

**STUDIES ON NOVEL TRIAZINE BASED LIGANDS AND ITS METAL COMPLEXES**  
**A Project report submitted for the partial fulfillment of the requirement for the degree of**  
**Master of Science in Chemistry**

**Submitted by**  
**R.ABITHA**  
**(Register No: 2020MSCC01)**



**DEPARTMENT OF CHEMISTRY**  
**FATIMA COLLEGE (AUTONOMOUS)**  
**Re-Accredited with “A++”(CGPA 3.61) by NAAC (Cycle-IV)**  
**MADURAI – 625 018.**

**Under the Guidance of**

**Dr. P. THARMARAJ, M.Sc., Ph.D.,**  
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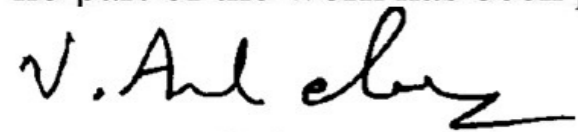


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**MAY-2022**

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This is to certify that **Ms. R. ABITHA**, M.Sc., (Chemistry) student of Fatima College, Madurai has done the project work entitled “**STUDIES ON NOVEL TRIAZINE BASED LIGANDS AND ITS METAL COMPLEXES**” during the academic year 2021-2022 under the supervision of **Dr. P. THARMARAJ**, Associate professor, Department of Chemistry, Madurai Kamaraj University, Madurai– 62502. This is to certify that no part of the work has been presented for any degree / diploma in any other form.



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**EXTERNAL EXAMINER**

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I do here by declare that this dissertation entitled “**STUDIES ON NOVEL TRIAZINE BASED LIGANDS AND ITS METAL COMPLEXES**” 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 - 18.

**Date:**



**Signature of the candidate**

**R. ABITHA (2020MSCC01)**

### **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 **Dr. Rev. Sr. G. CELINE SAHAYA MARY**, Fatima College, Madurai for giving me permission to do the project work in Thiagarajar college, Madurai.

With great pride and pleasure, I express my deep sense of gratitude to my beloved mentor **Dr. P. THARMARAJ**, Associate professor and P.G Research and Department of chemistry, Thiagarajar college, 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, Department 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. V. ARUL DEEPA**, Assistant Professor, Department of Chemistry, Fatima College for her guidance and support for the successful completion of the project work.

I express my heartfelt gratitude and sincere thanks to the **Dr. M. PRIYADHARSHINI**, Assistant Professor, Department of Chemistry, Fatima College for her untiring effort in completion of this project work in a successful way.

I express my sincere and soulful thanks to **Ms. A. STEFFY**, Research Scholar, Sarah Tucker College Department of Chemistry. Especially I am very grateful to them for their help rendered in the final proof- reading of the thesis.

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

**A NOVEL ZINC MANGANESE OXIDE EMBEDDED REDUCED GRAPHENE  
OXIDE AS AN ELECTRODE MATERIAL FOR SUPERCAPACITOR  
APPLICATIONS**

*A Project report submitted for  
Partial fulfillment of the Requirement for the degree of  
**MASTER OF SCIENCE IN CHEMISTRY***

**Submitted By**

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**(Register No: 2020MSCC02)**

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**EXTERNAL EXAMINER**

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**Place:** Madurai -18

**Signature of the Candidate**

**Date:**

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**(2020MSCC02)**

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

With great pride and pleasure, I express my deep sense of gratitude to my beloved mentor **Dr. SAYEE KANNAN**, Assistant Professor, PG & Research Department of Chemistry, Madurai-20 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.

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I express my heartfelt gratitude and sincere thanks to the **Dr. SUGANTHI**, Associate Professor and Head PG & Research Department of Chemistry, Thiagarajar College, Madurai for granting permission and providing a congenial environment with excellent lab facilities.

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**SYNTHESIS AND CHARACTERIZATION OF NEODYMIUM OXIDE  
ANCHORED GRAPHENE NANOSHEETS USING ELECTROCHEMICAL  
DETECTION OF IMIDAZOLE DRUG**

*A Project report submitted for  
Partial fulfillment of the Requirement for the degree of*

**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted By**

**Ms. T.AROCKIA AMRISHA**

**(RegisterNo:2020MSCC04)**

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**SYNTHESIS AND CHARACTERIZATION OF NEODYMIUM OXIDE  
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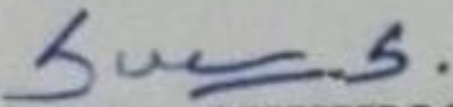
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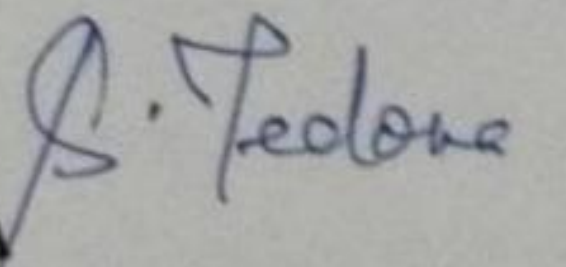
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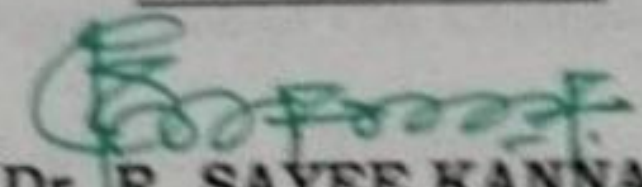
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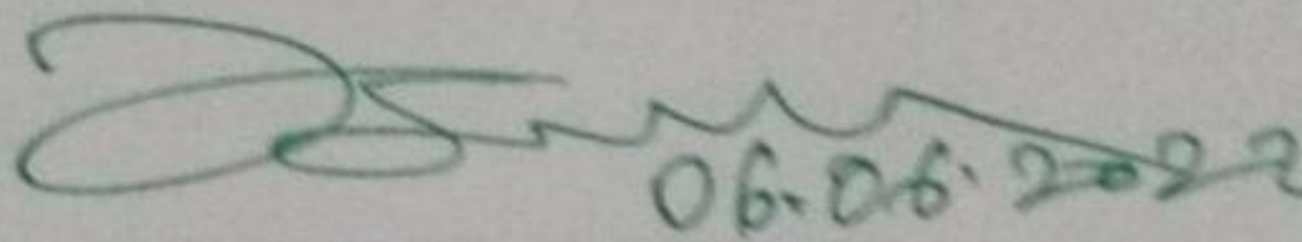
  
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06.06.2022

### DECLARATION

I do here by declare that this dissertation entitled "**SYNTHESIS AND CHARACTERIZATION OF NEODYMIUM OXIDE ANCHORED GRAPHENE NANOSHEETS USING ELECTROCHEMICAL DETECTION OF IMIDAZOLE DRUG**" 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 -18

Date: 09.05.2022

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**SYNTHESIS AND CHARACTERIZATION OF  $\gamma$ - LACTAM VIA  
CYCLIZATION**

*A Project report submitted for partial fulfilment of the requirement for  
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**Submitted By**

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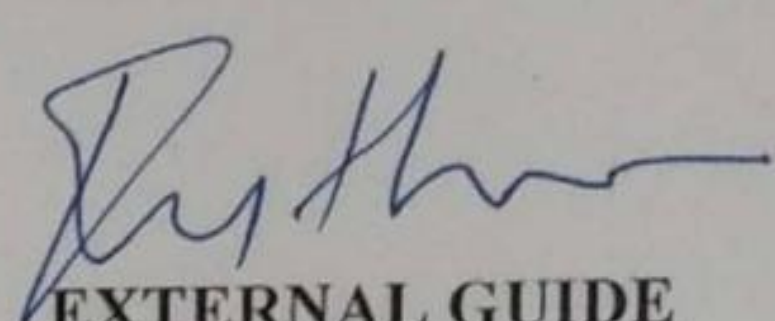
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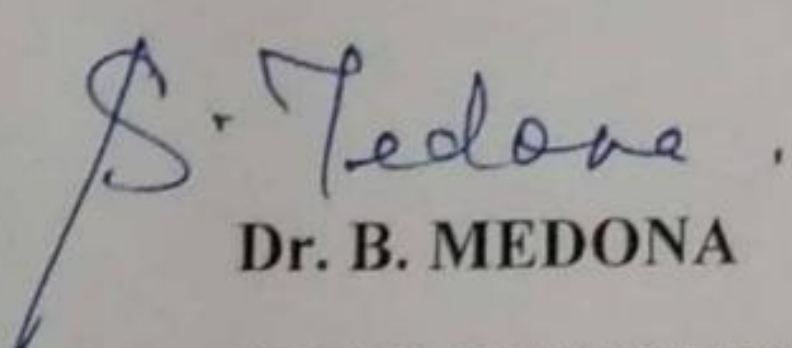
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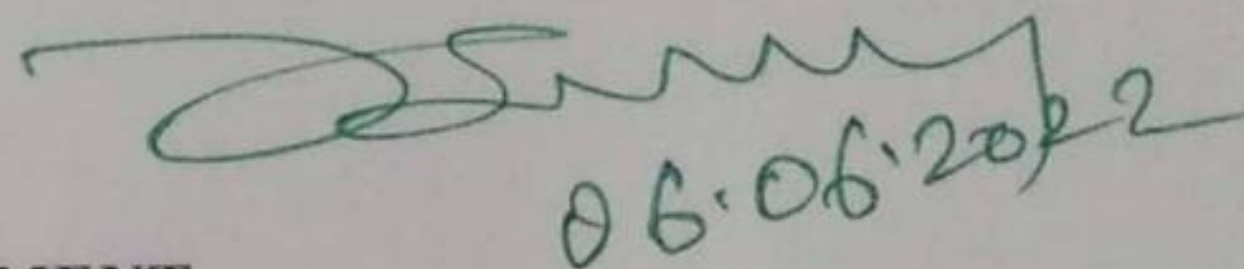
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06.06.2022

## DECLARATION

I do here by declare that this dissertation entitled "**Synthesis and characterization of  $\gamma$ -Lactam via cyclization**" submitted to Fatima College in partial fulfilment 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 -18.

