ACKNOWLEDGEMENT

It is my great pleasure to express my gratitude to my colleagues, friends, mentors and guides who always render their cooperation and moral support. Their encouragement made this task to the summit. I can not forget their efforts and valuable time they spent during my Ph.D. days. Their assistance is simply unmatched. I will never forget these memories in my life.

Dr. S. D. Dhole, my guide and mentor is exemplary and forthright. He introduced me in the field of Accelerator Physics. He is equally caring and compassionate for the students that helped me a lot. I appreciate his proficiency and the competency in the field of accelerator physics. He taught me to think, analyze and understand the concept of physics.

My co-guide Prof V. N. Bhoraskar, Department of Physics, University of Pune, is deeply committed person. He is a pool of enthusiasm and potential. I express my deep sense of gratitude to him. His constant guidance, encouragement and co-operation throughout this work is gratefully acknowledged. He developed my experimental, analytical and presentation skills. His incredible help will never be forgotten. Without him, it would not have been possible to complete this Ph.D. work.

I very much thankful to our all former Head of the Department and present Head of the Department, Prof. P. B. Vidyasagar for kindly extending all departmental facilities during my Ph.D. work. I am indebted to Prof. (Mrs.) S. V. Bhoraskar, Prof. S. I. Patil, Dr. V. L. Mathe, Prof. Mahedra More, Prof. V. P. Godabole , Prof. Sandesh Jadkar and Dr. S. W. Gosavi for the constant source of inspiration to me. I do respect them profound knowledge and beacon for me. I will not forget their backing in future.

I want to extend my esteem gratitude to Mrs. S. S. Dhole for her best attitude and encourage during entire period of Ph.D. work.

I would like to thank my colleagues Dr. Prashant, Dr. Abhi, Dr. Santosh, Dr. Indrani, Dr. Riyadh, Dr. Attar, Dr. Shailendra, Dr. Bhushan, Chhotu, Rema, Ashwini, Ganesh, Vikas, Avinash, Shahajad, Dr. Shilpa, Dr. Naveen, Dr. Harshada, Dr. Vishwas, Dr. Nandan, Vijay Ghodake, Sudhira etc. They helped me in different fronts.
I am really very fortunate to have colleagues like Mr. Vijay S. Jadhav, Dr. N. L. Mathakari, Mr. Nandakumar Madaliya, Mr. K. Sapnar and Mr. M. S. Barough. They helped me to take decisions when I stuck around.

I am very grateful to Dr. S. T. Chavan, SAMEER, Mumbai for giving all freedom for LINAC facility. The interaction with him gave precious methods and important experimental techniques.

I am thankful to the Director, Dr. Amit Roy, and scientists Dr. D. Kanjilal, Dr. D. K. Avasthi and all the scientific staff of Nuclear Science Center, New Delhi for providing all the facilities for ion irradiation, required time to time for experiments. My sincere thanks again to Prof. V. N. Bhoraskar, Center Director, UGC-DAE-CSR, Indore, Dr. N. P. Lalla, Dr. Vasant Sathe, (Late) Dr. S. M. Chaudhari and Dr. V. Ganeshan for providing me the experimental facilities, enormous help and fruitful discussions during my stay at Indore.

I would like to show gratitude towards the non teaching staff of the Department of Physics, University of Pune, Pune. Mr. Chavan, Mr. Kadam, Mr. Shinde, Mr. Bhujbal, Mr. Jagtap and Mrs. Joshi for the constant help as during characterizing the samples. I really admire the unconditional support and concern from Mrs. L. Ubhey, Mrs. K. Ovhal, Mrs. S. Bhalerao and Ms. P. Mokate. Thanks to Mr. Devke and his team for their time to time help.

I would like to drop a quick note, my father Mr. Rajarampanth H. Kulkarni and mother Mrs. Premalabai R. Kulkarni, standing beside me as a beacon. A warm thanks to my sisters Mrs. Vidhya Mrs. Durga and Vijayamala. I wish to express my deep gratitude towards Mr. Sudhir Kulkarni and Mr. Amol Answadkar and their family, for their affection, encouragement and moral support during this work. I am also warm thanks my brother Mr. R. S. Ambulgakar and Mrs. Varsha R. Ambulgakar. Special lovable thanks to my wife Anjali, child Vedang and sweet daughter Akhankasha.

At last looking back, I really thank God for giving me such best guide and co-guide, a wonderful child and daughter, an excellent university and the chance to work with all the wonderful people here.

(Vinodkumar R. Kulkarni)