ACKNOWLEDGEMENT

I understand that behind any successful work there is a huge list of supporters without whom the task would have been difficult to complete. It is the same in my case too. Now I am submitting my Ph.D. thesis and this work would not have been accomplished without the support, help, guidance and blessings of a large number of people.

The very first person I would like to acknowledge is my supervisor Prof. Nandiraju V. S. Rao, without his help and guidance I would not be able to reach at this stage in my life. My supervisor has guided me how to overcome the difficulties with patience. He has been a source of inspiration in my life. I appreciate his right approach and timely actions in most of the problems be it either the experiments or in my personal life. My heartiest gratitude to you, Sir for all that I have learnt from you.

My sincere thank to Dr. Manoj kr. Paul for sharing his knowledge on various topics in the field of Liquid Crystal research. I have learnt many experimental techniques from him. I express my deep gratitude to him.

There is a giant list of personalities who in some way or the other have supported me all these years of my research work. Through their valuable knowledge and experiences, I have gained great confidence in myself and it has helped me immensely. I am grateful to Prof. M. R. Islam, Prof. S. B. Paul, Prof. C. R. Bhattacharjee, Dr. P. C. Paul, Dr. P. Mandal, Dr. Sk. Jasimuddin, Dr. D. Sengupta, Dr. H. Acharya, Dr. S. K. Ghosh, Dr. S. Choudhury and Dr. Trirup Dutta Choudhury for guiding me throughout.

My sincere thank to Prof. A. M. Biradhar, NPL, Delhi and Prof. T. R. Rao, BHU, Banaras for giving me an opportunity to do work in their laboratory.

I am greatly thankful to Prof. Hideo Takezoe and Prof. Ken Ishikawa, Tokyo Institute of Technology, Japan for inviting me to do work in their laboratory via GCOE programme.

I thank all the non-teaching staff as well as official staff members of Assam University Chemistry Department for their help and managing the things very quickly.

I have been fortunate enough to have good discussion not only on my topic of research and also other latest news associates with our Liquid crystal research group. My special thanks to Nirmalangshu Chakraborty, Lopamudra Chakraborty and Atigur Rahman Laskar for their timely help in many reactions, handling the spectroscopic machines and valuable discussions on many topics.

I express my sincere thanks to Dr. Rahul K. Nath, K. Upadhyaya, G. Kalita, S. Debnath, G. Mohiuddin, N. Begum, S. Tularipati, D. D. Purkayastha, P. P. Adikari and other research
schoQirfor tHeir support during my research. I would like to thank the services of fourth semester students of our liquid crystal group of different year for their help efficiently during my research work in the laboratory.

My sincere thanks to my friends Biswajit Deb, Bimolendu Das, Abhik Choudhury, Minakshi Sinha, Prakash Kanoo and Manas Chakraborty, they did many works for me behind the screen. My thanks to all my friends at home for being with me always.

I have been lucky enough to get a friend like Dipika, without her help it would have been difficult to do this huge task of Ph.D work. I have gained immensely from the valuable discussions and express my gratitude for her support, care and encouragement throughout the period of my research.

My heart felt gratitude to Madam (Mrs. N. A. Lakshmi), for her love, affection and mother like behaviour throughout my Ph.D programme.

Nothing can be accomplished without family support. My sincere thank to my Maa-Gopa Deb and Baba-Rathindra Kumar Deb for supporting my decision to do Ph.D. My heartiest thank to them for being with me always. My greatest thanks go to my only sister-Tinki for always inspiring me. They have helped me in every way they can. I greatly owe to my family. I would like to express my sincere thanks to my grand fathers, grand mothers, aunts, uncles and cousins who have always infused confidence in me and boosted me to go ahead and accomplish this task. It is only through the care and blessings of all my family and relatives that I have been able to pursue my aim in life. I thank you all from the bottom of my heart.

I sincerely thank to my Rangamashi-Swapna Dey, Teacher of Ramkrishna Nagar Vidyapith H.S. School, Ramkrishna Nagar and Pankaj Choudhury, principal of Badarpur Railway H.S. School, Badarpur for their restless guidance up to (10+2) level and even in my Ph.D level. I express my thanks to both of them.

I am thankful to UGC and DST for providing financial assistance to aid the Ph.D work.

I am also thankful to Assam University, Silchar for giving me the platform to do education up to this level.

Ph.D is not the job of a single person. There are many who helped me in many ways they know who they are, my respected thanks goes to those person. Once again I would like to thank all of you for being with me always. Thank you all.

Rahul Deb
(Rahul Deb)