Acknowledgements

All the admirations are for Almighty Allah, who helped me in difficulties and gave me enough strength and ability to accomplish this research work.

My sincere thanks are due to my supervisor Prof. Faiz Mohammad for his proficient guidance, conscientious scrutiny and abounding encouragement. His wise counsel has honed my perception and application of scientific knowledge. Only from him I have procured the skill of analysis and re-analysis and a penchant towards perfection.

I thank Prof. Ali Mohammad, Chairman of the Department for unobtrusive benefaction of all necessary facilities to conduct this work. Many thanks to all the teaching and non-teaching staff of the Department of Applied Chemistry for the help they could provide.

I sincerely thank Prof. Akhtar Husain Ansari, University Polytechnic, for his invaluable support and guidance.

I exuberantly acknowledge the help for XRD facility offered by SAIF, Punjab University (Chandigarh) and TEM facility (DST sponsored), Department of Anatomy, AllIMS, New Delhi for conducting various analysis in their respective labs.

I would also like to thank Drs. Shams Tabrez, Shahnawaz Khan, Anish Khan, Showkat Bhawani, Mudasir Bande, Fahadullah Khan, Mohd. Khalid Azmi, Pijush Kanti Mondal, Parwaz Khan, Ayaz Mohd. and Mohd. Atif whose thoughtfulness often seemed to be shady tree during the time of distress. Much would have left unapproachable without them.

I also had the luck of being in the cohort of some magnificent human beings, my friends. Words fall short to describe contributions of Shaheen Khan and Shamim Ansari to this thesis. They have worn my coat to deload me from worries, stepped into my shoes to feel the pinches and drank in the same cup to bear the bitterness. They have been through all this. Shaheen and Shamim, you are unmatched and indispensable.

Dr. Omaish deserves a special mention for being the perfect aide-de-camp. I would also like to thank all my colleagues Tarique Anwer, Mohd. Alam, Qamaruzzaman and Rajiv for their all round support. I also thank Dr. Arfat Anis and Dr. Jeelani for their care and support whenever I needed them.

My other friends Riyazuddin Ansari, Samina Khan, Amit Krishna Varshney, Deepika Varshney, Bindu Sharma, Khalid Sayeed, Ahlam Khan, Mohd. Saud, Tasnim Zia, Mohd. Shahfaraz and Nagender Singh were always there to give their helping hands and precious time to share my moments of joy as well as of sorrows.

Words can not define the love and sacrifice of my adorable parents for me. I am highly thankful to Allah (S.W.T.) for giving such lovely parents. My sisters and brother in law need special praise, they were a source of motivation. My sweet niece, Aziza, was always stress reliever for me. My younger brothers, Hamid and Sajid, deserve special mention for their consonant consort.

(Shahid Pervez Ansari)