A NOVEL CHELATING CHEMOSENSOR FOR THE DETECTION OF TOXIC Cd^{2+} ION- A GREENER APPROACH

A Project report submitted to Research Centre of Chemistry,
FATIMA COLLEGE (Autonomous),
In Partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN CHEMISTRY

S. ABHISEKA

(REG.NO: 2022MSCC01)

Under the Guidance of

Dr. B. MEDONA, M.Sc., Ph.D.,
HEAD AND ASSOCIATE PROFESSOR

RESEARCH CENTRE OF CHEMISTRY
FATIMA COLLEGE (AUTONOMOUS)
Re-Accredited with A++ Grade by NACC
(CGPA: 3.61 in the fourth cycle)
Madurai-625018.

MARCH – 2024.

BONAFIDE CERTIFICATE

This is to certify that the project report entitled **"A NOVEL CHELATING CHEMOSENSOR FOR THE DETECTION OF TOXIC Cd^{2+} ION- A GREENER APPROACH"** Submitted to the Fatima College, Madurai in partial fulfillment for the award of the degree of **MASTER OF SCIENCE IN CHEMISTRY**. This is the record of research work done by **Ms. S. ABHISEKA** under the guidance of **Dr. B. MEDONA**, Head and Associate Professor, Research Centre of Chemistry, Fatima College, Madurai and submitted toResearch Centre of Chemistry, Fatima College, Madurai.

INTERNAL GUIDE

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EXTERNAL EXAMINER

Dr. B. MEDONA, M.Sc., Ph.D.,
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Research Centre of Chemistry,
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Madurai-625018.

DECLARATION

I do hereby declare that this dissertion entitled **"A NOVEL CHELATING CHEMOSENSOR FOR THE DETECTION OF TOXIC Cd^{2+} ION - A GREENER APPROACH"** has been carried out by **Ms. S. ABHISEKA (2022MSCC01)** in the PG Chemistry laboratory during 2023-2024 under the guidance of **Dr. B. MEDONA,** Head and Associate Professor. Research Centre of Chemistry, Fatima College, Madurai and this work or any part of this has not been submitted elsewhere for any other degree.

S. Abhiseka.

S. ABHISEKA

Reg No: 2022MSCC01

Place: Madurai.

Date: 26.03.2024.

ACKNOWLEDGEMENT

At first, I owe my faithful thanks to **Almighty God** for being with me in every moment of the career for sustaining me with his abundant grace and who is my strength of support in doing my research work.

We are grateful to **Dr. Sr. G. CELINE SAHAYA MARY,** Principal, Fatima College, Madurai for permitting us to carry out our project at Materials Research Center, Madurai and also, I would like to thank **Dr. Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

I Sincerely thank **Dr. B. MEDONA**, Head and Associate professor, Research Centre of Chemistry, Fatima College, Madurai for her constant support and encouragement in the successful completion of this project work.

My indebted thanks to my Internal Guide **Dr. B. MEDONA**, Head and Associate Professor, Research Centre of Chemistry, Fatima College, for her constructive and sustained interest towards each and every stage of this work and her valuable suggestions throughout my project work.

I record my sincere thanks to my teachers **Dr. M. PRIYADHARSANI, Dr. V. ARUL DEEPA and Dr. Mrs. J. JONE CELESTINA** Assistant Professors, Research Centre of Chemistry, Fatima College for their guidance and support for the successful completion of the work.

I would like to extend my thanks to my **LAB ASSISTANTS,** Research Centre of Chemistry, Fatima College, Madurai for their guidance and support for the successful completion of the work

I thank my beloved Mother **Mrs. S. MALARVIZHI** for her motivation and support during this project. I thank my Father **Mr. R. SUNDARARAJAN,** for giving me strength to chase my dreams and also for the successful completion of the work. Finally, I would like to extend my gratitude towards my **friends** for their support in carryingout this work successfully.

We acknowledge project fund received under **DST-CURIE core Grant** for Women PG Colleges **DST/CURIE-PG/2022/11**.

S. Abhiseka.

(S. Abhiseka)

2022MSCC01

Fabrication of Proton Conducting Primary Battery with Biomaterial (Cassia Auriculata) and Ammonium nitrate based membrane as an Electrolyte

A Project report submitted to Research Centre of Chemistry

FATIMA COLLEGE (Autonomous)

In Partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE IN CHEMISTRY

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(REG.NO: 2022MSCC02)

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MARCH - 2024

BONAFIDE CERTIFICATE

This is to certify that the project report entitled **"Fabrication of proton conducting primary battery with Biomaterial (Cassia Auriculata) and Ammonium nitrate based membrane as an Electrolyte"** was carried out by **Ms. S. AKILA** at Materials Research Center, Coimbatore under the guidance of **Dr. S. SELVASEKARAPANDIAN**, Director, Materials Research Center, Coimbatore & Emeritus Professor, Bharathiar University, Coimbatore and **Dr. S. SUKUMARI,** Associate Professor, The Research Centre of Chemistry, Fatima College, Madurai and submitted to The Research Centre of Chemistry, Fatima College, Madurai.

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EXTERNAL EXAMINAR

DECLARATION

I hereby declare that this project work entitled **"Fabrication of proton conducting primary battery with Biomaterial (Cassia Auriculata) and Ammonium nitrate based membrane as an Electrolyte"** has been originally carried out by **Ms. S. AKILA (2022MSCC02)** at Materials Research Center during the academic year, 2023 – 2024 and submitted to The Research Centre of Chemistry, Fatima College, Madurai in a partial fulfilment of the requirements for the award of **MASTER OF SCIENCE IN CHEMISTRY,** I also declare that this part of work has not been published earlier elsewhere in any manner.

S. AKILA

Place: Madurai

Date: 26/03/2024

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(REG. NO: 2022MSCC02)

ACKNOWLEDGEMENT

"GLORY TO GOD ALMIGHTY WHO GIVES US THE VICTORY"

We are grateful to **Dr. Sr. G. CELINE SAHAYA MARY**, Principal, Fatima College, Madurai for permitting us to carry out our project at Materials Research Center, Madurai and also, I would like to thank **Dr. Sr. M. FRANCISCA FLORA,** Secretary, Fatima College, Madurai for her prayers and blessings.

I thank **Dr. B. MEDONA**, Head and Associate Professor, The Research Centre of Chemistry, Fatima College, Madurai, for her constant support and encouragement in the successful completion of this project work.

I am greatly indebted to **Dr. S. SELVASEKARÂPANDIAN**, Director, Materials Research Center & Emeritus Professor, Bharathiar University, Coimbatore, for his constant support and supervisions throughout the project work and for initiating my interest in research. I owe a lot to him and express my deep sense of gratitude to him. I consider myself extremely fortunate to get an opportunity to work under him.

My indebted thanks to **Dr. S. SUKUMARI**, Associate Professor, The Research Centre of Chemistry, Fatima College, for her constructive and sustained interest towards each and every stage of this work and her valuable suggestions throughout my project work.

I thank **Ms. S. AAFRIN HAZAANA, Ms. R. MEERA NAACHIYAR, & Mr. N. MUNIRAJ@VIGNESH,** Research Scholars, Materials Research Center, Madurai for their constant support throughout this project.

I thank my beloved mother **Mrs. S. VENKADESWARI**, for her motivation and support during the project. I thank my father **Mr. G. SUNDARRAJAN** for giving me strength to chase my dreams. I would like to thank my friends for their valuable support.

We acknowledge project fund received under **DST CURIE** core Grant for **Women PG** colleges **DST/CURIE-PG/2022/11**

S. Akila

(S. AKILA)

FABRICATION OF A PRIMARY PROTON BATTERY USING CASSIA AURICULATA (AAVARAM POO) BASED MEMBRANE AS AN ELECTROLYTE

A Project report submitted to Research Centre of Chemistry,

FATIMA COLLEGE (Autonomous),

In Partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE IN CHEMISTRY

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MARCH - 2024

BONAFIDE CERTIFICATE

This is to certify that the project report entitled "**FABRICATION OF A PRIMARY PROTON BATTERY USING CASSIA AURICULATA (AAVARAM POO) BASED MEMBRANE AS AN ELECTROLYTE**" submitted to Fatima College, Madurai in partial fulfilment for the award of the degree of **MASTER OF SCIENCE IN CHEMISTRY.** This is the record of original project work done by **Ms. A. ARUL SHILPA** at Materials Research Center, Madurai under the guidance of **Dr. S. SELVASEKARAPANDIAN**, Director, Materials Research Center, Coimbatore and Emeritus Professor, Bharathiar University, Coimbatore and **Dr. S. SUKUMARI,** Associate Professor, The Research Centre of Chemistry, Fatima College, Madurai and submitted to The Research Centre of Chemistry, Fatima College, Madurai.

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EXTERNAL EXAMINAR

DECLARATION

I do hereby declare that this dissertation entitled **"FABRICATION OF A PRIMARY PROTON BATTERY USING CASSIA AURICULATA (AAVARAM POO) BASED MEMBRANE AS AN ELECTROLYTE"** has been carried out by **Ms. A. ARUL SHILPA (Reg.No: 2022MSCC03)** and submitted to The Research Centre of Chemistry, Fatima College, Madurai in a partial fulfilment of the requirements for the award of **MASTER OF SCIENCE IN CHEMISTRY,** during the academic year, 2023-2024.

