ACKNOWLEDGEMENT

I take great pleasure in expressing my gratitude to all those who have helped and supported me during my research work.

I am very thankful to my supervisor and research guide, Dr. S. Ponnusamy, Professor, Department of Physics, SRM University, Kattankulathur, Chennai, whose encouragement, guidance and support from then initial to the final level enabled me to develop an understanding of the subject.

My profound gratitude to Dr. T. R. Pachamuthu, Chancellor, Prof. P. Sathyarayanan, Vice-Chancellor, Dr. T. P. Ganesan, Pro-Vice Chancellor, Dr. Murugesan Ponnavaiko, Provost, Dr. N. Sethuraman, Registrar, Dr. C. Muthamizhchelvan, Director (Faculty of Engineering and Technology), Dr. M. Balasubramanian, Director (Faculty of Science and Humanities), Dr. Narayana Rao, Director (Research) and Dr. S. V. Kasimir Raja, Dean (Research), SRM University, Kattankulathur, Chennai, for permitting me to undertake the research programme. Their support and encouragement enabled me to complete my research work successfully.

I owe my deepest gratitude to Dr. M. Balasubramanian, Principal, Valliammai Engineering College, SRM Nagar, Kattankulathur, Chennai, for his support and encouragement.

The encouragement and cooperation I received from Dr. D. John Thiruvadigal, Professor and Head, Department of Physics and other faculty members of Department of Physics, SRM University, Kattankulathur, Chennai is gratefully acknowledged. I sincerely thank Dr. H. Krishnan, Professor and Head and my colleagues Ms. K. Sarojini, Mr. B. Karthikeyan, Ms. Nithya Balaji, Dr. K. Thiruppathi and Ms. S. Gandhimathi, Department of Physics, Valliammai Engineering
College, SRM Nagar, Chennai for their support and encouragement. I am thankful for the help rendered by Dr. Charles C Kanagam, Professor and Head, Dr. G. Ramachandran, Mr. L. Devaraj Stephen, Department of Chemistry and Mr. P. Mathivanan, Department of Mechanical Engineering, Valliammai Engineering College, SRM Nagar, Chennai.

This thesis would not have been possible without the help of Dr. K. P. Bhuvana, Technical officer, CIPET, Guindy, Chennai, Dr. A. Sekar, Department of Physics, Loganatha Narayanasamy Govt. Arts College, Ponneri, Chennai.

My thanks to Dr. K. Sivakumar, Professor and Head, Dr. S. Ganeshan, Professor and Mr. R. Jagan, Department of Physics, Anna University, Chennai, for their help in single crystal analysis and characterization studies. I am also thankful to Dr. R. Jayavel, Director, Nanotechnology, Anna University, Chennai and Dr. B. Palanivel, Professor and Head, Department of Physics, Pondicherry Engineering College, Pondicherry for their valuable advice and suggestions.

I would like to thank Dr. P. K. Das, Professor and Dr. Martin Britto Dhas, Mr. D. Mahesh, Department of Inorganic and Physical Chemistry, II Sc., Bangalore for SHG studies. I am grateful to my friends Mr. V. Babu, Technical officer, Material Engineering and Mr. P. Suresh, research scholar, MRC, II Sc., Bangalore. I thank Dr. M. Basheer Ahamed, Professor, Dept. of Physics, B.S. Abdur Rahman University, Vandalur, Chennai, for Laser studies. My thanks also go to Dr. S. Jerome Das, Dept. of Physics, Loyola College, Chennai. Thanks also go to Mr. Y. Vincent Sagayaraj, St. Joseph’s College, Trichy.

I would like to acknowledge the support of Dr. Babu Varghese, Dr. K.V. Rama, Dr. M.S. Moni and Ms. Bhavani Kumar, SAIF, IIT, Chennai, the staff members of ICP section, CECRI, Karaikudi,
Nanotechnology Centre and SRM College of Pharmacy, SRM University for their help in completing the characterization studies. I sincerely thank Mr. A. Narayan, Mr. V. Ramkumar, Technical Officer Gr. I, Department of Chemistry, IIT, Chennai. I would also like to thank Dr. P. K. Datta, Professor, Mr. S. P. Singh and Mr. P. K. Pal, Department of Physics and Meteorology, IIT, Kharagpur, India.

My thanks also go to Dr. P. Rajendran, Librarian and all the staff of Library, SRM University and Dr. K. Sivasamy, Librarian, TRP Engineering College, Trichy. I am also thank Prof. S. Padmanabhan (Retired) and Dr. K. Anbazhagan, Professor and Head, Department of English and Foreign Languages, SRM University for their help and encouragement.

My thanks are also to Dr. M. Navaneethan, Research Institute of Electronics, Shizuoka University, Hamamatsu, Shizuoka, Japan, for his help. I am also grateful to Mr. M. Krishna Mohan, Ms. K. D. Nisha, Ms. V. Subhashini, Ms. B. Dhanalakshmi, Mr. P. Saravanan, Ms. J. Archana, Mr. R. Ramesh, Mr. M. Alagiri, Ms. S. Sohila, Ms. Meegana Ramani, Ms. G. Arthi, Ms. Arockia Jaya Yasmi Prabha, Mr. T. Prakash and all other research scholars in the Department of Physics, SRM University, Chennai for their cooperation.

Very special thanks to my parents, my wife A. Revathi and my wards A. Lakshmipraba, A. Ragunath and my family members who have been a constant source of support throughout my research work. Lastly, I offer my regards to all of those who supported me during the compilation of the thesis.

M. ANBUCHEZHIYAN