

ACKNOWLEDGEMENTS

I would like to express my deep sense of respect and personal gratitude to my supervisor **Prof. Om Parkash**, Department of Ceramic Engineering, Indian Institute of Technology (Banaras Hindu University). It has been a great privilege to work under his able guidance. His awe-inspiring personality, kind cooperation and constant encouragement have been impetus behind this work. I would also like to express my sincere gratitude to my co-supervisors **Prof. Devendra Kumar** (Department of Ceramic Engg.) and **Dr. Shail Upadhyay**, (Department of Physics), Indian Institute of Technology (Banaras Hindu University) who always encouraged me and assisted me whenever it needed.

I am also thankful to the teaching faculty of Department of Ceramic Engineering especially **Prof. Ram Pyare** (Head, Department of Ceramic Engg., I.I.T. (B.H.U.)) and **Prof. S. P. Singh** for their kind cooperation during the course of this work. I am also pleased to acknowledge the encouragement of **Dr. Anil Kumar, Dr. Vinay Kumar Singh, Dr. (Mrs.) Kalyani Mohanta, Mr. Amar Nath, Dr. Manas Ranjan Majhi and Dr. Pradip Kumar Roy**.

I would also like to extend my heartiest thanks to **Prof. Rajiv Prakash** and **Prof. Pralay Maiti** of School of Material Science and Technology, IIT (BHU) for providing me the research facilities in their School.

I am also thankful to **Prof. S. K. Pratihar**, Department of Ceramic Engineering, National Institute of Technology, Rourkela for extending the FESEM and EDAX facility of his institute. I am also thankful to **Dr. Shobit Omar**, Dept. of Materials Science & Engineering, Indian Institute of Technology, Kanpur for supporting me to learn some software.

I am thankful to all the technical staffs especially **Mr. I. A. Khan, Mr. Bhagmal Singh, Mr. Krishan Gopal, Mr. Munnalal, Mr. Kashi Nath Vishwakarma, Mr. Mansa Ram, Mr. Pankaj Kumar Singh, Mr. Ashish Tripathi, Mr. R. P. Singh and Mr. Rajkumar Mishra** of (Department of Ceramic Engg., IIT (BHU)) for different technical and other assistance during my research work.

I am also thankful to my seniors **Dr. Nitish Kumar Singh, Dr. (Mrs.) Namrata Singh, Mr. Vijay Kumar, Mr. Abhinav Shrivastav, Mr. Himanshu Tripathi, Mr. Shreevats Pandey, Mr. Anshuman Srivastava, Mr. Ajay Kumar, Mr. A. Sampath Kumar, Mr. Vikash Kumar Vyas and B. N. Bhattacharjee** for their kind cooperation during the course of this work. I would like to express my deep sense of gratitude to my batch mate **Mr. P. Hemanth Kumar and Mr. Pallav Gupta.**

I am also extremely thankful to my juniors especially **Pankaj Tripathi, Mr. Brij Bansh Nath Anchal, Mr. Sushobhan Kobi, Mr. Balwan Singh Poonia, Mr. Brijesh Gupta, Ms. V. Divya Bhargavi and Mr. Khagesh Tanwar** for their kind help and support during my stay in IIT (BHU).

I would like to thank to **almighty God Hanuman Ji** for providing me strength and courage to do this work.

I am greatly indebted to my **whole family** who blessed me to carry out my Ph.D. work with most sincerity.

Lastly, the **Ministry of Human Resources & Development and Department of Science & Technology, New Delhi** is gratefully acknowledged for providing me the financial assistance.

Place: Varanasi, INDIA

(Nandini Jaiswal)

Date: