

## Preface

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Nitrogen is a naturally occurring element that is essential for growth and reproduction in both plants and animals. It is found in proteins, nucleic acids and in several other organic and inorganic compounds. A vast number of nitrogen containing heterocyclic compounds have applications in pharmaceutical research, agriculture science, and drug discovery. In nature, nitrogen present in the form of functional groups in organic moieties, some of the main functional groups like amines, imines, amides, oximes, cyanides, isocyanides and nitrogen containing some main class of heterocyclic compounds are pyridine, indole, pyrrole, quinoxaline, oxazine and thiazine. In this context, the thesis entitled “*Synthesis, Reactivity and Structural Characterization of Some Nitrogen Containing Organic Compounds,*” will introduce various aspects of nitrogen containing organic compounds.

**Chapter 1** will provide a general introduction and literature review of synthesis and applications of some main class of nitrogen containing organic compounds. **Chapter 2** will describe microwave induced stereoselective synthesis of *O*-vinyl oximes using acetylenic esters as efficient Michael acceptors. **Chapter 3** will describe a facile and convenient approach for transamidation of secondary amides using  $\text{CeCl}_3 \cdot 7\text{H}_2\text{O}$  catalyst in acetonitrile under ultrasound irradiation. **Chapter 4** will highlight the secondary amide transamidation by using *tert*-butyl hydroperoxide (TBHP) as a radical initiator. **Chapter 5** will describe a simple and efficient method for the reduction of amides to the corresponding alcohols and amines using  $\text{NaBH}_4$  in ethanol at room temperature. **Chapter 6** will explore a catalyst-free expeditious green synthesis of Quinoxaline, Oxazine, Thiazine and Dioxin derivatives in water under ultrasound irradiation at room temperature.