Acknowledgments

I would like to express my deep sense of gratitude to my supervisor Professor I. M. Govil who not only taught me physics in my M.Sc. class along with other renowned professors of Panjab University (PU), Chandigarh, but also inspired me to pursue a research career in the field of experimental nuclear physics. His guidance at every stage of this work has made this thesis possible. It is my pleasant duty to express indebtedness to my co-supervisor Professor Gulzar Singh for his encouragement and guidance during the course of my thesis work.

Since my research work has been done with the accelerator and other facilities of Inter-University Accelerator Centre (IUAC), New Delhi, and PU, Chandigarh, my endeavor in research got boosted due to the excellent academic atmosphere prevailing in these two places.

In IUAC, I was associated with GPSC group, where I worked in close association with Dr. S. K. Datta and Ms. K. S. Golda. Dr. S. K. Datta gave me all sorts of support both academic and non-academic. I learned various aspects of experimental techniques in nuclear physics including the physics motivation from Dr. S. K. Datta. Ms. K. S. Golda was generous enough to associate me in handling various equipments we came across during experimental set up which improved my experimental skills to a great extent. I am indebted to her for all sorts of support she extended at different stages of this work.

I thankfully acknowledge Dr. Santanu Pal for his advice, supervision and crucial contribution to this research work.

I am thankful to Prof. M. M. Gupta, Chairman, Department of Physics, PU, for providing me all necessary support and facilities during the course of this work.

I wish to thank Dr. A. Roy, Director, IUAC, for extending all the necessary support to carry out this work at the centre. I am grateful to him for the enlighting discussions and useful suggestions on different aspects of my thesis problem.

Seminars, group discussions and personal discussions with the physicists like Professor V. S. Ramamurthy, Dr. R. K. Bhowmik, Dr. S. Kailas, Dr. Alok Saxena, Dr. Ambar Chatterjee and Dr. Mihir Chatterjee enriched my understanding of the subject.
to a great extent.

I am grateful to my collaborators, Mr. P. Sugathan, Mr. R. P. Singh, Mr. Akl Jhingan, Mr. Pankaj Kumar, Dr. B. R. Behera, Dr. Ajay Kumar and Dr. S. Mand for extending their support during the experiment and analysis.

I would like to thank Dr. S. Chopra, Convenor, Accelerator User Committee (AUC) for the much needed help and support during the course of my work at IUAC. I am thankful to Mr. Rajan Joshi and Mr. Abhijit Sarkar for providing excellent quality pulsed beam during the experiments. The help received from Mr. E. T. Subramaniam on different computational aspects is acknowledged with thanks.

It is a pleasure to acknowledge the good company of my friends, Kamal, Chanchal, Tejinder, Kuldeep, Jaswinder, Gurwinder, Rajeev, Mohanty, Thakur, Praveen, Sunil, R hit, Mumtaz, Kuljeet, Vivek, Surender, Dinesh, Sathish, Shailender, Baba, Ramesh and many others for their constant moral support.

I am thankful to the technical, library, workshop and office staff of PU and IUAC who rendered support to me throughout this research work.

I gratefully acknowledge the help from the Pelletron staff during my experiments.

I would also like to thank the canteen staff of IUAC and PU hostel for providing nutritious food for these many years.

The financial support from Department of Science and Technology (DST), New Delhi and Council of Scientific and Industrial Research (CSIR), New Delhi during this work acknowledged.

Finally, I want to express my deepest gratitude to my parents and sisters for the love, support and encouragement, without which this work would not have taken this shape.

Date: 21/6/08

Chandigarh

(Hardev Singh)