

***Ternary Layered Double Hydroxide for Remediation of Methyl
Orange and Congo Red***



Thesis submitted in partial fulfillment for the

Award of Degree

Doctor of Philosophy

By

Amit Bar

SCHOOL OF MATERIALS SCIENCE & TECHNOLOGY

INDIAN INSTITUTE OF TECHNOLOGY

(BANARAS HINDU UNIVERSITY)

VARANASI-221005

Roll No- 19111002

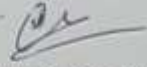
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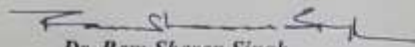
Dr. Chandan Upadhyay
Supervisor
Associate Professor
School of Materials Science and Technology
Indian Institute of Technology (BHU)
Varanasi, Uttar Pradesh, 221005

Associate Professor /सह-प्राचार्य
School of Material Science & Technology /पदार्थ विज्ञान एवं प्रौद्योगिकी स्कूल
Indian Institute of Technology /भारतीय प्रौद्योगिकी संस्थान
(Banaras Hindu University), Varanasi /काशी हिन्दू विश्वविद्यालय, वाराणसी



Dr. Akhilesh Kumar Singh
Head of the department
Professor
School of Materials Science and Technology
Indian Institute of Technology (BHU)
Varanasi, Uttar Pradesh, 221005

Coordinator /समन्वयक
School of Materials Science & Technology /पदार्थ विज्ञान एवं प्रौद्योगिकी स्कूल
Indian Institute of Technology /भारतीय प्रौद्योगिकी संस्थान
(Banaras Hindu University) / काशी हिन्दू विश्वविद्यालय, वाराणसी



Dr. Ram Sharan Singh
Co-Supervisor
Professor
Department of Chemical Engineering and Technology
Indian Institute of Technology (BHU)
Varanasi, Uttar Pradesh, 221005

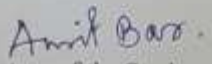
Dr. R.S. SINGH
Professor
Deptt. of Chem. Engg. & Tech.
IIT (B.H.U.), Varanasi

DECLARATION BY THE CANDIDATE

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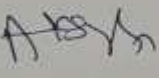

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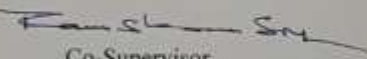
(AMIT BAR)

CERTIFICATE BY THE SUPERVISOR

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


Supervisor


Head of the Department


Co-Supervisor

Dr. Chandan Upadhyay
Associate Professor / सह-प्राचार्य
School of Material Science & Technology / परमर्ष विज्ञान एवं प्रौद्योगिकी स्कूल
Indian Institute of Technology / भारतीय प्रौद्योगिकी संस्थान
(Banaras Hindu University), Varanasi / काशी हिन्दू विश्वविद्यालय, वाराणसी

Prof. Akhilesh Kumar Singh
Coordinator / समन्वयक
School of Materials Science & Technology / परमर्ष विज्ञान एवं प्रौद्योगिकी स्कूल
Indian Institute of Technology / भारतीय प्रौद्योगिकी संस्थान
(Banaras Hindu University) / काशी हिन्दू विश्वविद्यालय, वाराणसी

Prof. Ram Sharan Singh
Dr. R.S. SINGH
Professor
Deptt. of Chem. Engg. & Tech.
IIT (B.H.U.), Varanasi

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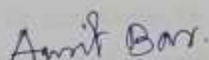
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Name & Signature of Research Scholar

Place: Varanasi

Date: 30.12.2024



Name & Signature and seal of Supervisor

Place: Varanasi

Date: 30.12.2024

Associate Professor/सह-शास्त्रकार
School of Material Science & Technology /सामग्री विज्ञान एवं प्रौद्योगिकी स्कूल
Indian Institute of Technology /भारतीय प्रौद्योगिकी संस्थान
(Banaras Hindu University), Varanasi /बनारस हिन्दू विश्वविद्यालय, वाराणसी



Name & Signature and seal of co-supervisor

Place: Varanasi

Date: 30.12.2024

Dr. R.S. SINGH
Professor
Deptt. of Chem. Engg. & Tech.
IIT (B.H.U.), Varanasi

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Date: 30.12.2024

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Amit Bar

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List of symbols and abbreviations

LDH	Layered Double Hydroxide
CLDH	Calcined Layered Double Hydroxide
LDO	Layered Double Oxide
MO	Methyl Orange
CR	Congo Red
MB	Methylene Blue
OII	Orange II
OG	Orange G
RR	Reactive Red
AR1	Acid Red
MG	Malachite Green
IC	Indigo Carmine
Rh-B	Rhodamine B
AB25	Acid Blue 25
AO7	Acid Orange
WHO	World Health Organization
pH	Potential of hydrogen
COD	Chemical Oxygen Demand
BOD	Biological Oxygen Demand
F ⁻ , Br ⁻ , I ⁻ , OH ⁻	Fluorine, Bromine, Iodine, Hydroxyl Ion
CO ₃ ²⁻ , NO ₃ ⁻ , SO ₄ ²⁻	Carbonate, Nitrate, Sulphate
TA	Thermal Activation
VS	Vinyl Sulphone
DO	Dissolved Oxygen
H ₂ O	Water
O ₂	Oxygen
Cl ₂	Chlorine
H ₂ O ₂	Hydogen Peroxide

ZIF	Zeolite imidazolate Framework
XRD	X-ray diffraction analysis
FTIR	Fourier Transform Infrared Spectroscopy
BET	Brunauer Emmett Teller
UV-vis	Ultraviolet-visible spectroscopy
TGA	Thermal Gravimetric Analysis
DSC	Differential Scanning Calorimetry
SEM	Scanning Electron Microscope
HRTEM	High Resolution Transmission Electron Microscope
EDS	Energy Dispersive X-ray Spectroscopy
CLDH	Calcined Layered Double Hydroxide
SWCNTs	Single-Walled Carbon Nanotube
TBP	Tributyl Phosphate
M ²⁺	Divalent Cation
M ³⁺	Trivalent Cation
d	Interplanar spacing
ATR	Attenuated Total Reflectance
KBr	Potassium bromide
FWHM	Full Width Half Maxima
CI	Crystallinity Index
ΔG	Gibbs Free Energy
ΔH	Enthalpy
ΔS	Entropy
R	Universal Gas Constant