

Synthesis of group VI metal carbonyl complexes for hydrogenation reactions

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In analogy to the hydrogenation catalysts $[\text{Mn}(\text{CO})_3(\text{NN})\text{Br}]$, (NN = 2-picolyamine) developed by Sortais *et al.* and $[\text{Mn}(\text{CO})_2(\text{PNP})\text{Br}]$, (PNP = bis[(2-diisopropylphosphino)ethyl]amine) from the Beller group, a variety of carbonyl complexes incorporating group VI metals and multidentate ligands bearing the N-H motif were prepared through substitution reactions on the respective $[\text{M}(\text{CO})_6]$ precursors, (M = Cr and W) [1-2]. The obtained complexes were characterized through UV/Vis-, infrared- and NMR spectroscopy. Furthermore, ligand substitution reactions on the tungsten (II) cyclopentadienyl carbonyl complex $[\text{WCp}(\text{CO})_3\text{Cl}]$, (Cp = cyclopentadienyl) conducted with certain bi- and tridentate ligands were explored. The unprecedented complexes were tested for their ability to catalyze the homogeneous hydrogenation of acetophenone and benzaldehyde. In this context, the influence of the solvent as well as the presence of selected base- and/or hydride additives on the catalyst performance was investigated. The composition of the corresponding reaction solutions was determined by GC-MS analysis.

[1] Bruneau-Voisine, A.; Wang, D.; Dorcet, V.; Roisnel, T.; Darcel, C.; Sortais, J.-B. *Org. Lett.* **2017**, 19, 3656–3659.

[2] Elangovan, S.; Topf, C.; Fischer, S.; Jiao, H.; Spannenberg, A.; Baumann, W.; Ludwig, R.; Junge, K.; Beller, M. *J. Am. Chem. Soc.* **2016**, 138, 8809–8814.