ACKNOWLEDGEMENTS

I am deeply indebted and grateful to my thesis supervisor Dr. Smruti Ranjan Mohanty for his support, encouragement and guidance during the entire Ph. D. period. The next person whom I want to thank is Prof. S. Buzarbarua, the founder director of CPP during which I was selected as JRF in this institute. I also offer my sincere thanks to Prof. P. K. Kaw, Director of IPR, Ahmadabad for the financial assistance and Prof. K. S. Goswami, the present Centre director of CPP-IPR for providing me the moral support and overwhelmed encouragement.

I also offer sincere thank to my group members of Plasma Focus lab namely Dr. N. K. Neog, Mr. M. K. D. Sarma for their support and help throughout my research activities. The help of other members namely Mr. N. Talukdar and Dr. T. K. Borthakur is also highly appreciated.

To Dr. M. Dey, the administrative officer, I express my deep sense of gratitude for valuable interaction during the research period and outside. I am thankful to the academic staff members of CPP-IPR, Dr. B. K. Saikia (Academic Dean), Dr. B. J.Saikia, Dr. M. Kakati, Dr. M. Chakravarty, Dr. S. Kaushik and Dr. P. J. Bhuyan, Dr. K. Rajkhowa, Dr. T. Kotoki for valuable academic discussion and otherwise.

I wish to offer sincere thanks to my friends namely Bharat, Bidyut, Aomoa, Partha, Akshaya, Rakesh, Asuman da, Nayan, Mridula, Nur, Samiran and Monirupa who always stand beside me in any academic and non-academic occasions. I also offer my thank to seniors namely Sangeeta bau, Sikhar da, Simanta da, Manas da, Mrinal da, Biswa da, Kamal da, Arindam da for various kind of interactions.

The co-operation and help provided by the office staffs of CPP-IPR is highly acknowledged. Among them my heartfelt thank goes to P. Deka, S. Sarma, T. Deka, A. Baishya, H.C. Hazarika, H.Sarma, A.Bujarbarua, P.Barua, G. D.Sarma, C.K.Sarma, J.Goswami, D. Kalita, M. Haloi, K. Deka, Lukendra, M. Talukdar, Prabhat da, Das and Hamanta.

The moral support provided by Prof. N. Nimai Singh, Head of Physics Department, Gauhati University and other faculties such as Prof. B. K. Sarma, Prof. D. K. Choudhury, Prof.
A. Gohain Barua, Dr. M. P. Bora, Prof. K. Borua and Prof. D. Sarkar of the same is gratefully acknowledged.

It gives me great pleasure to thank Dr. P. M. Raole, Dr. P.A. Rayjada, Dr. C.V. S. Rao from IPR, Ahmadabad for some academic discussions and co-operation. The helping hand of Dr. Paresh Barua, Dr. S. Verma of Delhi University in connection with AFM studies is gratefully acknowledged. My special thank goes to Dr. D. Mehta of Panjab University for EDXRF studies. The helping hand of Dr. S. Karmakar, Department of Instrument & USIC, G.U in connection with XRD studies is also acknowledged. The hardness testing carried out in association with Dr. Kanak Raj, IITG is also acknowledged. The SEM studies carried out at SAIF, NEHU with Dr. Sudip Dey is highly appreciated. The XRD studies with Dr. N. Adhikary of IASST are also acknowledged.

None of this would have been possible without the constant support and encouragement from my husband (Dr. K. Kalita), my mother, parents in-law, brothers- Rubu, Bubu, Siva da, sisters-Momi ba, Emi ba, Golapi, Gitanjali Bau and brothers in law- Nibir, Apurba, Maniram and other family members like Dhunu, Bashik, Abhijit, Dhiraj and Pinku. It is great moment to pay my respect and tribute to my father who had left me forever while I was in 8th standard. I am thankful to my relatives for their love and care. My sincere thank goes to one and all who have directly and indirectly helped me in preparing this thesis.

(Mousumi Bhuyan)
CPP-IPR, Sonapur