## <u>ACKNOWLEDGEMENT</u>

The work presented in this thesis would not have been possible without the blessing of God. First, I must thank Almighty God for making me capable of strength and willpower to complete my Ph.D. work. At this stage of my life, I won't miss the opportunity to express my sincere gratefulness to all who helped me throughout my Ph.D. work and made this thesis possible.

I, especially conveying my wholehearted words of thanks to my research guide *Dr. Chetan K. Modi* to allow me to accept this opportunity as a Ph.D. student and introducing me to this exciting field of research. His enthusiasm and support with his in-depth knowledge of the subject are being a great source of inspiration for me to uptake the insight sense of catalysis. He has given me full freedom during the entire research work and his constructive guidance throughout my research work made this thesis materialize in its present form. I truly respect your sincerity and devotion towards the work. It is the faith you show towards your students that makes the work with you a worth remembering experience. During the course of interaction from the very first day, I have learned a lot including how to resolve the research problems, how to see a new opportunity from the complexities, how to communicate the paper, how to answer the reviewer, how to write a book chapter and so on. Sir, you will always hold a very prominent place in my life. I pray to God to impart you with good health, peace, achievement and happiness always.

I heartily acknowledge *Prof. R. C. Tandel*, Head, Applied Chemistry Department for providing me all the required research facilities and for his words of encouragement during the course of the journey of my research. I would also like to thank *Dr. D. P. Bharambe* giving substantial help and support throughout this work. I would like to express my gratitude to *Prof. P. T. Deota* whose sensible advice helped me a lot during the course of work.

It's my immense happiness to acknowledge *Prof. P. K. Jha*, Department of Physics, Faculty of Science, The Maharaja Sayajirao University of Baroda, Vadodara, for acquiring a thorough understanding of my work through Theoretical Study (DFT study) and being very helpful for the characterization of research samples throughout my Ph.D. work. I don't miss to express my sincere thanks reserved for my research colleague *Mr. Dikin S. Patel* for his great support throughout my Ph.D. work. In fact, his help and support made this thesis successfully concluded. Being very cooperative, caring and supportive, he has actually kept me away from dispiriting. I am also thankful to Ms. Urvi Lad for being always helpful and supportive to me.

I am thankful to Late Mr. Yogesh Chamkure, Mr. Pavan Karkare, Mr. Pranav Chitte, Mr. Gaurang Bhatt and Ms. Nikita Tiwari for being greatly helpful during the Ph.D. work. I honestly acknowledge my colleagues Ms. Vaishali Sharma, Mr. Som Narayan, Mr. Dipak Upadhyay, Mr. Basant Roondhe, Mr. Srujal Sonera, Mr. Bharat Maru and M.Sc. dissertation students for their kind help and support.

I am happy to recall *Mrs. Tejal C. Modi* with a lot of thanks for her kind help and gentle care towards me and my family during the period of my whole research work.

I shall be culpable if I forgot to convey my special thanks to my friends Mr. Sharad Thesia, Mr. Rajesh Jadav and Mr. Viral Vakani for their great help and Mr. Jay Gotecha, Mr. Jignesh Solanki, Mr. Chirag Rayththa, Mr. Shashikant Raichura, Mr. Prakash Yadav, Manish Gondalia Sir for their immense moral support.

I am also grateful to Dr. Arun Basrur, Mrs. Ruhi Pathan, Mr. Ali Akbar Vohra for their great support in resolving the problem regarding GC analysis and much more help durig my Ph.D. work. I am also thankful to Dr. Arun L. Patel and Dr. Vinay Singh from the Department of Chemistry, The Maharaja Sayajirao University of Baroda, Vadodara, for their immense help and support during my research work.

I am also thankful to Mr. Sanjeev Kane and Dr. Himanshu Srivastava for their great help during my research work.

I must show my gratitude to all the teachers of Applied Chemistry Department for being helpful to me at different stages of my Ph.D. work. My heartfelt thanks go to all the non-teaching staff members of the department (Mr. Parag Vaishnav, Mrs, Kamini Patel, Mrs. Bhavna Desai) and all the staff members of the library (TKG & HM) and administrative office whose name is not written here but their support and help are unforgettable. I am thankful to Shri Kishore Tiwari, Aakar Scientific, Vadodara for donating modular furniture to the research laboratory and all my well-wishers.

Last but not list, I am intensely and eternally indebted to my great father *Mr. Shashikant G. Vithalani* who made me stronger is being a person of inspiration for me and caring mother *Mrs. Ranjan S. Vithalani* who taught me good things that really meant in life. Indeed, no words are there for the love, care and sacrifice of the parents but at this stage, I would not miss expressing my words of emotion to my parents from the bottom of my heart that what I am today is only because of them as they have always been the backbone of my life.

My heartfelt gratitude is always due to *my better half Meera R*. *Vithalani* for her endless support and understanding. Her flawless love, care and support have always provided me the strength to be with my goals and ambitions. Her persistence, patience and sacrifice will always be enthusiasm and motivation for me throughout my life. I don't miss to say that without her help; I actually would not be able to complete my dream and what I am in present.

My special thanks are owed to my little sister in law, *Krishna* for supporting me and creating the surroundings cheerful and positive during the journey of Ph.D. I must express my special gratitude to my mother in law *Mrs. Sarojben Raichura* for their sound care, love and sacrifice being a strength and peace of mind for me which always inspirited me to focus on my work, goal and aim.

I am greatly thankful to the Almighty for leading me to the success.

Date: Place: Vadodara

(Ravi S. Vithalani)