

Choose Your Own Adventure in Metal-Hydride Catalysis

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Metal hydrides promote a wide-range of organic transformations that include both C-C bond making and C-C bond breaking processes. This lecture will highlight the development of Rh and Co-catalysts for use in enantioselective hydrofunctionalizations (e.g., hydroacylation, hydroamination, hydrothiolation, and/or hydrogenation). In addition, a unique transfer hydroformylation will be described that allows conversion of aldehydes/alcohols to olefins. The presentation emphasizes mechanistic studies that showcase the role of counter-ions for controlling selectivities. Lastly, we disclose applications of these catalysts for transforming feedstocks into more complex building blocks and natural products.

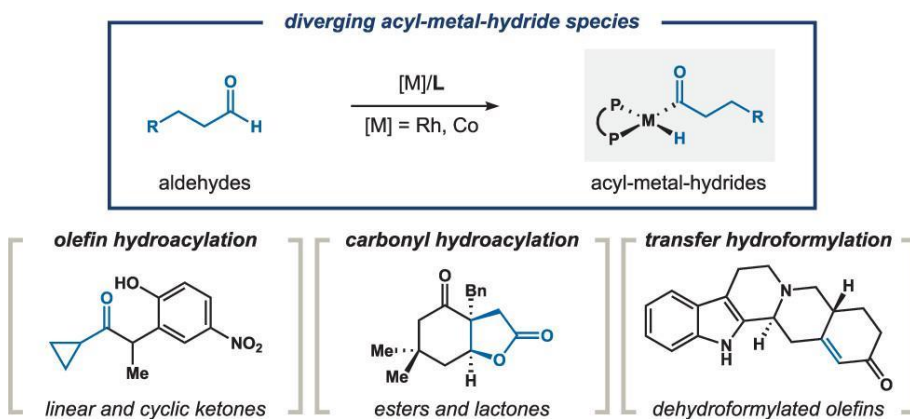


Figure 1: Metal-Hydride Catalysis

[1] Davison, R. T.; Kuker, E. L.; Dong, V. M. Teaching Aldehydes New Tricks Using Rhodium- and Cobalt-Hydride Catalysis. *Acc. Chem. Res.* 2021, 54 (5), 1236–1250, <https://doi.org/10.1021/acs.accounts.0c00771>

[2] Parker, P. D.; Hou, X.; Dong, V. M. Reducing Challenges in Organic Synthesis with Stereoselective Hydrogenation and Tandem Catalysis. *J. Am. Chem. Soc.* 2021, 143 (18), 6724–6745, <https://doi.org/10.1021/jacs.1c00750>