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C. Bhuvaneshwari

Signature of the Candidate

C. Bhuvaneshwari

(2020MSCC05)

## ACKNOWLEDGEMENT

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

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(C. BHUVANESHWARI)

**CuO/NiO/PEG NANOCOMPOSITE AS HIGH PERFORMANCE NON-  
ENZYMATIC ELECTROCHEMICAL GLUCOSE SENSOR**

*A Project report submitted for partial fulfillment of the Requirement for the degree of*  
**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted By**

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**(Register No: 2020MSCC06)**



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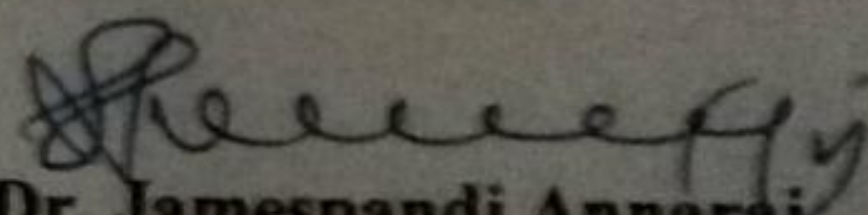
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This is to certify that the dissertation work entitled “CuO/NiO/PEG Nanocomposite as High Performance Non-enzymatic Electrochemical Glucose Sensor” has been carried out by V. BHUVANESHWARI (2020MSCC06) under my supervision during the academic year 2021-2022. The dissertation has not been submitted in full or part for any diploma, degree or other similar title in this or any other Universities.

Place: Madurai-18

Date: 13.05.2022

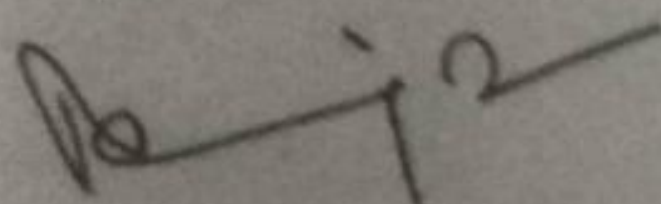
  
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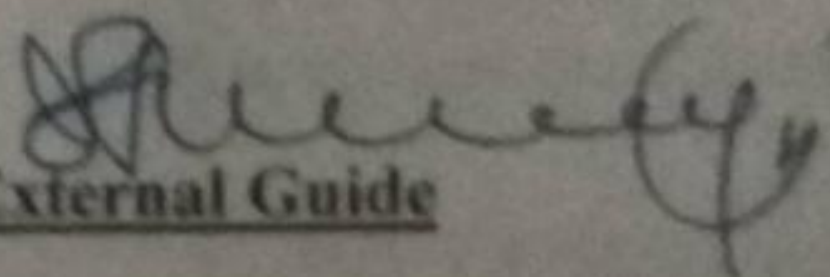
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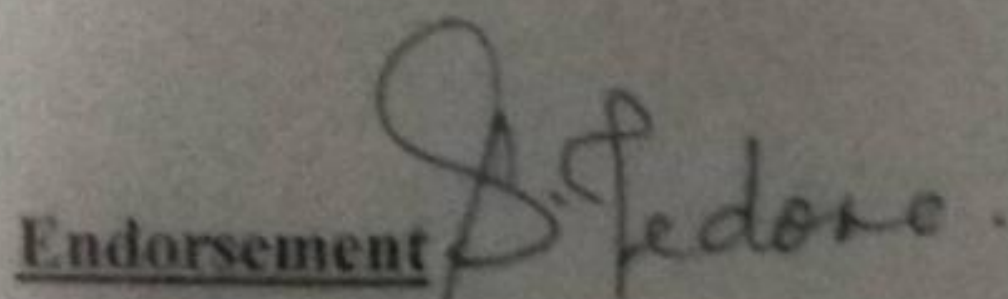
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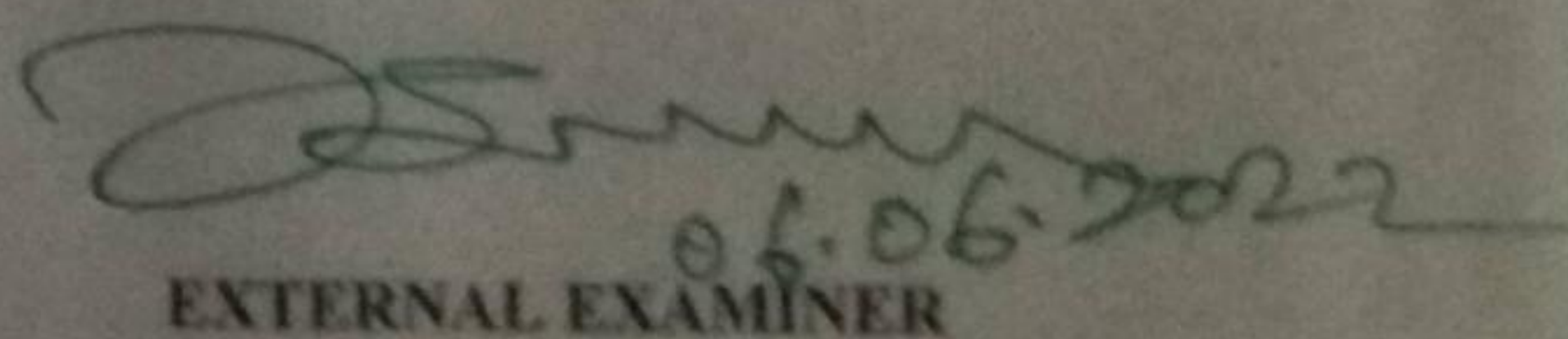
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Madurai-625021



Endorsement

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

  
06.06.2022  
EXTERNAL EXAMINER

**METAL(II) COMPLEXES BEARING KNOEVENAGEL CONDENSATE  
OF BENZOYL ACETONE DIKETIMINES AS MODELS FOR BLUE  
COPPER AND THEIR DNA INTERACTIONS**

*A Project report submitted for partial fulfillment of the Requirement for the degree  
of*  
**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted By**

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**(Register No: 2020MSCC07)**



**DEPARMENT OF CHEMISTRY  
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**Madurai Kamaraj University**

**University with potential for excellence**

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Dr. Jamespandi Annaraj  
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School of Chemistry

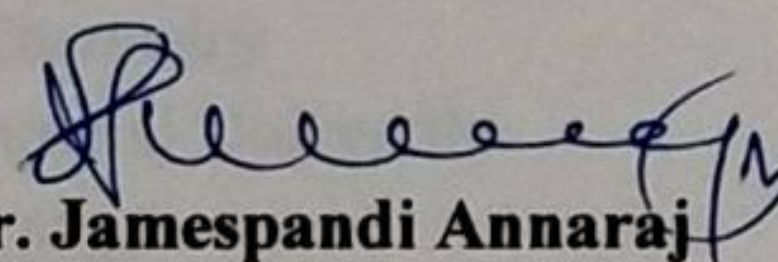


## CERTIFICATE

This is to certify that the dissertation work entitled “Metal(II) complexes bearing Knoevenagel condensate of benzoyl acetone diketimines as models for blue copper and their DNA interactions” has been carried out by **B. DURGA (2020MSCC07)** under my supervision during the academic year 2021-2022. The dissertation has not been submitted in full or part for any diploma, degree or other similar title in this or any other Universities.

**Place: Madurai-18**

**Date: 13 - 05 - 2022**

  
**Dr. Jamespandi Annaraj**

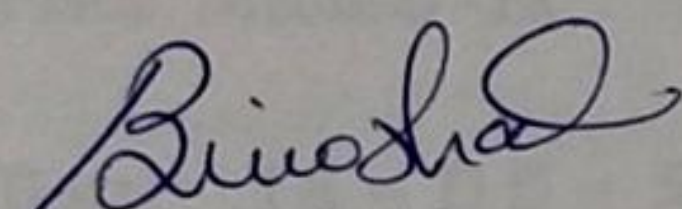
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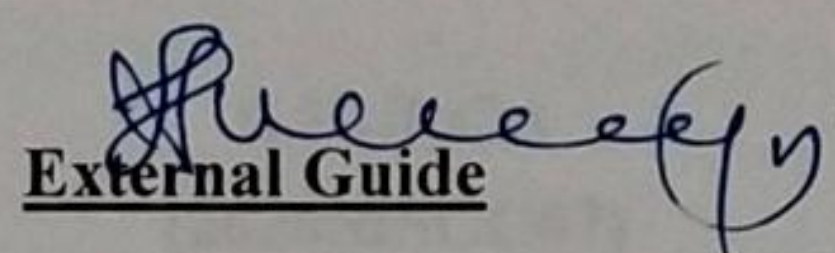
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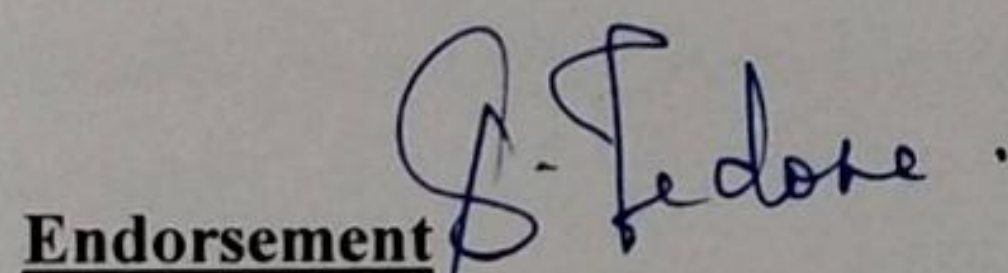
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Assistant Professor  
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Fatima College  
Madurai-625018



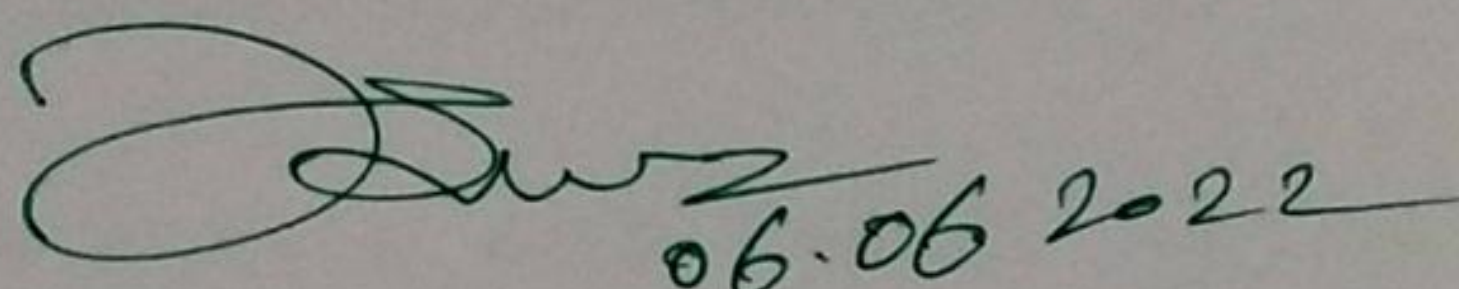
External Guide

**Dr. Jamespandi ANNARAJ**  
Assistant Professor & Head i/c  
Department of Materials Science  
School of Chemistry  
Madurai Kamaraj University  
Madurai-625021



Endorsement

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



**EXTERNAL EXAMINER**

## DECLARATION

I do here by declare that this dissertation entitled "**Metal(II) complexes bearing Knoevenagel condensate of benzoyl acetone diketimines as models for blue copper and their DNA interactions**" 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 -18.