A. Arul Shilpa

A. ARUL SHILPA

(Reg. No: 2022MSCC03)

Place: Madurai

Date: 26.05.2024

ACKNOWLEDGEMENT

"GLORY TO GOD ALMIGHTY WHO GIVES US THE VICTORY"

We are grateful to **Dr. Sr. G. CELINE SAHAYA MARY**, Principal, Fatima College, Madurai for permitting us to carry out our project at Materials Research Center, Madurai and also, I would like to thank **Dr. Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

I thank to **Dr. B. MEDONA,** Head and Associate professor, The Research Centre of Chemistry, Fatima College, Madurai for her constant support and encouragement in the successful completion of this project work.

I am greatly indebted to **Dr. S. SELVASEKARAPANDIAN**, Director, Materials Research Center, Coimbatore, for his constant support and supervision throughout the project work and for initiating my interest in research. I owe a lot to him and express my deep sense of gratitude to him. I considered myself extremely fortunate to get an opportunity to work under him.

My indebted thanks to **Dr. S. SUKUMARI,** Associate Professor, The Research Centre of Chemistry, Fatima College, for her constructive and sustained interest towards each and every stage of this work and her valuable suggestions throughout my project work.

I thank **Ms. S. AAFRIN HAZAANA, Ms. MEERA NAACHIYAR, Mr. N. MUNIRAJ@VIGNESH,** Research Scholars, Materials Research Center, Madurai for their constant support throughout this project work.

I thank my beloved Mother **Mrs. A. JESINTHA MARY** for her motivation and support during this project. I thank my Father late **Mr. M. ARULANDHU,** for giving me strength to chase my dreams. He will always be in my heart because in there he is still alive. And also I would like to thank my friends for their valuable support.

We acknowledge project fund received under DST CURIE core Grant for Women PG Colleges DST/CURIE-PG/2022/11.

A. Arul Shilpa.

(A.ARUL SHILPA)

FABRICATION OF PRIMARY PROTON CONDUCTING BATTERY USING CASSIA AURICULATA (AAVARAM POO) AS BIOMATERIAL BASED ELECTROLYTE

A Project report submitted to Research Centre of Chemistry, Fatima College (Autonomous), In Partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE IN CHEMISTRY

A. ARULSNEHA

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MARCH - 2024

BONAFIDE CERTIFICATE

This is to certify that the project report entitled "**FABRICATION OF PRIMARY PROTON CONDUCTING BATTERY USING CASSIA AURICULATA (AAVARAM POO) AS BIOMATERIAL BASED ELECTROLYTE**" submitted to Fatima College, Madurai in partial fulfilment for the award of the degree of **MASTER OF SCIENCE IN CHEMISTRY.** This is the record of original project work done by **Ms. A. ARULSNEHA** at Materials Research Center, Madurai under the guidance of **Dr. S. SELVASEKARAPANDIAN**, Director, Materials Research Center, Coimbatore and Emeritus Professor, Bharathiar University, Coimbatore and **Mrs. Dr. A. RAJESWARI,** Assistant Professor, Research Centre of Chemistry, Fatima College, Madurai and submitted to Research Centre of Chemistry, Fatima College, Madurai.

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EXTERNAL EXAMINER

DECLARATION

I do hereby declare that this dissertation entitled **"FABRICATION OF PRIMARY PROTON CONDUCTING BATTERY USING CASSIA AURICULATA (AAVARAM POO) AS BIOMATERIAL BASED ELECTROLYTE"** has been carried out by **Ms. A. ARULSNEHA (Reg.No:2022MSCC04)** and submitted to Research Centre of Chemistry, Fatima College, Madurai in a partial fulfilment of the requirements for the award of **MASTER OF SCIENCE IN CHEMISTRY,** during the academic year, 2023 – 2024.

A. ArulSneha

Place: Madurai

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(Reg. No: 2022MSCC04)

ACKNOWLEDGEMENT

"GLORY TO GOD ALMIGHTY WHO GIVES US THE VICTORY"

We are grateful to **Dr. Sr. G. CELINE SAHAYA MARY**, Principal, Fatima College, Madurai for permitting us to carry out our project at Materials Research Center, Madurai and also, I would like to thank **Dr. Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

I thank **Mrs. Dr. B. MEDONA,** Head & Associate professor, Research Centre of Chemistry, Fatima College, Madurai for her constant support and encouragement in the successful completion of this project work.

I am greatly indebted to **Dr. S. SELVASEKARAPANDIAN**, Director, Materials Research Center, Coimbatore, for his constant support and supervision throughout the project work and for initiating my interest in research. I owe a lot to him and express my deep sense of gratitude to him. I considered myself extremely fortunate to get an opportunity to work under him.

My indebted thanks to **Mrs. Dr. A. RAJESWARI,** Assistant Professor, Research Centre of Chemistry, Fatima College, for her constructive and sustained interest towards each and every stage of this work and her valuable suggestions throughout my project work.

I thank **Ms. S. AAFRIN HAZAANA, Ms. R. MEERA NAACHIYAR, Mr. N. MUNIRAJ@VIGNESH,** Research Scholars, Materials Research Center, Madurai for their constant support throughout this project work.

I thank my beloved Mother **Mrs. A. ARULSELVI** for her motivation and support during this project. I thank my Father **Mr. S. ARULRAJ** for giving me strength to chase my dreams. And also I would like to thank my friends for their valuable support.

We acknowledge project fund received under **DST CURIE** core Grant for **Women PG** Colleges **DST/CURIE-PG/2022/11.**

A. Arulsneha

(A. ARULSNEHA)

FABRICATION OF PRIMARY LITHIUM ION CONDUCTING BATTERY USING CASSIA AURICULATA (AAVARAM POO) AS BIOMATERIAL BASED ELECTROLYTE

A Project report submitted to Research Centre of Chemistry, Fatima College (Autonomous), In Partial fulfilment of the requirements for the degree of

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MARCH - 2024

BONAFIDE CERTIFICATE

This is to certify that the project report entitled "**FABRICATION OF PRIMARY LITHIUM ION CONDUCTING BATTERY USING CASSIA AURICULATA (AAVARAM POO) AS BIOMATERIAL BASED ELECTROLYTE**" submitted to Fatima College, Madurai in partial fulfilment for the award of the degree of **MASTER OF SCIENCE IN CHEMISTRY.** This is the record of original project work done by **Ms. A. DELICIA** at Materials Research Centre, Madurai under the guidance of **Dr. S. SELVASEKARAPANDIAN**, Director, Materials Research Center, Coimbatore and Emeritus Professor, Bharathiar University, Coimbatore and **Dr. A. RAJESWARI**, Assistant Professor, Research Centre of Chemistry, Fatima College, Madurai and submitted to Research Centre of Chemistry, Fatima College, Madurai.

S. Selvasekarapandian.

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S. Medona.

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EXTERNAL EXAMINAR

DECLARATION

I do hereby declare that this dissertation entitled "**FABRICATION OF PRIMARY LITHIUM-ION CONDUCTING BATTERY USING CASSIA AURICULATA (AAVARAM POO) AS BIOMATERIAL BASED ELECTROLYTE**" has been carried out by **Ms. A . DELICIA (Reg.No:2022MSCC05)** and submitted to Research Centre of Chemistry, Fatima College, Madurai in a partial fulfilment of the requirements for the award of **MASTER OF SCIENCE IN CHEMISTRY**, during the academic year, 2023 – 2024.

Place: Madurai

Date: 26.03.2024

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A. DELICIA

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ACKNOWLEDGEMENT

"GLORY TO GOD ALMIGHTY WHO GIVES US THE VICTORY"

We are grateful to **Dr. Sr. G. CELINE SAHAYA MARY**, Principal, Fatima College, Madurai for permitting us to carry out our project at Materials Research Center, Madurai and also, I would like to thank **Dr. Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

I thank **Dr. B. MEDONA,** Head and Associate professor, Research Centre of Chemistry, Fatima College, Madurai for her constant support and encouragement in the successful completion of this project work.

I am greatly indebted to **Dr. S. SELVASEKARAPANDIAN**, Materials Research Center, Coimbatore, for his constant support and supervision throughout the project work and for initiating my interest in research. I owe a lot to him and express my deep sense of gratitude to him. I considered myself extremely fortunate to get an opportunity to work under him.

My indebted thanks to **Dr. A. RAJESWARI,** Assistant Professor, Research Centre of Chemistry, Fatima College, for her constructive and sustained interest towards each and every stage of this work and her valuable suggestions throughout my project work.

I thank **Ms. S. AAFRIN HAZAANA, Ms. R. MEERA NAACHIYAR, Mr. N. MUNIRAJ@VIGNESH,** Research Scholars, Materials Research Center, Madurai for their constant support throughout this project work.

I thank my beloved Mother **Mrs. S. A. AMALI AROCKIA JOSEPHINE** for her motivation and support during this project. And also, I would like to thank my friends for their valuable support.

