Acknowledgements

In the innocent exuberance to delve deeper into the unfathomable sea and the glittering horizons of science, I pay glorious tributes to the galaxy of luminaries who have already illumined the track by their untiring explorations and invaluable inventions & have thus made going easier for me.

I humbly express my over-brimming gratitude to the divine reality whose unforeseen presence is exhibited in all our endeavours.

While acknowledging my deep sense of gratitude and reverence to all those who enabled me to make my thesis rendered attainable, the first and foremost are my teachers, Dr. K. K. Davoedt, Vice Chancellor, Arunachal University, Itanagar and Dr. D. T. Khathing, Head, Regional Sophisticated Instrumentation Centre, North Eastern Hill University, Shillong. I am indebted to them for their indefatigable supervision, exacting guidance and incessant encouragement that they provided with constancy that inspired me throughout the entire period of my research with them. I consider myself immensely fortunate to have them as my intellectual mentors.

My acknowledgement of gratitude is also due to Dr. D. Fink and Dr. M. Müller of Hahn Meitner Institute, Berlin for their keen interest in my work. I am indebted to them for effective and benevolent suggestions during the course of my research work. A very special feeling of acknowledgement goes to Prof. R. Brandt, Kernchemie, Philipps-University, Marburg, Germany for his encouragement during his short visit to India in 1998.

I extend my sincerest thanks to the scientific and technical staff of Hahn Meitner Institute, Berlin and Nuclear Science Centre, New Delhi for electron and heavy ion irradiation respectively. I am thankful to the scientific staff of Inter University Consortium, Indore for their generous cooperation in carrying out X-ray diffraction, A. C. Conductivity and Atomic
Force microscopy. I am grateful to the scientific staff of R.S.I.C & all the teachers of the Department of Chemistry and Physics, N.E.H.U. for making available to me all the facilities and amenities necessary for a befitting execution of my research work. I am thankful to the scientific staff of Institute of Physics, Bhubaneswar for allowing me to utilise the library facility available there.

I acknowledge the financial grant accorded in the form of Junior research fellowship by Department of Atomic Energy, Mumbai, India and in the form of Senior research fellowship by Council of Scientific and Industrial Research, New Delhi, India.

I wish to express my heartfelt gratitude to all my teachers for their encouragement throughout my career. I am very much indebted to all my seniors in the lab Dr. S. Ghosh, Dr. A. Kulkshresbita, Dr. D. Sinha and Mr. S.C. Kattiyar for their ingenious help. I take this opportunity to thank all my friends who always stood by me with a note of appreciation. I humbly thank Mrs. R. Divoedi and Mrs. N. Khathing for their motherly affection all along.

My abounding thanks are especially due to Sbyam, for his consistent encouragement and unstinted support. A special feeling of gratitude is for him for being with me in my crests and troughs.

I am beholden to all my family members my Dad, Mom, Munu and Tina, who have been a perpetual and abiding fountain of inspiration for me throughout my academic pursuits. The perennial blessings of my parents constitute my intellectual and spiritual strength.

07.10.2000

Rosaline Misbra
Shillong.