ACKNOWLEDGEMENT

I wish to express my deep sense of respect and personal gratitude to my supervisor, 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 also want to express my sincere gratitude to my supervisors **Prof. Ram Pyare** and co-supervisor **Dr. M. R. Majhi** Department of Ceramic Engineering Indian Institute of Technology (Banaras Hindu University) who always encouraged me and assisted me whenever it needed. I would also like to thank Professors for his valuable suggestions, extending facilities and giving his valuable time for discussions whenever needed.

I am also thankful to the teaching faculty of Department of Ceramic Engineering especially **Prof. Devendra Kumar** (Head, Department of Ceramic Engineering Indian Institute of Technology (Banaras Hindu University)) and **Prof. Om Prakash** for their kind cooperation during the entire duration of my work. I am also pleased to acknowledge the encouragement of **Dr. Anil Kumar**, **Prof. Vinay Kumar Singh**, **Dr.** (Mrs.) Kalyani Mohanta, Mr. Amar Nath, Dr. Pradip Kumar Roy, Dr. Preetam Singh, Dr. (Mrs.) Akanksha Dwivedi, Dr. Mohammad Imteyaz Ahmad, Dr. Ashutosh Kumar Dubey and Dr. Santanu Das.

I am thankful to all the technical staffs especially Mr. I. A. Khan, Mr. Bhagmal Singh, Mr. Krishan Gopal, Mr. Ashish Tripathi, Mr. Munnalal, Mr. Kashi Nath Vishwakarma, Mr. Mansa Ram, Mr. Pankaj Kumar Singh, Mr. R. P. Singh, Mr. R.d. Yadav and Mr. Rajkumar Mishra of (Department of Ceramic Engineering Indian Institute of Technology (Banaras Hindu University)) for different technical and other assistance during my research work.

I am also thankful to my seniors **Dr. Vikash Kumar Vyas, Dr. Vijay Kumar and Dr. Abhinav Srivatava** for their kind cooperation during the course of this work. I would like to thank **Dr. Himanshu Tripathi**, School of Material Science and technology for his tremendous help and support in carrying out my experimental work.

I would like to thank my friend **Mr. Niraj Singh Mehta**, **Mr. Md. Ershad**, **Mr. Kumar Saurabh**. I am thankful to my family members who encourage me for the

higher studies and continuous source of inspiration, motivation and support my decision to do Ph.D. I am also greatly indebted to my uncle **Mr. Daya Shankar Yadav**, my mother **Mrs. Prema Devi** and wife **Mrs. Nidhi Yadav** to support my decision and cooperation. I am thankful to the all research scholar **Mr. Sunil Prasad, Mr. Mahendra Kumar, Mr. Vipul Saxena, Mr. Rishikesh Yadav, Mr. Sandeep Kumar Gautam and Mr. Akher Ali** Department of Ceramic Engineering Indian Institute of Technology (Banaras Hindu University).

Above all, I thank God for his love and care.

Date: