Acknowledgement

This thesis work is the result of a few years of my life. I would like to thank all the people who have made it possible and gratifying.

First of all, I would like to thank and express my deepest gratitude to my thesis supervisor Dr. Dipankar Das, Scientist-G, UGC-DAE Consortium for Scientific Research, Kolkata Centre, for his invaluable guidance, constant support and encouragement for accomplishing this thesis work. Thank you dear Sir for helping me with everything and being so optimistic.

I express my sincere gratitude to my joint supervisor Dr. Souvik Chatterjee (I call him Souwikda), Scientist-D, UGC-DAE Consortium for Scientific Research, Kolkata Centre, for proposing me this work and leading me on the right way. He has offered me a lot of freedom during my research work so that I can think and handle the research problem independently. From the beginning of my research carrier to till now, I feel a friendly behaviour from him. I have learned a lot of things and enjoyed his guidance. I always felt free to discuss with him about research problem as well as any other problems. His constant support and encouragement helped me to grow up and improve my research interest. I always miss those years I have spent with you. Thanks Souwikda. I am really fortunate to have a guide like you.

I would like to thank to my associate supervisor Dr. Sudipta Bandyopadhyay, Associate Professor, University of Calcutta, for his fruitful discussion and help in magnetic and EDX measurements. I am very much thankful to Prof. Subham Ma-
jumdar, Indian Association for the Cultivation of Science, Kolkata, for giving me the opportunity to work in his research laboratory. I am also very much grateful to Prof. Majumdar for his valuable advice and discussions for improvement of the research work. I would like to thank Dr. V. Ganesan of UGC-DAE Consortium for Scientific Research, Indore Centre, for his help in heat capacity measurement.

I am thankful to Dr. Vijay Singh, Bar-Ilan University, Israel, for his help in theoretical calculation to understand the observed physical properties. I would also like to thank Dr. Sumanta Chattopadhyay of CEA-Grenoble, France for his valuable discussions about research work.

I am very much fortunate to have a friend like Dr. Sabysachi Pramanick, IACS, Kolkata. I am thankful to him for his help during sample preparation and for giving me valuable ideas.

I have spent most of the time of my research life in the material science lab of UGC-DAE Consortium for Scientific Research, Kolkata Centre where I have always felt a friendly atmosphere. My senior lab mates Amitda, Patida and Anirbanda were very helpful. I want to thanks all of them. My juniors Anusree, Sayan and Kanai are very cooperative and I have enjoyed their accompany. Thanks all of them. I would like to thank Rajeshda and Bikramda for their help during different measurements. I want to thanks all the other friends of UGC-DAE Consortium for Scientific Research, Kolkata Centre. I would like to thanks all the faculties especially Dr. A. K. Sinha (Director of UGC-DAE Consortium for Scientific Research) and staffs of my institute for their various assistance and supports. I wish also to acknowledge UGC-DAE Consortium for Scientific Research, Kolkata Centre for providing my fellowship and all types of facilities needed to carry out this thesis work.

I would like to thank all the teachers right from the beginning to till date for their supports, guidance and encouragement which help me to become a good man and eligible for research scholar.

This thesis work would not have been possible without constant support of my
family. I am lucky enough to have such understanding parents and a sweet sister. They have always encouraged and helped me in all the aspects of my life. I am always grateful to them for their sacrifices. I would also like to thank all other family members, friends and beloved one for their love, affection and supports.

I am very much thankful to all those people with whom I have had the chance to exchange ideas.

Finally, I offer my warm regards to all the well-wishers of my life.

UGC-DAE CSR, Kolkata
January 2017

Prabir Dutta