

# PARADIGMS OF COOPERATIVE VS. NON-COOPERATIVE LIGANDS IN METAL PINCER COMPLEXES IN (DE)HYDROGENATION REACTIONS

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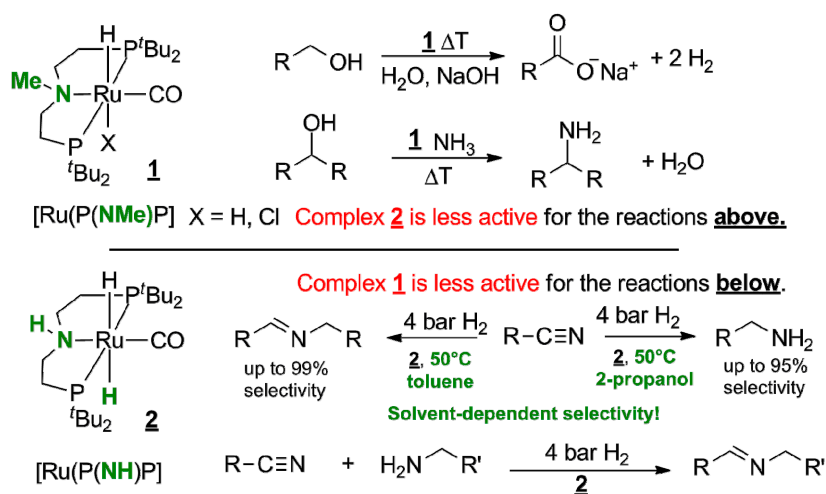
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In our studies, we found on the one hand that catalysts with non-cooperative pincer ligands, like P(NMe)P, are active for dehydrogenation reactions, but on the other hand and in strong contrast cooperative ligands, like P(NH)P, are crucial for hydrogenation reactions.<sup>[1-3]</sup> Additionally, the choice of solvent has a strong influence on the product selectivity in certain cases. For example under polar protic conditions nitriles are converted into primary amines and under non-polar non-protic conditions nitriles are converted into homo-coupled imines, likewise nitriles can be coupled with amines to form unsymmetrical secondary imines.<sup>[2]</sup> Moreover, the amination of alcohols with NH<sub>3</sub> using catalysts with non-cooperative ligands are much superior to cooperative ligands.<sup>[3]</sup>



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[1] J.-H. Choi, L. E. Heim, M. Ahrens, M. H. G. Prechtl, *Dalton Trans.* **2014**, 43, 17248-17254.

[2] J.-H. Choi, M. H. G. Prechtl, *Chemcatchem* **2015**, 7, 1023–1028.

[3] D. Pinggen, J.-H. Choi, H. Allen, G. Murray, P. Ganji, P. W. N. M. van Leeuwen, M. H. G. Prechtl, D. Vogt, *Catal. Sci. Technol.* **2018**, 8, 3969-3976.