Double Hydroelementation of N-Heteroarenes

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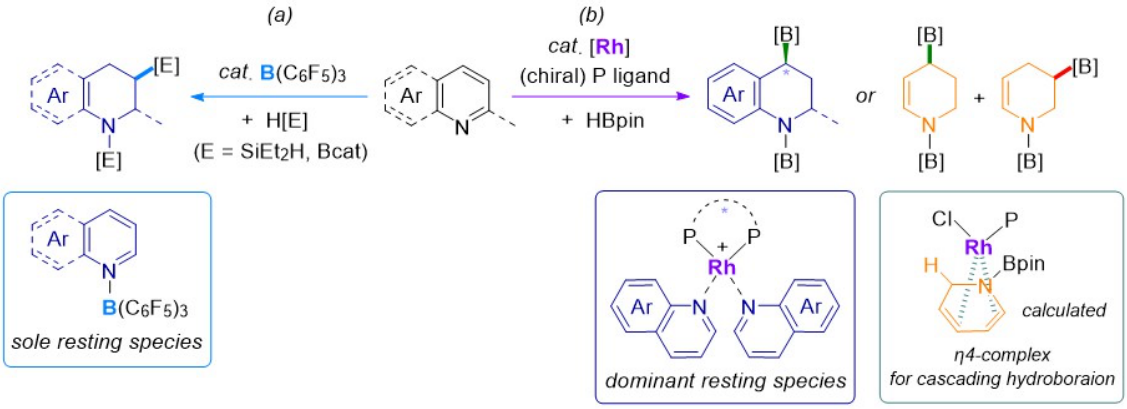
Catalytic dearomative reduction of N-heteroarenes is of important transformations in organic synthesis as well as medicinal chemistry. A number of organo(metallic) catalysts have been documented for selective hydrosilylation and hydroboration of pyridines to provide a broad range of dihydro-products.[1] However, double hydroelementation of pyridines possibly leading to a new family of tetrahydro-products bearing a sp^3 C–E bond (E = Si, B-based moieties), had been unknown until we disclosed.

In this talk, we will describe the full aspects of the *first* double hydrosilylation and hydroboration of quinolines and pyridines catalyzed by $B(C_6F_5)_3$ (Figure a).[2] Next, we will show the Rh-catalyzed regio- and enantioselective double hydroboration of quinolines as an advanced catalytic system.[3] Finally, we will discuss about the Rh-catalyzed double hydroboration of pyridine, where a combination of mechanistic experiments and DFT calculations reveal the origin of the chemo- and regioselectivities.[4] The Rh system represents the *first* example of a metal-catalyzed double hydroboration of N-heteroarenes (Figure b).



References

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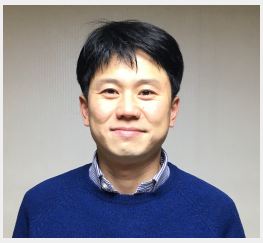
3. R. Wang, S. Park, *to be submitted* (**2023**).
4. H. Choi, R. Wang, S. Kim, D. Kim, M.-H. Baik, S. Park, *to be submitted* (**2023**).



Sehoon Park was born in Seoul (Korea) in 1977. He received his PhD degree (2008) in chemistry from Tokyo Institute of Technology under the supervision of Professor Kohtaro Osakada and Professor Daisuke Takeuchi. He then moved to the University of North Carolina at Chapel Hill to work as a postdoctoral fellow with Professor Maurice Brookhart (2009–2012). From April 2013 to February 2019, he worked at Institute for Basic Science (Korea) as a senior research fellow with Prof. Sukbok Chang an academic mentor. In early 2019, he became an assistant professor at Guangdong-Technion Israel Institute of Technology (GTIIT), where he is currently an associate professor at the Department of Chemistry. He has published over 40 peer-reviewed papers and over 5 US patents in the area of synthetic organic chemistry. His interests are the synthetic and mechanistic organo(metallic) catalysis particularly involving cascade reduction.

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