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Sincerely,

Date:

Place: Tezpur University

Priyankamoni Saikia

(TZ203816 of 2021)



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CERTIFICATE FROM SUPERVISOR

This is to certify that the thesis entitled "*Study of the Sensing and Photocatalytic Potentials of Some Perovskite-Based Materials*" submitted to the School of Sciences, Tezpur University in partial fulfillment for the award of the degree of Doctor of Philosophy in Chemical Sciences is a record of research work carried out by **Ms. Priyankamoni Saikia** under my supervision and guidance. She has been duly registered (Registration No. TZ203816 of 2021), and the thesis presented is worthy of being considered for Ph.D. Degree.

All help received by her from various sources have been duly acknowledged. No part of this thesis has been submitted elsewhere for award of any other degree.

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This is to certify that the thesis entitled “*Study of the Sensing and Photocatalytic Potentials of Some Perovskite-Based Materials*” submitted to the School of Sciences, Tezpur University in partial fulfillment for the award of the degree of Doctor of Philosophy in Chemical Sciences is a record of research work carried out by **Ms. Priyankamoni Saikia** under my supervision and guidance. She has been duly registered (Registration No. TZ203816 of 2021), and the thesis presented is worthy of being considered for Ph.D. Degree.

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This is to certify that the thesis entitled "*Study of the Sensing and Photocatalytic Potentials of Some Perovskite-Based Materials*" submitted by **Ms. Priyankamoni Saikia** to the School of Sciences, Tezpur University in partial fulfillment of the award of the degree of Doctor of Philosophy in the Department of Chemical Sciences has been examined by us on _____ and found to be satisfactory.

The committee recommends for the award of the degree of Doctor of Philosophy.

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Abbreviations and Symbols

t	Tolerance factor
LCD	Liquid Crystal Display
K	Kelvin (temperature unit)
PMMA	Poly Methyl Methacrylate
MHP	Metal Halide Perovskite
FWHM	Full width at half maximum
nm	Nanometer
DMF	<i>N,N</i> -dimethylformamide
DMSO	Dimethyl sulfoxide
%	Percentage
FTO	Fluorine-doped Tin Oxide
ETL	Electron Transport Layer
HTL	Hole Transport Layer
cd A ⁻¹	Candela Ampere (Current efficiency unit)
PeLED	Perovskite-based light-emitting diodes
TPBi	2,2',2''-(1,3,5-Benzinetriyl)-tris(1-phenyl-1 <i>H</i> -benzimidazole)
°C	degree Centigrade
FRET	Forster resonance energy transfer
PET	Photoinduced electron transfer
UV	Ultraviolet
MIP	molecularly imprinted polymer
Å	Angstrom unit
RhB	Rhodamine blue
PL	Photoluminescence
Vis	Visible
ASV	anodic stripping voltammetry
μM	micromolar
cm	centimeter
hν	Energy input from light
e ⁻	electron
h ⁺	hole
eV	Electron volt

MBT	mercapto-benzothiazole
g	gram
μmol	micromole
UA	Uric Acid
ppm	parts per million
AA	Ascorbic Acid
MOF	Metal organic framework
mL	millilitre
FT-IR	Fourier Transformed Infra-Red
μL	microliter
XRD	X-ray diffraction
EDX	Energy Dispersive X-ray
h	hour(s)
XPS	X-ray Photoelectron Spectroscopy
FE-SEM	Field emission scanning electron microscopy
TEM	Transmission Electron Microscopy
SAED	selected area diffraction pattern
IR	Infra-Red
PLQY	Photoluminescence quantum yield
K _{sv}	Stern-Volmer constant
ppb	parts per-billion
ICT	Intermolecular Charge Transfer
ns	nanosecond
WHO	World Health Organization
M	Molarity
mmol	milli mole(s)
MHz	Mega-Hertz
Me	methyl
m	multiplet
mg	milli gram(s)
CTAB	Cetyl Trimethyl Ammonium Bromide
mL	milli litre(s)
SDBS	Sodium Dodecyl Benzene Sulfonate
TX-100	Triton X-100
THF	Tetrahydrofuran
PNCs	perovskite nanocrystals

OA	Oleic Acid
TRPL	Time-resolved Photoluminescence
CCTO	Calcium Copper Titanate
PTC	<i>p</i> -thiocresol
λ	wavelength
C	Concentration
A	Absorbance
BQ	Benzoquinone
OH \cdot	hydroxyl radical
O ₂ $^{\cdot-}$	superoxide
UV-Vis	Ultraviolet-Visible
w.r.t	with respect to

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