

Acknowledgement

It is an immense pleasure for me to gratefully acknowledge the people who made my stay memorable during the last five years at Vidyasagar University. Writing of a thesis is a dream to me because it requires hard work, patience, dedication and of course enormous amount of physical and mental effort. During this course I have been motivated by a number of people who always inspired me to do something good. It is my great pleasure to express my thanks to all those who have contributed in many ways throughout this journey.

It is a great pleasure for me to express my sincere gratitude and respect to ***Professor Braja Gopal Bag***, my research supervisor, who helped in every moments of my journey both intellectually and physically. His constant encouragement and wise counsel were of immense value to me in completing this research work. I want to add that the interactions that I had with my research supervisor during the last few years is really remarkable to me.

I express my deepest sense of gratitude to

- The Honorable Vice chancellor, Professor Sibaji Pratim Basu, Registrar Dr. Jayanta Kishore Nandi, Dean Faculty of Science Professor Satyajit Saha for providing various facilities.
- The Honorable Ex-Vice chancellor, Professor Ranjan Chakrabarti, Registrar Ex-Dean Faculty of Science Professor Subrata Kumar De for providing various facilities.
- Professor Syed Sirajul Islam, Professor. Ajay Kumar Misra, Professor. Amiya Kumar Panda, Professor Sudipta Dalai, Dr. Sumita Roy, Dr. Subal Manna and Dr. Moidul Hussain, Dr. Subhasis Roy, Dr. Anirban Basu for helpful discussions.
- University Grand Commission (UGC), DST-SERB, New Delhi for financial support

and Department of Chemistry and Chemical Technology, Vidyasagar University, Midnapore for providing all types of facilities.

- Professor Santanu Bhattacharya, Director IACS Kolkata, for his valuable suggestions and encouragement.
- Professor J. K. Ray (IIT Kharagpur), Professor Subhrangsu Sekhar Mondal(University of Texas), Professor Kumaresh Ghosh (KU), Professor Subrata Mukhophadhaya (JU) and Dr Dibyendu Das (IISER Kolkata) for valuable suggestions and encouragement.
- I express my sincere thanks to scientist group from Patanjali.
- Professor Somenath Roy (VU) for his advices and encouragements.
- Professor Somsak Ruchirawat (CRI, Thailand), Dr. Prasat kittakop (CRI, Thailand), Dr. Nopporn Thasana (CRI, Thailand) for their valuable discussion.
- I express sincere thanks to my lab mates Dr. Rakhi Majumdar, Dr. Shib Sankar Dash, Dr. Koushik Paul, Dr. Subhajit Das, Dr. Kaushik Choudhari, Chhabidi, Subrata, Saikat, Soumen and friends as well as lab mate Nurul, for their wonderful cooperation in the laboratory.
- Special thanks go to my all friends for their valuable discussion and encouragement during this wonderful journey.
- I thank Dr. Sandeep Kr. Dash, Aditi Dey and Subhankar Manna for helpful discussions.
- USIC of Vidyasagar University is highly acknowledged for providing instrumental facilities for my research work.
- Thanks to IIT Kharagpur and IACS Kolkata for helping us in electron microscopy.
- I am also thankful to Mr. Shyamal Rana, Mr. Subrata Hazra and Mr. Ranjit Majhi of our Department for their cooperation.
- I express my deep regards to my parents and family member for their immense contribution and sacrifice behind my achievement. Without their constant support and inspiration it would have been impossible for me to be where I am at present.
- I want to express my deep sense of gratitude to my grandmother, for her continuous support and encouragement.

Abir Chandan Barai