

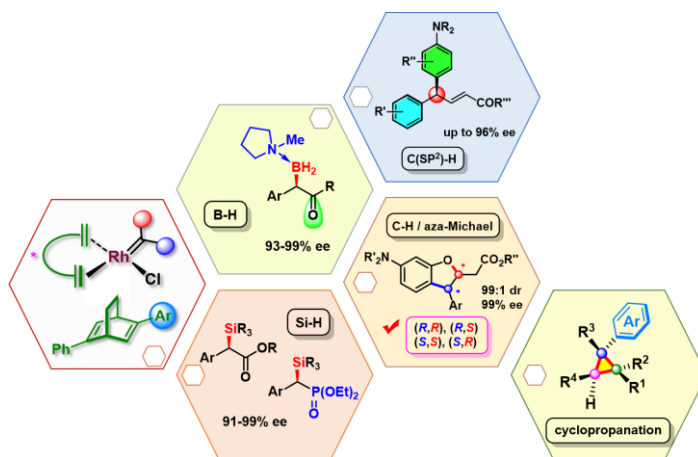
Asymmetric Carbene-Transfer Reactions Catalyzed by Low Coordination State Rhodium(I)

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Transition metal-catalyzed asymmetric carbene insertion reactions have been recognized as one of the most powerful methods for the construction of C-C or C-heteroatom bonds. In recent years, our group has been interested in Rh(I)-carbene chemistry, and achieved the first asymmetric metal-carbene insertion into B-H and Si-H bonds using Rh(I)/C₁-symmetric diene complexes as catalysts.¹ With the established Rh(I)-carbene chemistry, we also discovered that C-H insertion reaction of styryldiazoacetates with aniline derivatives could be achieved in a highly region- and enantio-selective manner.² Moreover, the rhodium(I)/chiral diene catalytic system also enables efficient asymmetric Rh(I)-carbene-directed S-H, C(sp³)-H, N-H, O-H insertions, as well as intramolecular cyclopropanations.³ In this presentation, these results together with some new achievements will be described.



1) a) Chen, X. Zhang, W.-Y. Qi, B. Xu, M.-H. Xu, *J. Am. Chem. Soc.* **2015**, *137*, 5268; b) D. Chen, D.-X. Zhu, M.-H. Xu, *J. Am. Chem. Soc.* **2016**, *138*, 1498. 2) a) D.-X. Zhu, H. Xia, J.-G. Liu, L.W. Chung, M.-H. Xu, *J. Am. Chem. Soc.* **2021**, *143*, 2608; b) D.-X. Zhu, J.-G. Liu, M.-H. Xu, *J. Am. Chem. Soc.* **2021**, *143*, 8583; c) Wang, T.-Y.; Chen, X.-X.; Zhu, D.-X.; Chung, L. W.; Xu, M.-H. *Angew. Chem. Int. Ed.*, **2022**, *61*, e202207008. 3) Zhang, J.; Xu, W.; Xu, M.-H. *Angew. Chem. Int. Ed.*, **2023**, *62*, e202216799.