

## PREFACE

The present thesis entitled “Naphthobipyrrole derived novel  $\pi$ -extended porphyrinoids: Synthesis, structure and optical properties” has been divided into seven chapters. Basically it describes synthesis and exploration of various conformationally rigid annulated  $\pi$ -extended porphyrinoids derived from alkylated naphthobipyrroles. In comparison to porphyrins,  $\pi$ -extension in other porphyrinoids viz. isomeric, contracted or expanded porphyrins are rarely explored. A bunch of  $\pi$ -extended porphyrins that has been synthesized till date reviewed very recently by Sessler and coworkers, which clearly reflects that most of the  $\pi$ -extended porphyrinoids has been reported in last few years. Thus, the chemistry of  $\pi$ -extended isomeric and expanded porphyrinoids is evolving very rapidly. A brief outline of the content included in the thesis is presented below.

In **chapter 1** a very concise description of isomeric, contracted and expanded porphyrins, with a special emphasis on expanded porphyrin and its  $\pi$ -extended annulated analogue has been presented. **Chapter 2** gives a brief account of the methods and materials used in our investigation. **Chapter 3** provides a general route towards synthesis of alkylated naphthobipyrroles along with synthesis of dinaphthoporphycenes derived from these alkylated naphthobipyrroles. Detail chemistry of dinaphthoporphycenes is also deliberated. **Chapter 4** deals with the synthesis and characterization of cyclo[4]naphthobipyrroles. Their photophysical properties are discussed along with few very interesting aspects of these macrocycles are pointed out. In **chapter 5**, syntheses of alkylated naphthosapphyrins that possess alkyl substitution in all  $\beta$ -pyrrolic positions, along with one which bears alkyl substituents in all  $\beta$ -pyrrolic positions except the ones on the pyrrole moiety opposite to the bipyrrolic unit, are outlined. A previously unknown analogous octaalkylsapphyrin derivative with an unsubstituted pyrrole ring is also synthesized. A comparative discussion of spectral properties of this molecule has been made with those of naphthosapphyrins. In **chapter 6**  $\pi$ -extended BODIPY dyes derived from alkylated naphthobipyrrole are discussed. Finally, **chapter 7** summarizes the findings of the present investigation along with the future scope.

September 2013

Tridib Sarma