ACKNOWLEDGMENT

This dissertation would not have the spirit that it has without the invaluable academic, educational, psychological and human support bestowed upon me by all the people during the journey of my Ph.D career and my life.

At the very onset, I would like to acknowledge the Almighty for everything that has come my way in this journey by his grace and mercy.

My heartfelt appreciation goes to my family – my parents and my sister for their immeasurable love, blessings and support during this crucial time of my life.

It gives me immense pleasure to convey my profound gratitude and appreciation to my Ph.D supervisor Dr. Niranjan Karak, Professor & Dean, Research and Development, Department of Chemical Sciences, Tezpur University for his inspired guidance, incisive criticism, healthy motivation, huge patience, constant support and the liberty to pursue my Ph.D work. I am highly indebted to him for his commitment to my research work, which has been influential in allowing me to nurture and evolve as a researcher. His sincere and unwavering dedication towards scientific research will continue to inspire me in my future endeavors.

I would like to express my sincere gratitude to my doctoral research committee members Dr. Ruli Borah, Professor & Head of the Department, Department of Chemical Sciences and Dr. Pankaj Bharali, Assistant Professor, Department of Chemical Sciences for their valuable suggestions and advice during my Ph.D career.

It is my utmost pleasure to acknowledge the former Head(s) of the Department, Professor Ashim Jyoti Thakur and Professor Ramesh Chandra Deka, for providing me the opportunity to carry out my research work in the department and their valuable advice during my Ph.D tenure.

I am especially grateful to Dr. Utpal Bora and Dr. Sanjeev Pran Mahanta, for their valuable suggestions, timely inputs and constant encouragement throughout my Ph.D tenure.

I am greatly thankful to the entire Faculty of Department of Chemical Sciences – Prof. Nashreen S. Islam, Prof. Swapan K, Dolui, Prof. Tarun K, Maji, Prof. Robin K, Dutta, Prof. Ashwini K, Phukan, Dr. Panchanan Puzari, Dr. Bipul Sarma, Dr. Nayanmoni Gogoi, Dr. Sajal K, Das, Dr. Kusum K, Bania, Dr. Sanjay Pratihar and Dr. Himangshu P. Goswami for their timely support and suggestions.

I would like to offer my sincere thanks to the Technical Staff of the department – Dr. Biren Gohain, Dr. Dhrubajyoti Talukdar, Mr. Sankur Phukan, Mr. Biraj J. Borah, Mr. Manoranjan Sarma, Mr. Biplob Ozah, Mr. Nipu Dutta and Mr. Raju K. Borah for their vital and timely contribution to my research.

I would also like to acknowledge Mr. Prakash Kurmi, Mr. Tridib R. Nath, Mr. Naba K, Gogoi, Mr. Pankaj Bharali, Mr. Ratan Baruah, Mr. Biju Boro, Mr. Anil Hazarika and SAIC, Tezpur University for the analytical support and contribution to my research.

My special thanks goes to Mr. Joston P. Nongkynrih and SAIF, NEHU, Shillong; CoE-SusPol and CIF, IIT Guwahati; and NEIST-SAIF, CSIR-NEIST, Jorhat for their analytical support and contribution to my research.

I would also like to offer my gratitude to the Office Staff, Department of Chemical Sciences, Ms. Bobita Das and Mr. Bubul Das for their kind assistance during my Ph.D tenure. A special mention goes to the Non-Technical & Cleaning Staff, Department of Chemical Sciences for their timely services.

It gives me immense pleasure to acknowledge the entire Research Scholar community of Department of Chemical Sciences, both past and present. A special mention goes to my dear seniors Dr. Anamika Kalita, Dr. Rajiv Khatioda, Dr. Monoj Mandal, Dr. Khairujjaman Laskar, Dr. Nazima Sultana, Dr. Basanta Saikia, Dr. Porag Bora, Dr. Pankaj Gogoi, Dr. Subrata Paul, Dr. Pankita Deka, Dr. Dharitri Das, Dr. Runjun Devi, Dr. Kiran J. Mohan, Dr. Manashi Sarmah, Mr. Kumar Kashyap Hazarika, Mr. Anup J. Borah, Miss Kabirun Ahmed, Miss Pranita Bora, Miss Moon Mandal, Miss Bagmita Bhattacharya and Miss Shrabani Das. My dear colleagues and friends Manali, Rakhee, Anurag, Chiranjita, Julie, Rituraj, Prashurya, Plaban, Simanta, Mukesh, Bhugendra, Hemi, Kasturi, Priyam, Rajkamal; and my dear juniors Raktim, Anup, Debojit, Debabrat, Arup, Prantika, Satyajit, Shivanee, Abhishek, Nishant, Asadullah, Gorishmita, Sangeeta, Niharika, Sudhamoyee, Sukanya and Himanshu. Thank you all for the camaraderie and memories.

My special gratitude goes to my dearest friends-cum-brothers Mr. Ankit Agarwal and Mr. Samarjit Choudhury for their constant support and motivation throughout the crucial times.

I would like to take this opportunity to give my heartfelt gratitude to my APNL family members; my seniors Dr. Shaswat Barua, Dr. Bibekananda De, Dr. Suman Thakur, Dr. Satyabrat Gogoi, Dr. Vijay K, Das and Dr. Haribandhu Chaudhuri for their active cooperation and prompt help during my research. My utmost regard, affection and

appreciation goes to my dearest lab members Dr. Rituparna Duarah, Dr. Deepshikha Hazarika, Aditi Saikia, Tuhin Ghosh, Geeti Kaberi Dutta, Dimpee Sarmah, Annesha Kar, Nobomi Borah and Samiran Morang for the excellent camaraderie, dynamic co-operation, timely assistance and cheerful environment during my time here.

I would like to express my special gratitude to Mrs. Susmita Karak for the warm hospitality and affection bestowed upon me during my stay at Tezpur University.

Finally, I would like to acknowledge the entire commune of Tezpur University for the experience of a lifetime.

Place: Tezpur University, Tezpur (Rajarshi Bayan)

Date: