Acknowledgements

This is the moment to express my sincere gratitude towards all those near and dears, without whose unstinted support, encouragement and affectionate behavior, the journey would not have been pleasant and full of achievements.

I am deeply obliged to my Ph.D. supervisor Prof. D.G. Kuberkar for introducing me to the fantastic world of research. His active and insatiable attitude for research in new technological fronts has significantly motivated me and developed real insight and aptitude for research. He is and will always remain an idyllic person, directing my research path with sharpness, not only during the Ph.D. work but also in every phase of life. He has guided and provided me a true platform to reach a place where I am capable of writing a Ph.D. thesis.

I am extremely thankful to Dr. P. Chaddah, Dr. Ajay Gupta and Dr. V. Ganesan, UGC - DAE CSR, Indore for providing experimental facilities. I express my thankfulness to Dr. D.M. Phase and Dr. R.J. Choudhary, UGC - DAE CSR, Indore for their constant support during the course of my Ph.D. work and providing PLD and XPS facilities. I acknowledge Mr. A. Wadiker for his help in RPES measurements at AIPES beamline on INDUS-1. Dr. V.R. Reddy and Dr. Mukul Gupta, UGC-DAE CSR, Indore are thankfully acknowledged for his help during P - E loop and XRD measurements. I am also thankful to Ms. Ridhi Master, Ms. Komal Bapna, Mr. Pankaj Pandey and Mr. Manish Kumar for help at UGC - DAE CSR, Indore.

I express my sincere regards to Dr. D. Kanjilal and Dr. K. Asokan, Inter University Accelerator Centre (IUAC), New Delhi for providing experimental facilities for this work. I am extremely thankful to Dr. Ravi Kumar, NIT, Hamirpur for providing PLD facility. I am also thankful to Dr. Yogesh Kumar, Mr. Shammi Verma and Mr. K. Phanendra for help at IUAC, New Delhi. I acknowledge Dr. O.P. Thakur, SSPL, New Delhi for deposition of Au metal contacts and Dr. D.S. Rana, IISER, Bhopal for PLD facility.
I express my thankfulness to **Prof. H.H. Joshi**, Head, Department of Physics, for providing the departmental facilities. I would like to thank all the teaching and non-teaching members of the physics department for showing interest in my work.

My sincere thanks to seniors **Dr. N.A. Shah, Dr. Bipin Savalia, Dr. C.M. Thaker, Dr. Sudhindra Rayaprol** (UGC-DAE CSR, Mumbai), **Dr. D.D. Pandya, Dr. J.H. Markna, Dr. P.S. Vachhani, Dr. R.R. Doshi** (I.I.Sc., Bangalore), **Dr. P.S. Solanki, Dr. Bharat Kataria, Mr. Sanjay Kansara** for their encouragement and help. I am thankful to my colleague friends **Dr. Uma Khachar** and **Dr. Ashish Ravalia** for their help and friendly support. I express my sincere thanks to my juniors **Mr. Mukesh Keshvani, Ms. Priyanka Trivedi, Mr. Davit Dhruv, Mr. Savan Katba, Ms. Sadaf Jethva, Mr. Malay Udeshi, Mrs. Kruti Borkhatariya** and **Ms. Zalak Joshi**. I am thankful to **Mr. R.A. Desai, Mr. M.J. Meghpara, Mr. M.S. Suthar** and **Mr. R.M. Vaghela** for their valuable technical help and support during the course of this work.

It is a time to remember my dearest friends **Ms. Purniba Jadeja** and **Ms. Chitra Soneji** and their families for moral support, hospitality and conductive environment during my entire career.

I owe my deepest gratitude to **Mrs. Preeti D. Kuberkar** and **Ms. Madhura D. Kuberkar** for nice hospitality and homely treatment during the course of Ph.D. work. Mrs. Preeti D. Kuberkar is specially appreciated for her kind temperament as a mother.

It is a great moment to remember my family for their valuable efforts for my career. My beloved parents **Mr. Vipulchandra Vagadia** and **Mrs. Varsha Vagadia** are acknowledged from the bottom of my heart, without whom I would not have been to this stage. I also acknowledge my sister **Mrs. Shradhdha Trivedi**, brother - in - law **Mr. Jay Trivedi** and my nephew **Jatan** for their love and affection which has been a source of motivation and shielding for me. Finally, I would like to express deep sense of gratefulness to all my teachers who have motivated me at different stages of my career.

October 2013

Megha V. Vagadia
I thankfully acknowledge University Grant Commission, New Delhi, India [No. 39-524/2010(SR), March 2011 - March 2012] for providing me financial assistance as Junior Research Fellow (JRF) under the Collaborative Research Project of Prof. D.G. Kuberkar and Council for Scientific and Industrial Research (CSIR), New Delhi for the award of Senior Research Fellowship [No. 9/151 (0033)/2012 EMR-I].

October 2013

Megha V. Vagadia