Date: 13 - 05 - 20 22

B. Durga

Signature of the Candidate

B.DURGA  
(2020MSCC07)

**METAL(II) COMPLEXES BEARING KNOEVENAGEL CONDENSATE  
OF ACETYL ACETONE DIKETIMINES AS MODELS FOR BLUE  
COPPER AND THEIR DNA INTERACTIONS**

*A Project report submitted for partial fulfillment of the Requirement for the degree  
of*  
**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted By**

**Ms. S. HARIHARANI**

**(Register No: 2020MSCC08)**



**DEPARTMENT OF CHEMISTRY  
FATIMA COLLEGE (AUTONOMOUS)  
(Re-Accredited with A++ Grade by NAAC (CGPA: 3.61) Cycle-IV)  
MARYLAND, MADURAI-625018**

*Under the Guidance of*

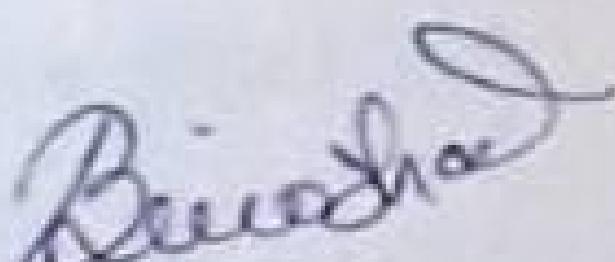
**Dr. Jamespandi ANNARAJ**  
Assistant Professor & Head (i/c)  
Department of Materials Science  
School of Chemistry  
Madurai Kamaraj University  
University with potential for excellence  
(Re-Accredited with A++ Grade by NAAC (CGPA: 3.54) in the fourth cycle)  
Madurai-625021.



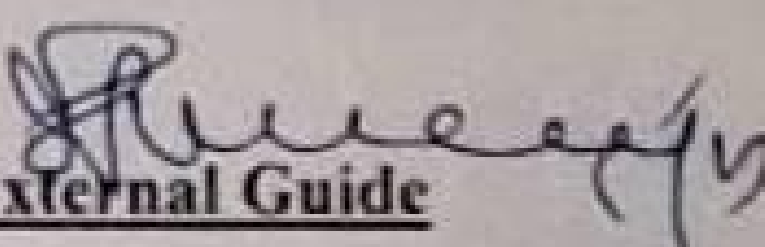
**May-2022**

### BONAFIDE CERTIFICATE

This is to certify that Ms. S. HARIHARANI (2020MSCC08), M.Sc., (Chemistry) student of Fatima College, Madurai has done the project work entitled "**Metal(II) complexes bearing Knoevenagel condensate of Acetyl acetone diketimines as models for blue copper and their DNA interactions**" during the academic year 2021-2022 under the supervision of Dr. Jamespandi ANNARAJ, Assistant Professor & Head i/c, 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

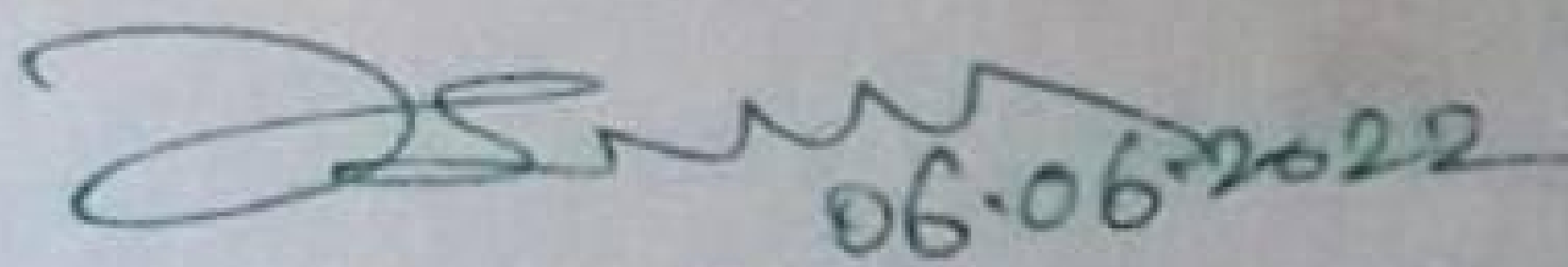
**Dr.B.VINOSHA**  
Assistant Professor  
Department of Chemistry  
Fatima College  
Madurai-625018

  
External Guide

**Dr. Jamespandi ANNARAJ**  
Assistant Professor & Head i/c  
Department of Materials Science  
School of Chemistry  
Madurai Kamaraj University  
Madurai-625021

Endorsement 

**Dr .B. MEDONA**  
Head & Associate Professor,  
Department of Chemistry,  
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Madurai-625018.

  
06.06.2022  
**EXTERNAL EXAMINER**



# MADURAI KAMARAJ UNIVERSITY

*(University with Potential for Excellence)*

Dr. Jamespandi Annaraj  
Assistant Professor & Head (i/c)  
Department of Materials Science  
School of Chemistry




## CERTIFICATE

This is to certify that the dissertation work entitled "Metal(II) complexes bearing Knoevenagel condensate of Acetyl acetone diketimines as models for blue copper and their DNA interactions" has been carried out by S. HARIHARANI (2020MSCC08) under my supervision during the academic year 2021-2022. The dissertation has not been submitted in full or part for any diploma, degree or other similar title in this or any other Universities.

Place: Madurai-18

Date: 13.05.2022

  
Dr. Jamespandi Annaraj

Supervisor

Email : jannarsju@gmail.com, annaraj.chem@mkuniversity.org, 8098478272

## DECLARATION

I do here by declare that this dissertation entitled "**Metal(II) complexes bearing Knoevenagel condensate of Acetyl acetone diketimines as models for blue copper and their DNA interactions**" 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 -18.

Date: 13.05.2022

S. Hariharani  
Signature of the Candidate

S. HARIHARANI  
(2020MSCC08)

**INVESTIGATION OF SPINEL  $MnCo_2O_4$  ON f-CB FOR  
ELECTROCHEMICAL PERFORMANCE OF HYDROGEN EVOLUTION  
REACTION**

**A project report submitted for partial fulfillment of the Requirement for  
the award of degree of**

**Master of Science in Chemistry**

**Submitted by**

**Ms. G. JAYA DHARSHNI**

**(Reg. No: 2020MSCC10)**



**Under the Internal Guidance of**

**Dr. B. SUGANTHANA**

**Assistant Professor**

**DEPARTMENT OF CHEMISTRY**

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**(Re-Accredited with A++ Grade by NAAC (CGPA: 3.61) in the fourth cycle)**

**Maryland, Madurai-625018**

**Under the External Guidance of**

**Dr. A. ELANGO VAN**

**Associate Professor**



**PG & Research Department of Chemistry**

**Thiagarajar College**

**Affiliated to Madurai Kamaraj University**

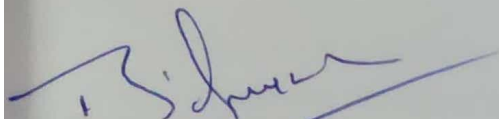
**Madurai - 625009**

**May-2022**

# CERTIFICATE

This is to certify that **Ms. G. JAYA DHARSHNI**, (Reg. No: 2020MSCC10) M.Sc., (Chemistry) student of Fatima College, Madurai has done the project work entitled **“INVESTIGATION OF SPINEL  $\text{MnCo}_2\text{O}_4$  ON  $f\text{-CB}$  FOR ELECTROCHEMICAL PERFORMANCE OF HYDROGEN EVOLUTION REACTION”** during the academic year 2021-2022 under the supervision of **Dr. A. ELANGO VAN**, Associate professor, PG & Research Department of Chemistry, Thiagarajar College, Madurai-625009. This is to certify that no part of the work has been presented for any degree/diploma in any other form.

## Internal Guide



**Dr. B. SUGANTHANA**

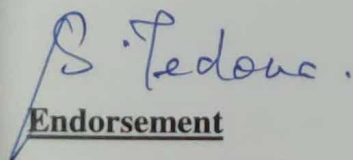
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Madurai - 625018.

## External Guide



**Dr. A. ELANGO VAN**

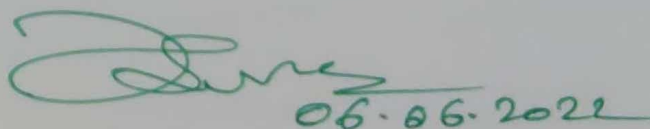
Associate Professor and Head  
Department of Chemistry  
Thiagarajar College  
Madurai - 625009.



## Endorsement

**Dr. B. MEDONA**

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

  
06.06.2022

**EXTERNAL EXAMINER**

## DECLARATION

I do hereby declare that this dissertation entitled **“INVESTIGATION OF SPINEL  $\text{MnCo}_2\text{O}_4$  ON  $f\text{-CB}$  FOR ELECTROCHEMICAL PERFORMANCE OF HYDROGEN EVOLUTION REACTION”** is 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 during the academic year 2021-2022 under the supervision of **Dr. A. ELANGO VAN**, Associate professor, PG & Research Department of Chemistry, Thiagarajar College, Madurai-625009. I also declare that this dissertation or part of work has not been published earlier elsewhere in any manner.

Place: Madurai

Date: 09.05.2022

G. Jaya Dharshni  
Signature of the Candidate  
(G. JAYA DHARSHNI)

## 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 play a key role in the completion of the work.

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

With great pride and pleasure, I express my deep sense of gratitude to my beloved Supervisor **Dr. A. ELANGO VAN** Associate Professor, PG & Research Department of Chemistry, Thiagarajar College, Madurai-09 for the independence he gave me to choose the project in my area of interest, his valuable and never-ending support, in spiring 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, Department of Chemistry, Fatima College for permitting to carry out the project work in Thiagarajar College, Madurai.

