Acknowledgements

If one has to consider the significant milestones in his own life, it would become necessary to also consider those who have made these milestones possible. Here, I will do my best to acknowledge the people who have made this thesis a reality.

Above all, all glory to God, creator in which all things are possible. I would like to begin by thanking my advisor and mentor, Dr. Vinod K. Shahi, Scientist, Electro-Membrane Processes Division, Central Salt and Marine Chemicals Research Institute, Bhavnagar, for his persistence, guidance and advice. His scientific input and mentoring support provides an example of someone who has truly found their calling in life. My gratitude and appreciation goes to him for his guidance and constructive appreciations during my research work which was invaluable and highly appreciated.

It is my profound privilege to express my feelings of gratitude and thanks to Dr. P. K. Ghosh, Director, Central Salt and Marine Chemicals Research Institute. I owe my sincere gratitude to Dr. S.K. Thampy, Discipline Coordinator, Dr. Vaibhav Kulshrestha, Scientist, and Dr. Soumyadeb Ghosh, Senior Principal Scientist, Electro-Membrane Processes Division, who have always been encouraging like an encouragement with their kind words and activities. I am also thankful to Dr. Arvind Kumar and Dr. D. N. Srivastava for their inspiration and valuable suggestions. My special thanks go to all scientists of CSMCRI, from whom I received encouraging and supportive words and also for useful discussion.

I wish to my cordial appreciation to Dr. M. Vijayan, Dr. D. Jeyakumar, Functional Materials Division, Central Electrochemical Research Institute, Kariakudi and Dr. Ch. Ramkishan Rao, Organic Coatings and Polymers Division, Indian Institute of Chemical Technology, Hyderabad.

I would like to express my special thanks to my research colleagues, Dr. (Mrs.) Arunima Saxena, Dr. Bijay P Tripathi, Dr. Mahendra Kumar, Ms. Tina Chakarabarty, Mr. Amaranadh Jasti, Dr. (Mrs.) Niharika Srivastava, Mr. Ajay Singh, Mr. Amit Thakur,
Mr. R.P. Pandey, Ms. Chumki, and Ms. Swati. I say thank you for the useful discussions and friendliness.

I wish to thank my friends, N. Prabu, S. Harish, M.S. Chandrasekar, C. Jeyabharathi, K. Munusamy, S. Madheswaran, J. Elango, D. Devarajan, for being true friends, an extraordinary source of suggestion and for helping me to visualize the importance of cordial sound working environment in doing research.

I am thankful to my friends and colleagues for the great time I had in CSMCRI. I enjoyed the atmosphere, their friendship and support, viz., Suresh, Mosae, Koilraj, Jinesh, Churchil, Manu, Patil, Yogesh, Shafee, Ramakrishna, Manoj, Murugan, Pratap, Gangadharan, Siva, Thillai, K. Saravanan, S. Saravanan, Kalithasan, Srinivas, Narottom, Rabindar, Phani, and Teji.

I am duty bound to thank Discipline Coordinator, Analytical Science Discipline, for their kind support for instrumental facilities. Finance assistance received in the form of Senior Research Fellowship from Council of Scientific and Industrial Research (CSIR), Government of India, New Delhi has been gratefully and co-ordinately acknowledged.

I would like to express my heartfelt thanks to my brother Mr. S. Bhaskaran, my sisters Mrs. S. Punitha, Ms. Monali, Ms. Mrinali, and family members for unconditional moral support and continuous motivation in every circumstances, results the successful completion of this work.

With core of my heart, I am thankful to Mrs. Madhulika Shahi, Ms. Bhavya Shahi, Ms. Himanshi Shahi and Mr. Anmol Shahi for sharing plenty of sweet and cheerful moments. I whole heartedly express my thanks to someone for whom words would fall short at present but feelings remain.

Last but not least; I am gratified to the enormous that has provided sound health and sprits to me for walk on the path of light and success.

May, 2012

S. PRAKASH