First and foremost, I express my deep sense of gratitude to Dr. T. S. Radhakrishnan, my research supervisor whose encouragement, guidance and concern made this thesis a reality.

I gratefully acknowledge Dr. Y. Hariharan, who has helped me a great deal in understanding the subject and provided technical and moral support throughout my Ph. D. Programme.

I am highly indebted to Dr. A. Bharathi for her active collaboration. I am immensely benefited by her thought provoking discussions at various times. Her critical reading and suggestions have improved the structure and readability of the thesis considerably.

I would like to thank my other research collaborators particularly Dr. Nithya Ravindran, who helped me in some experiments and sample preparation; Dr. C. S. Sundar for fruitful suggestions and his interest in my work; Dr. G. V. N. Rao and Mr. G. L. N. Reddy for their help in XRD characterization of the samples.

I owe my thanks to Mr. V. Sankara. Sastry for his useful advice in fabrication of miniature high pressure cell and to Prof. Bimal K. Sarma of Wisconsin University, Milwaukii (USA) for his help in developing $^4$He evaporation Cryostat.

My thanks are due to Dr. H. K. Sahu for his valuable help in writing some computer programmes. The invaluable help rendered by Dr. Sharat Chandra in carrying out Reitveld analysis of XRD data is gratefully acknowledged.

My special word of thanks to Dr. R. Divakar and Mr. D. V. Natarajan for their untiring help during the preparation of this thesis in terms of careful proof reading and suggestions.

I express my sincere thanks to Mr. Jacob, Mr. Chinnain (Retd.), Mr. Chinnasamy, Mr. Devanesan and Mr. Palani of MSD workshop for their help specifically in fabricating $^4$He evaporation Cryostat in stipulated time. I greatfully recall and acknowledge the
coordination and the help by (Late) Shri Sankaran in the above work.

I gladly recall the friendship I enjoyed with Dr. V. Sridharan, Dr. Venugopal Rao, Dr. T. N. Sairam, Mr. M. K. Ranganathan, Ms. Geetha Kumary, Dr. K. Gireesan, Ms. S. Kalavathi, Dr. S. Mathi Jaya, R. Baskaran, Mr. Nagendran, Mrs. Rita Saha, Dr. L. S. Vadhyanathan, Mr. M. P. Janawadkar and acknowledge them for their encouragement and moral support.

I am extremely thankful to Dr. B. Viswanathan, head MSD for his constant encouragement and concern.

It is my duty to express my sincere thanks to all the MSDites for providing the encouraging environment.

I express my heartfelt thanks to my wife Kamala and my mother, but for whose help at home, this thesis would have not been possible.

Finally I would like to thank the Management of this Centre for granting me permission to do this work.