

*This thesis is dedicated to my beloved parents,
my sister, and my husband.*

DECLARATION

I hereby declare that I prepared the thesis "**SYNTHESIS, CHARACTERIZATION AND APPLICATIONS OF SOME NANOPARTICLES SUPPLEMENTED WITH LIVING AND CHEMICAL SUBSTANCES**" under the supervision of Dr. Mahendra Nath Roy, Professor of Chemistry, University of North Bengal. No part of this thesis has previously been used to award a degree or fellowship.

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I thank God for giving me the strength and courage to complete this research journey.

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PREFACE

Under the supervision of Prof. Mahendra Nath Roy, the work in the thesis titled "**SYNTHESIS, CHARACTERIZATION AND APPLICATIONS OF SOME NANOPARTICLES SUPPLEMENTED WITH LIVING AND CHEMICAL SUBSTANCES**" was completed at the University of North Bengal's Department of Chemistry.

Nanochemistry is a hybrid of nanoscience and chemistry. Because of its physical, chemical, and electrical properties, nanochemistry is becoming more appealing to researchers. There are numerous applications for nanochemistry in materials science, medicine, biology, and engineering. This research work focuses on the synthesis of inorganic nanoparticles using green and chemical methods, as well as their biological applications.

During my research, I had access to a number of national and international seminars. The words of renowned scientists and experts greatly influenced and motivated me. Their research also inspired me to conduct my own.

Despite my precautions, I must accept responsibility for any misrepresentations or oversights.

I'm hoping that all of my research knowledge will prepare me to face any challenges that come my way.

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LIST OF PUBLICATIONS

1. Green Synthesis of Cu²⁺ doped ZnO nanoparticles to investigate their Structural, Optical, Morphological properties and Antifungal activities



(Included in Thesis)

***Published in Journal of Chemical, Biological and Physical Sciences**

JCBPS, Section A, January 2021, Vol. 11, No. 1, 066-081

2. Synthesis, Characterization, and Applications with the Manifestation of Antifungal Activity and Seed Germination Properties of Nickel Doped Zinc Oxide Nano platform by Biochemical Contrivance



ELSEVIER (Included in Thesis)

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3. Synthesis, Characterization and Visible Light Induced Photo-Degradation of Acid Orange II Dye in Aqueous Medium using a Novel Synthesized Al₂MoZnO₇ Nanocomposite



Journal of Advanced Chemical Sciences, Volume 6 Issue 2 (2020) 676-681

4. Green Synthesis of Iron Oxide Nanoparticles to Explore Cytotoxic Behaviour and to Diminish Environmental Pollution by a Novel Contrivance



Journal of Chemical, Biological and Physical Sciences, Section A, January 2021

Volume 11, No. 1, 147-170

5. Synthesis of β -Cyclodextrin Grafted Rhombohedral-CuO Antioxidant Nanozyme for Detection of Dopamine and Hexavalent Chromium through off-on Strategy of Peroxidase Mimicking activity



Microchemical journal, Volume 179, Issue 51, January 2022, 107514

6. Diverse Interactions of N-Methyl Glycine in Aqueous Paracetamol Solution with the Manifestation of Solvation Consequences



Journal of Advanced Chemical Sciences, Volume 4, issue 4 (2018) 601-605

7. Physicochemical and computational investigations of some food chemicals prevalent in aqueous 1-butyl-1-methyl-pyrrolidinium chloride solutions with the manifestation of solvation consequences



Journal of Molecular Liquids, Volume 353, Issue (10),

8. Probing Subsistence of Host Guest Inclusion Complexes of Oligosaccharides with Allopurinol for Regulatory Release with the Manifestation of Solvation Consequences



Journal of Advanced Chemical Sciences, Volume 5, Issue 1, (2019), 621-628

APPENDIX B

LIST OF SEMINAR/ CONFERENCE / WORKSHOP ATTENDED

1. International seminar on 'International year of the Periodic Table of Chemical Elements' -2019, 22nd-23rd November 2019. Organize by Dept. of Chemistry, University of North Bengal. (Poster presentation)
2. Two days national web-based conference on 'ENVIRONMENTAL DETERMINISMSM, DIVERSE POLLUTIONS, SOURCES AND CONTROLLING MANAGEMENT THROUGH SCIENCES AND HUMANITIES', 22nd and 23rd March, 2021. Organized by Alipurduar University. (Oral presentation)
3. Convention of Chemist and International Conference at Raipur, November 2019
4. SERB sponsored National conference on 'Green Chemistry: An Alternative of Conventional Chemistry' Organized by: Dept. of Chemistry, CBPBU, Cochbehar, West Bengal, India In association with Indian Chemical Society, Kolkata. Co-sponsored by – Antoon Paar India Pvt. Ltd, Date: 20th-21st September, 2019. (Poster presentation)
5. National Seminar on 'Frontiers in Chemistry-2020', March 5 2020, Organized by Dept. of Chemistry, University of North Bengal.