We acknowledge project fund received under **DST CURIE** core Grant for **Women PG** Colleges **DST/CURIE-PG/2022/11.**

A. Delicia.
(A. DELICIA)

FABRICATION OF PRIMARY LITHIUM ION CONDUCTING BATTERY USING CASSIA AURICULATA (AAVARAM POO) BASED MEMBRANE AS AN ELELCTROLYTE

A Project report submitted to Research Centre of Chemistry,
FATIMA COLLEGE (Autonomous),
In Partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE IN CHEMISTRY

M. DEVIKA

(REG.NO: 2022MSCC06)

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(CGPA: 3.61 in the fourth cycle)

MADURAI – 625 018

Under the guidance of

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COIMBATORE – 641 045

MARCH - 2024

BONAFIDE CETIFICATE

This is to certify that the project report entitled **"FABRICATION OF PRIMARY LITHIUM ION CONDUCTING BATTERY USING CASSIA AURICULATA (AAVARAM POO) BASED MEMBRANE AS AN ELECTROLYTE"** submitted to Fatima College, Madurai in partial fulfilment for the award of the degree of **MASTER OF SCIENCE IN CHEMISTRY.** This is the record of original project work done by **Ms. DEVIKA** at Materials Research Center, Madurai under the guidance of **Dr. S. SELVASEKARAPANDIAN**, Director, Materials Research Center, Coimbatore and Emeritus Professor, Bharathiar University, Coimbatore and **Dr. M. PRIYADHARSANI,** Assistant Professor, Research Centre of Chemistry, Fatima College, Madurai and submitted to Research Centre of Chemistry, Fatima College, Madurai.

M. Priya 4/3/24

INTERNAL GUIDE

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B. Fedona.

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EXTERNAL EXAMINER

DECLARATION

I do hereby declare that this dissertation entitled **"FABRICATION OF PRIMARY LITHIUM ION CONDUCTING BATTERY USING CASSIA AURICULATA (AAVARAM POO) BASED MEMBRANE AS AN ELECTROLYTE"** has been carried out by **Ms. M. DEVIKA (Reg.No:2022MSCC06)** and submitted to Research Centre of Chemistry, Fatima College, Madurai in a partial fulfilment of the requirements for the award of **MASTER OF SCIENCE IN CHEMISTRY,** during the academic year, 2023 – 2024.

M. Devika

Place: Madurai

Date: 26.03.2024

M. DEVIKA

(Reg. NO: 2022MSCC06)

ACKNOWLEDGEMENT

"GLORY TO GOD ALMIGHTY WHO GIVES US THE VICTORY"

We are grateful to **Dr. Sr. G. CELINE SAHAYA MARY**, Principal, Fatima College, Madurai for permitting us to carry out our project at Materials Research Center, Madurai and also, I would like to thank **Dr. Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

I thank **Dr. B. MEDONA,** Head and Associate Professor, Research Centre of Chemistry, Fatima College, Madurai for her constant support and encouragement in the successful completion of this project work.

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I thank **Ms. S. AAFRIN HAZAANA, Ms. R. MEERA NAACHIYAR, Mr. N. MUNIRAJ@VIGNESH,** Research Scholars, Materials Research Center, Madurai for their constant support throughout this project work.

I thank my beloved Mother **Mrs. M. UMARANI,** for her motivation and support during this project. I thank my Father **Mr. M. MURUGAN,** for giving me strength to chase my dreams. He will always be in my heart. And also I would like to thank my friends for their valuable support.

We acknowledge project fund received under DST CURIE core Grant for Women PG Colleges **DST/CURIE-PG/2022/11.**

M. Devika

(M. DEVIKA)

DEVELOPMENT OF NOVEL ORGANIC LIGAND FOR SENSING APPLICATION

A Project report submitted to Research Centre of Chemistry,
FATIMA COLLEGE (Autonomous),
In Partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN CHEMISTRY

INFANT NATALIA J

(REG.NO: 2022MSCC08)

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Madurai-625018.
MARCH – 2024.

BONAFIDE CERTIFICATE

This is to certify that the project report entitled **"DEVELOPMENT OF NOVEL ORGANIC LIGAND FOR SENSING APPLICATION"** Submitted to the Fatima College, Madurai in partial fulfillment for the award of the degree of **MASTER OF SCIENCE IN CHEMISTRY**. This is the record of research work done by **Ms. INFANT NATALIA J** under the guidance of **Dr. M. PRIYADHARSANI**, Assistant Professor, Research Centre of Chemistry, Fatima College, Madurai and submitted to Research Centre of Chemistry, Fatima College, Madurai.

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EXTERNAL EXAMINER

DECLARATION

I do hereby declare that this dissertation entitled **"DEVELOPMENT OF NOVEL ORGANIC LIGAND FOR SENSING APPLICATION"** has been carried out by **Ms. INFANT NATALIA J (2022MSCC08)** in the PG Chemistry laboratory during 2023-2024 under the guidance of **Dr. M. PRIYADHARSANI,** Assistant Professor, Research Centre of Chemistry, Fatima College, Madurai and this work or any part of this has not been submitted elsewhere for any other degree.

Infant Natalia .J

Place: Madurai.

Date: 26/3/2024

INFANT NATALIA J

Reg. No: 2022MSCC08

ACKNOWLEDGEMENT

I extend my first and foremost gratefulness to the god almighty and my parents for their blessings which plays a key role in the completion of the work.

I thank the Management and Principal, Fatima College, Madurai, for permitting me to carry out this project in Fatima College.

We are grateful to **Dr. Sr. G. CELINE SAHAYA MARY,** Principal, Fatima College, Madurai for permitting us to carry out our project at Research Center, Madurai and, I would like to thank **Dr. Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

I thank **Dr. B. MEDONA**, Head and Associate professor, Research Centre of Chemistry, Fatima College, Madurai for her constant support and encouragement in the successful completion of this project work.

My indebted thanks to **Dr. M. PRIYADHARSANI**, Assistant Professor, Research Centre of Chemistry, Fatima College, for her constructive and sustained interest towards each and every stage of this work and her valuable suggestions throughout my project work.

I extent my Profound thanks to **Dr. V. ARUL DEEPA**, Assistant Professor, Research Centre of Chemistry, Fatima College, for her great support and continuous help during the project work.

I express my heartful gratitude and sincere thanks to **Dr. J. JONE CELESTINA**, Assistant Professor, Research Centre of Chemistry, Fatima College, for her incredible effort and support during my project work.

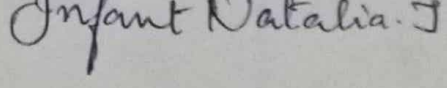
I also record my sincere thanks to all my department staff for their support and encouragement.

From the bottom of my heart, I extend my gratitude to my classmates and friends of Fatima College for their great support and constant encouragement.

I extent my deep sense of gratitude to my beloved Lab Assistances for their untired help during my project work.

We acknowledge project fund received under DST CURIE core Grant for Women PG Colleges DST/CURIE-PG/2022/11.

INFANT NATALIA J



SYNTHESIS AND CHARACTERIZATION OF COPPER(II) COMPLEX CONTAINING SCHIFF BASE LIGAND AND ITS BIOLOGICAL ACTIVITIES

A Project report submitted for partial fulfillment of the

requirement for the degree of

MASTER OF SCIENCE IN CHEMISTRY

Submitted By

Ms. J. Kanisious Mary

(Register No: 2022MSCC09)

RESEARCH CENTRE OF CHEMISTRY

FATIMA COLLEGE (AUTONOMOUS)

Re-Accredited with 'A++' Grade by NAAC (4th Cycle)

MARY LAND, MADURAI – 625 018

Under the Guidance of

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Associate Professor and Head

Department of Materials Science

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University with potential for excellence

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Madurai– 625021.

April – 2024

BONAFIDE CERTIFICATE

This is to certify that J. KANISIOUS MARY, M.Sc., (Chemistry) student of Fatima College, Madurai has done the project work entitled "**Synthesis and characterization of copper (II) complex containing Schiff base ligand and its biological activities**" during the academic year 2022-2024 under the supervision of **Dr. J. ANNARAJ**, Associate professor and Head, Department of Materials Science, School of Chemistry, Madurai Kamaraj University, Madurai– 625021. This is to certify that no part ofthe work has been presented for any degree / diploma in any other form.

INTERNAL GUIDE

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Assistant Professor,
Research Centre of Chemistry,
Fatima College
Madurai- 625018

EXTERNAL GUIDE

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Associate Professor and Head,
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School of Chemistry,
Madurai Kamaraj University,
Madurai- 625021

HEAD OF THE DEPARTMENT

Dr. B. MEDONA

Head & Associate Professor,
Research Centre of Chemistry,
Fatima College,
Madurai -625018.

EXTERNAL EXAMINER

DECLARATION

I do here by declare that this dissertation entitled "**Synthesis and characterization of copper (II) complex containing Schiff base and its biological activities"** submitted to Fatima College in partial fulfillment of requirement for the award of **MASTER OF SCIENCE IN CHEMISTRY**, is a record of original research work done by me. I also declare that this dissertation or part of work has not been published earlier elsewhere in any manner.

Place: Madurai

Date: 26.03.24.

J. Kanisious Mary

Signature of the Candidate

(J.Kanisious Mary-2022MSCC09)

ACKNOWLEDGEMENT

On the verge of completing my thesis, I extend my first and foremost gratefulness to the god almighty and my parents for their blessings which plays a key role in the completion of the work.

I have great pleasure in expressing my sincere thanks to management and the principal **Rev. Dr. Sr. G. CELINE SAHAYA MARY,** Fatima College, Madurai for giving me permission to do the project work in Madurai Kamaraj University, Madurai.

