

Acknowledgments

My PhD years at the Department of Physics, Cochin University of science and Technology, Cochin and this thesis has had mentorship from numerous outstanding individuals both from within the university and outside of it. When I look back, I realize that I have worked with a great number of people whose contribution in assorted ways to the research and the making of the thesis deserved special mention. It is a pleasure to convey my gratitude to them all in my humble acknowledgment.

First and foremost I would like to express my deep and sincere gratitude to my supervising guide Prof. M. Junaid Bushiri for his expertise shown in guiding my work and the willingness to share his knowledge and experience.

I express my sincere thanks to Prof. S. Jayalekshmi, Head, Department of Physics and all the former Heads of the Department - Prof. M. R. Anantharaman and Prof. B. Pradeep - for permitting me to use the research facilities in the Department. I would like to thank my doctoral committee member Prof. B. Pradeep and all the other teachers in Department of Physics.

I express my special gratitude to Prof. M. K. Jayaraj, Nanophotonic and Optoelectronic Devices laboratory, Department of Physics, CUSAT, for providing Raman and PL measurements under Department of science and Technology nanomission initiative programme. I am also thankful to him for providing an opportunity to work his laboratory as a part of MPhil course.

I am grateful to Prof. Vicente Munoz Sanjos and Prof. Carmen Martinez Tomas, Departamento de Fisica Aplicada y Electromagnetismo, Universitat de Valencia, Spain for their detailed constructive comments and support throughout this work.

I owe my most sincere gratitude to Prof. Alfredo Segura, Departamento de Fisica Aplicada-ICMUV, MALTA-ConsoliderTeam and Dr. Juan Angel

*Sans, Instituto de Diseo para la Fabricacin y Produccin Automatizada, MALTA
ConsoliderTeam, Universitat de Valencia, Spain for high pressure Raman and
PL measurements*

*I am greatly indebted to Dr. R. A. Sreekumar Departamento de Fisica
Aplicada y Electromagnetismo, Universitat de Valencia, Spain for SEM mea-
surements.*

*I express my sincere thanks to Dr. Senoy Thomas, Chemnitz University of
Technology, Germany for SQUID-VSM measurements.*

*I was delighted to the fruitful discussion with Dr. Hysen Thomas, Depart-
ment of Physics, CUSAT about Rietveld refinement analysis.*

*I would like to extend my thanks to Prof. T. Pradeep, IIT Madras for TEM
measurements. I thank Dr. Shibu M Eappen and Mr. Adarsh at SAIF STIC
for SEM measurements.*

*I express my sincere thanks to Dr. Nandakumar Kalarikkal and Miss. Anju,
Dept. of Physics, MG University, Kottayam, India for HRTEM measurements.*

*I would like to thank Mr. Presanth, Center for Nanosciences, Amrita In-
stitute, Cochin for XPS measurments.*

*I am thankful to all non teaching and library staff of the Department of
Physics, CUSAT for all the help and cooperation.*

*I am thankful to the University Grants Commission, the Government of
India for the Rajiv Gandhi National Fellowship.*

*I am indebted to my lab colleagues for providing a stimulating and fun filled
environment. I express my sincere thanks to my lab mates Sajan, Satheesh,
Sagar, Rasheed, Ganesh, Beena and Bini for their affection and invaluable help
extended towards me.*

*My time at Department of Physics, CUSAT was made enjoyable in large
part due to the many friends who have become a part of my life. I express my
special gratitude to all of them.*

*I treasure my friendship with Sreejesh, Priyesh, Satheesh Bhai and Aju villa
friends whom I got acquainted with at CUSAT.*

I record my deep and utmost gratitude to my family for their enduring support and encouragement.

Finally I thank all my well wishers and friends who have supported me in this venture. Above all, I thank God Almighty.

Vinod. R