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

I express my heartfelt gratitude and sincere thanks the Principal of Thiagarajar College and to **Dr. A. SUGANTHI** Associate Professor and Head, PG & Research Department of Chemistry, Thiagarajar College, Madurai for granting permission and providing a congenial environment with excellent lab facilities.

I express my sincere and soulful thanks to **Ms. C. SHARMILA**, Research Scholar, Thiagarajar College, PG & Research Department of Chemistry, Madurai. Especially I am very grateful to them for their help rendered in the final proof-reading of the thesis.

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, love and unfailing support and encouragement.

(G. JAYA DHARSHNI)

**ENHANCED ELECTROCHEMICAL DETECTION OF  
N-HYDROXY SUCCINIMIDE ON  $Zr_2Ce_2O_7$  ANCHORED ON REDUCED  
GRAPHENE OXIDE**

**A project report submitted for partial fulfillment of the Requirement for  
the award of degree of**

**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted by**

**Ms. J. JEYA PREETHA**

**( Reg. No: 2020MSCC11)**



**Under the Internal Guidance of**

**Dr. B. SUGANTHANA**

**Assistant Professor**

**DEPARTMENT OF CHEMISTRY**

**FATIMACOLLEGE (AUTONOMOUS)**

**(Re-Accredited with A++ Grade by NAAC (CGPA: 3.61) in the fourth cycle)**

**Maryland, Madurai-625018**

**Under the External Guidance of**

**Dr. A. ELANGO VAN**

**Associate Professor**



**PG & Research Department of Chemistry**

**Thiagarajar College**

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**Madurai-625009**

**May-2022**

# CERTIFICATE

This is to certify that **Ms. J. JEYA PREETHA**, (Reg. No: 2020MSCC11) M.Sc.,(Chemistry) student of Fatima College, Madurai has done the project work entitled **"ENHANCED ELECTROCHEMICAL DETECTION OF N-HYDROXY SUCCINIMIDE ON  $Zr_2Ce_2O_7$  ANCHORED ON REDUCED GRAPHENE OXIDE"** during the academic year 2021-2022 under the supervision of **Dr. A. ELANGO VAN**, Associate professor, PG & Research Department of Chemistry, Thiagarajar College, Madurai – 625009. This is to certify that no part of the work has been presented for any degree/diploma in any other form.


## Internal Guide



**Dr. B. SUGANTHANA**

Assistant Professor  
Department of Chemistry  
Fatima College  
Madurai- 625018.

## External Guide



**Dr. A. ELANGO VAN**


Associate Professor  
Department of Chemistry  
Thiagarajar College  
Madurai- 625009.

## Endorsement



**Dr. B. MEDONA**

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



06.06.22  
**EXTERNAL EXAMINER**

# DECLARATION

I do hereby declare that this dissertation entitled ***"ENHANCED ELECTROCHEMICAL DETECTION OF N-HYDROXY SUCCINIMIDE ON  $Zr_2Ce_2O_7$  ANCHORED ON REDUCED GRAPHENE OXIDE"*** is 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 during the academic year 2021-2022 under the supervision of **Dr. A. ELANGO VAN**, Associate professor, PG & Research Department of Chemistry, Thiagarajar College, Madurai-625009. I also declare that this dissertation or part of work has not been published earlier elsewhere in any manner.

Place: Madurai

Date: 09-05-2022

J. Jeya Preetha  
Signature of the Candidate  
(J. JEYA PREETHA)

## ACKNOWLEDGEMENT

First and foremost I thank lord almighty for showering his blessings upon me and my parents for their blessings which play a key role in the completion of the work.

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

With great pride and pleasure, I express my heartfelt gratitude and sincere thanks to my guide **Dr. A. ELANGO VAN** Associate Professor, PG & Research Department of Chemistry, Thiagarajar College, Madurai-09 for his guidance and advice, timely help, excellent suggestions and kindness to carry out and complete the project work.

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

I record my sincere thanks to my internal guide **Dr. B. SUGANTHANA** Assistant Professor, department of chemistry, Fatima College, for her continuous support and guidance for the successful completion of the project work.

I express my heartfelt gratitude and sincere thanks to the **Dr. A. SUGANTHI** Associate Professor and Head PG & Research Department of Chemistry, Thiagarajar College, Madurai for granting permission and providing a congenial environment with excellent lab facilities.

I express my sincere thanks to **Ms. C. BHUVANESWARI**, Research Scholar, Thiagarajar College, PG & Research Department of Chemistry, Madurai, for her guidance and support that helped me to complete the project work successfully.

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 for their great support and constant encouragement.

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

(J. JEYA PREETHA)

# **SYNTHESIS, CHARACTERIZATION AND INVESTIGATION OF ANTIBACTERIAL ACTIVITY OF Ag-ZnO NANOCOMPOSITE**

*A Project report submitted for partial fulfilment of the Requirement for the  
degree of*

**Master of Science in chemistry**

**Submitted by**

**Ms. J. JULIET**

**(REG.NO: 2020MSCC12)**



**Department of chemistry**

**Fatima College (autonomous)**

**Re-accredited with a++ grade by NAAC  
(CGPA: 3.61) in the 4<sup>th</sup> cycle**

**Mary land,**

**Madurai- 625018.**

**Under the guidance of**

**Dr. J. JEYASUNDARI M.Sc., M.Phil., Ph.D.,**

**Assistant professor**



**PG AND RESEARCH DEPARTMENT OF CHEMISTRY**

**N. M. S. S. Vellaichamy Nadar College (Autonomous)**

**(Re-Accredited with "A" Grade by NACC)**

**Nagamalai, Madurai - 625019.**

**May-2022.**

## BONAFIDE CERTIFICATE

This is to certify that Ms. J. JULIET, M.Sc., (Chemistry) student of Fatima College, Madurai has done the project work entitled "SYNTHESIS, CHARACTERISATION AND INVESTIGATION OF ANTI BACTERIAL ACTIVITY OF Ag-ZnO NANO COMPOSITE" during the academic year 2021-2022 under the supervision of Dr. J. JEYASUNDARI, Assistant professor, PG & Research Department of chemistry, N.M.S.S. VELLAICHAMY NADAR COLLEGE, Nagamalai, Madurai - 625 019. This is to certify that no part of the work has been presented for any degree / diploma in any other form.



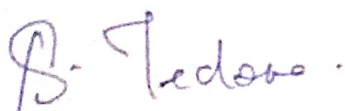
INTERNAL GUIDE

Dr. Sr. J. Arul Mary, M.Sc., M.Phil., Ph.D.,  
Assistant professor,  
Department of Chemistry,  
Fatima College,  
Madurai - 625 018.



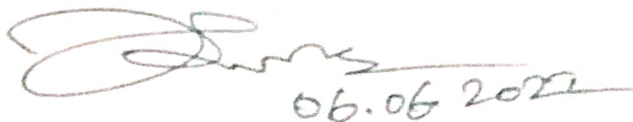
EXTERNAL GUIDE

Dr. J. Jeyasundari, M.Sc., M.Phil., Ph.D.,  
Assistant professor,  
PG & Research Department of Chemistry,  
N.M.S.S.V.N. College,  
Madurai - 625 019.



HEAD OF THE DEPARTMENT

Dr. B. Medona, M.Sc., Ph.D.,  
Associate professor,  
Department of Chemistry,  
Fatima College,  
Madurai - 625 018

  
06.06.2022

EXTERNAL EXAMINER

## DECLARATION

I do here by declare that this dissertation entitled “**synthesis, characterization and investigation of anti-bacterial activity of Ag-ZnO nano composite**” submitted to Fatima College in partial fulfilment 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 - 18.

Date: 09.05.2022

*J. Juliet*

J. JULIET

(2020MSCC12)

## 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 play a key role in the completion of the work.

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

I express my deep respect and gratitude to **Dr. B. MEDONA, M.Sc., Ph.D.**, Associate Professor and Head, Department 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. Sr. Arul Mary, M.Sc., M.Phil., Ph.D.**, Assistant Professor, Department of Chemistry, Fatima College for her guidance and support for the successful completion of the project work.

I express my heartfelt gratitude and sincere thanks to the **Dr. J. JEYASUNDHARI, M.Sc., M.Phil., Ph.D.**, Assistant professor, PG & Research Department of chemistry, N. M. S. S. Vellaichamy Nadar College, Madurai for granting permission and providing a congenial environment with excellent lab facilities.

I would like to thank the Management and Principal of N.M.S.S.V.N College for permitting me to do project successfully at N.M.S.S.V.N College. I express my heartfelt thanks to **Dr. M. RAJENDRAN, M.Sc., M.Phil., Ph.D.**, Head of the Department, PG and Research Department of Chemistry, N.M.S.S.V.N College for rendering me necessary facilities throughout my project.

I express my sincere and soulful thanks to **Ms. P. VENGATESH PRIYA**, Research Scholar, PG and Department of chemistry. Especially I am very grateful to them for their help rendered in the final proof-reading of the thesis.

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, love and unfailing support and encouragement.

**Synergistic action of Ag-CuO Nanocomposite – Synthesis, Characterization and  
antibacterial activity**

*A Project report submitted for partial fulfilment of the Requirement for the degree of*  
**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted By**

**Ms. R. KARTHIGA**

**(Register No: 2020MSCC13)**



**DEPARTMENT OF CHEMISTRY**

**FATIMA COLLEGE (AUTONOMOUS)**

**Re- Accredited with A++ Grade by NAAC**

**(CGPA: 3.61) (In the fourth cycle)**

**MADURAI – 625018**

**Under the guidance of**

**Dr.J.JEYASUNDARI M.Sc., M.Phil., Ph.D.,**

**Assistant professor**



**PG AND RESEARCH DEPARTMENT OF CHEMISTRY**

**N.M.S.S.Vellaichamy Nadar College (Autonomous)**

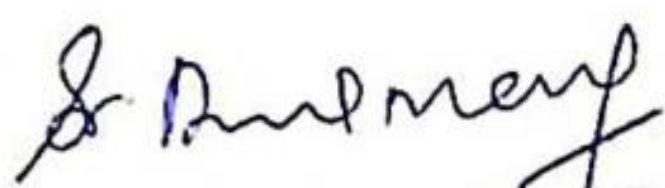
**(Re-Accredited with “A” Grade by NACC)**

**Nagamalai, Madurai- 625019.**

**MAY -2022.**

### BONAFIDE CERTIFICATE

This is to certify that the project entitled "Synergistic action of Ag-CuO Nanocomposite – Synthesis, Characterization and antibacterial activity" submitted is to Fatima College, Madurai in partial fulfilment for the award of degree of Master of Science in Chemistry is a bonafide record of the work carried by Ms. R. Karthiga (2020MSCC13) under the guidance of Dr.J. Jeyasundari, M.Sc., M.Phil., Ph.D., Assistant, PG & Research Department of Chemistry, N.M.S.S.Vellaichamy Nadar College, Madurai - 625 019 in the academic year 2021-2022.



