Acknowledgment

I owe my deepest debt of gratitude to Prof. L. M. Manocha, Head, Department of Materials Science, Sardar Patel University, Vallabh Vidyanagar, under whom I had the opportunity of working as a research student. I have been highly benefited from his previous probing and constructive criticism at all stages of my work. He who taught me the rudiments of research & guided me very painstakingly. The years spent in his counsel and company will have a lasting positive impact on my professional career. It is difficult to look for words adequate to thank him for his constant loving care & affection.

My interaction with my co-guide Dr.(Mrs.) S. Manocha, Reader in Materials Science Department made me aware of so many points which were indeed very central to one's understanding of the subject. She gave me a much needed moral support. I would like my gratitude to her for her help and guidance.

I sincerely thanks my friends and colleagues Dr. Ajay Patel, Dr. Hiren Bhatt, Dr. M. N. Joshi, Dr. Sanjay Shah, Jignesh Patel, Nilesh Patel, Ketan Patel, Rakesh Jasrai, Umesh Patel, Ashish Patel, Alpesh Patel, Jignesh Bhagat, Miss Mukta Patel, Chetan Panchal and Miss Bindu Stephen for their timely help and support during and towards successful completion of my research work.

I am thankful to Dr. N. M. Batra, Lecturer in the Department of Materials Science for valuable advice & cooperation given from time to time during the work.

I am thankful to the non-teaching staff Mr. S. A. Barot, Mr. P. C. Parikh, Mr. R. M. Rana and Mr. Piyush Parmar for their constant co-operation.

I am grateful to the Department of Atomic Energy(DAE), Govt. of India for providing me financial assistance as JRF for the first three years of my research. Also to Council of Scientific and Industrial Research(CSIR), Govt. of India for providing me financial assistance as SRF from Oct.'97.

I am also thankful to Department of Chemistry, Sardar Patel University and Department of Metallurgy, M S University, Baroda for carrying out the instrumental analysis.

With deep and heartiest sense of gratitude I thank my mentor Prof. L. M. Manocha, my parents and family members for providing me with all kinds of helps and best wishes.

DEVAL YOGENDRA VASHISTHA