With great pride and pleasure, I express my deep sense of gratitude to my beloved mentor **Dr. J. ANNARAJ**, Associate professor and Head, Department of Materials Science, Madurai Kamaraj University, Madurai for the independence he gave me to choose the project in my area of interest, his valuable and never-ending support, inspiring guidance,ceaseless encouragement during each and every stage of my project work.

I express my deep respect and gratitude to **Dr. B. MEDONA** Associate Professor and Head, Research Centre of Chemistry, Fatima College for permitting to carry out the project work in Madurai Kamaraj University, Madurai.

I record my sincere thanks to my internal guide **Dr. B. VINOSHA,** Assistant Professor, Research Centre of Chemistry, Fatima College for her guidance and support for the successful completion of the project work.

I express my heartful gratitude and sincere thanks to **Dr.T.NAGENDRARAJ, Ms.S.VISHNUPRIYA, Ms.A.SHIVANI**, Research scholar, Department of Materials Science, School of Chemistry, Madurai Kamaraj University, Madurai. for the guidance and encouragement for completing this project successfully.

We acknowledge project fund received under DST CURIE CORE GRANT for woman PG colleges DST/CURIE-PG/2022/11.

I also record my sincere thanks to all my department staffs for their support and encouragement. From the bottom of my heart, I extend my gratitude to my classmates and friends of Fatima College for their great support and constant encouragement.

I am deeply indebted my family for their understanding, care, loveand unfailing support and encouragement.

J. Kanisious Mary.

(J. KANISIOUS MARY)

SYNTHESIS AND CHARACTERIZATION OF COPPER(II) COMPLEX CONTAINING SCHIFF BASE LIGAND AND ITS BIOLOGICAL ACTIVITIES

A Project report submitted to Research Centre of Chemistry,

FATIMA COLLEGE (Autonomous),

In partial fulfilment of therequirement for the degree of

MASTER OF SCIENCE IN CHEMISTRY

Submitted By

Ms. R. Karthika

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Madurai– 625021.

March - 2024

BONAFIDE CERTIFICATE

This is to certify that R. KARTHIKA, M.Sc., (Chemistry) student of Fatima College, Madurai has done the project work entitled'**Synthesis and characterization of copper(II) complex containing Schiff base ligand and its biological activities**" during the academic year 2022-2024 under the supervision of **Dr. J. ANNARAJ**, Associate professor and Head, Department of Materials Science, School of Chemistry, Madurai Kamaraj University, Madurai– 625021. This is to certify that no part of the work has been presented for any degree / diploma in any other form.

INTERNAL GUIDE

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Assistant Professor,
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Madurai- 625018

EXTERNAL GUIDE

Dr. J. ANNARAJ
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Madurai- 625021

Head of the Department

Dr. B. MEDONA
Head & Associate Professor,
Research Centre of Chemistry,
Fatima College,
Madurai -625018.

EXTERNAL EXAMINER

DECLARATION

I do here by declare that this dissertation entitled '**Synthesis and characterization of copper(II) complex containing Schiff base and its biological activities**' submitted to Fatima College in partial fulfillment of requirement for the award of **MASTER OF SCIENCE IN CHEMISTRY**, is a record of original research work done by me. I also declare that this dissertation or part of work has not been published earlierelsewhere in any manner.

R. Karthika.

Place: Madurai

Signature of the Candidate

Date: 26.03.2024

(R. Karthika-2022MSCC10)

ACKNOWLEDGEMENT

On the verge of completing my thesis, I extend my first and foremost gratefulness to the god almighty and my parents for their blessings which plays a key role in the completion of the work.

I have great pleasure in expressing my sincere thanks to management and the Principal **Rev. Dr. Sr. G. CELINE SAHAYA MARY,** Fatima College, Madurai for giving me permission to do the project work in Madurai Kamaraj University, Madurai.

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I record my sincere thanks to my internal guide **Dr. B. VINOSHA,** Assistant Professor, Research Center of Chemistry, Fatima College for her guidance and support for the successful completion of the project work.

I express my heartful gratitude and sincere thanks to **Dr.T.NAGENDRARAJ, Ms.S.VISHNUPRIYA, Ms.A.SHIVANI**, Research scholar, Department of Materials Science, School of Chemistry, Madurai Kamaraj University, Madurai. for the guidance and encouragement for completing this project successfully.

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I am deeply indebted my family for their understanding, care, love and unfailing support and encouragement.

R. Karthika.

(R. KARTHIKA)

A NOVEL CHEMOSENSOR FOR SELECTIVE SENSING OF Pd(II) ION – A FLUORESCENT STUDY

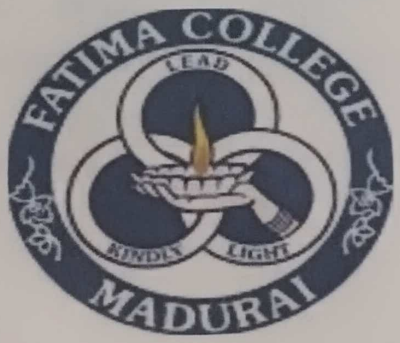
A Project report submitted to Research Centre of Chemistry,
FATIMA COLLEGE (Autonomous),
In Partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN CHEMISTRY

G. KAVIYA
(REG.NO: 2022MSCC11)

Under the Guidance of

Dr. V. ARUL DEEPA, M.Sc., M.Phil., Ph.D.,
ASSISTANT PROFESSOR



RESEARCH CENTRE OF CHEMISTRY

FATIMA COLLEGE (AUTONOMOUS)

Re - Accredited with "A^{++}" Grade by NAAC

(CGPA: 3.61 in the fourth cycle)

MADURAI – 625018.

MARCH -2024

BONAFIDE CERTIFICATE

This is to certify that the project report entitled "**A NOVEL CHEMOSENSOR FOR SELECTIVE SENSING OF Pd(II) ION – A FLUORESCENT STUDY**" submitted to the Fatima College, Madurai is partial fulfillment of the requirements of the award of the degree of **MASTER OF SCIENCE IN CHEMISTRY.** This is the record of research work done by **Ms. G. KAVIYA** under the guidance of **Dr. V. ARUL DEEPA**, Assistant Professor, Research Centre of Chemistry, Madurai and submitted to Research Centre of Chemistry, Fatima College, Madurai.

INTERNAL GUIDE

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HEAD OF THE DEPARTMENT

Dr. B. MEDONA M.Sc., Ph.D.,

Head & Associate Professor,
Research Centre of Chemistry,
Fatima College,
Madurai.

EXTERNAL EXAMINER

DECLARATION

I do hereby declare that this dissertation entitled "**A NOVEL CHEMOSENSOR FOR SELECTIVE SENSING OF Pd(II) ION – A FLUORESCENT STUDY**" has been originally carried out by **G. KAVIYA (2022MSCC11)** in the PG Chemistry laboratory during 2023-2024 under the guidance of **Dr. V. ARUL DEEPA,** Assistant Professor, Research Centre of Chemistry, Fatima college, Madurai and this work or any part of this has not been submitted elsewhere for any other degree.

G Kaviya

G.KAVIYA

Place: Madurai

Date: 26/3/24

Reg.No:2022MSCC11

ACKNOWLEDGEMENT

At first, I own my faithful thanks to **ALMIGHTY GOD** for being with me in every moment of the career for sustaining me with his abundant grace and who is my strength of support in doing my research work.

We are grateful to **Dr. Sr. G. CELINE SAHAYA MARY,** Principal, Fatima College, Madurai for permitting us to carry out our project at Fatima College, Madurai and, I would like to thank **Dr. Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

I thank **Dr. B. MEDONA**, Head and Associate professor, Research Centre of Chemistry, Fatima College, Madurai for her constant support and encouragement in the successful completion of this project work.

My indebted thanks to my internal guide **Dr. V. ARUL DEEPA,** Assistant Professor, Research Centre of Chemistry, Fatima College, for her constructive and sustained interest towards each and every stage of this work and her valuable suggestions throughout my project work.

I express my heartfelt gratitude and indebted thanks to **Dr. M. PRIYADHARSANI** and **Dr. J. JONE CELESTINA,** Assistant professor, Research Centre of Chemistry, Fatima College for their guidance and support for the successful completion of the work.

I also thank all the **Lab Technicians,** Research Centre of chemistry for their instant support and encouragement.

I thank my beloved Mother **Mrs. G. HEMALATHA,** for her motivation and support during this project. I thank my Father **Mr. B. GOVINDAN,** for giving me strength to chase my dreams. And also I would like to thank my friends for their valuable support.

We acknowledge project fund received under **DST CURIE core Grant** for Women PG Colleges **DST/CURIE-PG/2022/11**.

G. Kaviya

G. KAVIYA

A NOVEL SCHIFF BASE LIGAND - GREENER APPROACH

A Project report submitted to Research Centre of Chemistry,
FATIMA COLLEGE(Autonomous),
In partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN CHEMISTRY

Submitted by

N. MEERA SOWMIYA

(Reg. no:2022MSCC12)

Under the Guidance of

Dr. V. ARUL DEEPA, M.Sc., M.Phil., Ph.D.,
ASSISTANT PROFESSOR

RESEARCH CENTRE OF CHEMISTRY

FATIMA COLLEGE (Autonomous)

Re-Accredited with "A^{++}" Grade by NAAC

(CGPA: 3.61 in the fourth cycle)

Madurai- 625018.

