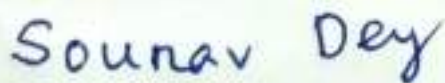


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to My
Beloved Parents

DECLARATION

I declare that the thesis entitled “**SYNTHESIS OF BIOACTIVE ORGANIC HETEROCYCLIC COMPOUNDS USING NOVEL CATALYSTS**” has been prepared by me under the guidance of Dr. Pranab Ghosh, Professor of Chemistry, University of North Bengal. No element of this thesis has formed the origin for the award of any degree or fellowship earlier.



.....
SOURAV DEY

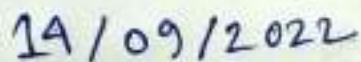
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SYNTHESIS OF BIOACTIVE ORGANIC HETEROCYCLIC COMPOUNDS USING NOVEL CATALYSTS A thesis submitted to the UNIVERSITY OF NORTH BENGAL For the award of DOCTOR OF PHILOSOPHY IN CHEMISTRY By SOURAV DEY (M.Sc in Chemistry) Supervised by Prof. PRANAB GHOSH DEPARTMENT OF CHEMISTRY UNIVERSITY OF NORTH BENGAL JULY 2022

Dedicated to My Beloved Parents

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about bioactive compound. The area of application of bioactive compounds are wide such as: plant science, modern pharmacology, geo-medicine, agrochemicals, cosmetics, food industry, nano-bioscience, etc. Thus it is a very promising area in full development, which has resulted in research works more and more numerous, designed to diversify the resources of bioactive compounds and improve their salvage pathways or synthesis. At first we need to prepare the synthesis of such bioactive compound. As their natural availability is not so promising, henceforth we feel to pursue our research interest to synthesize the precursor of bioactive compounds in a novel way. In Chapter II, it deals with green synthetic approach towards one pot multi component synthesis of hexahydroquinoline and 9-arythexahydroacridine-1,8- dione derivatives catalyzed by sulfonated rice husk. An efficient, straight

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PREFACE

Bioactive compounds have broad periphery of applications: plant science, modern pharmacology, geo-medicine, agrochemicals, cosmetics, food industry, nanobio-science... etc. Bioactive compounds contain chemicals that are found in small quantities in plants. As their natural availability is not so hopeful, researchers feel to prepare such compounds in a synthetic manner. The thesis starts with Chapter I, discussed about brief idea about the synthetic approaches towards the synthesis of heterocyclic moieties of bioactive heterocyclic compounds and brief idea about the heterogeneous catalyst for catalysis. Chapter II, deals with green synthetic approach towards one pot multi component synthesis of hexahydroquinoline and 9-arylhexahydroacridine-1,8-dione derivatives catalyzed by sulphonated rice husk. Chapter III, describes about convenient and greener route towards one pot multi-component synthesis of substituted pyrano-dichromeneo-dione and chromeno-pyrido-pyrimidinone derivatives using rice husk based heterogeneous catalyst. Lastly, Chapter IV deals with collective laboratory studies on one pot multi-component synthesis of a few varieties of heterocyclic compounds following greener approach using rice husk based greener catalyst.

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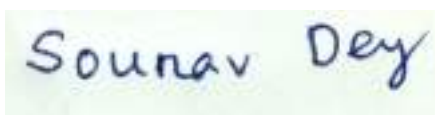
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A handwritten signature in blue ink on a light green background. The signature reads "Sourav Dey".

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Abbreviations

Å	Angstrom
Acac/acac	Acetylacetonate
AcOH	Acetic acid
°C	Degree Celsius
Cm	Centimeter
Cy	Cyclohexyl
d	Doublet
DBH	Dibenzoylhydrazine
DCE	1, 2-Dichloroethane
DCH	1,2-diaminocyclohexane
DMAP	4-dimethylaminopyridine
DME	1, 2-Dimethoxyethane
DMF	N, N-Dimethylformamide
DMSO	Dimethyl sulfoxide
Dppe	1, 2-Bis(diphenylphosphino)ethane
Dppf	1, 1-Bis(diphenylphosphino)ferrocene
DS	Dodecyle sulphate
Eqv.	Equivalent
EtOH	Ethanol

EDX ray	Energy dispersive X-
FT-IR	Fouriertransform infraredspectroscopy
g	Gram/grams
h	Hour/hours
HRMS	High-resolution mass spectroscopy
ILS	Ionic liquides
m	Multiplet
m	Meta
MHz	Mega hertz
min.	Minute/Minutes
mL	Milliliter
mmol	Millimole
MNP	Metal nao-particles
Mole%	Mole percent
mp	Melting point
MSAIm	3-methyl-1-sulphonic acid -imidazolium hydrogen sulphate
MW	Microwave
nm	Nanometer
NMR	Nuclear magnetic resonance
o	ortho
p	para
PEG	Polyethylene glycol

Ph	Phenyl
Pr	Propyl
RT/rt	Room temperature
s	Singlet
SEM	Scanning electron microscope
t	Triplet
t-BuOCl	tert-butyl hypochlorite
TEA	Triethylamine
TEMPO	(2,2,6,6-Tetramethylpiperidin-1-yl)oxyl
TfOH	Triflic acid
THF	Tetrahydrofuran
TLC	Thin-layer chromatography

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