



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI  
SHORT ABSTRACT OF THESIS

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Programme of Study : Ph.D.  
Thesis Title: Studies Towards Auxiliary Assisted Positional-Selective C-H Functionalization: A Quest for C-C and C-N Bond Formation  
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Thesis Submitted to the Department/ Center : Chemistry  
Date of completion of Thesis Viva-Voce Exam : 18.03.2020  
Key words for description of Thesis Work : Transition-metal catalysis, C-H Functionalization and Heterocycle Synthesis

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The thesis is divided into four chapters. The first chapter describes a Cu(II)-catalyzed oxidative coupling of aromatic amides with dialkyl malonates *via* a tandem C(sp<sup>2</sup>)-H activation followed by an intramolecular oxidative N-C bond formation for the construction of synthetically valuable isoindolinones and dihydrobenzoindoles structural scaffolds. The second chapter deals with the picolinamide directed Cu(II)-mediated regioselective *N*-(hetero)arylation of indoles, pyrazoles and pyrrole *via* dehydrogenative cross-coupling. The third chapter demonstrates a Rh(III)-catalyzed weak-coordination facilitated C4-selective redox-neutral allylation of indoles expending Morita-Baylis-Hillman (MBH) adducts with functional group diversity. The fourth chapter focuses on a Rh(III)-catalyzed switchable reactivity between C4-selective oxidative alkenylation and alkylation of indoles with allylic alcohols depending on the electronic nature of the directing group and the reaction conditions.