March – 2024

BONAFIDE CERTIFICATE

This is to certify that the project report entitled "**A NOVEL SCHIFF BASE LIGAND BASED ON A GREENER APPROACH.**" Submitted to the Fatima college, Madurai, is partial fulfillment for the award of the degree **MASTER OF SCIENCE IN CHEMISTRY.** This is the record of research work was originally carried out by the **Ms. N. MEERA SOWMIYA.** During the period of 2023-2024. Under the guidance of **Dr. V. ARUL DEEPA,** Assistant professor, The Research Centre of Chemistry, Fatima College, Madurai.

INTERNAL GUIDE

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Assistant Professor,

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Madurai-625018

HEAD OF THE DEPARTMENT

Dr. B. MEDONA M.Sc., Ph.D.,

Head and Associate Professor,

Research Centre of Chemistry,

Fatima College,

Madurai-625018

EXTERNAL EXAMINER

DECLARATION

I do hereby declare that this project work entitled "**A NOVEL SCHIFF BASE LIGAND - GREENER APPROACH**" this research work has been originally carried out by **Ms. N. MEERA SOWMIYA (2022MSCC12)** in the PG Chemistry laboratory during 2023- 2024 under the guidance of **Dr. V. ARUL DEEPA,** Assistant Professor, Research Centre of Chemistry, **Fatima college,** Madurai and this work or any part of this has notbeen submitted elsewhere for any other degree.

Place: Madurai

Date: 4/3/24

N. Meera Sowmiya

N.MEERASOWMIYA
Reg no: 2022MSCC12

ACKNOWLEDGEMENT

At first, I owe my faithful thanks to **Almighty God** for being with me in every moment of the career for sustaining me with his abundant grace and who is my strength of support in doing my research work.

We are grateful to thank **Dr. Sr. G.CELINE SAHAYA MARY,** Principal, Fatima College, Madurai for permitting us to carry out our project at Fatima College, Madurai and, I would like to thank **Dr. Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

I am thankful to **Dr. B. MEDONA**, Head and Associate professor, Research Centre of Chemistry, Fatima College, Madurai, for her constant support and encouragement in the successful completionof this project work.

I am very greatful to thank my internal guide **Dr. V. ARUL DEEPA,** Assistant professor, Research Centre of Chemistry, Fatima College, Madurai, for her motivational guidance and for constant support and encouragement in the successful completion of this project work.I am very much thankful and indebted to my teachers **Dr. M. PRIYADHARSANI,** The Assistant professor and **Dr. J. JONE CELESTINA,** The Assistant Professor, Research Centre of Chemistry, and all my department staff of Fatima College, for their support and constant motivation to complete my research work successfully .I would like to extend my thanks to all my **LAB ASSISTANTS,** Research Centre of Chemistry, Fatima College, Madurai for their guidance and support for the successful completion of the work.

I thank my beloved Mother **Mrs. N. SANTHI,** for her motivation and support during this project. I thank my Father **Mr. K.NAMMALVAR,** for giving me strength to chase my dreams. And also I am deeply thankful and words are not sufficed to thank my Brother **K.N. HITLER METHA** for his tremendous support in achieving my goals and constant motivation.I am especially thankful to my Friend **Ms. K. BRINDHA** for her support , she stoods beside me and took my hands in achievingmy goals and motivating me in all my ups and downs.

We acknowledge project fund received under **DST-CURIE core Grant** for Women PG Colleges **DST/CURIE-PG/ 2022/11.**

N. Meera Sowmiya
(2022MSSC12)

FABRICATION OF PRIMARY MAGNESIUM ION CONDUCTING BATTERY USING CASSIA ARTICULATA (AAVARAM POO) BIOMATERIAL – BASED MEMBRANE AS AN ELECTROLYTE

A Project report submitted to Research Centre of Chemistry,
FATIMA COLLEGE (Autonomous),
In Partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE IN CHEMISTRY

S. PRIYADHARSHINI

(REG.NO: 2022MSCC14)

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Under the guidance of

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MARCH-2024

BONAFIDE CERTIFICATE

This is to certify that the project report entitled **FABRICATION OF PRIMARY MAGNESIUM ION CONDUCTING BATTERY USING CASSIA AURICULATA BIOMATERIAL – BASED MEMBRANE AS AN ELECTROLYTE** submitted to Fatima College, Madurai in partial fulfilment for the award of the degree of **MASTER OF SCIENCE IN CHEMISTRY.** This is the record of original project work done by **Ms. S. PRIYADHARSHINI** at Materials Research Centre, Madurai under the guidance of **Dr. S. SELVASEKARAPANDIAN,** Director, Materials Research Centre, Coimbatore and Emeritus Professor, Bharathiar University, Coimbatore and **Dr .Sr. J.ARUL MARY** Assistant Professor Research Centre of Chemistry, Fatima College, Madurai and submitted to Research Centre of Chemistry, Fatima College, Madurai.

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Fatima College,

Madurai – 625 018

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Materials Research Center,

Coimbatore – 641045 &

Emeritus Professor,

Bharathiar University,

Coimbatore – 641 046.

HEAD OF THE DEPARTMENT

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Associate Professor,

Department of chemistry,

Fatima College,

Madurai – 625 018.

EXTERNAL EXAMINER

DECLARATION

I do hereby declare that this dissertation entitled **FABRICATION OF PRIMARY MAGNESIUM ION CONDUCTING BATTERY USING CASSIA AURICULATA BIOMATERIAL – BASED MEMBRANE AS AN ELECTROLYTE** has been carried out by **S. PRIYADHARSHINI (Reg.No:2022MSCC14)** and submitted to Research Centre of Chemistry, Fatima College, Madurai in a partial fulfilment of the requirements for the award of **MASTER OF SCIENCE IN CHEMISTRY,** during the academic year, 2023 – 2024.

S. PRIYADHRASHINI

Reg. No: 2022MSCC14

Place: Madurai

Date: 26\03\2024

ACKNOWLEDGEMENT

"GLORY TO GOD ALMIGHTY WHO GIVES US THE VICTORY"

We are grateful to **Dr. Sr. G. CELINE SAHAYA MARY**, Principal, Fatima College, Madurai for permitting us to carry out our project at Materials Research Centre, Madurai and also, I would like to thank **Dr. Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

I thank **Dr. B. MEDONA**, Head and Associate professor, Research Centre of Chemistry, Fatima College, Madurai for her constant support and encouragement in the successful completion of this project work.

I am greatly indebted to **Dr. S. SELVASEKARAPANDIAN**, Director, Materials Research Center, Coimbatore, for his constant support and supervision throughout the project work and for initiating my interest in research. I owe a lot to him and express my deep sense of gratitude to him. I considered myself extremely fortunate to get an opportunity to work under him.

My indebted thanks to **Dr. Sr. J. ARUL MARY**, Assistant Professor, Research Centre of Chemistry, Fatima College, for her constructive and sustained interest towards each and every stage of this work and her valuable suggestions throughout my project work.

I am extremely thankful to **Ms. R. MEERA NAACHIYAR, Ms. S. AAFRIN HAZAANA, Mr. N.MUNIRAJ@VIGNESH**, Research Scholars, Materials Research Center, Madurai for their constant support throughout this project work.

I thank my beloved Mother **Mrs. S. TAMILSELVI** for her motivation and support during this project. I thank my Father **Mr. T.SUBRAMANI**, for giving me strength to chase my dreams. And also I would like to thank my friends for their valuable support.

We acknowledge project fund received under DST CURIE core Grant for Women PG Colleges **DST/CURIE-PG/2022/11.**

S.PRIYADHARSHINI

FABRICATION OF PRIMARY LITHIUM ION CONDUCTING BATTERY USING CASSIA AURICULATA (AAVARAM POO) BASED MEMBRANE AS AN ELECTROLYTE

A Project report submitted to Research Centre of Chemistry,

FATIMA COLLEGE (Autonomous),

In Partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE IN CHEMISTRY

R. RAMYA

(REG.NO: 2022MSCC15)

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FATIMA COLLEGE (AUTONOMOUS)

Re - Accredited with A++ Grade by NACC

(CGPA: 3.61 in the fourth cycle)

MADURAI – 625 018

Under the guidance of

Dr. S. SELVASEKARAPANDIAN, M.Sc., Ph.D.,

DIRECTOR

MATERIALS RESEARCH CENTER

COIMBATORE – 641 045

MARCH - 2024

BONAFIDE CERTIFICATE

This is to certify that the project report entitled "**FABRICATION OF PRIMARY LITHIUM ION CONDUCTING BATTERY USING CASSIA AURICULATA (AVARAMPOO) BASED MEMBRANE AS AN ELECTROLYTE**" submitted to Fatima College, Madurai in partial fulfilment for the award of the degree of **MASTER OF SCIENCE IN CHEMISTRY**. This is the record of original project work done by **R. RAMYA** at Materials Research Center, Madurai under the guidance of **Dr. S. SELVASEKARAPANDIAN**, Director, Materials Research Center, Coimbatore and Emeritus Professor, Bharathiar University, Coimbatore and **Dr. Sr. J. ARUL MARY**, Assistant Professor, Research Centre of Chemistry, Fatima College, Madurai and submitted to Research Centre of Chemistry, Fatima College, Madurai.

