INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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SHORT ABSTRACT

The contents of this thesis have been divided into five chapters based on the results of experimental works performed during the complete course of the research period. The chapter I of the thesis presents introduction to metal free catalyzed C–H functionalizations, their advantages, challenges and applications in organic synthesis. All the other chapters emphasize on the oxidative C–O bond formation via C–H functionalization and oxidative cyclization under metal free conditions. Chapter II describes the syntheses of benzylic esters from alkylbenzenes as the only precursor via a cross dehydrogenative coupling (CDC) under a metal free condition involving four sp^3 C–H bond activations. A method for cyclic ethers to esters and monoesters to diesters (*gem*-diacylates) under metal free conditions via cleaving sp^3 C–H bonds in simple solvents like 1,4-dioxane, tetrahydropyran, tetrahydrofuran and ethyl acetate with terminal aryl alkenes and alkynes illustrated in chapter III. Chapter IV demonstrates the treatment of benzylamines with esters possessing α-sp^3 C–H bond in the presence of TBAI/TBHP provided *bis*-acyl ketals rather than amides. Benzylamines under the same oxidative conditions generate α-acyloxy ethers with cyclic ethers. Chapter V describes the synthesis of 2,5-disubstituted 1,3,4-oxadiazoles from *N*-aroylhydrazones and *N*-acetylhydrazones via oxidative cyclization using catalytic quantity of iodine in the presence of an aqueous hydrogen peroxide oxidant. Each of these chapters comprises of seven subsections which include introduction, literature reports, present work, experimental section, references, spectral data and some selected spectra.