

Acknowledgement

First and foremost I would like to express my sincere gratitude to my advisor Prof. Rupam Kataki for the continuous support on my research work. His insightful comments, untiring moral support and constructive criticisms at different stages of my research were thought-provoking and they helped me to develop an understanding of the subject. His guidance helped me in all the time of research and writing of this thesis.

I am grateful to Prof. R. Kataki, Head of the Department, Energy, for his academic support and the facilities provided to carry out the research work.

I would like to thank Hon'ble Vice-Chancellor of Tezpur University (Formerly, Prof. Mihir Kanti Chaudhuri; Prof. M.M Sarma (acting) and at present Prof. Vinod Kumar Jain), for giving encouragement and beneficial advice throughout my research work.

Besides my advisor, I would like to thank the rest of my doctoral committee members: Prof. D.C. Baruah, Prof. D. Deka, and Prof. S.K. Dolui, for serving as my doctoral committee members and for their valuable advice, helpful suggestions, insightful comments and encouragement, but also for the hard question which helped me to widen my research from various perspectives.

I convey my sincere gratitude and thanks to Prof. D. Deka and Prof. D.C. Baruah, Dr. S. Mahapatra, Dr. P.K. Choudhury, Dr. B.K. Kakati, Dr. N. Sarmah and Dr. V. Verma of Department of Energy for their support, encouragement and valuable advice. Without their precious support, it would not be possible to conduct this research.

Most of the results described in this thesis would not have been obtained without a close collaboration with few laboratories. I owe a great deal of appreciation and gratitude to Director of CSIR-North East Institute of Science & Technology and Chief Executive Officer of Guwahati Biotech Park for giving me the opportunity to do few experiments at their institute.

I thank my fellow labmates- Rahul Da, Rumi, Debashis, Ruprekha, Lina, Nilutpal for the stimulating discussions and for all the fun we have had in the last five years. I thank all the research scholars of Energy Dept., Bijumoni Baa, Plabon, Lakhya, Subrat, Sampriiti, Ranjana, Anjalu, Rupam, Dipam, Anuchaya, Velentina, Manash, Swagat, Barkhang, Bibha, Minakshi, Honey, Doljit, Niran, and Syeda for sharing a wonderful time during my research work.

It is my pleasure to offer gratitude and thanks to Biswajit Gogoi, Technical officer, Tapanjit Borah, Technical Assistant, T. Lahon, Lab assistant, Chittaranjan Gogoi, Office Assistant, Department of Energy, Tezpur University, for their co-operation and encouragement.

I received great help from my friends Pallabi, Warisha, Suhasini, Nivedita, Nazneen, Pankaj, Rekha, Shaswat and Satyabrat during the entire period of my Ph.D. work. Special thanks to Ritusmita Ba and Manash Deep for their suggestions and help in writing my Ph.D. thesis.

I express my sincere thanks to Dr. R. Mukhopadhyay, Department of Molecular Biology and Biotechnology, Tezpur University for his efforts and timely help during the preparation of the manuscripts.

I am highly thankful to Tezpur University for its financial support in the form of Institutional Fellowship for three years which supported me to pursue my doctoral research conveniently.

Lastly, I would like to thank my family: my parents, to my brothers for all their love and encouragement and to my husband (Dr. Anup Kr. Bordoloi) whose faithful support, love, care, timely inspiration during the final stages of my research work is so appreciated.

Neonjyoti Bordoloi