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Title:	Phosphine-Free Manganese Catalyst Enables Selective Transfer Hydrogenation of Nitriles to Primary and Secondary Amines Using Ammonia–Borane
Authors:	Kundu, Abhishek (/jspui/browse?type=author&value=Kundu%2C+Abhishek) Adhikari, Debashis (/jspui/browse?type=author&value=Adhikari%2C+Debashis)
Keywords:	Transition metals Transfer reactions
Issue Date:	2021
Publisher:	ACS Publications
Citation:	ACS Catalysis, 11(5), 2786–2794.
Abstract:	Herein we report the synthesis of primary and secondary amines by nitrile hydrogenation, employing a borrowing hydrogenation strategy. A class of phosphine-free manganese(I) complexes bearing sulfur side arms catalyzed the reaction under mild reaction conditions, where ammonia–borane is used as the source of hydrogen. The synthetic protocol is chemodivergent, as the final product is either primary or secondary amine, which can be controlled by changing the catalyst structure and the polarity of the reaction medium. The significant advantage of this method is that the protocol operates without externally added base or other additives as well as obviates the use of high-pressure dihydrogen gas required for other nitrile hydrogenation reactions. Utilizing this method, a wide variety of primary and symmetric and asymmetric secondary amines were synthesized in high yields. A mechanistic study involving kinetic experiments and high-level DFT computations revealed that both outer-sphere dehydrogenation and inner-sphere hydrogenation were predominantly operative in the catalytic cycle.
Description:	Only IISERM authors are available in the record.
URI:	<a href="https://pubs.acs.org/doi/10.1021/acscatal.0c05406">https://pubs.acs.org/doi/10.1021/acscatal.0c05406</a> ( <a href="https://pubs.acs.org/doi/10.1021/acscatal.0c05406">https://pubs.acs.org/doi/10.1021/acscatal.0c05406</a> ) <a href="http://hdl.handle.net/123456789/4961">http://hdl.handle.net/123456789/4961</a> ( <a href="http://hdl.handle.net/123456789/4961">http://hdl.handle.net/123456789/4961</a> )
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