ACKNOWLEDGEMENT

I craving to articulate my deepest appreciation and genuine thanks to my supervisor **Dr. M.R. Majhi** and co- supervisor **Prof. V. K. Singh**, Department of Ceramic Engg, Indian Institute of Technology (Banaras Hindu University), Varanasi beneath whose precious leadership sustain and inspiration to inclusive my doctorate research work. The precious hours of argument and suggestion that I had with him have undeniably helped in enhancement my thoughts in the correctly direction for conquer the preferred objectives. I believe myself exceptionally fortunate for having the opportunity to be taught and work under his expensive supervision over the entire period of my association with him.

I desire to express my genuine thanks to Prof. D. Kumar, Head, Department of Ceramic Engg, Indian Institute of Technology (Banaras Hindu University), Varanasi for providing high-quality infrastructure facilities and motivational prop up.

I auxiliary express my thanks to all faculty members of the Department of Ceramic Engg, Indian Institute of Technology (Banaras Hindu University), Varanasi for their cooperation, technological support and suggestions.

I would like to articulate my genuine regards to Dr.H .L .Pramanik , External Subject Expert, Chemical Department and Dr. Anil Kumar , Department of Ceramic Engg, Indian Institute of Technology (Banaras Hindu University), Varanasi for his constructive discussion during my explore work.

I am indebted to Prof. Ram Pyare, Department of Ceramic Engg, IIT (BHU) for helping in shipping out the research work.

My sincere thanks to my lab mates and seniors for their cooperation and ever ready help. I am furthermore thankful to all the lab mates of the Department of Ceramic, Indian Institute of Technology (Banaras Hindu University), Varanasi for helping academic and nonacademic levels during my research work.

V

Next, I would like to recognize all my previous teachers, who conduct me towards the right track to reach the modern stage.

My genuine thanks to all my relations members and friends for their honest support and support to absolute my research work.

(Mr. Kumar Saurav)