Preface

Barbituric acid (pyrimidine 2,4,6(1*H*,3*H*,5*H*)-trione) used as a precursor for various barbiturate drugs, was first synthesized by Adolf von Baeyer in 1864. The chemistry of barbituric acid has taken a considerable attention from synthetic organic chemists due to variable properties of barbiturates. Barbituric acid derivatives show many biological activities such as antifungal, antioxidant, antibacterial, etc., and are also used as anxiolytics, sedatives, anticonvulsants and hypnotics that act on the central nervous system. Barbituric acid itself does not show any biological activity but its derivatives show good pharmacological activities.

In this context, the thesis entitled "**Synthesis of Some Biologically Active Barbituric Acid Derivatives**," will introduce various aspects of synthesis of barbituric acid derivatives. **Chapter 1** will provide a general introduction and literature review of synthesis and application of barbituric acid and its derivatives. **Chapter 2** will describe $Sc(OTf)_3$ catalyzed multicomponent synthesis of chromeno[2,3-*d*]pyrimidine-trione derivatives under solvent-free condition. **Chapter 3** will disclose lemon juice catalyzed synthesis of chromenonopyrimidines via one-pot, three-component reaction of thiobarbituric acid/ barbituric acid, methyl arenes and dimedone/ 1,3-cyclohexanedione using TBHP as an oxidant. **Chapter 4** will highlight an efficient and photocatalyst-free method for the synthesis of dibarbiturates of oxindole and arylidene barbituric acid derivatives via condensation of isatin/aryl aldehydes with barbituric acid, through irradiation of visible light in ethanol. **Chapter 5** will present a visible light-initiated catalyst-free synthesis of naphthopyranopyrimidines from *β*-naphthol/2,3-dihydroxynaphthalene, barbituric acid and aromatic aldehydes in aqueous medium. Finally, **Chapter 6** will summarize and conclude the total thesis work.