ACKNOWLEDGEMENTS

It is my gratitude and pleasure, I wish to acknowledge my research guide Dr. A. Ilangoovan, Professor, School of Chemistry, Bharathidasan University, Tiruchirappalli-620024 for his enthusiastic guidance, unflinching support and profound understanding during my Ph.D course. His remarkable scientific abilities, hard working and friendly advice are always an inspiration helped me to reach this stage. It is indeed a great pleasure and privilege for me to be under his tutelage during this valuable period of learning in my life. I would like to extend my gratitude for the great degree of independence and freedom to explore.

I am grateful to Dr. M. Nallu, Retired Professor, School of Chemistry, Bharathidasan University, Tiruchirappalli for his keen interest, constant advice, encouragement, interest in my personal welfare and continuous support during my research program.

I am indebted to Dr. S. Thamodharan, Assistant Professor, SASTRA University, Tanjur for his valuable suggestions during the course of my Ph.D. I am also thankful to Dr. S. Dhanuskodi, Professor & Head, School of Physics, Bharathidasan University, Tiruchirappalli-620 024 for helping to study SHG activity. I am very much thankful to Prof. M. Sundararaman, Department of Marine Biotechnology, Bharathidasan University, Tiruchirappalli-620024 for helping to evaluate antimicrobial activity.

I am very much grateful to Dr. K. Ramamoorthy, Retired Professor, School of Physics, Bharathidasan University and Dr. R. Ramesh Babu, Assistant Professor, School of Physics, Bharathidasan University for their valuable suggestions during my doctoral committee meeting.

I thank Dr. P. Thomas Muthaiah, Head, School of Chemistry, Bharathidasan University for his support. I take this opportunity to thank some of my former teachers Prof. M. Palaniandavar, Prof. P. Venuvanalingam, Prof. R. Renganathan, Prof. S. Arunachalam, Prof. R. Ramesh and faculty members, Prof. S. Muthusamy, Dr. K. Srinivasan and non-teaching staffs, School of Chemistry, Bharathidasan University for their help and support.
It gives me a great pleasure to express my thanks to my colleagues at the School of Chemistry Dr. R. Ganesh Kumar, Dr. S. Malayappasamy, Mr. S. Saravanakumar, Mr. K. Anandhan, Mr. P. Sakthivel, Mr. G. Satish and Mr. Ashok Polu who have rendered their assistance whenever needed without a selfish cause.

I thank UGC-SAP (DRS-III), DST-FIST, COSIST for providing instrumentation facilities at School of Chemistry, Bharathidasan University, Tiruchirappalli-620024.

I am highly indebted to Dr. T. Seethalakshmi and Dr. T. V. Sundar for their constant encouragement, inspirations and moral support. I wish to thank my friends Dr. K. Balasubramani, Dr. K. Thanigaimani, Dr. Ganga, Dr. Kannan, Mr. Paraman, Dr. Suguna, Dr. Subhashini, Ms. Subha, Mr. Rajesh, Mr. D. Mahamuni for their constant support.

I thank all the Research Scholars and Students of School of Chemistry, Bharathidasan University, Tiruchirappalli-620024 for their help and support.

I am thankful to Mr. M. Jhonson, Central Workshop, Bharathidasan University, Tiruchirappalli for his help in glass blowing and also Mr. S. Thangavel, for his help in supplying chemicals in time for the research work.

It is my duty to express my soulful thanks to all my school and college teachers and all my schools and the colleges.

This thesis would not have seen the light of the day without the moral support, love and affection from my beloved parents Mr. V. Perumal and Mrs. P. Palaniyammal and my family members Mr. Ramu, Mrs. Yasotha, Mr. Tiru, Mrs. Raji, Mr. Raja, Mr. Rajesh, Ms. Jeevitha, Mr. Mano, Mr. Senthil, Mr. Vicky, Mr. Samy, Mr. Sasi, Baby Rahesha.

Mr. P. VENKATESAN
GENERAL REMARKS

1. Nuclear magnetic Resonance spectra were recorded on AVANCE-400 MHz (Bruker) and spectrometer using tetramethylsilane (TMS) as the internal standard. Chemical shifts have been expressed in (δ) ppm units downfield from TMS. Selected data are reported as follows. Chemical shifts, multiplicity (s = singlet, d = doublet, t = triplet, q = quartet, m = multiplet, br = broadened, dd = doublet by doublet, dt = doublet by triplet and td = triplet by doublet), coupling constants (J in Hz) and assignments.

2. **Crystallography:** Good quality single crystals of for this study were used for data collection using a Bruker SMARTAPEX-II diffractometer at room temperature (296 K) equipped with graphite-monochromatic Mo-KR radiation (λ = 0.71073 Å). Integration and cell refinement were carried out using Bruker SAINT. The absorption corrections were performed by multi scan method using SADABS. The molecular structures were solved by direct methods (SHELXL-97) and refinement by full-matrix least-squares on F² (SHELXS-97). The non-hydrogen atoms were refined anisotropically. The hydrogen atoms involved in hydrogen bonding were located in electron-density maps. While the other hydrogen atoms were placed in their geometrically idealized positions and constrained to ride on their parent atoms. The program PLATON was used to generate hydrogen bond table, while MERCURY was used for all graphical representation of the results.

3. The mass spectra were recorded on Agilent LC/MSD SL 1100 instrument with electrospray ionization technique. The elemental analysis was performed on Thermo Finnigan EA 1112 CHN analyzer.

4. Optical rotations were measured with a Jasco Dip 300 digital polarimeter at 25 °C.

5. Melting points were recorded on Buchi 545 melting point apparatus and are uncorrected.

6. All evaporations were carried out under reduced pressure on Buchi rotary evaporator at below 50 °C.
All solvents and reagents were purified and dried by standard techniques.

All the reactions were monitored by analytical thin layer chromatography using E-Merck silicagel plates (60G-254). Visualization was accomplished with UV light (254 nm), iodine.

Nomenclature mentioned in the experimental section was adopted from ACD/Name version 1.0 β, Advanced Chemistry Development Inc., Toronto, Canada.

Room temperature = 25-27 °C.

Brine means saturated aqueous NaCl solution.

60-120 Mesh silica gel is generally denoted as ‘silica gel’.