INTERNAL GUIDE

Dr.Sr.J. Arul Mary, M.Sc., M.Phil., Ph.D.,

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EXTERNAL GUIDE

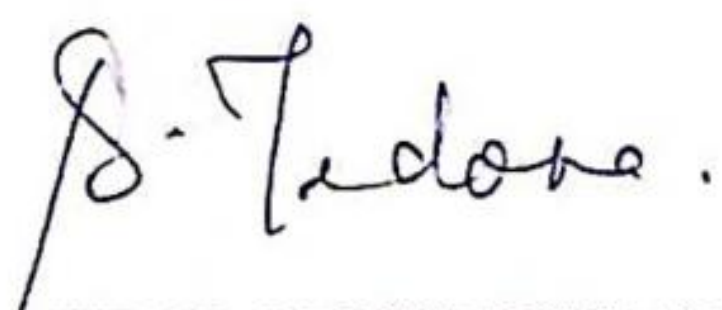
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EXTERNAL EXAMINER

## DECLARATION

I hereby declare that the work entitled “Synergistic action of Ag-CuO Nanocomposite – Synthesis, Characterization and antibacterial activity” presented in this report has been carried out by me under the supervision of **Dr.Sr.J. Arul Mary,M.Sc.,M.Phil.,Ph.D.,** Assistant Professor, Department of Chemistry, Fatima College (autonomous), Madurai. The work presented here is in original and not from the award of any other degree /Diploma /fellowship or other similar title to any candidate of any university.

*Karthiga .R*

Place: Madurai

KARTHIGA .R

Date: 09.05.2022

(2020MSCC13)

**Colorimetric Biosensor for Glucose Detection using 3-(anthracen-9-yl)-  
N-(2-oxo-1,2-dihydropyrimidin-4-yl)acrylamide [ANDA]**

*Dissertation submitted to Madurai Kamaraj University  
for the partial fulfillment of the requirement for the degree of*

**MASTER OF SCIENCE IN CHEMISRY**

**By**

**P. Mercy Magdalene  
(Reg. No: 2020MSCC15)**



**DEPARTMENT OF CHEMISTRY  
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***Under the Supervision of***

**Prof. V.S.VASANTHA  
Head- Dept. of Natural Products Chemistry**



**Department of Natural Products Chemistry  
School of Chemistry  
Madurai Kamaraj University  
Madurai-625 021.**

**May 2022**



**Madurai Kamaraj University**  
(University with potential for excellence)  
**Department of Natural Products Chemistry**  
**School of Chemistry**  
**Madurai-625 021.**



**Dr. V. S. Vasantha**  
**Professor & Head**  
E mail: [vasantham999@yahoo.co.in](mailto:vasantham999@yahoo.co.in)

Mobile: 9442357392  
Phone: + 91 - 452 - 245 8471, Ex: 337  
Fax: + 91 - 452 - 245 8449

**CERTIFICATE**

This is to certify that the dissertation work entitled "**Colorimetric Biosensor for Glucose Detection using 3-(anthracen-9-yl)-N-(2-oxo-1,2-dihydropyrimidin-4-yl)acrylamide [ANDA]**" has been carried out by **P. Mercy Magdalene** under my supervision during the academic year 2022. The dissertation has not been submitted in full or part for any diploma, degree or other similar title in this or any other University.

Place: Madurai

Date: 13.05.2022

**Dr. V. S. Vasantha**

**Supervisor**

**The Head**

**Department of Natural Products Chemistry**

**Dr. V.S. VASANTHA**  
Head & Professor  
Department of Natural Products Chemistry  
School of Chemistry  
Madurai Kamaraj University  
Madurai - 625 021

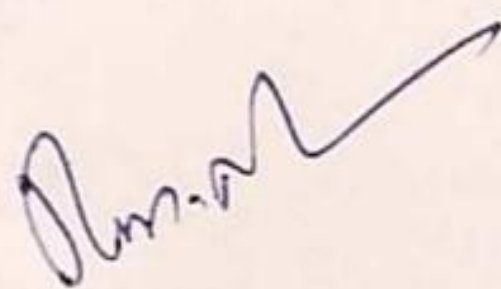
**The Chairperson**

**School of Chemistry**

**CHAIRPERSON**  
School of Chemistry  
Madurai Kamaraj University  
Madurai - 625 021

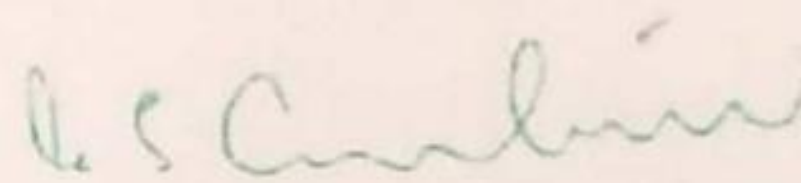
## BONAFIDE CERTIFICATE

This is to certify that **Ms. P. Mercy Magdalene**, M.Sc., (Chemistry) student of Fatima College, Madurai has done the project work entitled "**Colorimetric Biosensor for Glucose Detection using 3-(anthracen-9-yl)-N-(2-oxo-1,2-dihydropyrimidin-4-yl)acrylamide [ANDA]**" during the academic year 2021-2022 under the supervision of **Prof. V. S. VASANTHA**, Head- Dept. of Natural Products Chemistry, 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.



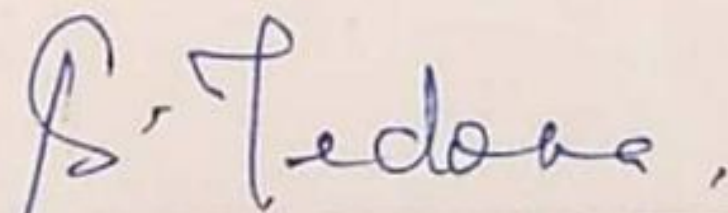
### INTERNAL GUIDE

**Mrs. R. M. NAGALAKSHMI**, M.Sc., M.Phil., B.Ed.  
Assistant Professor,  
Department of Chemistry,  
Fatima College,  
Madurai- 625018.



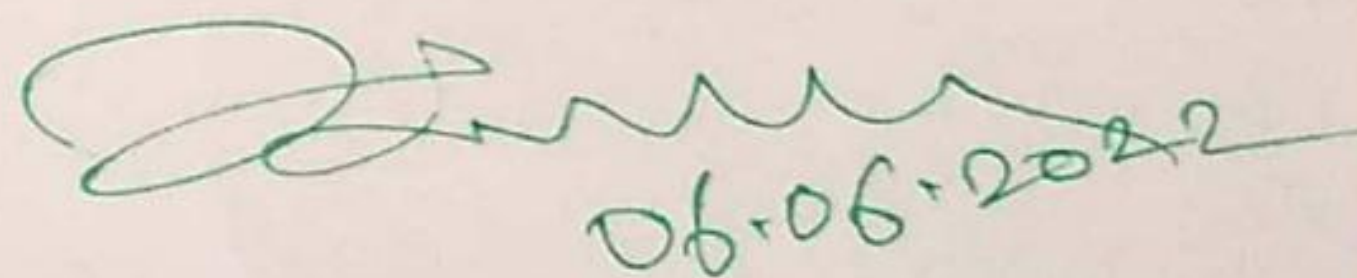
### EXTERNAL GUIDE

**Dr. V.S. VASANTHA**,  
Professor & Head  
Department of Natural Products Chemistry,  
School of Chemistry,  
Madurai Kamaraj University,  
Madurai- 625 021.



### HEAD OF THE DEPARTMENT EXTERNAL EXAMINER

**Dr. B. MEDONA**,  
Head and Associate Professor,  
Department of Chemistry,  
Fatima College,  
Madurai- 625 018.

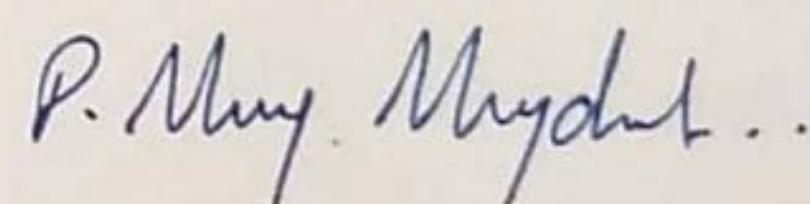
  
06.06.2022

## DECLARATION

I hereby declare that the dissertation entitled "**Colorimetric Biosensor for Glucose detection using 3-(anthracen-9-yl)-N-(2-oxo-1,2-dihydropyrimidin-4-yl)acrylamide (ANDA)**" submitted to Fatima College in partial fulfillment of the requirements for the award of **MASTER OF SCIENCE IN CHEMISTRY**, is the result of study originally carried out by me independently under the guidance of **Prof. V. S. VASANTHA** Department of Natural products Chemistry, School of Chemistry, Madurai Kamaraj University, Madurai-625 021. This work has not been submitted earlier in full or part elsewhere in any manner.

Place: Madurai

Date: 13.05.2022



**P.MERCY MAGDALENE**

**(2020MSCC15)**

**Greener Approach for Synthesis of 4-(((2mercaptophenyl) imino) methyl) benzaldehyde (MMB) for the Naked Eye Sensing of  $Hg^{2+}$  Ions**

*Dissertation submitted to Madurai Kamaraj University  
for partial fulfilment of the requirements  
for the degree of*

**MASTER OF SCIENCE IN CHEMISTRY**

By

**S.PAVITHRA**

**(Reg. No: 2020MSCC16)**



**DEPARTMENT OF CHEMISTRY  
FATIMA COLLEGE (AUTONOMOUS)**

**[Re-Accredited with A++ Grade by NAAC (CGPA: 3.61) in the fourth cycle]  
MARYLAND, MADURAI – 625 018.**

*Under the Supervision of*

**Prof. V.S.VASANTHA**

**Registrar (i/c)**

**Head - Dept. of Natural Products Chemistry**



**School of Chemistry  
Madurai Kamaraj University  
Madurai - 625 021.**

**May 2022**



**Madurai Kamaraj University**  
(University with potential for excellence)  
**Department of Natural Products Chemistry**  
**School of Chemistry**  
**Madurai-625 021.**



**Dr. V. S. Vasantha**  
**Registrar (i/c)**  
**Professor & Head**  
E mail: [vasantham999@yahoo.co.in](mailto:vasantham999@yahoo.co.in)

Mobile: 9442357392  
Phone: + 91 - 452 - 245 8471, Ex:337  
Fax: + 91 - 452 - 245 8449

**CERTIFICATE**


This is to certify that the dissertation work entitled "Greener Approach for Synthesis of 4-(((2mercaptophenyl)imino) methyl) benzaldehyde (MMB) for the Naked Eye Sensing of  $Hg^{2+}$  ions" has been carried out by S.PAVITHRA (2020MSCC16) under my supervision during the academic year 2021-2022. The dissertation has not been submitted in full or part for any diploma, degree or other similar title in this or any other University.

Place: Madurai

Date: 13.05.2022

  
Dr. V. S. Vasantha

Supervisor

  
The Head

Department of Natural Products Chemistry

Dr. V.S. VASANTHA  
Head & Professor  
Department of Natural Products Chemistry  
School of Chemistry  
Madurai Kamaraj University  
Madurai - 625 021

  
The Chairperson

School of Chemistry

CHAIRPERSON  
School of Chemistry  
Madurai Kamaraj University  
Madurai - 625 021

## BONAFIDE CERTIFICATE

This is to certify that **Ms. S.PAVITHRA**, M.Sc., (Chemistry) student of Fatima College, Madurai has done the project work entitled "**Greener Approach for Synthesis of 4-(((2mercaptophenyl)imino) methyl) benzaldehyde (MMB) for the Naked Eye Sensing of Hg<sup>2+</sup>Ions**" during the academic year 2021-2022 under the supervision of **Prof. V.S.VASANTHA**, Registrar (i/c), Head & Department of Natural Products Chemistry, 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



**Mrs.R.M.NAGALAKSHMI**, M.Sc., M.Phil., B.Ed.

Assistant Professor  
Department of Chemistry  
Fatima College  
Madurai- 62501

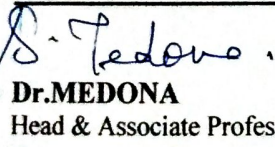
### EXTERNAL GUIDE



**Prof. V.S.VASANTHA**


Registrar (i/c) & Head  
Department of Natural Products Chemistry  
School of Chemistry  
Madurai Kamaraj University  
Madurai- 625021.

### HEAD OF THE DEPARTMENT



**Dr.MEDONA**  
Head & Associate Professor,  
Department of Chemistry,  
Fatima College,  
Madurai -625018.

### EXTERNAL EXAMINER



06.06.2022

## DECLARATION

I do here by declare that this dissertation entitled "**Greener Approach for Synthesis of 4-(((2mercaptophenyl)imino) methyl)benzaldehyde (MMB) for the Naked Eye Sensing of Hg<sup>2+</sup> ions**" submitted to Fatima College in partial fulfillment of requirement for the award of **MASTER OF SCIENCE IN CHEMISTRY**, is the result of study originally carried out by me independently under the guidance of **Prof. V. S. VASANTHA**, Registrar (i/c), Head & Department of Natural Products Chemistry, School of Chemistry, Madurai Kamaraj University, Madurai-625 021. I also declare that this dissertation or part of work has not been published earlier elsewhere in any manner.

Place: Madurai - 18.

Date: 13.05.2022

*S. Pavithra .*  
Signature of the Candidate

S.PAVITHRA  
(2020MSCC16)

## 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 **Dr. Rev. 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 **Prof.V.S.VASANTHA**, Registrar (i/c) and Head, Department of Natural Products Chemistry, School of Chemistry, Madurai Kamaraj University, Madurai-21 for the independence he gave me to choose the project in my area of interest, her 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, Department 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 **Mrs. R. M. NAGALAKSHMI**, Assistant Professor, Department of Chemistry, Fatima College for her guidance and support for the successful completion of the project work.

I sincerely thanks to **Dr. K. Shenbagavalli**, Department of Natural Products Chemistry, School of Chemistry, Madurai Kamaraj University for her constant support and encouragement, towards the successful completion of the work.

I owe my profound thanks and gratitude to our lab research scholars , **Dr. Ellairaja**, **Mr. P. Ananthappan**, **Mrs. S. Seena**, **Mrs. S. Karthika lakshmi**, **Mr. C. Arun Balaji**, **Mrs. C. Sudharsana** for their valuable help, kind cooperation and e ncouragement during the course of this project work.

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, love and unfailing support and encouragement.

S. Pavithra .  
(S.PAVITHRA)

**NOVEL TRIAZINE BASED LIGAND AND ITS METAL(II)COMPLEXES  
FOR SENSING AND ANTIMICROBIAL STUDIES**

*A Project report submitted for partial fulfillment of the Requirement for the  
degree of*

**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted By**

**Ms.M.PRIYANKA**

**(Register No: 2020MSCC17)**



**DEPARTMENT OF CHEMISTRY**

**FATIMA COLLEGE(AUTONOMOUS)**

**(Re-Accredited with A++ (CGPA: 3.61) Grade by NAAC(cycle - IV)**

**MARYLAND, MDURAI-625018**

**Under the Guidance of**

**Dr. P.THARMARAJ, M.Sc., ph.D.,**

**Associate professor**



**Department of chemistry**

**THIAGARAJAR COLLEGE**

**Madurai Kamaraj University**

**University with potential for excellence**

**(Re-Accredited with A++ (CGPA: 3.54) Grade by NAAC(cycle – IV)**

**Madurai - 625021.**

**May-2022**

**Dr. V. ARUL DEEPA,**

Assistant Professor,

Department of chemistry,

Fatima College,

Madurai-625 016.

**Dr. P. THARMARAJ,**

Supervisor,

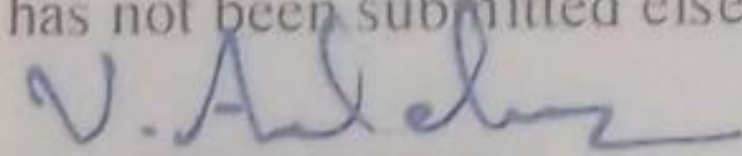
Department of Chemistry,

Thiagarajar College,

Madurai -625 009.

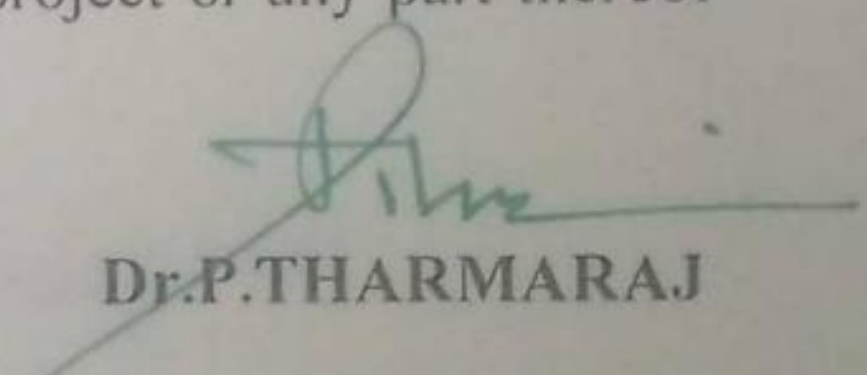
### CERTIFICATE

This is to certify that this project work entitled, " NOVEL TRIAZINE BASED LIGANDS AND ITS METAL(II) COMPLEXES FOR SENSING AND ANTIMICROBIAL STUDIES" submitted by M.Priyanka (2020MSCC17) for the award of MASTER OF SCIENCE IN CHEMISTRY to the department of chemistry, Fatima College, Madurai is based on the result of her studies under my guidance and supervision. This project or any part thereof has not been submitted elsewhere for any other degree or diploma.



**Dr. ARUL DEEPA**

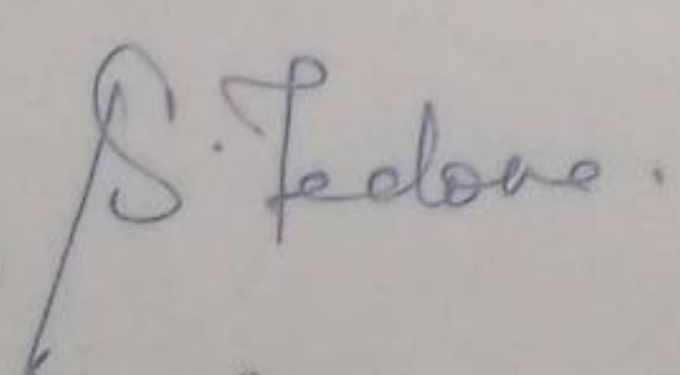
**Internal Guide**



**Dr. P. THARMARAJ**

**SUPERVISOR**

Endorsement

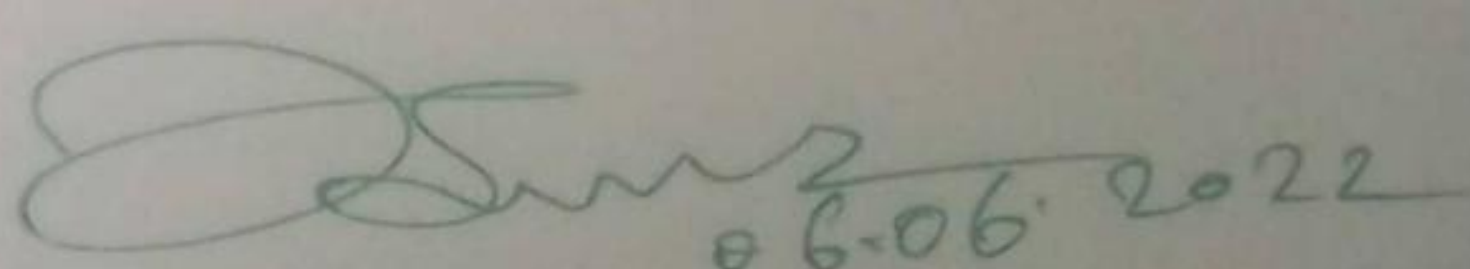


**Dr. B. Medona**

Head & Associate professor,

Fatima College,

Madurai-625018.



