

ACKNOWLEDGEMENTS

I wish to express my sincere sense of respect and personal gratitude to my supervisor Prof. Devendra Kumar, Department of Ceramic Engineering, Indian Institute of Technology (Banaras Hindu University). It has been a great privilege to work under his able guidance. His extraordinary personality, kind cooperation, and constant encouragement have been the impetus behind this work. I also want to express my sincere gratitude to Prof. Om Parkash (Department of Ceramic Engg.), Prof. R. B. Rastogi (Department of Chemistry) and Dr. P. K. Roy (Department of Ceramic Engg.) Indian Institute of Technology (Banaras Hindu University) for their encouragement, guidance, and availability whenever it was needed.

I would also like to extend my heartiest thanks to the teaching faculty of Department of Ceramic Engineering Prof. Ram Pyare, Prof. S. P. Singh, Dr. Anil Kumar, Dr. Vinay Kumar Singh, Dr.(Mrs.) Kalyani Mohanta, Mr. Amar Nath, Dr. Manas Ranjan Majhi, Dr. Akansha Dwivedi, Dr. Santanu Das, Dr. Preetam Singh, Dr. Mohammad Imteyaz Ahmad, Dr. Ashutosh Kumar Dubey and Dr. Bhupendra Singh for their kind cooperation and support during my Ph.D. work.

I am thankful to all the ministerial and technical staffs especially Mr. I. A. Khan, Mr. Ashish Tripathi, Mr. Bhagmal Singh, Mr. Shailendra, Mr. Pawan Kumar, Mr. Krishan Gopal, Mr. Munnalal, Mr. Kashi Nath Vishwakarma, Mr. Mansa Ram, Mr. Pankaj Kumar Singh, Mr. R. P. Singh and Mr. Rajkumar Mishra (Department of Ceramic Engg.) for different technical and other assistance during my research work. I would also like to extend my heartiest thanks to Prof. Rajiv Prakash (Prof.- in-charge, CIFC) and his technical team (especially Mr. Girish Sahu, Mr. Nirmal Mallick, Mr. Akhilesh and Mr. Vinay) for providing the research facilities. I would also like to thank Dr. K. K. Singh and his research team (Department of Metallurgical Engineering) for providing the tube furnace facility.

I am also thankful to my seniors Dr. Sitashree Banerjee, Mr. Pankaj Tripathi, Mr. Shukdev Pandey and Mr. B. N. Bhattacharjee for their kind cooperation during this work.

I would like to express my deep sense of gratitude to my friends and colleagues Rupali Singh, Preeti Kumari, Deepshikha, Sumedha Mukharjee, Suruchi Poddar, Akanksha Mishra, Meena Yadav, Ekta Purwar, Gargi Srivastava, Surbhi Saraswat, Swati Yadav, Manushi Gupta, Anuwedita Singh, Swati Sharma, Dr. Himanshu Ranjan Verma, and Prem Prakash for all their help and support during my stay at IIT(BHU). I would especially thank my friend Vaibhav Pandey for not only his help throughout my work but also making this journey unforgettable.

I am greatly indebted to my parents (Mr. Rajendra Prasad Singh and Mrs. Vidya Singh) and family members for always encouraging me and inspiring me emotionally to follow my dreams.

- Neera Singh