Acknowledgements

I would like to express my deep sense of gratitude to my Ph.D supervisors, Dr. Ameer Azam (Reader) and Prof. Rajendra Prasad, former Chairman, Department of Applied Physics, Z. H. College of Engineering and Technology, Aligarh Muslim University, Aligarh. They have shown me the path and lightened it for me through their useful suggestions, thorough discussion and interpretation of results. I would like to convey my sincere gratitude to Prof. Rajendra Prasad who introduced me to the subject and whose learned guidance and support at every step has helped me in the completion of this study. His indepth knowledge, meticulous attention to details, constant encouragement and lively criticism of this work done proved invaluable. I sincerely acknowledge that I have learnt the importance of keeping one self constantly updated and abreast of in the field.

I express my deepest gratitude to Prof. Alimuddin, Chairman, Department of Applied Physics, Z. H. College of Engineering and Technology, Aligarh Muslim University for providing me the experimental facilities for this work and to Prof. Javed Husain, Prof. K. M. Lal, Prof. Alim Hussain Naqvi, Dr. Shakeel Khan and Dr. M. K. Bhardwaj and all academic and non-academic staff of the Department of Applied Physics, Aligarh Muslim University for their constant support and help.

I am thankful to Dr. Amit Roy, Director, Inter University Accelerator Centre (IUAC) New Delhi, for providing experimental facilities at IUAC, for natural radioactivity measurements. I express my deepest gratitude to Dr. R. G. Sonkawade, Senior Scientist, IUAC, New Delhi for helping me in natural radioactivity measurements. I take this opportunity to express my deepest gratitude to Prof. D. Sengupta, Department of Geology and Geophysics, I.I.T. Kharagpur for his constant encouragement, moral support and many fruitful suggestions during the course of this thesis work. I am also thankful to him for providing me some samples of fly ash, rocks, soil and building construction materials.

I also wish to express my sincere thanks to Dr. R. Swarup, former Head Physics Department, D. S. College, Aligarh.
I wish to express my sincere thanks to all editors, publishers and their honorable referees who have published our research papers.

My sincere thanks are my seniors Dr. Rajesh Kumar, Dr. P. J. Jojo, Dr. A. K. Singh and Dr. Ashawani Kumar for their enlightening comments and suggestions during this work. Special thanks to my lab mates Mr. S. Asad Ali and Km. Menna Mishra for their support and help.

I remember with great pleasure to my friends Mukesh Babu, Dr. Shalendra Kumar, Dr. Dinesh Singh, Arun Pawar, Dr. Naseem A. Khan, Devendra Kumar, Rupesh Kumar, Hargyan Singh and Bindesh Kumar Dixit for making my days cheerful and enjoyable and also for encouragement from time to time.

I am grateful to University Grant Commission (UGC), Department of Science and Technology (DST), New Delhi. Council of Scientific Industrial Research (C.S.I.R.), New Delhi and Indian National Science academy, (INSA), Chennai for providing financial assistance.

None of this would have been possible without the constant support and encouragement of sister, brother and relatives and well-wishers throughout. I am really at the loss of words to express my obligation to my parents who have supported me all through and allowed me to work smoothly. This thesis owes most to them.

Lastly, I am in dearth of proper words to express my abounding feelings for my wife, Mrs. Shashi who has been a source of inspiration to me and my sons, Ayush Kumar Singh and Nikhil Kumar Singh for their understanding and cooperation shown. I miss very much my grand father who is no more by my side to share my moment of joy. I dedicate this thesis to my beloved family and to the sacred memory of my grand father.

(Ajay Kumar Mahur)