ACKNOWLEDGEMENT

First and foremost, it is a privilege to express my heartfelt gratitude and indebtedness to my supervisor Dr. Shashi Bhushan (Head, S.O.S in Physics, Pt. Ravishankar Shukla University, Raipur) for his expert, painstaking guidance, foresightedness, unflinching strong will and also his positive and simple approach to solve every kind of problem. I have been overwhelmed by his constant encouragement, extra care and affection throughout the tenure of my Ph.D work. I have learned a lot of things from him, not only in the field of research but also in other fields of life. I am quite fortunate to have been associated with him and will remain indebted to him for life long. I would also like to express my thanks to his wife Mrs. Indira Srivastava and the members of his family who have always encouraged and showered love and affection on me during the course of work.

I am also thankful to other teachers of this department Prof. B.P. Chandra (Vice Chancellor, Pt. Ravishankar Shukla University), Dr. D. K. Chakraborty, Dr. S. K. Pandey and Dr. R.C. Agarwal.

The deep sense of gratitude are also due to Dr. Kallol K. Ghosh and Dr. M. K. Deb (S.O.S in chemistry) for being easy to approach and for the help rendered to me during the tenure of this work. I am also thankful to Dr. M.W.Y. Khan, Head, (S.O.S in Geology) for providing me facilities for absorption spectral studies.

I would also like to take this opportunity to express my heartfelt thanks to each and every staff members of S.O.S in Physics and US/C for their timely and requisite help to solve technical as well as other problems during the experimental work. The names which deserve special mention are: Mr. K.P. Rathore, Mr. B.K. Jethwa, Mr. N. K. Jani. Mr. K.L. Rawate, Mr. P. R. Pachauri, Mr. B. B. Kashyap, Mr. M. L. Tikaria, Mr. S.K. Yadav, Mr. S.K. Upadhyay, Mr. S.C. Soni, Mr. H.S. Dhanendra, Mr. K. Sonwani, Mr. A.K. Yadav, Mr. N.P. Patel, Mr. N.K. Yadu, Mrs Indravati, Mr. T.K. Verma and Mr. Nand kishore Yadav and others. The help received from the staff members of S.O.S in Chemistry is also thankfully acknowledged.

I must thank my research colleagues of this laboratory: Dr. Purna Bose, Dr. R. B. Sahu, Mr. T. Chandra, Mr. Ayush Khare and Ms. Swati Srivastava for their timely cooperation and rendering useful discussion. The name which deserve special mention is Dr. Purna Bose for having initially introduced me to Dr. Shashi Bhushan.

I owe my thanks to other research colleagues of this department as well: Dr. Ravindra Gupta, Dr. Parijat Thakur, Mr. Mohan Lal Verma, Mr. Shudhansum Barvey, Ms Manasumi Das and Mr. Chetan Sinha.

The help and support extended to me by research scholars of chemistry: Dr. R.C. Agarwal, Dr. Manisha Thakur, Dr. Nidhi Tiwari, Mr. Pukhray Sharma, Mr. Ravi Banjare, Mr. Kamlesh Shirvast, Ms Harsha Wanjare, Ms. Kavita Agarwal, Ms. Ankur Agarwal, Mr. Pushpa Khande, Mr. Vikas Jain and Mr. Dhananjaya Sahu are also gratefully acknowledged. I would like to specially thank Dr. Manisha Thakur (S.O.S in Chemistry) for the help, support and encouragement extended to me during the tenure of this work.

I specially acknowledge Mr. Hari Narayan Sahu (S.O., CSIR, ND), Mr. Beshaj Kumar Devangan and Sanjay kumar Trivedi (S.O.S in electronics) for their cooperation and support during this work.
The help received from Mr. Shamsher Bahadur Singh (Graphic Designer, Informatics) in the final processing of this thesis is thankfully acknowledged. At this moment, it will not be an exaggeration to say that this work might not have taken its present shape without his help and personal interest on my thesis. I would remain indebted to him for lifelong.

My heartfelt feelings of obligations are due to my parents (Shri D.N. Mukherjee and Smt. Beta Mukherjee) for their inspirations and blessings which provided me great energy for leading the work to completion. I am also thankful to my elder brother (Mr. Partha Mukherjee) and sister in law (Mrs Lopamudra Mukherjee) for their whole hearted support and encouragement. Also the name which deserve special mention is my nephew Master Prateem Mukherjee for the love he showered on me. I am also grateful to my maternal uncle (Mr. Satyakumar Chatterjee) for his words of encouragement. I express my thanks to Mr. Joydeep Mukherjee (cousin brother) for his kind support and help. The help received from other relatives and friends is also thankfully acknowledged.

The financial assistance extended by Pt. Ravishankar Shukla University, Raipur is thankfully acknowledged. Also the financial assistance received in the form of Senior Research Fellowship from C.S.I.R, New Delhi [9/266 (60) 2002 EMR-1] is gratefully acknowledged.

Last but not the least, my deep sense of obligations are to all the known and unknown persons for their cooperation without which this thesis could not have been completed.

Finally, I thank almighty God for giving me enough strength to complete this task.

MIMI MUKHERJEE