

**Dedicated to.....**

*Maa-Deuta  
Dada and Mahi*

## **Declaration of Academic Integrity**

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Sincerely,

*Gorishmita Borah*

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(TZ132964 of 2013)

Place: Tezpur University

Date: 20-03-2023



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### CERTIFICATE FROM SUPERVISOR

This is to certify that the thesis entitled “**Phosponate functionalized N-heterocyclic carbenes and zirconium phosphate supported CdS quantum dots: Application in aerobic oxidation reactions**” 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. Gorishmita Borah** under my supervision and guidance. She has been duly registered (Registration No. TZ132964 of 2013) and the thesis presented is worthy of being considered for the 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.

Date: 20-03-2023

Place: Tezpur

Dr. Nayanmoni Gogoi

(Supervisor)

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## List of Abbreviations

g	Gram
mg	Milligram
mL	Milliliter
L	Liter
m	Meter
cm	Centimeter
mm	Millimeter
nm	Nanometer
Å	Armstrong
K	Kelvin
mol	Mole
mmol	Millimole
v	Stretching mode (FT-IR)
s	Second
$\sigma$	Sigma
br	Broad
$\lambda$	Wavelength
m	Medium
w	Weak
T	Temperature
<i>viz.</i>	Namely
<i>ca.</i>	About
<i>i.e.</i>	That is
<i>e.g.</i>	For example
m. p.	Melting point
NMR	Nuclear magnetic resonance
FT-IR	Fourier transform - infrared
AAS	Atomic absorption spectroscopy
EDS	Energy dispersive X-ray spectroscopy
UV	Ultraviolet
m/z	Mass to charge ratio

Me	methyl
H - bond	hydrogen bond
RT	room temperature
TGA	Thermo gravimetric analysis
XRD	X-ray diffraction
XPS	X-ray photoelectron spectroscopy
BET	Brunauer-Emmett-Teller surface area analysis
SEM	Scanning electron microscopy
TEM	Transmission electron microscopy
ICP	Inductively coupled plasma
EDX	Energy-Dispersive X-ray
TLC	Thin-layer chromatography
<i>p</i>	para
MAS NMR	Magic angle spinning nuclear magnetic resonance
CPMAS	Cross polarization magic angle spinning
MOF	Metal organic framework
THF	Tetrahydrofuran
DCM	Dichloromethane
ZrP	Zirconium phosphonate
NHC	N-heterocyclic carbene

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