

*This Thesis is
Dedicated to My
Beloved Parents*

DECLARATION

I declare that the thesis entitled "**SYNTHESIS AND CHARACTERISATION OF HOST-GUEST INCLUSION COMPLEXES FOR BETTER APPLICATIONS BY PHYSICOCHEMICAL TECHNIQUES**" has been prepared by me under the supervision of Dr. Mahendra Nath Roy, Professor of Chemistry, University of North Bengal. No part of the thesis has formed the basis for the award of any degree or fellowship previously.

Pranish Bomzan

Pranish Bomzan,

Department of Chemistry,

University of North Bengal,

West Bengal, Pin: 734013, India

Date: *20/06/2022*

UNIVERSITY OF NORTH BENGAL

ACCREDITED BY NAAC WITH GRADE A

PROF. (DR.) M. N. ROY

Awardee of One Time Grant from UGC,
Fest. Surabhi C. Amrita awardee from ICI,
Shiksha Ratna by Govt. of West Bengal
and
Bronze Medal from CSIR

Department of Chemistry

E-mail: mahendraroy2002@yahoo.co.in



ENLIGHTENMENT TO
PERFECTION

Phone: +91 353 2776381

Mobile: +91 94344 96154

Fax: +91 353 2699001

Darjeeling 734013, India

June, 2022

CERTIFICATE

I certify that Mr. Pranish Bomzan has prepared the thesis entitled "SYNTHESIS AND CHARACTERISATION OF HOST-GUEST INCLUSION COMPLEXES FOR BETTER APPLICATIONS BY PHYSICOCHEMICAL TECHNIQUES", for the award of Ph. D. degree from University of North Bengal, under my supervision. He has carried out the work at the Department of Chemistry, University of North Bengal.

Mahendra Nath Roy

DR. MAHENDRA NATH ROY,

Professor of Chemistry,

Department of Chemistry,

University of North Bengal,

Darjeeling: 734013,

West Bengal, India

Prof. (Dr.) M.N. Roy





FRSC (London), UK
Department of Chemistry
University of North Bengal
Darjeeling-734013, India

Date: 20-06-2022

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Pranish Bomzay 20/06/2022

Signature of the Candidate

Meladon Nath Roy
20-06-2022

Signature of the Supervisor

Prof. (Dr.) M.N. Roy
FRSC (London), UK
Department of Chemistry
University of North Bengal
Darjeeling-734013, India

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I am always aware of the huge debt that I owe to the sources of information required for my research work - the numerous books, monographs, articles, websites, etc. I put my gratitude to those whose publications I have cited in this thesis.

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Pranish Bomzan 20/06/2022

Pranish Bomzan

Research Scholar

Department of Chemistry

University of North Bengal

West Bengal, Pin: 734013, India

PREFACE

The research work described in this thesis entitled **“SYNTHESIS AND CHARACTERISATION OF HOST-GUEST INCLUSION COMPLEXES FOR BETTER APPLICATIONS BY PHYSICOCHEMICAL TECHNIQUES”** was started in January 2019 under the supervision of Prof. Mahendra Nath Roy in Department of Chemistry, University of North Bengal.

This research work involves thorough exploration of formation of host-guest inclusion complexes of various cyclodextrins and calixarenes with phytochemical compound, antiplatelet agent, sunscreen agent and amino acids by highly sophisticated calorimetric, spectroscopic techniques and various physicochemical methods. Besides this, biological activity, thermal stability, solubility, and photo stability of some inclusion complexes have also been investigated.

In the journey of this research work I was delighted to participate in various seminars/conferences across the country. I was highly nurtured and motivated by interacting with distinguished scientists and researchers, which helped me a lot in my research. I am also very happy to publish my research works described in this thesis in reputed international journals.

In writing this thesis all scientific observations of other researchers related to the concerned work have been duly acknowledged. I must admit the responsibility of any unintended exclusion and mistake, which might have crept in spite of insurances.

I expect further challenges in my life in order to exercise my earned knowledge for the development of the society.

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Effect on antimicrobial activity and cytotoxicity**



ELSEVIER

Journal of Molecular Structure, 1225 (2021) 129093

(Included in the Thesis)

2. **Inclusion of an antiplatelet agent inside into β -cyclodextrin for
biochemical applications with diverse authentications**



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Food Chemistry Advances, 1 (2022) 100015

(Included in the Thesis)

3. **Exploring β -CD grafted GO nanocomposites with an encapsulated
fluorescent dye duly optimized by molecular docking for better
applications**



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Journal of Molecular Liquids, 329 (2021) 115481

4. **An extensive investigation on supramolecular assembly of a drug
(MEP) with β -CD for innovative applications**



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Journal of Molecular Liquids, 344 (2021) 117977

5. Synthesis and Characterization of an Inclusion Complex of DL-Aminoglutethimide with β -Cyclodextrin and its Innovative Application in a Biological System : Computational and Experimental Investigations



ACS Omega, 2022, 7, 11208 – 11216

6. Probing Host–Guest inclusion complexes of Ambroxol Hydrochloride with α - & β -Cyclodextrins by physicochemical contrivance subsequently optimized by molecular modeling simulations



Chemical Physics Letters, 748 (2020) 137372

7. Inclusion of tyrosine derivatives with α -cyclodextrin in aqueous medium of various pH conditions by surface tension, conductance, UV-Vis and NMR studies



Journal of Molecular Liquids, 230 (2017) 104 – 112

8. Studies of solvation behaviour of LiI prevailing in diverse solvent systems conductometrically and spectrometrically supported by ab initio technique



Chemical Physics Letters, 671 (2017) 7 – 14

LIST OF SEMINARS/CONFERENCES ATTENDED

| Sl. No. | Seminar/Conference | Date/Year | Organizer and Venue | Role |
|----------------|---|-----------------------|---|---------------------|
| (1) | National Conference on "Environmental Determinism, Diverse Pollutions, Sources, and Controlling Management through Sciences and Humanities" | March 22-23, 2021 | Alipurduar University | Oral Presentation |
| (2) | National Seminar on "Frontiers in Chemistry" | March 05, 2020 | Department of Chemistry, University of North Bengal & CRSI North Bengal Local Chapter | Poster Presentation |
| (3) | SERB sponsored National Conference on "Green Chemistry : An Alternative of Conventional Chemistry" | September 20-21, 2019 | Coochbehar Panchanan Barma University | Poster Presentation |
| (4) | National Seminar on "Frontiers in Chemistry 2019" | 2019 | Department of Chemistry, University of North Bengal & CRSI North Bengal Local Chapter | Participation |