**EXTERNAL EXAMINER**

### DECLARATION

I hereby declare that the Project Work presented in this thesis entitled, "NOVEL TRIAZINE BASED LIGANDS AND ITS METAL(II) COMPLEXES FOR SENSING AND ANTIMICROBIAL STUDIES" is original and has been done at Department of Chemistry, Thiagarajar College, Madurai. It has not previously formed the basis for the award of any degree, diploma or similar title of this or any other university.

Place: Madurai-18.

Date: 9.05.2022

M. Priyanka

Signature of the candidate

M.PRIYANKA(2020MSCC17)

**EXPLORING COMPOUNDS AND INTERACTION OF CONSTITUENTS OF  
ABASURA KUDINEER WITH COVID 19 VIRUSES - AN INSILICO APPROACH**

*A Project report submitted for partial fulfillment of the Requirement for the award  
of the degree of*

**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted By**

**Ms. B. RAMA ROHINI**

**(Reg. No: 2020MSCC18)**



**UNDER THE INTERNAL GUIDANCE OF**

**Dr. B. MEDONA**

**HEAD & ASSOCIATE PROFESSOR**

**DEPARTMENT OF CHEMISTRY**

**FATIMA COLLEGE (AUTONOMOUS)**

**(Re-Accredited with A++ Grade by NAAC (CGPA: 3.61)**

**IN THE FOURTH CYCLE MARYLAND,**

**MADURAI - 625018.**

**UNDER THE EXTERNAL GUIDANCE OF**

**Dr. A. ELANGO VAN**

**ASSOCIATE PROFESSOR OF CHEMISTRY**



**THIAGARAJAR COLLEGE (AUTONOMOUS),  
AFFILIATED TO MADURAI KAMARAJ UNIVERSITY**

**MADURAI - 625009.**

**MAY 2022**

## CERTIFICATE

This is to certify that **Ms. B.RAMA ROHINI**, (Reg. No: 2020MSCC18)

M.Sc., (Chemistry) student of Fatima College, Madurai has done the project work entitled

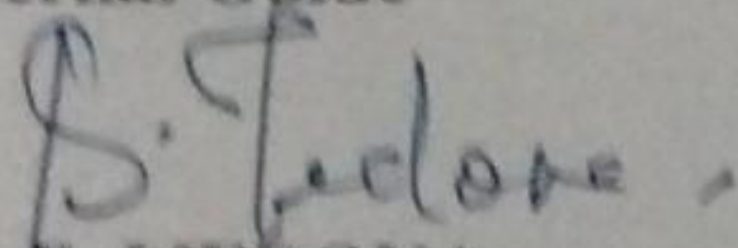
**"EXPLORING COMPOUNDS AND INTERACTION OF CONSTITUENTS OF  
KABASURA KUDINEER WITH COVID 19 VIRUSES - AN INSILICO APPROACH"**

during the academic year 2021-2022 under the supervision of **Dr. A. ELANGO VAN**

Associate Professor, Department of Chemistry, Thiagarajar College, Madurai-625009. This is

to certify that no part of the work has been presented for any degree/diploma in any other form.

### Internal Guide



**Dr. B. MEDONA**

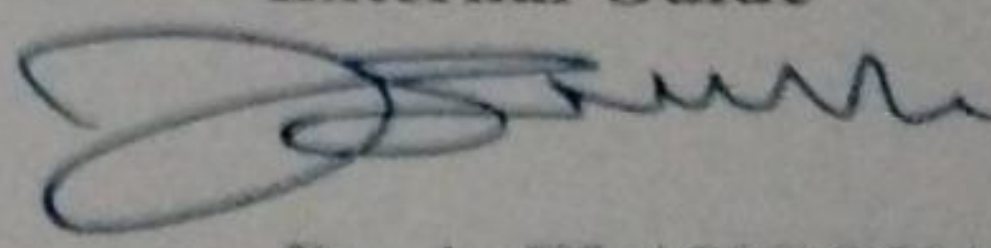
Head & Associate Professor

Department of Chemistry

Fatima College

Madurai-625018

### External Guide



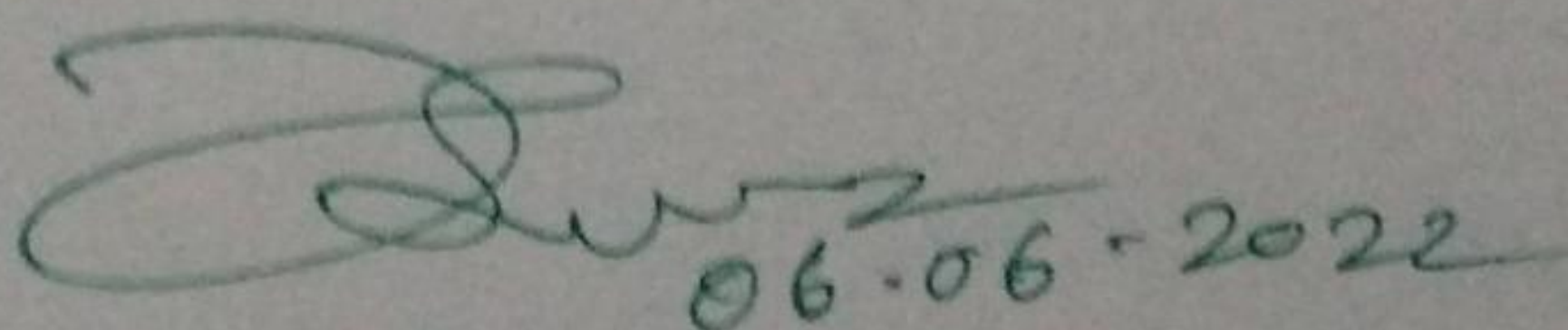
**Dr. A. ELANGO VAN**

Associate Professor

Department of Chemistry

Thiagarajar College

Madurai- 625009



06.06.2022

**EXTERNAL EXAMINER**

## DECLARATION

I hereby declare that this project work entitled "**EXPLORING COMPOUNDS AND INTERACTION OF CONSTITUENTS OF KABASURA KUDINEER WITH COVID 19 VIRUSES – AN INSILICO APPROACH**" has been originally carried out by me in the PG Chemistry laboratory during 2021-2022 under the guidance of **Dr. A. Elangovan**, Associate Professor of Chemistry, Thiagarajar College, Madurai and this work or any part of this not been submitted elsewhere for any degree.

B. Rama Rohini  
Signature of the Candidate

(B. RAMA ROHINI)

Place: Madurai

Date: 09.05.2022

## 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 play a key role in the completion of the work.

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

With great pride and pleasure, I express my deep sense of gratitude to my beloved External Guide **Dr. A. ELANGO VAN** Associate professor, PG & Research Department of chemistry, Thiagarajar College, Madurai-09 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 my Internal Guide **Dr. B. MEDONA** Associate Professor and Head, Department of Chemistry, Fatima College for permitting to carry out the project work at Thiagarajar College, Madurai.

I express my heartfelt gratitude and sincere thanks the Principal of Thiagarajar College and to **Dr. A. SUGANTHI** Associate Professor and Head, PG & Research Department of Chemistry, Thiagarajar College, Madurai for granting permission and providing a congenial environment with excellent lab facilities.

I take my immense pleasure to thank my parents **K. BOOPATHI** and **B. ANANTHALAKSHMI**, who are the pillars of my life, encouraged and stand with me in all stages of my life.

I like to express my lovable gratitude for my friends for their cooperation and support for completing the project.

(B. RAMA ROHINI)

# **“STUDIES ON NOVEL TRIAZINE BASED COMPOUND AND Cu(II) COMPLEX”**

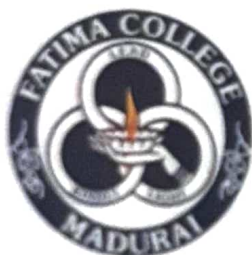
A Project report submitted for the partial fulfillment of the requirement for the  
degree of

**Master of Science in Chemistry**

Submitted by

**K. SINDHU**

**[Reg.No.2020MSCC21]**



**DEPARTMENT OF CHEMISTRY**

**FATIMA COLLEGE (AUTONOMOUS)**

**Re-Accredited with “A++”(CGPA 3.61) by NAAC (Cycle-IV)**

**MADURAI – 625 018.**

Under the guidance of

**Dr. P. THARMARAJ, M.Sc., Ph.D.,**

**Associate Professor,**



**Department of Chemistry,**

**Thiagarajar College,**

**Madurai- 625009.**

**MAY - 2022**

**Dr. M. PRIYADHARSANI**

Assistant Professor

Department of Chemistry

Fatima College

Madurai-625 018.

**Dr. P. THARMARAJ,**

Supervisor,

Department of Chemistry,

Thiagarajar College,

Madurai -625 009.

### **CERTIFICATE**

This is to certify that this project work entitled, "**STUDIES ON NOVEL TRIAZINE BASED COMPOUNDS AND Cu(II) COMPLEX**" submitted by **K.SINDHU (2020MSCC21)** for the award of **MASTER OF SCIENCE IN CHEMISTRY** to the department of chemistry, Fatima College, Madurai is based on the result of her studies under my guidance and supervision. This project or any part thereof has not been submitted elsewhere for any other degree or diploma.



**Dr.M.PRIYADHARSANI**

**Internal Guide**



**Dr.P.THARMARAJ**

**Supervisor**



**Endorsement**

**Dr. B. MEDONA**

**Head & Associate Professor**



**External Examiner**

## DECLARATION

I hereby declare that the Project Work presented in this thesis entitled, "**STUDIES ON NOVEL TRIAZINE BASED COMPOUND AND Cu(II) COMPLEX**" is original and has been done at Department of Chemistry, Thiagarajar College, Madurai. It has not previously formed the basis for the award of any degree, diploma or similar title of this or any other university.

**Place:** Madurai

**Date:** 10.05.2022

K. Sindhu

K. SINDHU

(2020MSCC21)

## ACKNOWLEDGEMENT

I, whole heartedly surrender my sincere thanks to the almighty who gave blessings for the successful completion of the work.

I deem it a proud privilege and pleasure in expressing my sincere gratitude and indebtedness to **Dr. P. Tharmaraj**, Associate professor, Thiagarajar College, Madurai, for suggesting the research work, stimulating discussion, inspiring guidance, constant encouragement, and much helpful assistance for the completion of my work well in time. I sincerely acknowledge their help and thank him heartily for the extreme care they have shown throughout the project work. I shall always be indebted to them for this.

