## ACKNOWLEDGEMENTS

All praises to Almighty God, the Omnipotent, the Omnipresent, the most Merciful, the most Compassionate, the most Perfect and exalted among and of ever born on the surface of Earth, who is always torch of guidance and knowledge of humanity as a whole.

The work presented in this thesis was accomplished under the inspiring guidance, generous assistance and enlightened supervision of **Prof. N. L. Singh**, Department of Physics, The Maharaja Sayajirao University of Baroda, Vadodara. I express my deep sense of gratitude and respectful regards to him for putting me at ease and affectionately inspiring me during my research studies.

My sincere gratitude and thanks to **Prof.** Nikhil Desai, former Dean, Faculty of Science, The Maharaja Sayajirao University of Baroda for all the valuable support. I am thankful to **Prof. A.C. Sharma**, Dean, Department of Physics, Faculty of Science, The Maharaja Sayajirao University of Baroda for all the help during my stay in the department. I express my heartiest thank to **Prof. P. K. Mehta** for his cooperation and encouragement during this work. Thanks are also due to **Prof. C. F. Desai, Prof. D. K. Kanchan, Prof. J. P. Singh, Prof. S.** Mukharjee, Dr. M. B. Sureshkumar, Dr. D. G. Rathod, Dr. K. R. Jotania, Dr. Keyur Vyas, **Dr. Mitesh Sarkar, Dr. P. H. Soni and Shri N. V. Patel**, for their co-operation.

I am also grateful to The Maharaja Sayajirao University of Baroda, Vadodara for providing me infrastructure and research facility. I am thankful to the fellowship provided by UGC and CSIR, New Delhi.

I would like to thank each and every non-teaching staff of my Physics department for their timely help. I am also thankful to faculty office staff for all the help.

Valuable suggestions and constant support are greatly acknowledged and appreciated which I had during the discussions with **Dr. P. K. Khanna**, Dept. of Applied Chemistry, Defence Institute of Advanced Technology (DIAT), Govt. of India, Girinagar, Pune.

I thank Fr.Director- Inter University Accelerator Centre (IUAC), Dr Amit Roy for encouragement and financial support during my work and stay at the centre. I would like to express special gratitude and thanks to Dr. D. Kanjilal (Director-IUAC), Dr. D. K. Awasthi, Dr. S. Chopra, Dr. F. Singh, Dr. A. Tripathi and scientists for constant support and fruitful discussions extended to me during experimental work carried out at IUAC, New Delhi. I would like to thank **Dr. Ajay Gupta**, Fr. Center Director, IUC-UGC-CSR, Indore and **Dr.** V. Ganesan (Center Director, IUC-UGC-CSIR, Indore), **Dr. D. Alok Benerjee, Dr. Ram** Janay Choudhary, for providing laboratory facility. I would like to thank **Dr. V Shrinet** (ERDA, Vadoadara) and **Dr. Sunil Shah, Dr. Sanjeev kapoor** (DDU, Nadiad) for providing laboratory facility.

No work is accomplished without appreciation and healthy environment we receive from friends and well-wishers. I wish to record my deep gratitude to my colleague Dr. Sejal Shah, Dr. Bhagwati Bishnoi, Dr. Poonam Sharma, Dr. Anjum Qureshi, Dr. Dolly Singh, Dr. Devang Shah, Dr. Satish Pelagde, Dr. Prashant Kumar Rath, Ms. Anamika Panihari, Dr. Paresh Prajapati, Mr. Aditya Patel, Mr. Gaurang Patel, Mrs. Purvi Patel, Dr. Sagar Ambavale, Ms. Sangeeta Kishore, Dr. Kanti Bhambhariya, Mr. Gyansagar Patel, Dr. Nirali, Prajkata, Gargi, Dr. Nikit Deshmukh, Manishbhai and many others.

I am very much grateful for the moral support of my parents throughout the period of my research work. I am very indebted to them without whose help I could not have finished my work. Without their several sacrifices, it would not have been possible for me to accomplish whatever I have achieved in my life so far. I am short of words to express my deep gratitude to my Father (**Mr. Dilip Gavde**) and my dearest and most loving Mother (**Mrs. Nayna Gavde**), brother (**Mr. Kunal Gavde**) along with my dear and loving bhabhi (**Mrs. Pratibha Gavde**) and little **Nachiket** for their constant support throughout my thesis work and encouraged me to complete my work. I like to thank my relatives who support and motivate me throughout my work.

I also express deep gratitude to my in-laws and sister-in-law who also stood beside me in all hardships. I therefore would like to thank them from the bottom of my heart. I am very much thankful to my loving and caring Husband (*Mr. Sandeep Kulkarni*) whose constant support and encouragement has led me to complete my thesis. Finally I again thank to the almighty for giving such a supportive and loving family being with us in all the ups and downs of life.

C. P. Cleve

CHAITALI GAVADE

Date: 5/6/14

PLACE: VADODARA