Declaration

I hereby declare that the work presented in this Thesis titled *Characterization of Clay Ceramics based on reuse of Organic residue and Industrial wastes for Point of Use Water Filtration Application* submitted to the Indian Institute of Technology Jodhpur in partial fulfilment of the requirements for the award of the degree of Doctor of Philosophy, is a bonafide record of the research work carried out under the supervision of Professor Anand Krishnan Plappally. The contents of this thesis in full or in parts, have not been submitted to, and will not be submitted by me to, any other Institute or University in India or abroad for the award of any degree or diploma.

Amrita Kaurwar
P14ME007

Certificate

This is to certify that the thesis titled *Characterization of Clay Ceramics based on reuse of Organic residue and Industrial wastes for Point of Use Water Filtration Application*, submitted by *Amrita Kaurwar* (P14ME007) to the Indian Institute of Technology Jodhpur for the award of the degree of *Doctor of Philosophy*, is a bonafide record of the research work done by her under my supervision. To the best of my knowledge, the contents of this report, in full or in parts, have not been submitted to any other Institute or University for the award of any degree or diploma.

Anand K. Plappally
Ph.D. Thesis Supervisor

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List of Symbols

Symbol	*Description*
˚C	Degree Centigrade
R^2	Coefficient of Determination
s	Model Error
D_n^{α}	Value of Random Variable at Significance Level α
X_i,	Predictor Random Variable at Step i
σ_f	Flexural Strength
F_Q, F_q	Load at the Onset of Failure
L	Distance Between the Support Points
B	The Breadth of the Specimen
W	The width of the Specimen
σ_c	Compressive Strength of Sintered Ceramic
A_0	Initial Cross-Sectional Area
C_o	Initial Concentration of Arsenic
C_e	Final Concentration of Arsenic
V	Volume of Adsorbate
t	Time of Contact
q_t	Rate of Adsorption
q_e	Adsorption at Equilibrium
q_{max}	Maximum Adsorption
h	Initial Adsorption rate
k_f	Freundlich Constant related to Adsorption Capacity
n	Freundlich Constant related to Adsorption Affinity

List of Abbreviations

Abbreviation	*Full form*
AIRF	Advanced Instrumentation Research Facility
ASTM	American Standards for Testing of Materials
C	Clay
CC	Clay Ceramics
CGWB	Central Ground Water Board
CPCB	Central Pollution Control Board
CRT	Cathode Ray Tube
EDS	Energy Dispersive Spectroscopy
FCC	Ferrous additive based Clay Ceramics
FESEM	Field Emission Scanning Electron Microscope
FTIR	Fourier Transform Infra-Red Spectroscopy
IIT	Indian Institute of Technology
IR	Infrared Radiations
JNU	Jawaharlal Nehru University
MIP	Mercury Intrusion Porosimetry
MIT	Massachusetts Institute of Technology
MCC	Marble additive based Clay
MNIT	Malaviya National Institute of Technology
O	Organic filler (Saw dust)
Ph.D.	Doctor of Philosophy
S	Sawdust
SEM	Scanning Electron Microscopy
TFS	Thermo-Fisher Scientific
UNCHS	United Nations Human Settlements Programme
UNICEF	United Nations International Children's Education Fund
UTM	Universal Testing Machine
WHO	World Health Organization
XRD	X-Ray Diffraction
XRF	X-Ray Fluorescence