The work presented in the present thesis deals with the synthesis and characterization of novel chalcones from readily available starting materials and modified prepared products using urea and Guanidine to produce a library of compounds which gives good antimicrobial activities.This thesis incorporate seven chapters dealing with the synthesis of two different pyrimidine moieties. The biological activity of all the synthesized compounds is discussed in chapter VI.

CHAPTER-I: INTRODUCTION

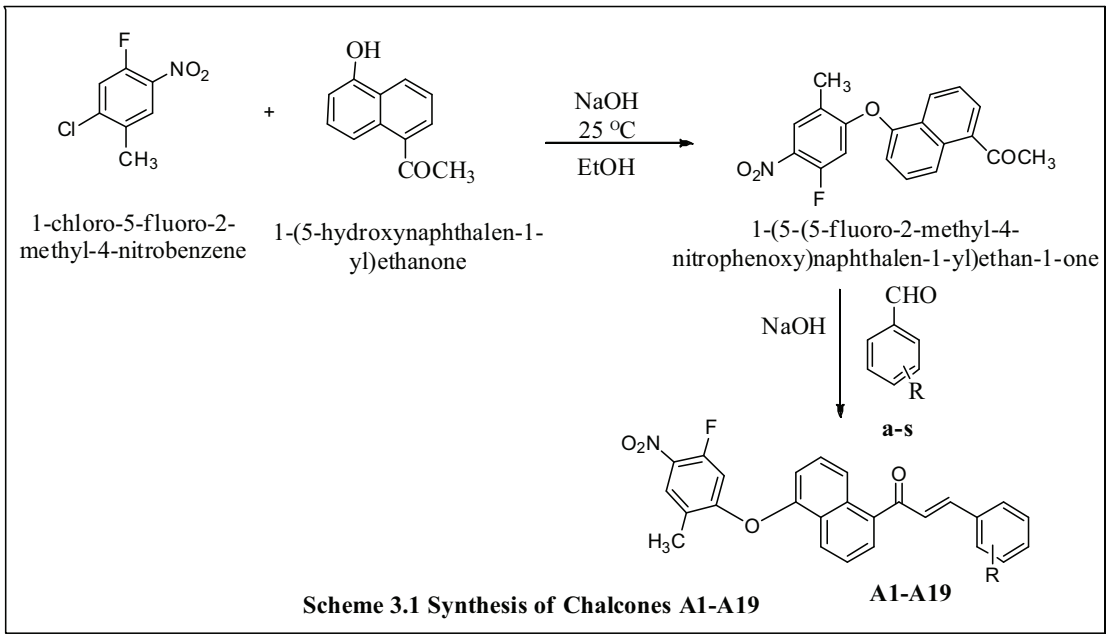
This chapter deals with the general introduction to heterocyclic compounds and its synthesis using different catalyst and energy sources. This chapter also describes aim and objectives of the present work.

CHAPTER-II: LITERATURE REVIEW

This chapter deals with the general introduction and detail literature study of pyrimidine moiety.

CHAPTER-III: SYNTHESIS AND CHARACTERIZATION OF CHALCONES A1-A19.

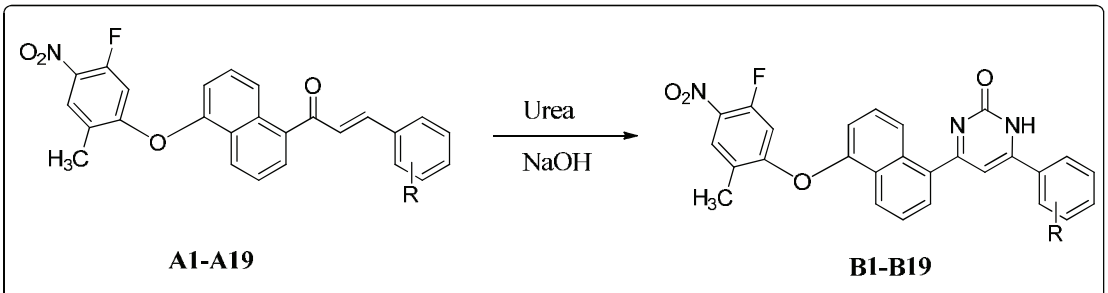
This chapter describe the synthesis of chalcone compounds **A1-A19**. First synthesized 1-(5-(5-fluoro-2methyl-4-nitrophenoxy) naphthalen-1-yl) ethan-1-one by refluxing 1-(5-hydroxynaphthalen-1-yl)ethan-1-one with 1-chloro-5-fluoro-2-methyl-4-nitrobenzene in the presence of sodium hydroxide under ethanol as the solvent. (**Scheme 3.1**). All the synthesized compounds have been characterized by using ^{1}H NMR, ^{13}C NMR, IR and Mass spectroscopy.



