ACKNOWLEDGEMENT

An endeavor such as researching and writing a PhD thesis is such that it cannot be done alone. There are doubtless people who contributed, who have been overlooked below. If so, I offer sincere apologies and ask for corrections. Without any hesitation, the first acknowledgement here must go to my supervisor Prof. Arunabha Basumajumdar, Department of Chemical Technology (Ceramic Engineering Section), University of Calcutta, India for giving me the opportunity to be a part of his research group. I recognize that he is a preeminent professor and specialist as well as being a good person, providing me continuous support and guidance along the whole way of this work. He has set a positive example that is one I haven’t encountered many times in my life and one I will never forget.

I am also grateful to my Joint Supervisor, Dr. P. K. Maiti, Assistant Professor, Department of Chemical Technology (Ceramic Engineering Section), University of Calcutta, India for his uninterrupted help and advice in my day to day activities in the research work.

I would like to acknowledge my indebtedness to Dr. P. Kundu, Ex-Scientist, Central glass and Ceramic Research Institute, Calcutta, India for his guidance, valuable suggestions, fruitful advices, and endless encouragements throughout the work.

I would like to acknowledge my indebtedness to Mrs. (Dr.) Kaberi Das, Associate Professor, Government College of Engineering and Technology, India for differential thermal analysis (DTA) study and constant encouragement, suggestions and help during the entire course of the research work.

I wish to extend my deep and sincere gratitude to my respected teachers, Prof. P. K. Daspadar, Prof. T. K. Parya and Dr. Sunanda Mukhopadhyay, Dept. of Chemical Technology, University of Calcutta. This work could not have come to the present shape without their constant motivation, valuable suggestions and endless encouragement throughout the work.

I wish to recognize with thanks the sincere help rendered by Prof. Pravash Chandra Chakrabarti, Department of Metallurgy, Jadavpur University, for Vicker's hardness study and Mr. Vivek Narayan, Aditya Birla Insulator, Calcutta, India for modulus of rupture study. I wish to recognize with thanks the sincere help rendered by Dr. Debnamyan Jana, Department of Physics, University
of Calcutta for X-ray diffraction study.

I have enjoyed the company of many more people outside the lab: Tamashree Mahanti, Dr. Tushar Dhabal Das, Amit Das, Kashinath Bhattacharya, Soumen Kundu, Chittabratta Mal, Bijan Pal, Samit Majumdar, Md. Mabud Hossain, Sunil Rana, Pradyout Koley, Suman Roy, Parthasarathi Roy, Sanjib Kabi, S. K. Neogi, Chanchal Hazra to name a few for their inspiration.

This research work has been supported by Rajib Gandhi National Fellowship under the University Grant Commission, New Delhi, India.

My indebtedness is also due to my parents and other relatives who brought me up with meticulous care and affection to shape my future career.

Calcutta
March, 2012

(Amit Mallik)