

Acknowledgement

Words often fall short to reveal one's deep regards. I take this opportunity to acknowledge and extend my sincere thanks to those who helped me to make this Ph.D. thesis possible.

First and foremost, I express my utmost gratitude and reverence to my guide Dr. K. Sreekumar, Professor, Department of Applied Chemistry, Cochin University of Science and Technology, without whom this thesis would have been a far-fetched dream. I am very thankful to him for giving me the opportunity to be in his research group. He offered me a topic which enabled me to push my boundaries and gave me full freedom to 'experiment' in my research work. He has always patiently mentored me at every stage without losing his temper. I thank him earnestly for painstakingly correcting the draft thesis well on time. I feel blessed to be one among his student community.

Dr. K. Girish Kumar, former HOD deserves special mention at this point. His motivation has helped me to venture confidently in competitive platforms and his constructive criticism has always boosted my morale.

My honest thanks go to Dr. N. Manoj, Head, Department of Applied Chemistry, CUSAT for providing me the opportunity to accomplish my research work in this department. I express my heartfelt gratitude to Dr. P. V.Mohanan, doctoral committee member. Dr. S. Prathapan, has been an encouraging presence during my time in the department. I would like to extend my sincere thanks to Dr. S. Sugunan, Dr. Muhammed Yusuff, Dr. Prathapachandra Kurup and Dr. P. A Unnikrishnan of the department who inspired me in one way or the other. I specially thank Dr. Sabura Begum for her kind friendship.

I have fond memories of my seniors who were ready to help me at the time of need and for the environment they provided me to experiment well in the lab. I thank them individually, Dr. Rajesh, Dr. Mangala, Dr. Kannan, Dr. Anoop and Dr. Elizabeth at this juncture. I thank Dr. Mahesh specially for his presence till time.

Life in a research lab is tedious, but my time in the lab was made enjoyable due to the togetherness with Ms. Jiby. I enjoyed the moments with Jiby, from the beginning of my research to this time and I enjoyed as senior together with her with equal sound of suggestions.

Ms Sinija P.S. was always with me offering help and I thank her wholeheartedly. Words are not enough to thank Ms. Anjaly Jacob, Ms. Jisha K. A. and Ms Sowmya Xavier who were always ready with help, be it in proof reading, structure documentation, or any other matter. I thank Ms. Jisha K.A for helping me in spectral analysis also. Dr. Jaimy K. B., the post doctoral fellow in our lab facilitated the MS end-note referencing along with Ms. Anjaly Jacob. I thank them wholeheartedly for their selfless aid. I also thank Ms. Anjali C.P and Ms. Jesny Jagan for the help I received. The help rendered by my juniors during the documentation of the research work, has been instrumental in the successful outcome of this thesis. Ms. Sherlymol P.B, her presence has always given me special homely affection. I am lucky to have her presence in the lab.

I remember here the presence of new juniors Ms. Letcy and Ms. Shaibuna.

I thank Dr. K.A. Maniram for the interest he took to deliver me an idea about how a good thesis should look like.

My thanks are also due to the Friends in the Department of Applied Chemistry, especially, Analytical and Biochemistry labs and other departments of CUSAT for their cooperation. I have fond memories of Jabia, Jithin, Dr. Mothi, Dr. Eason, Dr. Navya Antony, Dr Sandhya Unnithan, Dr. Reny, Dr. Reshma G., Dr Renjini Joseph, Dr Laina A.L., Divya Thomas, Anuja E.V and Rakesh. The special relationship I shared with Dr. Priya Briet and Dr. Jomon Jacob, will always stay with me.

I have fond memories of the project students Megha, Nihara and especially Shafna from IISER, Bhopal.

I can never forget the applaude bestowed on me by the Department of Applied chemistry as well as the University for my achievements.

I recollect the memories of the support offered by the friends during my participation in various cultural events especially Onam and Christmas Celebrations which always boosted me.

I would like to place on record my sincere thanks to the CSIR, Govt. of India for financial assistance in the form of fellowship.

The non-teaching staff of the Department of Applied Chemistry has always been ready with their help and support and I thank them.

The various instrumental analysis of my work was completed with the help of friends in other institutions. I sincerely thank Sona Narayanan, PSRT, CUSAT for GPC analysis; Krishnan Kartha, NIIST, Thiruvananthapuram for MALDI-MS analysis; Sunil Sekhar and Shabeeb, NCL, Pune for Solid state ^{13}C NMR analysis and Tittu Thomas, Dept of Physics, CUSAT for AFM analysis. Mr. Saji, STIC, CUSAT deserves special mention for his help in NMR analysis.

I would like to put in a word of appreciation for the services rendered by RGCB, TVM (MALDI-MS); AIIMS, Kochi (XPS), IIT, Chennai (Magnetic susceptibility); IIT, Mumbai (EPR) and STIC, CUSAT, specially, Dr. Shibu, Dr. Adarsh and Miss Anitha.

Mr. Vishnu, P., Alpha Chemicals and Diagnostics deserves special mention for the prompt supply of chemicals.

This thesis would not have been a reality, but for the sacrifices made by my family. I thank my appachan, who is no more now, used to stay with me during the initial stages of my research for the easy going of the work. Words are not enough to thank my ammachi who helped me face the hardships of my research with her taking up my role as mother and housewife. I remember the encouragement offered by my brother, papa and mummy during this period. My husband had been a pillar of strength with his love and support. I thank my kids, especially, Suzanne, my elder one for bearing my absence during their formative years.

Above all, I bow my head in reverence before the **God Almighty** for His blessings.

Smitha George