Taming Boron-to-Transition-Metal Transmetalation:

Insights from Mechanistic Studies

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Transmetalation from boron to transition metals is the key step of numerous high-interest reactions of high interest (homocoupling of boron derivatives, Suzuki-Miyaura cross-coupling, Cham-Lan coupling). The transmetalation from boron to palladium was thoroughly studied,1 on the contrary, transmetalation to first row metals has been scarcely investigated despite the considerable interest to help develop cheaper and less toxic metals compare to palladium.

Our recent results on detailed mechanistic aspects of the transmetalation of aryl boronic acid to nickel2 as well as unpublished results about transmetalation to copper will be presented. A combination of experiments (electrochemistry, NMR, kinetics …) and theory (DFT) has been used to study the impact of the pH of the reaction mixture as well as electronic and ligand effects.



Figure 1 Boron to Transition Metal Transmetalation for Ni and Cu.

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