Dr. Sr. J. ARUL MARY
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Assistant Professor,
The Research Centre of Chemistry,
Fatima College,
Madurai – 625018

Dr. S. SELVASEKARAPANDIAN
M.Sc., Ph.D.,
Director,
Material Research Center,
Coimbatore &
Emeritus Professor,
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HEAD OF THE DEPARTMENT
Dr. B. MEDONA, M.Sc., Ph.D.,
Head and Associate Professor,
Research Centre of Chemistry,
Fatima College,
Madurai – 625018.

EXTERNAL EXAMINER

DECLARATION

I do hereby declare that this dissertation entitled "**FABRICATION OF PRIMARY LITHIUM ION CONDUCTING BATTERY USING CASSIA AURICULATA(AVARAMPOO) BASED AS AN ELECTROLYTE**" has been carried out by **R. RAMYA (Reg.No:2022MSCC15)** and submitted to Research Centre of Chemistry, Fatima College, Madurai in a partial fulfilment of the requirements for the award of **MASTER OF SCIENCE IN CHEMISTRY**, during the academic year, 2023 – 2024.

R. Ramya.

Place: Madurai

Date: 26/03/2024

R. RAMYA

Reg. No:2022MSCC15

ACKNOWLEDGEMENT

"GLORY TO GOD ALMIGHTY WHO GIVES US THE VICTORY"

We are grateful to **Dr. Sr. G. CELINE SAHAYA MARY**, Principal, Fatima College, Madurai for permitting us to carry out our project at Materials Research Center, Madurai and also, I would like to thank **Dr. Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

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I thank **Ms. R. MEERA NAACHIYAR, Ms. S. AAFRIN HAZAANA, Mr. N. MUNIRAJ@VIGNESH,** Research Scholars, Materials Research Center, Madurai for their constant support throughout this project work.

I thank my beloved Mother **Mrs. R. MAHALAKSHMI** for her motivation and support during this project. I thank my Father **Mr. P. RAMAMOORTHI,** for giving me strength to chase my dreams. And also I would like to thank my friends for their valuable support.

We acknowledge project fund received under **DST CURIE** core Grant for Women PG Colleges **DST/CURIE-PG/2022/11.**

R. Ramya

(R. RAMYA)

THE INFLUENCE OF GREEN INHIBITOR ON CARBON STEEL CORROSION BEHAVIOUR IN SIMULTED CONCRETE PORE SOLUTION PREPARED IN WELL WATER

A Project report submitted to Research Centre of Chemistry, FATIMA COLLEGE (Autonomous), In Partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN CHEMISTRY

V.RESHMA

(REG.NO: 2022MSCC16)

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FATIMA COLLEGE (AUTONOMOUS)

Re - Accredited with A++ Grade by NACC

(CGPA: 3.61 in the fourth cycle)

MADURAI – 625 018

Under the guidance of

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DINDIGUL– 624 005

MARCH - 2024

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This is to certify that the project report entitled "**THE INFLUENCE OF GREEN INHIBITOR ON CARBON STEEL CORROSION BEHAVIOUR IN SIMULTED CONCRETE PORE SOLUTION PREPARED IN WELL WATER** "submitted to Fatima College, Madurai in partial fulfillment for the award of the degree of **MASTER OF SCIENCE IN CHEMISTRY.** This is the record of original project work done by **Ms. V. RESHMA** at, G.T.N. Arts & Science College, Dindigul under the guidance of **Dr. A.SAHAYA RAJA**, Assistant Professor of Chemistry, PG& Research Department of Chemistry and **Dr. B.SUGANTHANA,** Assistant professor Research Center of Chemistry, Fatima College, Madurai and submitted to Research Centre of Chemistry,Fatima College, Madurai.

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I do hereby declare that this dissertation entitled **"THE INFLUENCE OF GREEN INHIBITOR ON CARBON STEEL CORROSION BEHAVIOUR IN SIMULATED CONCRETE PORE SOLUTION PREPARED IN WELL WATER"** has been carried out by **Ms. V. RESHMA (Reg.No:2022MSCC16)** and submitted to Research Center of Chemistry, Fatima College, Madurai in a partial fulfillment of the requirements for the award of **MASTER OF SCIENCE IN CHEMISTRY,** during the academic year, 2023 – 2024.

V. Reshma

V. RESHMA

REG. NO: (2022MSCC16)

Place: Madurai

Date: 26.03.2024

ACKNOWLEDGEMENT

"GLORY TO GOD ALMIGHTY WHO GIVES US THE VICTORY"

We are grateful to **Dr. Sr. G. CELINE SAHAYA MARY**, Principal, Fatima College, Madurai for permitting us to carry out our project at Materials Research Center, Madurai and also, I would like to thank **Dr. Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

I thank **Dr. B. MEDONA,** Head and Associate professor, Research Center of Chemistry, Fatima College, Madurai for her constant support and encouragement in the successful completion of this project work.

I am greatly indebted to **Dr. A. SAHAYA RAJA**, G.T.N. Arts & Science College, Dindigul , for his constant support and supervision throughout the project work and for initiating my interest in research. I owe a lot to him and express my deep sense of gratitude to him. I considered myself extremely fortunate to get an opportunity to work under him.

My indebted thanks to **Dr. B.SUGANTHANA,** Assistant Professor, Research Center of Chemistry, Fatima College, for her constructive and sustained interest towards each and every stage of this work and her valuable suggestions throughout my project work.

I thank my beloved Mother **Mrs. V. SHARMILA** for her motivation and support during this project. I thank my Father **Mr. D. VIJAYA KUMAR** for giving me strength to chase my dreams. He will always be in my heart because in there he is still alive. And also I would like to thank my friends for their valuable support.

We acknowledge project fund received under DST CURIE core Grant for Women PG Colleges **DST/CURIE-PG/2022/11.**

V. Reshma

(V. RESHMA)

ABSTRACT

This project summarizes the application of natural product (*Vitex Negundo*) (In Tamil - Nochi Leaves) as corrosion inhibition for concrete protection and also scrutinizes various factors influencing its applicability.

The main objective is to develop a new environmentally friendly inhibitor formulation for corrosion of carbon steel in simulated concrete pore solution containing *Vitex Negundo* extract and Zn^{2+}, which is chosen as a synergist. Statistical study "F" test has been used in the present study to prove the synergistic effect. In order to investigate the nature of the protective film, scanning electron microscopy (SEM), Energy dispersive analysis of X-rays (EDAX) and Fourier Transform-infrared spectroscopy (FTIR) have been used in the present study. The mechanistic aspects of corrosion inhibition are based on the classical weight loss method, the polarization study and different surface examination techniques are used. Based on the combined results of the weight loss method, potentiodynamic polarization study and FTIR, a suitable mechanism of corrosion inhibition is proposed. It's found that the protective film consists of Fe^{2+}- inhibitor complex and $Zn(OH)_2$.

This is supported by the surface morphological studies carried out by SEM. The references are given at the end of the individual Chapters.

CONSTRUCTION OF PRIMARY ZINC- ION CONDUCTING BATTERY USING CASSIA AURICULATA (AAVARAM POO) AS BIOMATERIAL BASED ELECTROLYTE

A Project report submitted to Research Centre of Chemistry,
FATIMA COLLEGE (Autonomous),
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MARCH – 2024

BONAFIDE CERTIFICATE

This is to certify that the project report entitled **"CONSTRUCTION OF PRIMARY ZINC-ION CONDUCTING BATTERY USING CASSIA AURICULATA AS BIOMATERIAL-BASED ELECTROLYTE"** submitted to Fatima College, Madurai in partial fulfillment for the award of the degree of **MASTER OF SCIENCE IN CHEMISTRY.** This is the record of original project work done by **Ms. N. SAKTHI PANDIMEENA** at Materials Research Centre, Madurai under the guidance of **Dr. S. SELVASEKARAPANDIAN**, Director, Materials Research Center, Coimbatore and Emeritus Professor, Bharathiar University, Coimbatore and **Dr. B. SUGANTHANA,** Assistant Professor Research Centre of Chemistry, Fatima College, Madurai and submitted to Research Centre of Chemistry, Fatima College, Madurai.

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EXTERNAL EXAMINER

DECLARATION

I do hereby declare that this dissertation entitled **"CONSTRUCTION OF PRIMARY ZINC-ION CONDUCTING BATTERY USING CASSIA AURICULATA AS BIOMATERIAL-BASED ELECTROLYTE"** has been carried out by **Ms. N. SAKTHI PANDIMEENA (Reg.No:2022MSCC17)** and submitted to Research Centre of Chemistry, Fatima College, Madurai in a partial fulfillment of the requirements for the award of **MASTER OF SCIENCE IN CHEMISTRY,** during the academic year, 2023 – 2024.

N. Sakthi Pandimeena

N. SAKTHI PANDIMEENA

Place: Madurai

Date: 26.03.2024

REG. NO: (2022MSCC17)

ACKNOWLEDGEMENT

"GLORY TO GOD ALMIGHTY WHO GIVES US THE VICTORY"

We are grateful to **Dr. Sr. G. CELINE SAHAYA MARY**, Principal, Fatima College, Madurai for permitting us to carry out our project at Materials Research Center, Madurai and also, I would like to thank **Dr. Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

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I thank, **Ms. R. MEERA NAACHIYAR, Ms. S. AAFRIN HAZAANA, Mr. N. MUNIRAJ@VIGNESH,** Research Scholars, Materials Research Center, Madurai for their constant support throughout this project work.

