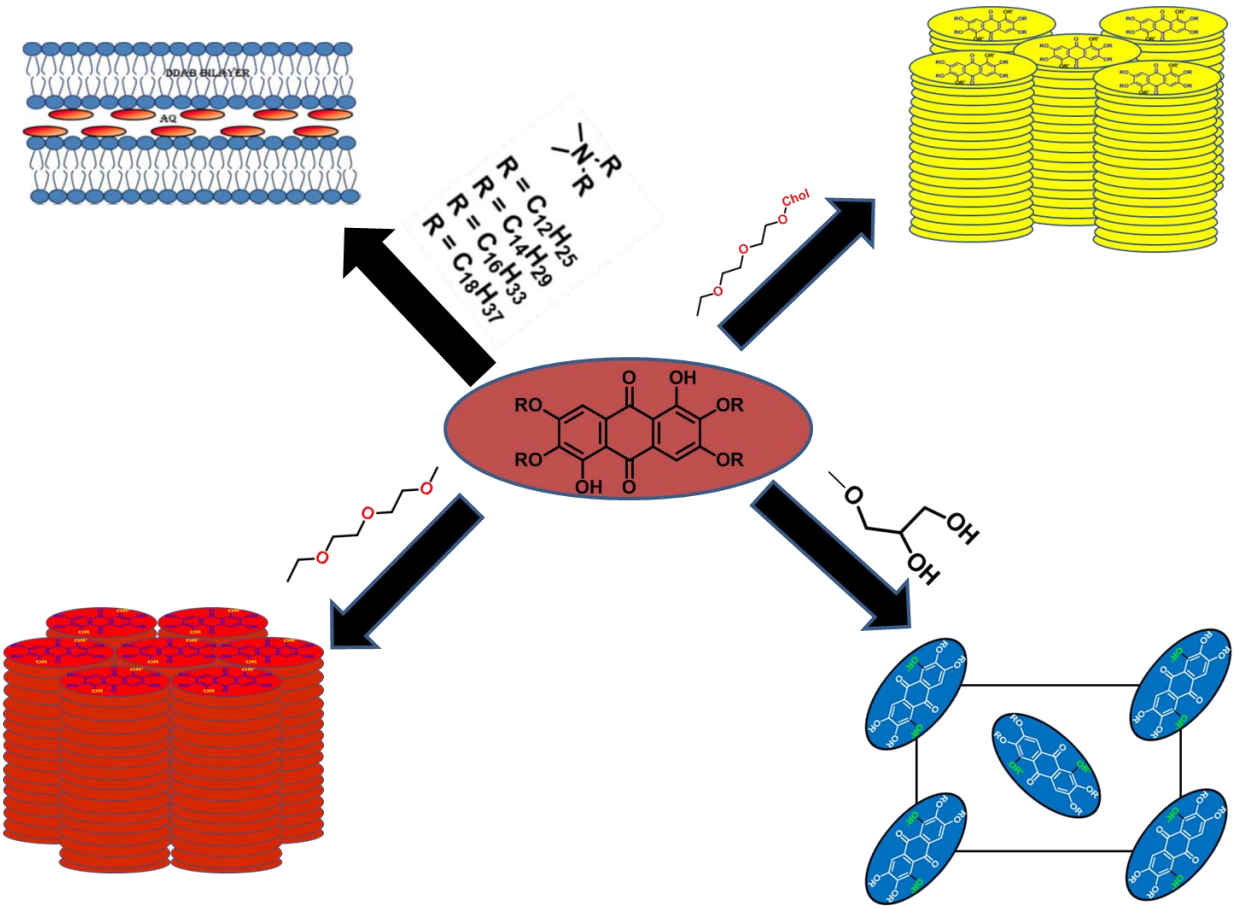
Chapter-6

Summary

Abstract

This chapter summarises the whole dissertation which revolves around the topic synthesis and characterization of some discotic amphiphiles. We briefly discuss the diverse possibilities and scope for future work based on the results obtained.



The research work which is documented in this thesis has been divided into 5 chapters

Chapter 1:** **Introduction

This chapter describes liquid crystals, their classification, the techniques which are used to characterize liquid crystals in a detailed manner. Further, since this thesis involves experimental work related to discotic liquid crystals. The information about discotic liquid crystals has been dealt with in detail.

Chapter 2:** **Synthesis and mesomorphism of discotic polyelectrolyte-surfactant complexes

This chapter involves details about the synthesis of discotic polyanion surfactant complexes and their mesomorphic behavior. The complexes have been prepared through ionic self-assembled approach with discotic cores such as anthraquinone and triphenylene as a polyanion. The isolated complexes show lamellar phase. Further, the lyotropic behavior of these complexes has also been explored. It was also found that they show the lamellar phase with different water concentration.

Chapter 3:** **Synthesis and mesomorphism of anthraquinone based bolaamphiphiles

In this chapter, we have reported the synthesis of ethyleneoxy derivatives functionalized anthraquinones. We have studied the structure-property relationship of these bolaamphiphiles. It was found that the lower homolog was found to show the plastic columnar phase, whereas the rest

shows the columnar hexagonal phase as typical of discotic compounds. Further lyotropic behavior of these compounds with respect to water have been studied. Except for **4a,** all the other compounds show the columnar phase as typical of chromonic systems.

Chapter 4: ***Synthesis and characterization of cholesterol functionalized amphiphilic anthraquinones***

This chapter explains about the synthesis of cholesterol functionalized anthraquinone discs with ethylene glycol (EG) spacers. The influence of mesomorphic properties as a function of the length of the ethylene glycol spacer was studied. Only two compounds were found to show the rectangular phase and the reset were non -mesomorphic. The rectangular arrangement was found to be retained when the compound was mixed with water at appropriate weight percentages.

Chapter 5*: Synthesis and characterization of amphiphilic anthraquinones with glycerol head groups*

This chapter describes the mesomorphic behavior of compounds involving glycerol functionalization in anthraquinone scaffold. The glycerol derivatives were found to show columnar rectangular lattice. In addition to that, the prefinal compounds were also mesomorphic showing hexagonal columnar phase. The final compounds were analyzed for lyotropic behavior with respect to water and Formamide. Formamide based systems were found to be mesomorphic whereas the aqueous-based were not.

Finally, this thesis can be concluded as follows, this thesis explored the mesomorphic potential of derivatives of anthraquinones. On functionalizing with different hydrophilic systems. the mesomorphic behavior of synthesized compounds was studied in detail.

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