

ACKNOWLEDGEMENTS

Every new accomplishment involves a journey that begins with the seed of an idea and travels its own unique path until its final destination. This thesis is the end of my journey to accomplish my Ph.D. degree. I love the thrill of journey, with its unexpected twists and turns, surprises, excitements and joys. But more than anything else, when I look back on the journey I have taken, I am completely humbled by the number of incredible people who played a vital role in helping me reach my destination. I would like to acknowledge the following people who helped in different ways to make this study successful.

First and foremost, I would like to bow down my head in front of Lord of Lords “SHIV”, continuous source of bliss, love and inspiration, most beneficent and merciful for giving me wisdom and energy to pursue the career in research.

*I am extremely obliged to my Research Supervisor, **Dr. Sonal I. Thakore**, Assistant Professor, Department of Chemistry, Faculty of Science, The Maharaja Sayajirao University of Baroda, Vadodara, for giving me an opportunity to do research in the field of Polyurethane Chemistry under her supervision and strong leadership. I am also extremely grateful to her for her advice in every step of difficulty and her never ending enthusiasm that ultimately created a source of motivational energy within my heart. Her continuous flow of suggestions, excellent time management and constant encouragement throughout the course of this investigation helped me achieve my goals within a timeline. She managed to teach me how to work independently and gave me freedom to develop my own ideas. She also put emphasis and developed me for looking at the optimistic side of things and to think out of box. My words and thoughts fall short whenever I try to describe those always astonishing ideas and discussion she offered during the tenure of Ph.D. I feel privileged to have her as a supervisor who has inspired me to do research in the interdisciplinary area. The outcome of this thesis is a small tribute to my supervisor.*

*I am thankful to Head, **Prof. N. D. Kulkarni**, and former Head, **Prof. B. V. Kamath**, Department of Chemistry, Faculty of Science, The M. S. University of Baroda, for providing necessary facilities and constant support throughout my research work.*

*I am deeply indebted by **Shri Jayen Mehta**, Chief Manager, R&D centre, GNFC Ltd, Bharuch for his continuous guidance and motivation. He managed to provide all the infrastructure, laboratory equipments, instruments and chemicals required for this investigation time to time. My earnest homage goes to him for this work would not be completed without his continuous support and help. I would also like to thank **Dr. Jayalaxmi Ayyer**, former Head, R&D centre, GNFC Ltd, Bharuch and **Shri A. T. Patadia**, former Executive Director, GNFC Ltd, Bharuch for their kind help and efforts for collaboration.*

*My sincere thanks to **Jaydeep Sheth** and **Sneha Sheth**, ERDA, Vadodara for SEM analysis and mechanical testing respectively. I would like to thank **Dr. K. V. Rama** and **A. Muthukumaran**, Sophisticated Analytical Instrument Facility, Chennai for DSC analysis and VSM analysis respectively. I am also thankful to **Dr. Vandana Rao** and **Dr. Bharati Rehani**, Metallurgy Department, Faculty of Technology and Engineering, The M. S. University of Baroda, Vadodara for help in the SEM-EDX analysis and XRD analysis respectively. My sincere thanks go to Alembic Ltd., Vadodara for providing the drugs for this entire investigation.*

*I would like to thank **Mrs. Revathi Ganeshan**, Department of Chemistry, The M. S. University of Baroda, Vadodara, for her constant encouragement and support throughout my research work. I am also thankful to my seniors **Dr. Mayur Valodkar** and **Dr. Puran Rathore**, for their helps throughout this research. I am thankful to all teaching and nonteaching staff of the department, **Mr. Rane, Mr. Kalpesh, Mr. Dinesh, Mr. Rathva** and **Mr. Rawal**.*

*I would like to thank my friends, colleagues, seniors and lab mates **Jigar Y. Soni, Manita Das, Khushboo Bhanderi, Shardul Bhatt, Ronak Bhatt, Dr. Ayaz Rangrez, Harnish Soni, Rahul Bhatt, Binita Pillai, Upasna Benergy, Priyanka, Nagendra Prasad, Harshil Joshi, Dr. Atul Oza, Dushyant Reddy, Ishani, Aman, Namrata, Nisha, Ridhhi, Sukruti, Shweta Patel, Aditya, Pawan** and **Rabichandra** for their all time support.*

*I would like to acknowledge **Tejal Gajaria, Shridhar Sanghvi** and **Dr. Ranjitsinh Devkar**, Department of Zoology, Faculty of Science, The Maharaja Sayajirao University of Baroda, Vadodara, for MTT analysis. My gratitude goes to **Mr. Javed Shabir** and **Prof. Subho Mozumdar**, University of Delhi for TEM analysis. I would like to acknowledge **Rhonda Byrne**, for reading of a page everyday of her book "The Secret" provided the continuous source of motivation and enthusiasm to me.*

Words won't be enough to thank my mother, **Mrs. Hansa Pandya** for being the best teacher of my life, showing interest in my likes and dislikes from my childhood and motivating me towards this successful academic career. I am truly grateful for her endless sacrifices, unconditional support, undying love, encouragement, blessings and prayers, which made tougher times look easier. Without you, I would not be the person I am today. My deepest gratitude goes to my father, (Late) **Mr. Rohit Pandya**, for raising me with pride, all of his support and teachings and for putting faith in me. Even after your handicap leg and financial struggles, you provided all the best facilities to your children. I might have found my prince, but you will be my KING forever. I know that your guiding hand will always remain with me on my shoulder. I can never forget the enthusiasm and love given by my brother **Mr. Vishal** and my bhabhi **Mrs. Priyanka**. I thank them for always being there for me.

My heartfelt regard goes to my father in law **Mr. Hasmukh Solanki**, mother in law **Mrs. Rekha Solanki**, sister in law **Mrs. Krina** and brother in law **Mr. Pritesh**, for their love and moral support. I am grateful to my son **Aryan**, for his single smile always made all my worries away.

I would like to give special thanks to my better half **Mr. Ritesh Solanki**, for his love and support rendered on me. He played a role of my closest friend, a great adviser, a mentor and my all time supporter. Without his continuous encouragement and understanding, it would have been impossible for me to finish this work. In fact, I feel that the most important decision that helped me flourish in my career was when I choose him as my life partner. Thank you for always being there. I deem myself the most fortunate to have such a supportive family, standing behind me with their love and care.

I thank everybody who knowingly or unknowingly helped me during the course of this investigation; thereby making it a life time achievement for me.

Archana Solanki