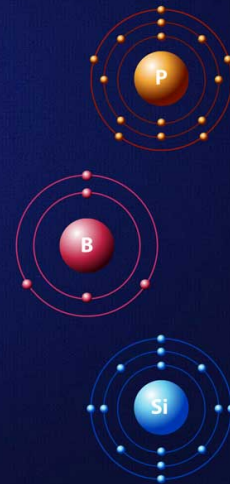


PBSi 2017

International Conference On
Phosphorus, Boron and Silicon

July 3-5, 2017 | Paris



Transition metal catalyzed B-H activation and functionalization of carboranes

PROF. ZUOWEI XIE
The Chinese University of Hong Kong

Carboranes are a class of polyhedral boron hydride clusters in which one or more of the BH vertices are replaced by CH units. They constitute a class of structurally unique molecules with exceptionally thermal and chemical stabilities and the ability to hold various substituents. These properties have made them useful basic units in supramolecular design, medicine, catalysts and materials. However, their unique structures make derivatization difficult, resulting in a limited application scope. Thus, it is important and necessary to develop new methodologies for the functionalization of carboranes. Inspired by transition metal catalyzed C-C/C-B bond forming reactions via benzene C-H activation and our earlier work on transition metal mediated multicomponent cross-cycloaddition for the preparation of benzocarboranes, we have developed transition metal catalyzed regioselective direct cage B-H functionalization of o-carboranes including cage B(4,5)-dialkenylation, B(4,5)-diarylation, B(4)-alkenylation, B(4)-alkynylation, B(4)-amination, and B(4)-hydroxylation. These results will be discussed in this lecture. 1-8

References

- [1] Qiu, Z.; Ren, S.; Xie, Z. *Acc. Chem. Res.* 2011, 44, 299.
- [2] Quan, Y.; Xie, Z. *J. Am. Chem. Soc.* 2014, 136, 15513.
- [3] Lyu, H.; Quan, Y.; Xie, Z. *Angew. Chem. Int. Ed.* 2015, 54, 10623.
- [4] Quan, Y.; Qiu, Z.; Xie, Z. *J. Am. Chem. Soc.* 2015, 137, 3502.
- [5] Quan, Y.; Xie, Z. *Angew. Chem. Int. Ed.* 2016, 55, 1295.
- [6] Quan, Y.; Tang, C.; Xie, Z. *Chem. Sci.* 2016, 7, 5838.
- [7] Lyu, H.; Quan, Y.; Xie, Z. *Angew. Chem. Int. Ed.* 2016, 55, 10840.
- [8] Lyu, H.; Quan, Y.; Xie, Z. *J. Am. Chem. Soc.* 2016, 138, 12727.