

CBC SEMINAR ANNOUNCEMENT



Professor Zhenfeng Xi
Peking University

Transition-Metal Catalyzed Cleavage of Si-Me Bond and Silyl C-H Bond in a Si-Me₃ Group: Synthesis of Silacycles

Silicon possesses some crucial differences from carbon (eg. covalent radius and electro-negativity). Thus, when a carbon atom is replaced by a silicon atom (the C/Si switch), the chemical and physicochemical properties of an organic compound may be changed dramatically. For example, silacyclopentadiene (often named silole) as organic material of electronic and opto-electronic devices demonstrates much superiority to its carbon-analogue, cyclopentadiene. In particular, the C/Si switch strategy has been applied successfully for odorant design and pharmaceutical applications. Furthermore, specific properties can be expected from totally new silicon-containing compounds, of which the carbon analogues cannot be synthesized or are very difficult to make. Thus, as a consequence, the development of synthetic methods for silacyclic compounds remains one of the most important frontiers in synthetic chemistry.

The C(sp³)-Si bond and silyl C(sp³)-H bond in trialkylsilyl groups such as SiMe₃ are among the most frequently encountered C-Si and C-H bonds, because many compounds are substituted with trialkylsilyl groups. Thus, a transition metal catalyzed coupling reaction accompanied with selective cleavage of the trialkyl C(sp³)-Si bond¹ and silyl C(sp³)-H bond² would be of great challenge and would lead to a synthetically useful protocol for the synthesis of diversified silacycles.³ In this presentation, synthetic methods recently developed in this research group along this line will be introduced.



References:

- (a) Liang, Y.; Zhang, S.; Xi, Z. *J. Am. Chem. Soc.* **2011**, *133*, 9204. (b) Liang, Y.; Geng, W.; Wei, J.; Xi, Z. *Angew. Chem. Int. Ed.* **2012**, *51*, 1934. See also: Tobisu, M.; Onoe, M.; Kita, Y.; Chatani, N. *J. Am. Chem. Soc.* **2009**, *131*, 7506. Onoe, M.; Baba, K.; Kim, Y.; Kita, Y.; Tobisu, M.; Chatani, N. *J. Am. Chem. Soc.* **2012**, *134*, DOI: 10.1021/ja3096174.
- Liang, Y.; Geng, W.; Wei, J.; Ouyang, K.; Xi, Z. *Org. Biomol. Chem.* **2012**, *10*, 1537. See also: Ohmura, T.; Torigoe, T.; Sugimoto, M. *J. Am. Chem. Soc.* **2012**, *134*, 17416.
- Ouyang K.; Liang, Y.; Xi, Z. *Org. Lett.* **2012**, *14*, 4572.

Date: 11th December 2012 (Tuesday)
Time: 11:00am – 12:30pm
Venue: NTU SPMS CBC Building Level 2,
Conference Room
Host: Professor Koichi Narasaka