof. Zuowei Xie



The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Prof. Kazushi Mashima
Department of Chemistry
Osaka University

Title: C-H Activation and Functionalization by Y, Hf, and Ir Catalysts

<< Abstract >>

C-H bond activation followed by functionalization play key roles on constructing C-C bond formations. In this contribution, three reactions are demonstrated. One is a novel oxidant-free cross dehydrogenative coupling reaction of 2,6-lutidine and internal alkynes leading to five-membered carbocyclic compounds by non-metallocene cationic hafnium alkyl complexes. Based on mechanistic studies of the coupling reaction, the reaction begins from the C(sp³)-H bond activation via s-bond metathesis, and the coordinatively unsaturated hafnium center mediates further insertion, migration, and b-H elimination reactions giving five-membered carbocycles from readily available substrates. The second one is polymerization of 2-vinylpyridine, in which end-capping functional groups were incorporated to poly(2-vinylpyridine)s by initial introduction of the functional groups on yttrium catalysts through C-H bond activation of heteroaromatics and internal alkynes to the yttrium center via an alkylyttrium-mediated s-bond metathesis reaction. In addition, Ir-carbene complexes serve as catalysts for C-H silylation reactions, and its mechanism where carbene ligands acted as hemilabile ligands is reported.

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H. Kaneko, H. Nagae, H. Tsurugi, and K. Mashima, *J. Am. Chem. Soc.*, **133**, 19626-19629 (2011).
- (6) Oxidant-Free Dehydrogenative Coupling of Internal Alkynes and 2-Alkylpyridine via Double C-H Activations by Alkylhafnium Complexes.
H. Tsurugi, K. Yamamoto, and K. Mashima, *J. Am. Chem. Soc.*, **133**, 732-735 (2011).

Date: May 31, 2016 (Tuesday)

Time: 10:30 a.m.

Venue: L2, Science Centre



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Contact Person:
Prof. Zuowei Xie



The Chinese University of Hong Kong
Department of Chemistry
Research Seminar Series

Speaker: Prof. David Crich
Department of Chemistry
Wayne State University

Title: Stereocontrolled glycosidic bond formation:
A challenge and an inspiration for organic
chemists

Date: May 31, 2016 (Tuesday)

Time: 2:30 p.m.

Venue: L2
Science Centre



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Contact Person:
Prof. Tony K.M. Shing