



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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The thesis consists of five chapters. The first chapter presents the general aspects of hypervalent iodine compounds, including the definition, bonding, nomenclature and reactivity. Following, the recent literature survey of the hypervalent iodine mediated/catalyzed carbon-carbon and carbon-heteroatom bond formation reactions are outlined. In chapter 2, iodobenzene catalyzed synthesis of 2-substituted *N*-sulfonyl benzimidazoles and *N*-aryl benzimidazoles are described by the oxidative amination of *N*'-aryl-*N*'-tosyl/*N*'-methylsulfonylamidines and *N,N*'-bis(aryl)amidines in presence of *m*CPBA as a terminal oxidant at room temperature in 1,1,1,3,3,3-hexafluoro-2-propanol (HFIP) as a solvent. A metal-free protocol for the synthesis of 2-alkyl/aryl benzoxazoles from alkyl/arylanilides has been demonstrated in chapter 3. The reaction is performed using 1-iodo-4-nitrobenzene as the catalyst and oxone as an inexpensive and environmentally benign terminal oxidant at room temperature. In chapter 4, the cyclization of alkyl/arylthioanilides to 2-alkyl/aryl benzothiazoles has been described. The reaction involves the same catalytic system employed in chapter 3. In chapter 5, the synthesis of substituted benzimidazol-2-ones has been described under metal and base-free condition using [bis(trifluoroacetoxy)iodo]benzene by oxidative cyclization of *N,N*'-diarylureas. These metal-free reactions are efficient, general and simple to provide the corresponding benzofused azoles in moderate to high yields.