

Dedicated to.....

*My Parents, and to all
those who had faith in me...*

Declaration of Academic Integrity

"I, Anurag Dutta, hereby declare that this written submission 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 and 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 cause for disciplinary action as per the rules and regulations of the Institute."

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CERTIFICATE FROM SUPERVISOR

This is to certify that the thesis entitled “**Development of "on-water" reaction strategies for the synthesis of N- and O- heterocycles using alkyl/arylidene barbiturates**” 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 **Mr. Anurag Dutta** under my supervision and guidance. He has been duly registered (Registration No. TZ167088 of 2016) and the thesis presented is worthy of being considered for the Ph. D Degree.

All help received by him, 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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LIST OF ABBREVIATIONS, ACRONYMS, AND SYMBOLS

Ac	Acetyl
Aq	Aqueous
Ar	Aryl
bp	Boiling point
br	broad
d	doublet
dd	doublet of doublet
DCE	Dichloroethane
DCM	Dichloromethane
DMAP	4-Dimethylaminopyridine
DMF	Dimethylformamide
DMSO	Dimethylsulphoxide
ESI	Electrospray ionisation
Et	Methyl
^1H	Proton
HRMS	High resolution mass spectrometry
IL	Ionic liquid
IR	Infra-red
<i>J</i>	Coupling constant
LAG	Liquid assisted grinding

m	Multiplet
M	Molar
MCR	Multicomponent reaction
MW	Microwave
Me	Methyl
mmol	millimol
NMR	Nuclear magnetic resonance
PTSA	<i>p</i> -Toluenesulphonic acid
ppm	parts per million
rt	Room temperature
s	singlet
t	triplet
TBHP	Tertiarybutyl hydroperoxide
TLC	Thin layer chromatography
TMS	Tetramethylsilane
δ	Chemical shift