

## DECLARATION BY THE CANDIDATE

I, Deepshikha Shekhawat, am certified that the work embodied in this Ph.D. thesis is my own bona fide work and carried out by me under the supervision of Dr. Pradip Kumar Roy from **23<sup>rd</sup> July 2014** to **9<sup>th</sup> May 2019** at the Department of Ceramic Engineering, Indian Institute of Technology (BHU), Varanasi. The matter embodied in this thesis has not been submitted for the award of any other degree/diploma.

I declare that I have faithfully acknowledged and given credits to the research workers wherever their work has been cited in my work in this thesis. I further declare that I have not wilfully copied any other's work, paragraphs, text, data, results, etc., reported in journals, books, magazines, reports dissertations, theses, etc., or available at websites and have not included them in this thesis and have not cited as my own work.

**Date :**

**Place : Varanasi**

**Signature of the Student**  
**(Deepshikha Shekhawat)**

## CERTIFICATE BY THE SUPERVISOR

It is certified that the above statement made by the student is correct to the best of our knowledge.

**(Dr. Pradip Kumar Roy)**  
**Supervisor**  
Assistant Professor,  
Department of Ceramic Engineering,  
Indian Institute of Technology (BHU),  
Varanasi - 221005, (U.P.), India

**(Prof. Rama Nand Rai)**  
**Co-Supervisor**  
Professor  
Department of Chemistry,  
Banaras Hindu University,  
Varanasi - 221005, (U.P.), India

**(Prof. Devendra Kumar)**  
**Signature of Head of Department**  
"SEAL OF THE DEPARTMENT"