

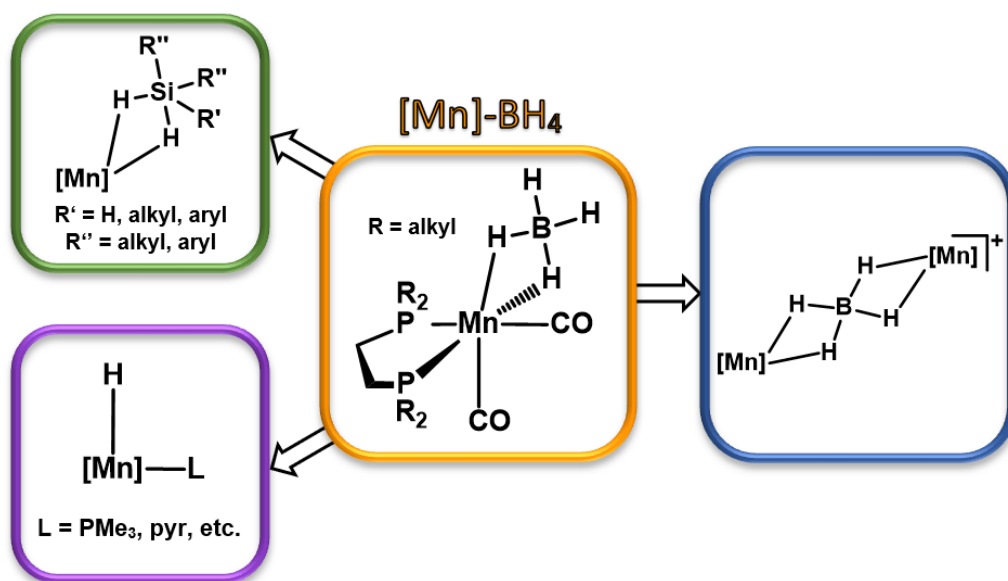
SYNTHESIS AND CATALYTIC APPLICATION OF MANGANESE(I) COMPLEXES CONTAINING σ -B-H BONDS

Ines Blaha, Stefan Weber and Karl Kirchner

Institute of Applied Synthetic Chemistry, Vienna University of Technology,
Getreidemarkt 9, 1060 Vienna, Austria
ines.blaha@tuwien.ac.at

Activation of E-H bonds (E = H, Si, B) at transition-metal centers are intensely studied and are considered to be crucial steps in a variety of catalytic processes [1]. In this field, the role of coordinated B-H bonds is a subject of great interest [2]. As a compound of such kind, the well-defined complex $[\text{Mn}]\text{-BH}_4$ (Scheme 1) was investigated for its structure, reactivity and catalytic application.

The synthesis of $\text{Mn-}[\text{BH}_4]$ was based on the catalytically active [3] Mn(I) alkyl species. The resulting borohydride complex can be used as a versatile platform for further functionalizations. Adduct formation of coordinated $[\text{BH}_4]^-$ grants access to a variety of functionalized Mn(I) compounds. Thus, different complexes are accessible, including compounds bearing hydrides or anionic silane ligands (Scheme 1).



Complex $\text{Mn-}[\text{BH}_4]$ was examined as a catalyst in olefin isomerization reactions. Isomerization plays a crucial role in a variety of industrial processes and organic transformations [4]. $\text{Mn-}[\text{BH}_4]$ was proven to isomerize aliphatic and aromatic alkenes at room temperature. At elevated temperatures, isomerization over multiple bonds – so called “chain-walking” – is possible.

[1] Kubas, G. J. *Modern Inorganic Chemistry*; Kluwer Academic Publishers: Boston, 2002.

[2] Alcaraz, G.; Grellier, M.; Sabo-Etienne, S. *Acc. Chem. Res.* 2009, 42, 1640–1649.

[3] Weber, S.; Zobernig, D.; Stöger, B.; Veiros, L. F.; Kirchner, K. *Angew. Chem. Int. Ed.* 2021, 60, 24488–24492.

[4] Liu, X.; Li, B.; Liu, Q. *Synthesis* 2019, 51, 1293–1310.