



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study : Ph.D.

Thesis Title : Synthesis of *N/O*-Heterocycles *via* Prins Cyclization, Hydroalkoxylation and Intramolecular Oxycyclization Reactions

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SHORT ABSTRACT

The contents embodied in this thesis are divided into six chapters, including an introductory chapter, based on experimental results obtained during the research period. The introduction provides a concise overview of cascade reactions, with a primary focus on different types of Prins cyclization reaction and their role in constructing intricated heterocyclic motifs. Additionally, it also explores the aspects of hydroalkoxylation and intramolecular oxycyclization strategies in the advancement of complex heterocycles.

Chapter II presents a highly efficient strategy for synthesizing pyrimido[2,1-*a*]isoindole-1-one and isoindolo[2,1-*a*]quinazolin-4(1*H*)-one derivatives *via* an intramolecular aza-Prins type cyclization reaction of *N*-acyliminium ions and amides. Chapter III introduces a metal-free approach for the construction of spiro-furan quinazolinones from *o*-alkynolphenylureas and carbonyl compounds through a cascade alkynyl Prins cyclization reaction. Chapter IV describes a Lewis acid-mediated aza-Prins cyclization followed by hydroalkoxylation strategy which provides easy access to a diverse array of functionalized pyrano- and isochromenoquinoline scaffolds. Chapter V details the synthesis of spiro-furan/pyran quinazolinones *via* a cascade hydroalkoxylation and intramolecular amide-cyclization reaction of *o*-alkynolphenylureas. Chapter VI outlines a Lewis acid-mediated protocol for assembling dispiro isobenzofuranimine-cyclobutane derivatives leveraging an intramolecular oxycyclization followed by a [2+2] cycloaddition of *o*-propargyl alcohol-substituted benzamides.

Each of these chapters comprises nine subsections, which include an introduction, previous work, present work, results and discussion, conclusions, experimental section, references, characterization data, and a few representative spectra.