

Dedicated

To

MY BELOVED

PARENTS

*With profound sense of indebtedness and reverence,
I wish to express my sincere feelings of gratitude to my
research guide Dr. Uma V. Chudasama, Professor, Applied
Chemistry Department, Faculty of Technology and
Engineering, The M. S. University of Baroda, Vadodara,
for her inspiring and enthusiastic guidance throughout the
research work. Special thanks and recognition go to her,
whose drive and commitment to research has inspired,
motivated and enabled me to complete this endeavour. She
has played a fundamental role in defining my future.*

(Tarun Parangi)

***** ACKNOWLEDGEMENTS *****

Primarily, I would like to express my profound gratitude to Dr. (Mrs.) Uma V. Chudasama, Professor, Applied Chemistry Department, Faculty of Technology and Engineering, The M. S. University of Baroda, who constantly encouraged, inspired and guided me right from the beginning of this work. Her receptive attitude, untiring enthusiasm and positive approach will always remain a source of inspiration. Her deep passion for perfection of work has not only taken care of my present study, but shall always be a guide to me in future.

I wish to express my gratitude to the DAE-BRNS, BARC-Mumbai for providing research fellowship and financial assistance to carry out the research work. In this context, I am also thankful to Dr.(Mrs.) B. N. Wani, SO/F, Chemistry Division, BARC-Mumbai for her encouragement and support.

I wish to express my gratitude to the Dean, Faculty of Technology and Engineering and The Head, Applied Chemistry Department for providing me the required facilities to carry out my research work.

My sincere thanks to The Head, Department of Metallurgical & Materials Engineering, Faculty of Technology and Engineering, The M. S. University of Baroda, for providing instrumental facilities (SEM and EDX analysis), The Head, Department of Chemistry and The Head, Department of Physics, Dr. D. K. Kanchan, Department of Physics, Faculty of Science, The M. S. University of Baroda for providing NMR facilities and Impedance Measurement facilities respectively. Thanks are also due to SAIF, IIT Kochin for elemental analysis by ICP-AES and to the management of Sud-Chemie India Pvt. Limited, for providing instrumentation facilities for surface area and surface acidity measurements.

I extend my sincere thanks to all the teaching staff members who have helped me in many ways during my research work.

I had the pleasure of working with an excellent group of lab mates, Dr. Parimal Patel, Dr. Rajesh Patel, Mr. Brijesh Shah and Mr. Shrinivas Ghodke for making my work an enjoyable one and who helped me in each and every step of my work right from literature survey to compilation of the thesis and the useful suggestions and support they gave me at various stages of my research work. . I am also thankful to Dr. Kalpana Maheria, Dr. Rikesh Joshi and Dr. Rakesh Thakkar for providing me help and guidance

Thanks are also due to Dr. Mayur Patel, Mr. Gautam Patel, Mr. Umesh Chaudhri, Mr. Deepak Singh, Mr. Heemanshu Bhatt, Ms. Prajakta Joge, and to all my fellow research mates who have maintained a cordial and supportive environment during the research period. I am also thankful to my friends at the hostel specially Mr. Dharmendra Patel, Mr. Rakesh Chauhan, Mr. Jigar Trivedi, Mr. Rakesh Manji, Mr. Manikandan, Mr. Vijay Padhiyar, Mr. Chaitanya Shah, Mr. Harnish Soni, Mr. Hemant Mande, Mr. Shyam Muthukutu, Mr. Kushan Parikh, Mr. Nishant Anasane, Mr. Puran Singh who have maintained supportive environment during the research. I am also thankful to people from my native place - Mrs. Taraben Patel, Mr. Bhavin Shah, Mr. Milin Gandhi, Mr. Rajubhai Jethani, Mr. Kiritbhai Shah, Dr. Paresh Shah, Mr. Bakulbhai Jaybansiwale and Mr. Gopalbhai Gandhi, for their support and help to complete my study.

I cannot forget the cooperation extended to me by the non-teaching staff members of the department.

I am indebted to my parents, my wife and all family members for their love and encouragement, who above all have taught me that patience, determination, persistence and faith are the keys to success.

There were so many people who did so many things to help me out at critical times. In this short space, it is impossible to acknowledge all of them individually. I thank all of you, my friends, colleagues and well wishers, who have been always with me, in times of need.

(Tarun Parangi)