INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study	:	Ph.D.
Thesis Title	:	Studies Toward 1,3-Enyne Cyclization for the Synthesis of Functionalized Pyrroles, Pyrazoles and Thiophenes
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SHORT ABSTRACT

The thesis contains four chapters. The first chapter deliberates the recent developments of alkyne cyclization reactions employing various electrophiles and transition metal catalysts for the construction of diverse heterocycles.

The second chapter presents the synthesis of tetra- and penta- substituted pyrroles from 1,3-enynes and amines using molecular iodine *via* aza-Michael addition-iodocyclization and oxidative aromatization under mild conditions. These results suggests that the electron deficient conjugated 1,3-enynes are hypothetically useful class of substrates for the synthesis of desired cyclized compounds. The presence of iodine and nitro groups may facilitate further amplification of the products into the complex derivatives.

The third chapter focuses on Cu-catalyzed domino 5-*endo-dig* cyclization of 1,3-enynes with amines for the synthesis of pyrroles/pyrazoles under air. The widespread substrate scope, atom economy, mild reaction conditions and eco-friendliness are the notable features.

The fourth chapter covers DABCO-mediated reaction of 1,3-enynes and 2-mercaptoacetaldehyde for the construction of functionalized thiophenes at room temperature via a sequential Michael addition-5-*exo-dig* carboannulation and oxidation. The use of the mild organic base, metal-free conditions and wide substrate scope are the significant practical advantages.