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## Preface

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A central objective in synthetic organic chemistry has been to develop a greener and more economically competitive processes for the efficient synthesis of biologically active compounds with potential application in the pharmaceutical and related industries.

Isatin and its derivatives represent an important class of ‘privileged structures’ capable of serving as ligands for a wide range of biological targets. Due to this reason, in past few decades, isatin and its derivatives have been used extensively as key intermediate in organic synthesis.

The content of the thesis have been divided into five chapters.

**Chapter 1** gives an overview of the chemistry of isatin, it starts from short introduction followed by methods of synthesis and after that chemical reactivity of isatin. In this section, reduction, oxidation, electrophilic aromatic substitution, N-substitution and reactivity of the carbonyl group of isatin are briefly covered. After that, synthesis of isatin based spiro-fused heterocyclic scaffolds and at least, recent application of isatin in organic synthesis have been briefly included. The actual investigation and findings are presented in the subsequent four chapters.

**Chapter 2** deals with a facile and efficient multicomponent synthesis of benzodiazepine ring via the reaction of isatin, diphenylamine, and 1,3-diketone under ultrasound irradiation in water.

**Chapter 3** gives an account for a grinding induced catalyst-free, multicomponent synthesis of indoloindole pyrimidine from isatin, barbituric acid and enaminone under ethanol as a solvent at room temperature.

**Chapter 4** investigates of a facile and ecologically friendly one-pot multicomponent synthesis of biologically active spiro [indoline-3, 4'-quinoline] derivatives via oxidative coupling of indole with enaminone and malononitrile under EtOH: H<sub>2</sub>O (4:1) as a solvent. **Chapter 5** describes a facile, efficient and environment friendly , easy work, short reaction time approach for the synthesis of Spiro[Indoline-3,4'-Quinoline] via one pot, four component reaction of amine, dimedone, isatin , and malononitrile using DABCO in the presence of ethanol at 80°C.