Main-group catalysed hydrosilylation

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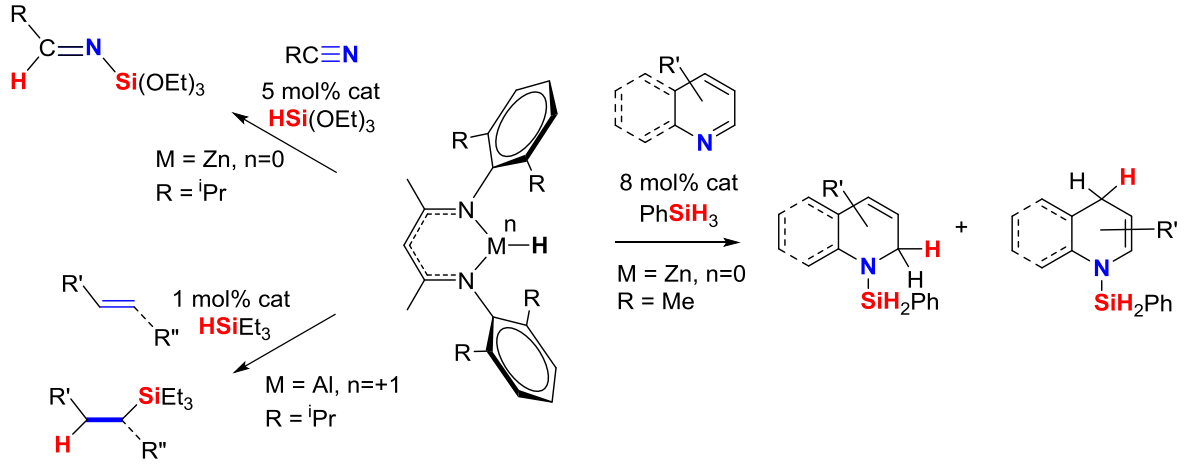
We have previously reported Ru-catalysed chemoselective hydrosilylation of nitriles and pyridines.[1] Given the growing interest in main-group catalysis,[2] we elected to develop main-group surrogates for these catalytic reactions. We have shown that diketoiminate complex of zinc (**1**) catalyses chemoselective hydrosilylation of nitriles to imines. Kinetic and labelling studies revealed an unusual mechanism based on silane preco-ordination to the Zn(II) center.[3] Modification of the catalyst as in **2** allowed for chemoselective reduction of pyridines and benzannulated congeners.[4] The nature of this catalytic process was elucidated by mechanistic and DFT studies. Finally, by using the isolobal analogy between the neutral zinc compound **1** and the cationic aluminium complex **3**, we developed hydrosilylation of olefins which proceeds by a Lewis acid catalysis.[5]



Scheme 1. Zinc- and aluminium-catalysed hydrosilylation.

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[2] Review: K. Revunova, G. I. Nikonov, *Dalton Trans.* **2015**, *44*, 840–866.
[3] C. Boone, G. I. Nikonov, *ACS Catalysis* **2013**, *3*, 2336–2340.
[4] J. Lortie, T. Dudding, B. Gabidullin, G. I. Nikonov, *ACS Catalysis*, **2017**, *7*, 8454–8459.
[5] K. Jakobsson, T. Chu, G. I. Nikonov, *ACS Catalysis*, **2016**, *6*, 7350–7356