In

Memoriam

of my Father

Declaration of Academic Integrity

I do hereby declare that this thesis titled "***Development of Polymeric Organogels for the Removal of Toxic Pollutants from Water***" represents my ideas in my own words and where other's ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty, integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be caused for disciplinary action as per the rules and regulations of the Institute.

Due acknowledgement to all the related data used from different sources in order to support my research findings have been made wherever necessary. All funding agencies have been duly acknowledged for providing research grants to carry out my research work smoothly.

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She has fulfilled all the requirements for submitting the thesis for award of the Degree of Doctor of Philosophy in Science. 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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PFORM-XV

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REPORT OF EXAMINERS OF ORAL DEFENCE EVALUATION COMMITTEE

The examiners of Oral Defense Evaluation Committee (ODEC) certify that the thesis entitled **"Development of Polymeric Organogels for the Removal of Toxic Pollutants from Water"** submitted by **KANKANA BARUAH** [Regn No. **TZ 203897 of 2022**] to the Tezpur University in partial fulfillment of requirement of the Ph.D. degree in the discipline of **CHEMICAL SCIENCES** under the school of **SCIENCE** has been examined on **7th OCT. 2024** and recommend that **the degree be Awarded.**

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Forwarded to Controller of Examination

Signature of Head of the Department

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ABBREVIATIONS AND SYMBOLS

%	percentage
^{o}C	degree centigrade
µm	micrometer
Å	angstrom
λ_{max}	Absorbance maxima
π	pi
δ	delta
θ	theta
a.u.	arbitrary unit
cm	centimetre
As	Arsenic
AMPS	Acrylamido methylpropane sulfonic acid
AO	Acridine orange
APS	Ammonium persulphate
Al-MMT	Aluminium montmorillonite
BET	Brunauer-Emmett-Teller
C	carbon
C_i	Initial concentration
C_f	Final concentration
Cd	Cadmium
Co	Cobalt
Cr	Chromium
Cu	Copper
CBz	Chlorobenzene
CCl_4	Carbon tetrachloride
$CHCl_3$	Chloroform
CNF	Cellulose nanofibril

CR	Congo Red
CV	Crystal Violet
D	dipole moment
DCM	Dichloromethane
DEG	Diethylene glycol
DMA	Dimethylacetamide
DMF	Dimethylformamide
DMSO	Dimethylsulfoxide
DSC	Differential scanning colorimetry
DTG	Differential thermogram
eV	Electron volt
EBT	Eriochrome black T
EDX	Energy dispersive X-ray spectroscopy
EV	Ethyl Violet/ Ethyl purple
FPBA	Formylphenylboronic acid
FT-IR	Fourier Transform Infrared spectroscopy
g	gram
g/mol	gram per mole
G′	Storage modulus
G″	Loss modulus
hr	hour
Hg	Mercury
H-bonding	Hydrogen bonding
HCl	Hydrochloric acid
HRXRD	High resolution X-ray diffractometer
Hz	Hertz
IR	Infrared
kg	kilogram
K	Pottasium

k_1, k_2	rate constants
k_{id}	Intraparticle diffusion constant
K_F	Freundlich isotherm constant
K_L	Langmuir isotherm constant
K_T	Temkin isotherm constant
KBr	Pottasium bromide
log	Logarithm
ln	Natural log
L	litre
Li	Lithium
LMWGs	low molecular weight gelators
o/w	oil in water
mg	milligram
mL	millilitre
mmol	Milli molar
mol	mole
min	minute
M	molar
MB	Methylene blue
MCP	modified clay pani
MBA	Methylenebisacrylamide
MO	Methyl orange
MG	Malachite green
MMT	Montmorillonite
MPa	Mega pascal
MTBE	Methyl ter-butyl ether
MTMS	Methyltrimethoxysilane
MV	Methyl violet/ Gentian violet
MW	Molecular weight

nm	nanometre
N	nitrogen
Na	Sodium
Ni	Nickel
$NaHCO_3$	Sodium hydrogencarbonate
NCI	non covalent interaction
O	oxygen
Oh	octahedral
OH	Hydroxyl group
pH	potential of hydrogen
ppm	parts per million
p-TSA	para toluenesulfonic acid
PAni	Polyaniline
PDMS	Polydimethylsiloxane
Pb	Lead
POGs	polymeric organogelators
PPG	polypropyleneglycol
PVA	Polyvinyl alcohol
PVP	Polyvinyl pyrrolidone
PS	Polystyrene
Q_e	Adsorption capacity
q_e	adsorption at equilibrium
q_t	adsorption at given time
q_{max}	maximum adsorption
R^2	Regression coefficient
R_e	Removal efficiency
R_L	Separation factor
RB	Round bottom flask
RhB	Rhodium Blue

S	sulphur
SA	Stearic acid
SEM	Scanning Electron Microscopy
$t^{1/2}$	half life
Td	tetrahedral
T_d	Degradation temperature
T_{end}	End temperature
T_g	Glass transition temperature
T_m	Melting temperature
T_{max}	Maximum temperature
T_{onset}	Onset temperature
TDH	Tartaric acid dihydrazide
THF	Tetrahydrofuran
TGA	Thermogravimetric analysis
UV-Vis	Ultraviolet-visible
V	volume
w/o	water in oil
wt%	weight percentage
W	weight
W_D	Dried weight
W_S	Swollen weight
WCA	Water contact angle
XRD	X-ray diffractometer
XPS	X-ray photoelectron spectroscopy

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