I thank my beloved Mother **Mrs. M. MUTHU LAKSHMI** for her motivation and support during this project. I thank my Father **Mr. S. NAGENDRA MANI,** for giving me strength to chase my dreams. And also I would like to thank my friends for their valuable support.

We acknowledge project fund received under **DST CURIE** core Grant for Women PG Colleges **DST/CURIE-PG/2022/11**.

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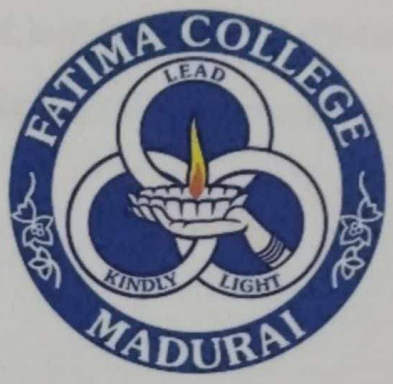
SYNTHESIS AND SPECTRAL ANALYSIS OF 4,6-*O*-PROTECTED BUTYLIDINE N-GLYCOSYL IMINES

A Project report submitted to Research Centre of Chemistry, FATIMA COLLEGE (Autonomous), In Partial fulfilment of the requirements for the degree of

MASTER OF SCIENCE IN CHEMISTRY

M. SHANMUGAPRIYA

(REG.NO: 2022MSCC18)



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This is to certify that the project report **"SYNTHESIS AND SPECTRAL ANALYSIS OF 4,6-*O*-PROTECTED BUTYLIDINE N-GLYCOSYL IMINES"** was carried out by **Miss. M. SHANMUGAPRIYA (Reg. No. 2019MSCC18)**, under the guidance of **Dr. K. R. SUBIMOL** and submitted to Research Centre of Chemistry, **FATIMA COLLEGE (AUTONOMOUS), MADURAI,** in partial fulfilment of the requirements for the award of the Degree of **MASTER OF SCIENCE** in Chemistry, during the academic year 2023-2024.

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DECLARATION

I hereby declare that this project work entitled **"SYNTHESIS AND SPECTRAL ANALYSIS OF 4,6-*O*-PROTECTED BUTYLIDINE N-GLYCOSYL IMINES"** has been originally carried out by me in PG Chemistry department laboratory during the academic year 2023-2024, under the guidance of **Dr. K.R. SUBIMOL, Assistant Professor, Research Centre of Chemistry, Fatima college, Madurai -18,** and this work or any part of this has not been submitted elsewhere for any other degree.

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ACKNOWLEDGEMENT

"Thanks be to God Almighty who gives us the Victory"

I whole heartedly surrender my sincere thanks to the Management and the Principal **Dr. Sr. G. CELINE SAHAYA MARY,** Fatima College, Madurai for giving me permission to do the Project Work at Fatima College, Madurai.

I would like to attribute my sincere and heartfelt thanks to **Dr. B. MEDONA,** Head of the Department, Department of Chemistry, Fatima College, Madurai for her valuable help and support for the successful completion of this work.

I am very much thankful to **Dr. K. KARTHIK KUMAR,** Assistant Professor, Department of Chemistry, The American College, Madurai for his valuable and inspiring, encouragement during each and every stage of my project work.

It is impossible to fully express my indebtedness to **Dr. K. R. SUBIMOL**, Assistant Professor, Research Centre of Chemistry, Fatima College, Madurai for her constructive and sustained interest towards each and every stage of this work and her valuable suggestions throughout my project work.

I would like to thank **Mrs. R. SHOBANA, MRS. P. PANDI SUDHA, MR. S.P. VIJAYAN, MS. M. SUJIDHA, MS. P. NAGA NANDHINI** Research scholars, OMCR Laboratory Madurai for their endless support and guidance.

I also extend my thanks to other faculty members in the department. I also thank all the staff members and lab technicians for their instant support and encouragement. I would like to give my Sincere thanks to all my **Family members and friends** for their constant Love and Moral Support during my Project days.

We acknowledge project fund received under **DST CURIE** core Grant for Women PG Colleges **DST/CURIE-PG/2022/11.**

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M. SHANMUGAPRIYA

SYNTHESIS AND CHARACTERIZATION OF 4, 6-O PROTECTED BUTYLIDENE-N-GLYCOSYL IMINE

A Project report submitted to Department of Chemistry, FATIMA COLLEGE (Autonomous), In partial fulfilment of the requirement for the degree of

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EXTERNAL EXAMINER

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Date: 26.03.2024

M.Sneka

M. SNEKA

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ACKNOWLEDGEMENT

"Thanks be to God Almighty who gives us the Victory"

I whole heartedly surrender my sincere thanks to the Management and the Principal **Dr. Sr. G. CELINE SAHAYA MARY,** Fatima College, Madurai for giving me permission to do the Project Work at Fatima College, Madurai.

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It is impossible to fully express my indebtedness to **Dr. K. R. SUBIMOL**, Assistant Professor, Research Centre of Chemistry, Fatima College, Madurai for the dynamic guidance, constant help, sincere and compassionate advice, patience and insightful discussion for planning and execution of my project work I consider myself extremely fortunate to have worked under the guidance of her.

I would like to thank **Mrs. R. SHOBANA, Mrs. P. PANDI SUDHA, Mr. S.P. VIJAYAN, Ms. M. SUJIDHA, Ms. P. NAGA NANDHINI** Research scholars, OMCR Laboratory Madurai for their endless support and guidance.

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I would like to give my sincere thanks to all my family members and friends for their constant Love and Moral Support during my Project days.

We acknowledge project fund received under DST CURIE core Grant for Women PG Colleges DST/CURIE-PG/2022

M. SNEKA

M. Sneka

6-FORMYL INDOLE BASED SCHIFF BASE LIGAND - A BIOLOGICAL STUDY

A Project report submitted to Research Centre of Chemistry,
FATIMA COLLEGE (Autonomous),
In Partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN CHEMISTRY

G. SOUNDARYA

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Madurai-625018.

MARCH – 2024.

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This is to certify that the project report entitled **"6-FORMYL INDOLE BASED SCHIFF BASE LIGAND – A BIOLOGICAL STUDY"** Submitted to the Fatima College, Madurai in partial fulfillment for the award of the degree of **MASTER OF SCIENCE IN CHEMISTRY**. This is the record of research work done by **Ms. G. SOUNDARYA** under the guidance of **Dr. J. JONE CELESTINA**, Assistant Professor, Research Centre of Chemistry, Fatima College, Madurai.

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EXTERNAL EXAMINER

DECLARATION

I do hereby declare that this dissertation entitled **"6-FORMYL INDOLE BASED SCHIFF BASE LIGAND – A BIOLOGICAL STUDY"** has been carried out by **Ms. G. SOUNDARYA (2022MSCC20)** in the PG Chemistry laboratory during 2023-2024 under the guidance of **Dr. J. JONE CELESTINA,** Assistant Professor, Research Centre of Chemistry, Fatima College, Madurai and this work or any part of this has not been submitted elsewhere for any other degree.

G. Soundarya

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Reg. No: 2022MSCC20

Place: Madurai.

Date: 26.03.2024

ACKNOWLEDGEMENT

I extend my first and foremost gratefulness to the god almighty and my parents for their blessings which plays a key role in the completion of the work.

I thank the Management and Principal, Fatima College, Madurai, for permitting me to carry out this project in Fatima College.

We are grateful to **Dr. Sr. G. CELINE SAHAYA MARY,** Principal, Fatima College, Madurai for permitting us to carry out our project at Research Center, Madurai and, I would like to thank **Dr. Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

I thank **Dr. B. MEDONA**, Head and Associate professor, Research Centre of Chemistry, Fatima College, Madurai for her constant support and encouragement in the successful completion of this project work.

My indebted thanks to **Dr. J. JONE CELESTINA** Assistant Professor, Research Centre of Chemistry, Fatima College, for her constructive and sustained interest towards each and every stage of this work and her valuable suggestions throughout my project work.

I extent my Profound thanks to **Dr. M. PRIYADHARSANI**, Assistant Professor, Research Centre of Chemistry, Fatima College, for her great support and continuous help during the project work.

I express my heartful gratitude and sincere thanks to **Dr. V. ARUL DEEPA**, Assistant Professor, Research Centre of Chemistry, Fatima College, for her incredible effort and support during my project work.

I also record my sincere thanks to all my department staff for their support and encouragement.

From the bottom of my heart, I extend my gratitude to my classmates and friends of Fatima College for their great support and constant encouragement.

I extent my deep sense of gratitude to my beloved Lab Assistances for their untired help during my project work.

We acknowledge project fund received under DST CURIE core Grant for Women PG Colleges DST/CURIE-PG/2022/11.

