S. HANADA, E. TSUTSUMI, Y. MOTOYAMA, H. NAGASHIMA* (KYUSHU UNIVERSITY, FUKUOKA, JAPAN)

Practical Access to Amines by Platinum-Catalyzed Reduction of Carboxamides with Hydrosilanes: Synergy of Dual Si–H Groups Leads to High Efficiency and Selectivity
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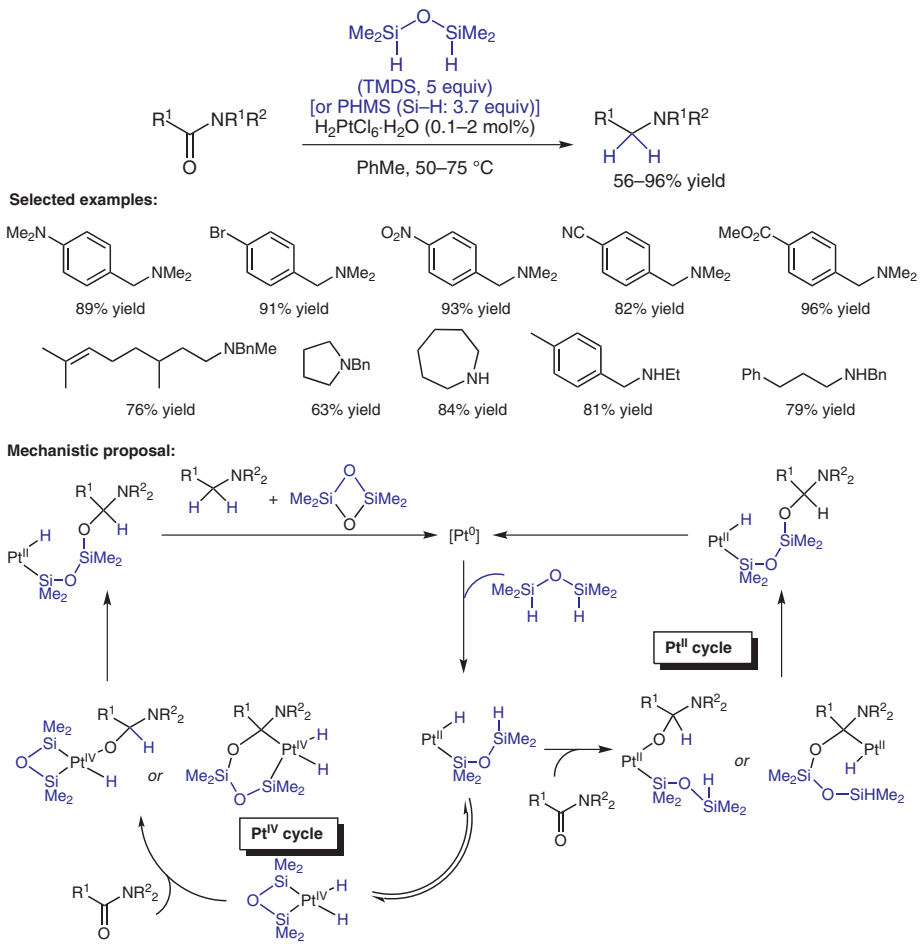
Category

Metal-Mediated Synthesis

Key words

platinum
reduction
hydrosilanes
carboxamides
amines

Pt-Catalyzed Reduction of Carboxamides Using Hydrosilanes



Significance: In this comprehensive article the platinum-catalyzed reduction of carbamides using hydrosilanes is described in detail. The reaction is highly chemoselective and proceeds with a remarkably high tolerance towards functional groups that are also prone to reduction, including cyano, ester and even nitro groups.

Comment: The key feature of this reaction is the 'dual Si–H effect' in which two proximate Si–H groups cooperatively promote the reduction reaction. Inexpensive and readily available disiloxanes, such as TMDS, can be used. The use of polymethylhydrosiloxane (PHMS) has the advantage that the silicone and platinum species can easily be removed from the product.

SYNFACTS Contributors: Paul Knochel, Tobias Thaler
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