I would like to give my sincere thanks to my teacher and guide, Dr. M. V. Rajasekharan for his guidance and direction of this work.

I thank the present and past dean(s) of the School of Chemistry for extending all the facilities of the Department. I also thank all the faculty members of the School.

The bulk of the x-ray data were collected at the Regional Sophisticated Instrumentation Centre, Indian Institute of Technology, Madras and at the National single crystal x-ray diffraction facility recently established in our school. Prof. W. T. Robinson, University of Canterbury, New Zealand, Dr. N. Arulsamy, Prof. D. J. Hodgson, University of Wyoming, Laramie and Dr. A. Vij, University of Idaho, Idaho, provided data for two samples (compound 1 and 2). I would like to thank Dr. T. P. Radhakrishnan for allowing me to do resistivity measurements in his lab and Dr. Sathya Prasanna for his help. The Raman measurements were made in the laboratory of Prof. H. U. Guedel, University of Bern, Switzerland. Dr. F. von Helmont and Dr. P. Tregannane, helped with the measurements. I thank Prof. K. -F. Tebbe for sending me several useful re-prints of his work.

I thank all the technical and non-teaching staff of the School of Chemistry and Central Instrumentation Lab for their help and cooperation.

I thank my labmates Dr. G. Swarnabala, Dr. K. Rajender Reddy and Dr. Sindhu Menon and Ms. S. Sailaja for their help and cooperation.

I thank all the staff and research scholars of R.S.I.C., LIT., Madras, especially Dr. Babu Varghese, Dr Manisekharan, Dr. R. Muthukumaran, Dr. G. V. R. Chandramouli, Dr. Asokan, Dr. Baby and Ms. Vani.

I thank all my teachers of M.Sc, whose lectures, made Chemistry more convincing and interesting to me. I would like to thank Prof. R. Jagannathan for
his advice and support on many occasions. I would like to thank Prof. M. Perisamy for kindly allowing me to take laser print-out. I would also like to thank Dr. P. Appa Rao for allowing me to do anti-microbial testing in his lab and Ms. Sangeetha for her help.

I extend special thanks to my family members whose support and encouragement was always with me and also to my friends Hema and Leena. The cheerful company of all my M.Sc. classmates, especially Anthony, is always remembered. The pleasant memories with my friends on campus, Sindhu, Chandrakala, Aneetha, Vijjulatha, Madhavi, Mangai, Sailaja, Manjula, Sudha, Saroja, Anita, Soujanya, Gayatri, Nisha, Padmaja, Sangeetha, Sonika, Padma, Subbalakshmi, ... the list goes on. Special thanks to my junior labmates (M.Sc.&M.Phil.), who remember the lab even after the completion of their project. My thanks to the Upper lab association members, Satyen, Sankaran, Srinivasan, Senthil ... for their cheerful company. In fact, all the students in the school were friendly and helpful, the record of which is left for memory.

Financial Assistance from UGC is gratefully acknowledged.