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CONSTRUCTION OF PRIMARY SODIUM ION CONDUCTING BATTERY USING BIOMATERIAL *CASSIA AURICULATA* BASED SOLID MEMBRANE AS AN ELECTROLYTE

A Project report submitted to Research Centre of Chemistry,

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MARCH – 2024

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This is to certify that the project report entitled "**CONSTRUCTION OF PRIMARY SODIUM ION CONDUCTING BATTERY USING BIOMATERIAL *CASSIA AURICULATA* BASED SOLID MEMBRANE AS AN ELECTROLYTE**" submitted to Fatima College, Madurai in partial fulfilment for the award of the degree of **MASTER OF SCIENCE IN CHEMISTRY.** This is the record of original project work done by **Ms. K. SUDARSORNALAKSHMI** at Materials Research Center, Madurai under the guidance of **Dr. S. SELVASEKARAPANDIAN**, Director, Materials Research Center, Coimbatore and Emeritus Professor, Bharathiar University, Coimbatore and **Dr .J. BELINDA ASHA**, Assistant Professor, Research Centre of Chemistry, Fatima College, Madurai and submitted to Research Centre of Chemistry, Fatima College, Madurai.

J. Belinda Asha

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S. Selvasekarapandian.

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Dr. B. MEDONA, M.Sc., Ph.D.,

Head & Associate professor,

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Madurai– 625018.

EXTERNAL EXAMINER

DECLARATION

I do hereby declare that this dissertation entitled **"CONSTRUCTION OF PRIMARY SODIUM ION CONDUCTING BATTERYUSING BIOMATERIAL *CASSIA AURICULATA* BASED SOLID MEMBRANE AS AN ELECTROLYTE"**has been carried out by **Ms.K. SUDARSORNALAKSHMI (Reg.No:2022MSCC21)** and submitted to Research Centre of Chemistry, Fatima College, Madurai in a partial fulfilment of the requirements for the award of **MASTER OF SCIENCE IN CHEMISTRY,** during the academic year, 2023 – 2024.

K. SudarSornalakshmi

Place: Madurai

Date: 26/03/2024

K.SUDARSORNALAKSHMI

Reg. No:2022MSCC21

ACKNOWLEDGEMENT

"GLORY TO GOD ALMIGHTY WHO GIVES US THE VICTORY"

We are grateful to **Dr .Sr. G. CELINE SAHAYA MARY**, Principal, Fatima College, Madurai for permitting us to carry out our project at Materials Research Center, Madurai and also, I would like to thank **Dr.Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

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FABRICATION OF PRIMARY SODIUM ION CONDUCTING BATTERY USING CASSIA AURICULATA (AAVARAM POO) BASED MEMBRANE AS AN ELECTROLYTE

A Project report submitted to Research Centre of Chemistry,

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MARCH - 2024

BONAFIDE CERTIFICATE

This is to certify that the project report entitled "**FABRICATION OF PRIMARY SODIUM ION CONDUCTING BATTERY USING CASSIA AURICULATA (AAVARAM POO) BASED MEMBRANE AS AN ELECTROLYTE**" submitted to Fatima College, Madurai in partial fulfilment for the award of the degree of **MASTER OF SCIENCE IN CHEMISTRY.** This is the record of original project work done by **Ms. S. UDHAYA PRIYA** at Materials Research Center, Madurai under the guidance of **Dr. S. SELVASEKARAPANDIAN,** Director, Materials Research Center, Coimbatore and Emeritus Professor, Bharathiar University, Coimbatore and **Dr. J. BELINDA ASHA,** Assistant Professor Research Centre of Chemistry, Fatima College, Madurai and submitted to Research Centre of Chemistry,Fatima College, Madurai.

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EXTERNAL EXAMINER

DECLARATION

I do hereby declare that this dissertation entitled **"FABRICATION OF PRIMARY SODIUM ION CONDUCTING BATTERY USING CASSIA AURICULATA (AAVARAM POO) BASED MEMBRANE AS AN ELECTROLYTE"** has been carried out by **Ms. S. UDHAYA PRIYA (Reg.No:2022MSCC22)** and submitted to Research Center of Chemistry, Fatima College, Madurai in a partial fulfilment of the requirements for the award of **MASTER OF SCIENCE IN CHEMISTRY,** during the academic year, 2023 – 2024.

S. Udhaya Priya

Place: Madurai

Date: 26/03/2024

S. UDHAYA PRIYA

(Reg. No:2022MSCC22)

ACKNOWLEDGEMENT

"GLORY TO GOD ALMIGHTY WHO GIVES US THE VICTORY"

We are grateful to **Dr. Sr. G. CELINE SAHAYA MARY**, Principal, Fatima College, Madurai for permitting us to carry out our project at Materials Research Center, Madurai and also, I would like to thank **Dr. Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

I thank **Dr. B. MEDONA,** Head and Associate professor, Research Center of Chemistry, Fatima College, Madurai for her constant support and encouragement in the successful completion of this project work.

I am greatly indebted to **Dr. S. SELVASEKARAPANDIAN**, Director, Materials Research Center, Coimbatore, for his constant support and supervision throughout the project work and for initiating my interest in research. I owe a lot to him and express my deep sense of gratitude to him. I considered myself extremely fortunate to get an opportunity to work under him.

My indebted thanks to **Dr.J. BELINDA ASHA,** Assistant Professor, Research Center of Chemistry, Fatima College, for her constructive and sustained interest towards each and every stage of this work and her valuable suggestions throughout my project work.

I thank **Ms. R. MEERA NAACHIYAR, Ms .S. AAFRIN HAZAANA, Mr. N. MUNIRAJ@VIGNESH,** Research Scholars, Materials Research Center, Madurai for their constant support throughout this project work.

I thank my beloved Mother **Mrs. S. MAHESHWARI** for her motivation and support during this project. I thank my Father **Mr. A. SAKTHIVEL** , for giving me strength to chase my dreams. He will always be in my heart because in there he is still alive. And also I would like to thank my friends for their valuable support.

We acknowledge project fund received under DST CURIE core Grant for Women PG Colleges **DST/CURIE-PG/2022/11**.

S. Udhaya Priya

(S. UDHAYA PRIYA)

Isatin And Its Derivatives – A Computational Study

A Project report submitted to Research Centre of Chemistry,
FATIMA COLLEGE (Autonomous)
In partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN CHEMISTRY

Submitted by

K. BRINDHA
(Reg.No: 2022MSCC23)

Under the Guidance of

Dr. J. JONE CELESTINA, M.Sc.., Ph.D.,
ASSISTANT PROFESSOR

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Re-Accredited with "A^{++}" Grade by NAAC
(CGPA: 3.61 in the fourth cycle)
Madurai- 625018

March - 2024

BONAFIDE CERTIFICATE

This is to certify that the project report entitled **"ISATIN DERIVATIVE – A COMPUTATIONAL STUDY"** submitted to the Fatima College, Madurai, is partial fulfillment for the award of the degree **MASTER OF SCIENCE IN CHEMISTRY.** This is the record of research work done by **Ms. K. BRINDHA** under the guidance of **Dr. J. JONE CELESTINA** during the period of her study in the Research Centre of Chemistry, Fatima College, and Madurai.

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DECLARATION

I hereby declare that this project work entitled **"Isatin Derivative – A Computational Study"** has been originally carried out by **Ms. K. BRINDHA (2022MSCC23)** in the PG Chemistry laboratory during 2023-2024 under the guidance of **Dr. J. JONE CELESTINA,** Assistant Professor, Research Centre of Chemistry, **Fatima College,** Madurai and this work or any part of this has not been submitted elsewhere for any other degree.

K. Brindha

K.BRINDHA

2022MSCC23

PLACE: MADURAI

DATE : 26.03.2024

ACKNOWLEDGEMENT

At first, I owe my faithful thanks to **Almighty God** for being with me in every moment of the career for sustaining me with his abundant grace and who is my strength of support in doing my research work.

We are grateful to **Dr. Sr. G.CELINE SAHAYA MARY,** Principal, Fatima College, Madurai for permitting us to carry out our project at Fatima College, Madurai and, I would like to thank **Dr. Sr. M. FRANCISCA FLORA**, Secretary, Fatima College, Madurai for her prayers and blessings.

I am thankful to **Dr. B. MEDONA**, Head and Associate professor, Research Centre of Chemistry, Fatima College, Madurai, for her constant support and encouragement in the successful completion of this project work. I am very grateful to thank my internal guide **Dr. J. JONE CELESTINA,** Assistant professor, Research Centre of Chemistry, Fatima College, Madurai, for her motivational guidance and for constant support and encouragement in the successful completion of this project work .I am very much thankful and indebted to my teachers **Dr. M. PRIYADHARSANI,** and **Dr. V. ARUL DEEPA,** Assistant Professor, Research Centre of Chemistry, and all my department staff of Fatima College, for their support and constant motivation to complete my research work successfully .I would like to extend my thanks to all my **LAB ASSISTANTS,** Research Centre of Chemistry, Fatima College, Madurai for their guidance and support for the successful completion of the work.

I thank my beloved Mother **Mrs. K. RATHIDEVI,** for her motivation and support during this project. I thank my Father **Mr. S. KARUPPUSAMY,** for giving me strength to chase my dreams. And also I am deeply thankful and words are not sufficed to thank my uncle **ARULVIGNESH** for his tremendous support in achieving my goals and constant motivation. .I am especially thankful to my Friend **Ms. N. MEERA SOWMIYA** for her support ,she stood beside me and took my hands in achieving my goals and motivating me in all my ups and downs. We acknowledge project fund received under **DST-CURIE core Grant** for Women PG Colleges **DST/CURIE-PG/ 2022/11.**

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26/03/24