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(Dr. Hiralal Pramanik)

Supervisor

Department of Chemical Engineering & Technology

Indian Institute of Technology

(Banaras Hindu University)

Varanasi -221005

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I, "**Pramendra Gaurh**", certify that the work embodied in this thesis is my own bona fide work and carried out by me under the supervision of "**Dr. Hiralal Pramanik**" from "July 2013 to Jan 2019" at the "Department of Chemical Engineering & Technology", Indian Institute of Technology, 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 works have been cited in my work in this thesis. I further declare that I have not willfully 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.

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

(Dr. Hiralal Pramanik)

Supervisor

Department of Chemical Engineering & Technology

Indian Institute of Technology

(Banaras Hindu University)

Varanasi -221005

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