

## PREFACE

This thesis entitled “*Phase transitions in binary mixtures of calamitic and bent-core mesogens*” is an outcome of the experimental investigation in liquid crystal system carried out from 2014, at the Department of Physics, University of North Bengal as a Research Fellow in the DST-SERB funded research project, under the supervision of Prof. Malay Kumar Das. These five years imparted me a lot of acquirments on in-depth understanding on the subject matter as well as hands-on experience on the operation of different sophisticated instruments through several endure. This dissertation covers the experimental findings regarding the order character of a number of mesophase transitions associated with binary liquid crystal systems and the investigation has been extended to obtain different mesophase properties that certainly help me to understand the molecular interactions in several mesophases. During this research period, my perception over the phase transition and critical phenomena has been grown up over time all the way through the theoretical interpretation and experimental activities. In order to achieve the high-resolution experimental data, precise modifications have been carried out by me in the experimental set-ups. Best on my ability, I have reached a few steps to solve the problems related to phase transitions in liquid crystal compounds. I have compiled all those problems in this dissertation combined with theoretical knowledge. Although the innumerable research activities are going on in the field of phase transitional behavior, still some problems yet not have been resolved. The outcomes of this dissertation may contribute a significant dimension for the attention of scientists towards an easy framework.

All these scientific activities and achievements make my life full of joy and happiness. With regards, the support and inspiration of a number of people obviously make it possible to accomplish in realizing this wonderful journey. Therefore, I would like to avail this opportunity to convey my indebtedness one and all of them for their role throughout the journey.

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