PREFACE

N-Nitrosamines are the chemical compounds with direct N-N bond which received a great attention in biochemical research due to its unique carcinogenic and mutagenic properties. On the other hand, *N*-nitrosamines are considered as valuable intermediates in organic synthesis and primarily used in the preparation of hydrazines, sydnones, aryl *C*-nitroso compounds (through Fischer-Hepp rearrangement), etc. More recently, *N*-nitrosamine functional groups have emerged as traceless directing groups for the activation of aryl C-H bonds with transition metals.

In this context, the thesis entitled "**Synthesis and Applications of *N*-Nitrosamines in Organic Syntheses**" will introduce various organic transformations of *N*-nitrosamines under green chemistry perspective. **Chapter 1** will provide a general introduction to different nitroso compounds including *C*-nitroso, *S*-nitroso, *O*-nitroso and *N*-nitroso compounds and their chemical and biological of applications. **Chapter 2** will disclose an efficient method for the synthesis of *N*-nitrosamines under solvent, metal and acid free conditions using *tert*-butyl nitrite. **Chapter 3** will highlight the development of an efficient and practical method for the denitrosation of *N*-nitrosamines using iodine and triethylsilane. **Chapter 4** will describe a new method for the preparation of *N*-alkyl nitroanilines from corresponding *N*-alkyl anilines using *tert*-butyl nitrite under mild conditions. **Chapter 5** will present an efficient and sustainable method for the reduction of aryl-*N*-nitrosamines into α-substituted aryl hydrazines using eco-friendly reductant thiourea dioxide. Finally, **Chapter 6** will summarize and conclude the total thesis work.