

Acknowledgments

Pursuing a Ph.D. is a both enjoyable and painful experience. It's just like climbing a high peak, step by step, accompanied with bitterness, hardships, frustration, encouragement, and trust with so many people's kind help. When I found myself at the top enjoying the beautiful scenery, I realized that it was, in fact, teamwork that got me there. This thesis is the end of my journey in obtaining my Ph.D. Though it will not be enough to express my gratitude in words to all those people who helped me. At the end of my thesis, it is a pleasant task to express my thanks to all those who contributed in many ways to the success of this study and made it an unforgettable experience for me.

I thank the almighty, **Shri Ram** for giving me the strength and patience to work through all these years so that today I can stand proud with my head held high.

I would like to start with the person who made the biggest difference in my life and take me as such a height of glory, **my mentor, Prof. M. Srinivas**, Professor, Department of Physics, The M. S. University of Baroda, Vadodara, for his valuable guidance, scholarly inputs and consistent encouragement that I received throughout my research work. This feat was possible only because of the unconditional support provided by him. He has been there with me from last Six years. He motivating and inspiring me towards new possibilities in life. I owe a lot of gratitude to him for always being there for me. I feel privileged to be associated with a person like him during my life. His observations and comments helped me to establish the overall direction of the research and to move forward with investigation in depth. Without his guidance and constant feedback, this Ph.D. would not have been achievable. Under his guidance, I successfully overcame many difficulties and learned a lot. His unflinching courage and conviction will always inspire me in future also.

It gives me great pleasure in expressing my indebtedness and deep sense of gratitude to **Dr. K.V.R. Murthy**, Applied Physics Department, Faculty of

Technology, The M. S. University of Baroda. I have immensely benefited from the discussion with him and his critical evaluations for which I shall always be obliged to him.

I express my heartfelt gratitude to Head, **Prof. N. L. Singh**, Department of Physics, The M. S. University of Baroda, Vadodara for providing necessary infrastructure and resources to accomplish my research work. I am grateful to **My Dear Teachers** of the Department of Physics for their encouragements. I am thankful to **Non-Teaching Staff** of the Department of Physics for their support.

My sincere thanks to **Prof. Haribhai Kataria**, Dean, Faculty of Science, The M. S. University of Baroda, Vadodara for the immense help I received from them. I am also grateful to The Maharaja Sayajirao University of Baroda for providing infrastructure and research facility for doing my research.

I am grateful to University Grants Commission, New Delhi, India for the award of UGC-BSR Fellowship. I am grateful to **Dr. Mukul Gupta** and Centre Director, **Dr. V. Ganesan**, UGC-CSR, Indore Center for providing XRD characterization facilities during my research.

I am highly obliged to my dear friends **Mr. Vishwnath Verma** and **Mr. Piyush Bhatt** for their constant support, whenever and whatever I needed during my research.

I would like to acknowledge my senior, **Dr. Dharmendra Tawde**, **Dr. Dhaval Modi**, **Dr. Devang Shah**, **Dr. Naveen Agrawal**, **Dr. Digish Patel** for all their support and motivation.

I am thankful to my dear friends **Mrs. Sarmisthaben**, **Dr. Laxmi Tomar**, **Dr. Pramodbahi (Botany Department)**, **Dr. Hardik Vora (Anesthesia Specialist)**, **Mr. Hemant Bhatt**, **Alpeshbhai**, **Dr. Ankit Sudhir**, **Mr. Krunal Patel**, **Mr. Vishal Jigyashu**, **Their Family** and **Vishwanath's Family**, who consider me as a family member and keeping me happy forever in Vadodara.

I am thankful to my research friend from the Department of Physics, **Dr. Rajnikant Makwana**, **Gnansagar Patel**, **Mayur**, **Ketanbhai**, **Rakeshbhai**, **Nishantbhai**, **Jaimin**, **Chaitanya**, **Abhishek**, **Ratan**, **Bhargav**, **Basant**,

Prajakta, Charmy, Shilpa, Ashwini, Gargi, Nidhi, Shesha, Mudra, for their support. I am thankful **Ajitbhai** and **Rajeshbhai** for their kind support.

I am thankful to my M.Sc. friends **Vishal, Gaurmag, Mitesh, Naresh, Parikshit, Jabbar, Kalpesh, Dharmesh, Tenzin Tsepak, Jay, Naresh, Deep, Nayan, Parvez, Hina, Hiral, Sweta, Nayana, Susmita, Charul, Rakesh, Parikshit**, for their support during my research.

I am grateful to my hostel friends **Dr. Sanjay Yadav, Dr. Jigar Soni, Dr. Harnish Soni, Riyazbhai, Mohitbhai, Maheshbhai (Pharmacy), Hardikbhai, Niravbhai, Sagarbhai, Dushyantbhai, Jitubhai, Kanubhai, Hitenbhai, Gauravbhai, Rahulbhai, Mehul Sadhu, Ravibhai, Naveenbhai, Vishalbhai, Ashokbhai, Maheshwaran, Bharat, Mani, Ankit, Jigar, Denish, Brijesh, Shutansubhai, Bhanu Pratap, Pavanbhai, Dr. Rabi, Rafikbhai, Jagdishbhai and Hostel Staff** for staying happy with me during my hostel life.

I am thankful to my dear teacher **Mr. Umesh Maheswari** and **Mr. Sanjay Rana** for the constant support in Vadodara. I am grateful to my dear **Dr. Anil Pillai**.

I would like to acknowledge the people who mean world to me, My Father **Prafulbhai**, My mother **Ushaben**, My dearest sisters **Vaishaliben, Falguniben, Swatiben, Urvashiben**, My brother-in-laws **Rakeshbhai, Sunilbhai, Bhaveshbhai**, My Brother **Purvesh**, and all my dear nephew.

I wish my special thanks to the **Beautiful, Lovable, Enthusiastic, Simple, Soulful, Youthful** person who played noteworthy role during my journey of research.

If I have missed out a name of any of my dear-ones than I apologize.

Thank you very much to all the people, the reason and the conditions that take part during my research, who help me and make me strong to live a healthy life.

Nimesh Prafulbhai Patel