I express my sincere gratitude to Dr K.V.R. Murthy, Reader in Applied Physics Department, who inspired me, encouraged and guided. The person, who is my guide, asked me to work hard which leads the work a reality in the form of thesis. I sincerely thank him and Dr.(Mrs.) Hema Latha Murthy for her constant support.

In this regard the keen interest taken in the progress of the work and valuable suggestions by Prof. T. R. Joshi (Former Head, Applied Physics Department) are greatly acknowledged with sincere thanks. I also extended my sincere thanks to Dr. A. J. Shah (Ex. Head) and Prof. V. N. Potbhare (Ex. Head) Applied Physics Department for their kind co-operation. I also thank the Dr. Arun Pratap, the Head Applied Physics Department for his valuable suggestions. I also thank Prof. S. M. Josi, the Dean, and Faculty of Technology and Engineering for his co-operation.

My sincere thanks are due to the Management and the Principal of the Vasavi College of Engineering, Hyderabad for their kind encouragement for allowing me to do Ph.D.

I sincerely acknowledge the help rendered by Dr. T. K. Gundu Rao, IIT, Mumbai for his help in getting the XRD of the samples. I thank Dr. M. P. Chougankar (EAD, BARC), Dr. S. S. Sanaye (RPAD, BARC) for his kind co-operation in performing some of the experiments. I thank Prof. Louis Rey laboratory, AERIAL Crt, Illkirch, France for providing the low temperature TL and X-ray irradiation experimental facility.

Thanks are due to the teachers of Applied Physics Department Dr. Y. H. Gandhi and Dr. B. S. Chakraborty for their suggestions.

I thank my research colleges M. Parmar, Y S. Patel, S. P. Pallavi and Rahul G. for providing friendly atmosphere.

Lastly I thank the non-teaching staff of Applied Physics Department for their kind co-operation. I thank all those who has made me to pass a tough time and made me to submit the thesis.
I also thank my colleagues at the Physics Department, Vasavi College of Engineering, Hyderabad for their co-operation for the last four years in completing the thesis.

Finally the author recalls his deep sense of gratitude to his parents Shri A. Parvateeswara Rao and Mrs. Lakshmi Sarojini.

I owe my success to my wife Mrs. Lakshmi and my son Mr. Praneeth and my daughter Deepika without whose inspiration, encouragement and help the work could not be completed.

A.S.Sai Prasad

Vadodara

Date: 12/10/2015