Scheme 3.1 Synthesis of Chalcones A1-A19

CHAPTER-IV: SYNTHESIS AND CHARACTERIZATION OF PYRIMIDINES B1-B19.

This chapter describe the synthesis of Pyrimidines **B1-B19**. Chalcones synthesized in chapter-3 were allowed to react with urea in the presence of sodium hydroxide as the base under ethanol as the solvent which gives pyrimidines **B1-B19** (**Scheme 4.1)**. All the synthesized compounds have been characterized by using ^{1}H NMR, ^{13}C NMR, IR and Mass spectroscopy.

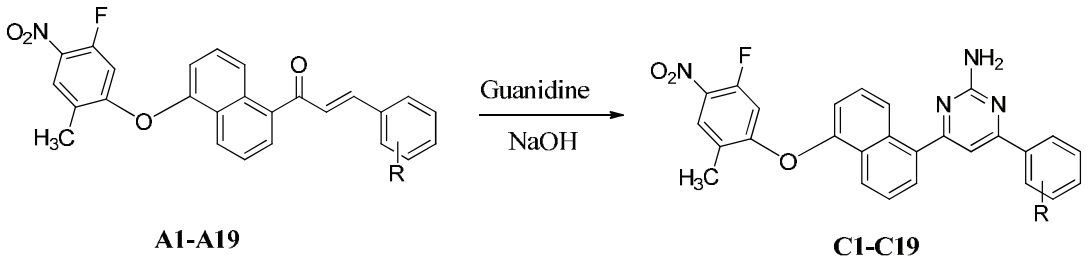


Scheme 4.1 Synthesis of Pyrimidines B1-B19

CHAPTER-V: SYNTHESIS AND CHARACTERIZATION OF PYRIMIDINES C1-C19

This chapter describe the synthesis of novel Pyrimidines **C1-C19**. Chalcones synthesized in chapter-3 were subjected to react with Guanidine in the presence of sodium hydroxide as the base under ethanol as the solvent gives pyrimidines **C1-C19**

(**Scheme 5.1)**. All the synthesized compounds have been characterized by using ^{1}H NMR, ^{13}C NMR, IR and Mass spectroscopy.



Scheme 5.1 Synthesis of Pyrimidines C1-C19

CHAPTER-VI: ANTIMICROBIAL ACTIVITY

This chapter includes antimicrobial activity of pyrimidines synthesized in chapter-IV and chapter-V. The invitro antimicrobial activity of all the synthesized compound were screened against two Gram(+ve) strains, *Staphylococcus aureus* and *Bacillus megaterium* and two Gram (−ve) strains, *Escherichia coli* and *Proteus vulgaris*.

Pyrimidine is a remarkable bioactive moiety due to its diverse biological and pharmacolpgical activities. The present synthesis of thirty eight pyrimidine based compounds have also shown antimicrobial activity. The global health challenge the humanity is facing is cancer. The treatment of cancer is also suffering from serious side effects with multidrug resistance. Pyrimidine is considered as privileged scaffold and therefore present investigation opened new avenues for synthesis of novel pyrimidine based compounds having more potent biological and pharmacological activity to pave the way for better treatment of cancer.