## ACKNOWLEDGEMENT

The present thesis has undergone completion through the support and encouragement of numerous people including my well wishers, friends, colleagues and my institute. It is really a great pleasure to express my gratitude to the people who have influenced and encouraged me directly or indirectly over the course of my studies and my life in general.

First of all, I would like to express my deep sense of gratitude to my supervisor Dr. Ashim Jyoti Thakur, Professor, Department of Chemical Sciences, Tezpur University for his guidance, teachings, support, tolerance and advices throughout my PhD work. His innovative ideas and heartiest support introduced and exposed me to new worlds of research and made my work continue smoothly throughout my PhD term as well. My whole research career is highly indebted to his sincere efforts. Thank you doesn't seem sufficient but it is said with appreciation and respect to you for your support, encouragement, care, understanding, spending precious times to read this thesis and gave valuable suggestions.

I am also extremely indebted to Dr. Vijay Veer, Sc 'G' & FRES, Director, DRL Tezpur, for providing me all necessary facilities during my research work. His heartiest support & well wishes inspire me to do more innovative work and made my work continue smoothly throughout my PhD term. I am extremely thankful to our parent organisation DRDO, MoD, Govt. Of India for giving me permission and financial as well as technical support to fulfil my PhD works. I express thanks to all of DRDO fraternity who is directly or indirectly related over the course of my studies and my life.

I would also like to express my sincere gratitude and humble respect to my doctoral committee members Prof. T. K. Maji and Prof. R. C. Deka, Department of Chemical Sciences, Tezpur University for their timely help and advises.

It is my pleasant duty to acknowledge with thanks the cooperation and support extended to me by the Tezpur University fraternity.

It is of great pleasure to acknowledge the present and former Heads of the Department, Prof. R. C. Deka and Prof. N. Karak for giving me the opportunity to work on my topic and valuable advises throughout my stay at Tezpur University. I would also like to express my sincere gratitude and humble respect to Dr. U. Bora for his inspiration and advice for some synthetic route of organic reaction.

I am extremely thankful to Prof. M. K. Purkait for his continuing inspiration and support not only for PhD but for other corners of life. I extend my gratitude to Prof. M.K. Purkait and Dr. C. Das, Department of Chemical Engineering, IIT Guwahati for their whole hearted cooperation for help to do some of the characterization of nanomaterials. Words fail me to express my appreciation to Prof. S. K. Srivastava, Department of Chemistry, IIT Kharagpur for his support and generous care.

I am immensely grateful to Prof. M. Lakshmi Kantam, Prof. N. S. Islam, Prof. S. K. Dolui, Prof. R. K. Dutta, Prof. N Karak, Prof. A. K. Phukan, Dr. R. Bora, Dr. P. Puzari, Dr. P. Bharali, Dr. N. M. Gogoi, Dr. K. K. Bania, Dr. S. K. Das, Dr. S. Pratihar and Dr. B. K. Sharma, faculty members of Department of Chemical Sciences, Tezpur University for their valuable suggestions and advices.

I am extremely thankful to Dr. R. R. Devi, Sc 'D' for her continuing inspiration and support not only for PhD but for other corners of life. I extend my thanks to Dr. H. K. Gogoi, Sc 'F', HoD, Chemistry Division and my colleagues Dr. S Banerjee, Sc 'D', Mr. A Saikia, Sc 'D', Dr. I. M. Umlong, Sc 'C', Mrs. K Borah, TO 'C', Mr. B Das, TO 'A' and others of DRL family for their whole hearted wishes and cooperation to materialize the PhD work. I am pleased to acknowledge with thanks the cooperation and support extended to me by the DRL Tezpur fraternity.

It's my fortune to gratefully acknowledge the support of some special individuals. Words fail me to express my appreciation to Arijit and Asish for their support and generous care.

My heartfelt thanks go to my lab-mates Dr. L Saikia, Dr. V Das, Dr. D Talukder and Dr(Mrs.). A. Dewan, Mr. A. Dutta for their manifold help and active co-operation. I would like to special thanks to my group members Mr. A. Mahanta and Mr. R. Bora for their constant inspiration and help during my PhD work.

I would like to offer my sincere thanks to Dr. B. Gohain, Mr. N. Dutta, Mr. R. K. Borah, Mr. S. Phukan, Mr. R. Borah, Mr. B. Borah, Mr. A. Chakrabarty, Mr. M. Sarma, Mr. R. Baruah and Mr. P. Kurmi for instrumental and experimental helps. DRL Tezpur, IIT Kharagpur, NEHU Shillong, IIT Guwahati and other institutions are highly acknowledged for their help in analyzing and testing works.

I would like to thank also the office staffs of Department of Chemical Sciences, Tezpur University, Ms B. Das, Mr. H. Gogoi and Mr. B. Das for their kind help during my PhD

work.

I wish to thank all my friends, research scholars of Department of Chemical Sciences,

Tezpur University for their help and support during the course of my work. I would like to

appreciate Dr. S Barua and Mr. S Thakur for their help and suggestions.

I must make a special mention about my grandmother Late Mrs. Jhapi Bala Raul, for

her blessings throughout my carrier. I would like to pay regards and love to my father Mr.

Nimai Chand Raul, mother Mrs. Aruna Raul, brother Mr. Susanta Raul, sister-in-law Mrs.

Shrabanti Raul and daughter-in-law Shreyosi for their encouragement and inspiration

throughout my research work. My whole hearted love goes to my wife Samarpita Senapati

Raul who never fails to care, inspire and support in all respect in my life and research

work. I am thankful to God who has blessed me with my small loving daughter "Sharanya"

who is great inspiration to me. Whatever I am and whatever I intend to be in future are

because of the unstinted encouragements, unfailing support and trust. Their kind

cooperation helped me in pursuing the PhD course and no words are enough to

acknowledge them.

I want to thank all of my teachers and all other elders who have contributed for what I

am today. The endless love of them will always be in my heart that will inspire me in every

step of my future life.

Place: Tezpur

(Prasanta Kumar Raul)

Date

Х