ACKNOWLEDGEMENTS

With profound feelings of gratitude I acknowledge the contribution of all those who helped me in the course of this study and its completion.

I owe a considerable debt to my mentor and guide Dr. Mahavir Singh, Chairman, Department of Physics, H. P. University, Shimla, who initiated me into the realm of research and introduced me to the exciting field of nanotechnology. Without his invaluable suggestions, incessant inspiration and unstinted co-operation, the present dissertation would not have been possible.

I wish to express my sincere thanks to Dr. Dipankar Das, UGC-DAE Consortium for Scientific Research, Kolkata and Dr. V. R. Reddy, IUC-UGC, Consortium for Scientific Research, Indore, for providing facility of Mössbauer study.

I wish to express my thanks to Prof. Sukh Dev, Dr. Nainjeet Singh Negi, H. P. University Shimla, Dr. S. N. Dolia, University of Rajasthan, Jaipur, for their help, suggestions and encouragement at various stages of this work.

I sincerely express my gratitude to all my teachers in the Physics Department, H. P. University, Shimla, for having kindled in me an interest in Physics and their words of encouragement.

Known words become inadequate to express my gratitude to my wife Preeti for her meticulous suggestions, support and unstinting help throughout the completion of this project.
I wish to express my gratitude to my Nana-Nani, parents Sh. Pawan Thakur and Smt. Shakuntala Thakur and my in-laws Sh. S. K. Mathur and Smt. Anjana Mathur for their magnanimous encouragement that sustained my spirits throughout this venture.

I also appreciate my sister Miska, brother-in-law Mukesh and my sister-in-law Monika for their unconditional help.

Last but not the least, I would also like to thank my friends Fr. John Thatheus, Dr. Brijesh Chauhan, Sanjay Mehta, Vimal, Kuldeep, Ajay Kumar, Ajay Sharma, Ashwani, G. D. Sharma, Ashish Aggrawal, Sant Ram Thakur, Arif Samma, Arun Sharma, Rajesh Verma, Virender, Vijay Sanoria, Ravi Thakur, Anil Thakur, Inder Mohan, Krishan, Manohar, and all my staff members for their encouragement and motivation.

Atul Thakur
01-08-07 (Atul Thakur)