



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Thesis Title: ***Synthesis of Tridentate NNS-Ligand Derived Manganese Complexes and Their Application toward Acceptorless Dehydrogenation and Borrowing Hydrogen Catalysis***

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1. Acceptorless dehydrogenation and Borrowing hydrogen catalysis
2. Synthesis of NNS-Mn(I) complexes and characterization
3. Application of NNS-Mn(I) complexes for synthetic chemistry

SHORT ABSTRACT

In the context of the rapid depletion of fossil fuels and growing awareness towards environmental safety as well as economic benefits, the development of atom economical, environmentally benign catalytic reactions using alternative raw materials is presently an area of intense research of synthetic chemistry. In this perspective, the acceptorless dehydrogenative coupling (ADC) reaction and Borrowing Hydrogen (BH) catalysis are the extremely powerful approaches to synthesize a diverse range of useful organic building blocks from various inexpensive earth-abundant transition metal catalysts.

In the present thesis, new air stable phosphine free tridentate NNS-ligand derived manganese metal complexes have been synthesized to investigate their applicability towards the selective synthesis of amines (secondary and tertiary amines) or imines and the sustainable synthesis of structurally important heterocyclic compounds such as 1,2-di-substituted benzimidazole, 2-substituted benzimidazole, benzothiazole, 2,3-dihydro-1*H*-perimidine, quinoxaline, quinoline, pyrazine, quinazoline, 2-aminoquinoline, 2-alkylaminoquinoline derivatives from relatively cheap and renewable study materials *via* different de(hydrogenative) processes.