ABSTRACT

Investigations embodied in this dissertation entitled **"DEVELOPMENT OF NEW AND EFFICIENT METHODS TOWARDS THE SYNTHESIS OF BENZO-FUSED HETEROCYCLES"** with the aim finding out more general, efficient and convenient methodologies to synthesize a variety of nitrogen and oxygen containing heterocyclic and selectively substituted benzofused compounds catalyzed by metallic and nonmetallic Lewis acids under environmentally friendly conditions.

The thesis has been divided into three chapters. **Chapter 1** demonstrates the development of an efficient synthesis of functionalized 3-alkylated indole and benzofuran which are one of the less invaded part of research till date in the region of synthetic organic chemistry. In this part we have we have reported an iron(III)-catalyzed strategy for the general synthesis of selectively substituted heterocycles via isomerization of 3-(methylene)indoline and 3-methylene-2,3-dihydrobenzofuran derivatives under mild conditions. **Chapter 2** describes a diversity-orientated synthesis of indolo[2,3-*b*]quinolines derivatives which are popular for in medicinal chemistry and hence synthesis of these type of organic moieties becomes major point of interest. In this report, we have implemented a unique and competent approach which involves the synthesis of polycyclic heterocycles comprising of palladium-catalyzed intramolecular carbopalladation/Suzuki coupling and successive cycloisomerisation development of C–N bond through DDQ-mediated cross-dehydrogenative (CDC) couplings. **Chapter 3** describes DDQ-mediated dehydrogenative oxyfunctionalization of indoles to afford tertiary indole-3-carbinols, which as well serve as excellent methylene surrogates as their applications to synthesize unsymmetrical bis(indolyl)methanes (BIMs) containing all carbon quaternary centers. BIMs are actually the prime metabolite compound produced in our body at certain conditions, which are also present in nature and popular for its pharmacological importance and so deserves the attention of the synthetic organic chemists.

Each chapter in this thesis consists of general introduction followed by a brief review of related methodological studies, elaborated description of reactions performed, experimental section containing details of experiments with necessary spectroscopic and analytical data, related references and finally some representative scan picture of NMR spectra.

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