

Chiral Cyclopentadienyls: Enabling Ligands for Broad Range of Asymmetric C-H Functionalizations

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Reactions involving the selective activation and subsequent functionalization of C-H bonds have a high synthetic potential because of their economic and ecological benefits. Despite significant progress in addressing reactivity and selectivity issues, catalytic enantioselective transformations remain very challenging. The design and development of efficient chiral ligand systems is critical to the success these transformations. Over the past decade, Cp^{*}Rh(III) and Cp^{*}Ir(III) complexes have emerged as extremely powerful catalysts for a very broad range of highly useful C-H functionalizations. This makes the development and engineering of the Cp ligand to an highly relevant task. The presentation will focus on recent developments of chiral cyclopentadienyls as ligands for late transition-metals.¹ The arising complexes are shown to be competent catalysts for enantioselective C-H activations for a streamlined access to relevant small molecules.

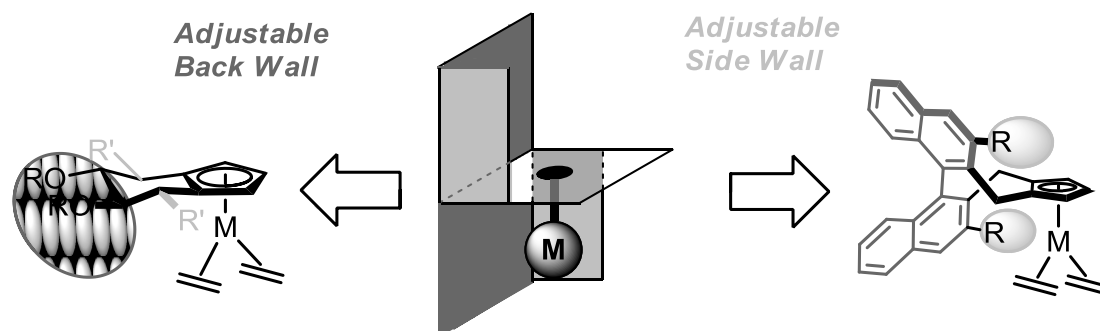


Figure 1 Schematic design of chiral Cp^x metal complexes for asymmetric catalysis

1 (a) B. Ye, N. Cramer, *Acc. Chem. Res.* **2015**, *48*, 1308. (b) C. G. Newton, D. Kossler, N. Cramer, *J. Am. Chem. Soc.* **2016**, *138*, 3935.