NOVEL NHC-BASED Mn(I) PINCER COMPLEX FOR THE HYDROGENATION OF TERMINAL ALKENES AND BEYOND

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The utilization of base-metal catalysts in favor of more expensive precious-metal catalysts has been extensively researched in the last few decades. In that regard, manganese has seen a rise in popularity as it is earth-abundant, cheap, and non-toxic, especially for the use in (de)hydrogenation catalysis. There are numerous examples for the hydrogenation of polar bonds such as C-O and C-N, however, there are very few examples for the hydrogenation of non-polar bonds such as alkenes and alkynes.[1–3]

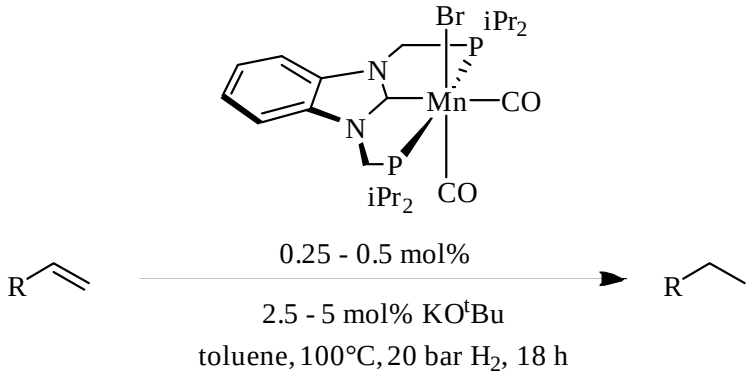

Figure 1. Hydrogenation of Alkenes

In this contribution, we present our results in the hydrogenation of alkenes using a novel Mn(I) NHC-based pincer-type complex (Figure 1). A wide variety of different alkenes both aliphatic and aromatic were reacted, with the catalyst exhibiting a very good substrate scope. The catalyst loading could be reduced to 0.25 mol% for several substrates while still maintaining full conversion.

Furthermore, our recent advances in the synthesis and application of the corresponding alkyl complexes, both bidentate and tridentate, will be presented. These have been shown to undergo migratory insertion, opening up a wide array of hydrogenation and hydrofunctionalization reactions without need for a base.

[1] Weber, S.; Stöger, B.; Veiros, L. F.; Kirchner, K. Rethinking Basic Concepts—Hydrogenation of Alkenes Catalyzed by Bench-Stable Alkyl Mn(I) Complexes. *ACS Catal.* **2019**, *9*, 9715–9720.

[2] Garbe, M.; Budweg, S.; Papa, V.; Wei, Z.; Hornke, H.; Bachmann, S.; Scalone, M.; Spannenberg, A.; Jiao, H.; Junge, K.; Beller, M. Chemoselective Semihydrogenation of Alkynes Catalyzed by Manganese(i)-PNP Pincer Complexes. *Catal. Sci. Technol.* **2020**, *10*, 3994–4001.

[3] Wang, Y.; Wang, M.; Li, Y.; Liu, Q. Homogeneous Manganese-Catalyzed Hydrogenation and Dehydrogenation Reactions. *Chem* **2021**, *7*, 1180–1223.