Acknowledgement

It is indeed true that accomplishment of any goal calls for hard work sincerity and dedication, but such an accomplishment of goal becomes achievable and falls within one's reach if one proceeds with proper method and right direction. This becomes accessible through proper guidance and supervision. Accomplishing a difficult task is wide-ranging and sometimes unanticipated difficulties may arise which might make one to lose courage and slacken dedication. Under such a kind of circumstances a person not only giving guidance but also giving encouragement and moral support is required to be at hand. I would like to record my gratitude to my guide **Dr. S. S. Bhattacharya**, Professor in Department of Textile Engineering, Faculty of Technology & Engineering, The Maharaja Sayajirao University of Baroda, for his supervision, guidance and support from the early stage of this research as well as giving me extra ordinary throughout the work. His truly scientific knowledge has made him as a constant oasis of ideas and passions, which exceptionally inspire and enrich my growth as a student and researcher. Thank you sir you made me believe in myself.

I would like to thank Prof. A. N. Misra, Dean, Faculty of Technology & Engineering, for giving his support. I am also thankful to Dr. M. V. Koranne, Head of the Textile Engineering Department and Dr. B. S. Chakrabarty for his support. I am grateful to, Head of the Textile Chemistry Department, Head of the Metallurgical and Materials Engineering Department, Head of the Applied Physics department for extending laboratory facilities & assistance for carrying out experimental work in the department.

Collective and individual acknowledgments are also owed to lab mates whose presence show how perpetually refreshed, helpful and memorable. Many thanks goes in particular to **Bhadreshbhai**, **Jyotindra**, **Amrish**, **Hitesh**, **Piyush** and **Bhavsarbhai** for giving me such a pleasant time when working together with them.

My parents deserve special mention for their support and prayers. My mother Smt. Vimalben, who sincerely raised me with her care, love and constant source of inspiration. My father Shri. Babanbhai, who put the fundament of learning character in me and supported to persue my educational carrier. I owe so much to my wife, Pallavi for her constant

encouragement and support throughout my life. I would like to thank my sons Aditya and Himaksh for showing me 'the meaning of life'.

I extend my heartiest thanks to my friends **Dr. Bharat Patel & Aadhar Mandot** for their constant encouragement and support.

Finally, I would like to thank everybody who directly or indirectly involved in the successful completion of this thesis, as well as expressing my apology that I could not mention personally one by one.

Finally, I thank to almighty for his blessings on me forever.....

Satyajeet B. Chaudhari