ACKNOWLEDGEMENT

I am indeed very much delighted to express my deep sense of gratitude and indebtedness to both of my research guide Dr. M. Ponnavaikko, the Vice-chancellor of the SRM University and co-guide Prof. T. Pradeep, Professor, Department of chemistry, Indian Institute of Technology Madras, for their valuable guidance and inspiring encouragement at all phases, right from the beginning, and throughout the tenure of my research work.

Dr. M. Ponnavaikko is known for his love for the fraternity of students of all faculties irrespective of the institution to which they belong to. His special interest is to enable me to pass through all the hurdles of my research work despite my incongruent age to undertake my academic pursuit for a research degree in nanoscience at the SRMU and also facilitate the use of external lab facilities of Raman spectroscopy, etc. at the Indian Institute of Technology, Madras. He encouraged me to work and be guided technically by Prof. T. Pradeep, Dept. of Chemistry, Indian Institute of Technology, Madras since 2005 for my spectroscopic studies and by providing me with the materials of natural diamonds needed for my research. I admire him as the icon of generosity and love for his students of SRMU, a globally recognized institution of higher education of scientific research.

Prof. T. Pradeep of IIT M is a real mentor who supported, motivated, nourished and directed me to bring out my hidden scientific potentials. I feel fortunate, blessed and proud to experience the guidance of such a renowned scientist and an innovator. I respect him for his excellent contributions in science and love him for his sacrifice, dedication and sincerity. He has always been the guiding force in my life who believed in my mental prowess and continuously activated my curiosity.

I offer my humble obeisance to both of my gurus, my role models who inspired me to dream, to work and to achieve my goal of a research degree. I admire them both for their passion for their work, their magical abilities to mould students to their best, and the empathy they exhibit, which has always encouraged me to move forward.
Besides, I owe my gratitude to Dr. M. Vijayan, Physics Dept. I.I.T. Dr. Satish V. Kailas of Indian Institute of Science, Bangalore and all other members of my D.C. committee for being interactive and to offer their useful suggestions during my research work. The suggestions and clarifications made during every evaluation time were helpful and beneficial to me.

I am also grateful to the Dean, Academic Research, Dr. Kasmir Raja, SRMU, for providing me a cordial research atmosphere in the University and also Mr. C. Gopakrishnan, Head, Nano Technology Research centre, SRMU including Dr. Shivaramakrishnan, a research associate for their technical co-ordination.

I would like to express my special thanks and gratitude to Dr. P. R. Sajanlal, a research associate at IIT M who was really the source of my energy to undertake all the experimental studies of probing into all my diamond samples for discovering the nano and sub-micron inclusions in them. His painstaking interest in an entirely different discipline of earth science and spectroscopic mineralogy with which he is not familiar is amazing as he bestowed more time for my work than for his own research. I was able to focus my observation and analysis by his uncanny interest and curiosity to probe into the inclusions that are to be explored and studied through Raman spectrometer, Scanning electron microscope and MALDI MS. His sincere dedication was really a divine gift amidst his own research work schedule requiring the use of the same instruments. My thanks are due to all other research associates who rescheduled their work to suit my convenience as and when needed.

Thanks are due to my collaborators of both SRMU and IIT M, for all the help and co-ordination extended to me during my research work.

I would like to express my profound gratitude to the Indian Institute of Technology Madras for providing me a wonderful learning environment. In science you are never on your own, especially when you are working in a group. I count myself fortunate to have been involved in such a fantastic group, Dr. TP group. It is my pleasure to express my personal thanks to the current and past students and colleagues;
Mr. Udaybhascraper, Mr. Soumabha Bag, Mr. Bootharaju, Mr. Kamalesh, Mr. Robin, Mrs. Banupriya, Mr. Anshup, Mr. Udhaya Sankar, Mr. Venkatesan and Mr. Selvakumar. Special thanks to Dr. P. R. Sajanlal and Mr. Antony, for their constant help during data acquisition, synopsis and thesis writing. A tremendous amount of help, out of every one’s busy schedule of work, was received by me during my research period. Life in such a group is a hybridization of diverse cultures from all parts our nation, with the beautiful and complex feelings of love and sharing, which may not often be put into black white nor expressed in words. Their support, encouragement and a parental approach shown to me is rare among rarer opportunities, which I was able to earn during my research work, since 2005.

I express my special thanks to my friends Dr. Sreeprasad, Dr. Samal, Mr. Anshup, Dr. Shibu and Dr. Habeeb Muhammed for their help and support throughout my Ph.D career. Special thanks are due to the young ladies of research from both the institutions from whom I enjoyed their affection and shared their good company.

I shall be failing in my duty if I do not thank my previous research group members, particularly Dr. Subramaniam, Dr. Sreekumaran, Mrs. Sajini Sreekumaran, Dr. Renjis, Dr. Jobin Cyriac, Dr. Rosemary, Mr. David and Ms. Lisha for their kindness and wonderful friendship. I extend my sincere thanks to Dr. Jobin for his fantastic companionship and co-operation in helping me whenever I faced any problems in handling computers, with internet connections, etc. I enjoyed their camaraderie and hospitality on every Saturday after the group meetings and it is one of the pleasant experience and treasure I found in IIT Madras.

In the domestic front, my heartfelt gratitude is due to my late parents, my maternal uncle for their blessings in pursuing a Ph. D at this age of 79. My special love and gratitude is to my wife Meenakshi for her undaunted support and encouragement to pursue my research objective in the evening of my life both at SRMU and IIT reenacting the scores of duties for her children with breakfast / lunch etc. for me which she made decades before. My heart and mind have been functioning well till now because of the love, affection and moral encouragement shown to me by her, my
son Srinivsan and my daughters, Mahalakshmi and Mirunalini and my daughter-in-law, Dr. Vasantha Vasan and my sons-in-law Janardhanan and Rajendran throughout my research work including all my grandchildren.

My wife Meenakshi is to be thanked profusely as she took care of my health and study facilities despite her poor health demanding periodic residential medical interventions and treatments.

Last but not the least, I humbly bow my head to Almighty of Gods of all faiths and to the unknown God entrenched deep into my heart for steering all my activities of my research objective unflinchingly and to rejuvenate my energy for carrying out the responsibilities of my research while caring for my duties to family.