I owe my sincere thanks to **Dr. Sr. G. Celine Sahaya Mary**, principal, Fatima College, Madurai, for granting me permission to do the project work in Thiagarajar College, Madurai.

I express my sincere thanks to **Dr. Mrs. Medona**, Head, Associate professor, Department of Chemistry, Fatima College, Madurai and I extend my sincere thanks to my internal guide **Dr. Mrs. M. Priyadharsani**, Assistant professor, Department of Chemistry, Fatima College, Madurai for their support and constant encouragement.

With great pleasure, I express my sincere thanks to **Dr. S. Sukumari**, **Dr. A. Rajeswari**, **Dr. B. Vinosha**, **Dr. B. Suganthana**, **Dr. Sr. J. Arul Mary**, **Mrs. R.M. Nagalakshmi**, **Dr. V. Aruldeepa**, **Dr. K.R. Subimol**, **Dr. P. Silviya Reeta** Department of Chemistry, Fatima College, Madurai.

I wish to express my gratitude and hearty thanks to **Ms. A. Steffy** and all my friends for their timely help care and support in all possible ways.

I express my heartfelt thanks to my beloved family members for their everlasting love, support and encouragement. They have always been behind me in whatever I did and I would not be where I am today if it were not for them.

**A GREENER APPROACH FOR PORPHYRIN SYNTHESIS USING MICROWAVE  
IRRADIATION**

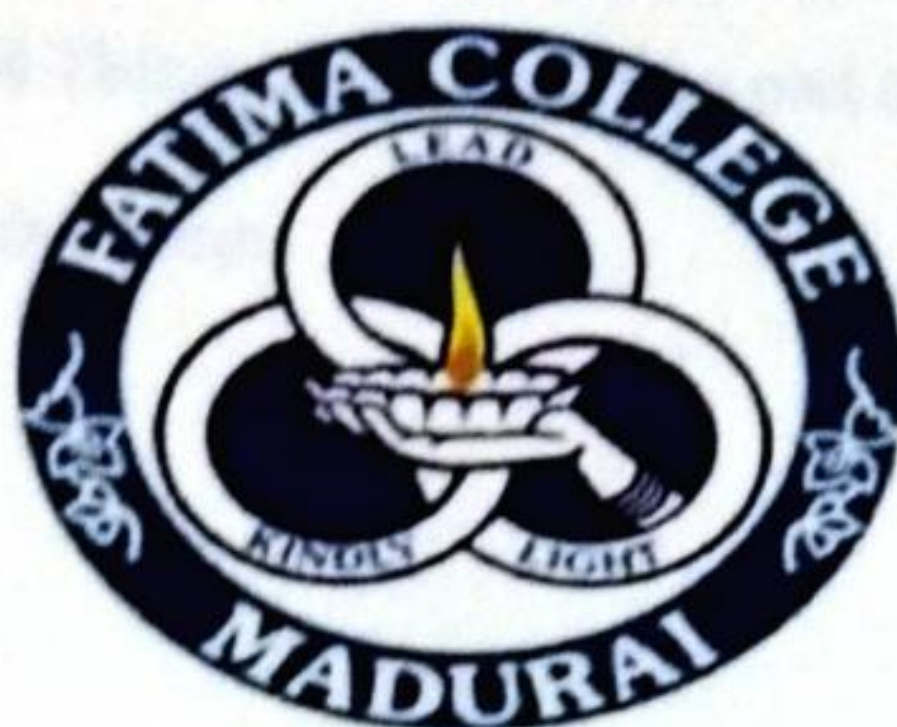
*A Dissertation submitted in partial fulfillment for the degree of*

**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted By**

**Ms. S. SINDHUJHA**

**(Reg. No: 2020MSCC22)**



**UNDER THE GUIDANCE OF**

**Dr. P. SILVIYA REETA**

**ASSISTANT PROFESSOR**

**DEPARTMENT OF CHEMISTRY**

**FATIMA COLLEGE (AUTONOMOUS)**

**(Re-Accredited with A++ Grade by NAAC (CGPA: 3.61)**

**IN THE FOURTH CYCLE MARYLAND,**

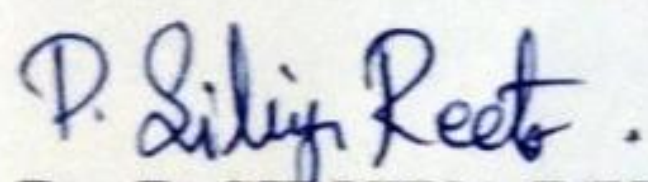
**MADURAI - 625018.**

**MAY 2022**

# CERTIFICATE

This is to certify that **Ms. S. SINDHUJHA**, (Reg. No: 2020MSCC22) M.Sc., (Chemistry) student of Fatima College, Madurai has done the project work entitled "**A GREENER APPROACH FOR PORPHYRIN SYNTHESIS USING MICROWAVE IRRADIATION**" during the academic year 2021-2022 under the supervision of Dr. **P. SILVIYA REETA** Assistant Professor, Department of Chemistry, Fatima college, Madurai-625018. This is to certify that no part of the work has been presented for any degree/diploma in any other form.

## Internal Guide



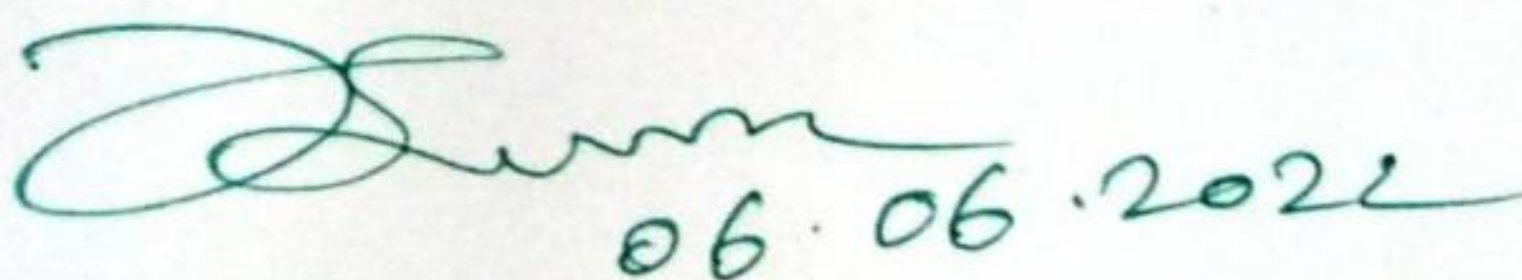
**Dr. P. SILVIYA REETA**

Assistant Professor  
Department of Chemistry  
Fatima College  
Madurai-625018

  
**Head Of The Department**

**Dr. B. Medona**

Head & Associate Professor  
Department of Chemistry  
Fatima College  
Madurai- 625018

  
06.06.2022

**EXTERNAL EXAMINER**

## DECLARATION

I hereby declare that this project work entitled "**A GREENER APPROACH FOR PORPHYRIN SYNTHESIS USING MICROWAVE IRRADIATION**" has been originally carried out by me in the PG Chemistry laboratory during 2021-2022 under the guidance of **Dr. P. SILVIYA REETA**, Assistant Professor of Chemistry, Fatima College, Madurai and this work or any part of this has not been submitted elsewhere for any degree.

Place: Madurai

Date: 16.05.2022

*S. Sindhuja*  
Signature of the Candidate

(S. SINDHUJHA)

### 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 play a key role in the completion of the work.

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

I express my deep respect and gratitude to my Internal Guide **Dr. P. SILVIYA REETA**, Assistant Professor Department of Chemistry, Fatima College for permitting me to carry out the project work at Fatima College, Madurai. For her sincere and compassionate advice, patience and insightful discussion for planning and execution of my research project. I owe a lot to her and express my deep sense of gratitude to her. I consider myself extremely fortunate to have worked under her guidance.

I am extremely grateful and highly thankful to **Dr. B.MEDONA, HOD**, Department of chemistry, Fatima college (Autonomous), Madurai- 625018 for her valuable help and support for the successful completion of this work.

I also extend my thanks to other faculty member in the department. I also thank all the staff members and lab technicians for their constant support and encouragement.

I would like to thank my relatives and family members for their moral support. And I am always thankful to the Lord Almighty for His blessings. Finally, I also thank my dear friends for their support, constant encouragement and caring.

*S. Sindhuja*

(S. SINDHUJHA)

**SYNTHESIS AND CHARACTERISATION OF  
 $\alpha$ - AMINOPHOSPHONATES USING FERRIC CHLORIDE  
AS CATALYST**

*A Project report submitted for partial fulfilment of the  
requirement for the degree of*

**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted By**

**Ms. C. SIVA DHARSHANI**

**(Reg. NO: 2020MSCC23)**



**DEPARMENT OF CHEMISTRY**

**FATIMA COLLEGE (AUTONOMOUS)**

**(Re-Accredited with A++ Grade by NAAC (CGPA: 3.61) in the fourth cycle)**

**MARY LAND, MADURAI – 625018.**

**Under the Guidance of**

**Dr.K.Karthik Kumar**

**Assistant Professor,**

**Department of Chemistry,**

**The American College,**

**Madurai – 625 002**

**May – 2022**

**SYNTHESIS AND CHARACTERISATION OF  
 $\alpha$ - AMINOPHOSPHONATES USING FERRIC CHLORIDE  
AS CATALYST**

*A Project report submitted for partial fulfilment of the  
requirement for the degree of*

**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted By**

**Ms. C. SIVA DHARSHANI**

**(Reg. NO: 2020MSCC23)**



**DEPARMENT OF CHEMISTRY**

**FATIMA COLLEGE (AUTONOMOUS)**

**(Re-Accredited with A++ Grade by NAAC (CGPA: 3.61) in the fourth cycle)**

**MARY LAND, MADURAI – 625018.**

**Under the Guidance of**

**Dr.K.Karthik Kumar**

**Assistant Professor,**

**Department of Chemistry,**

**The American College,**

**Madurai – 625 002**

**May – 2022**

**The American College**  
The Department of Chemistry  
Madurai Tamil Nadu – 625 002  
INDIA



**Dr. K Karthik Kumar**  
Assistant Professor  
[karthikkumar1265@gmail.com](mailto:karthikkumar1265@gmail.com)  
Tel: + 91-9789975169

**BONAFIDE CERTIFICATE**

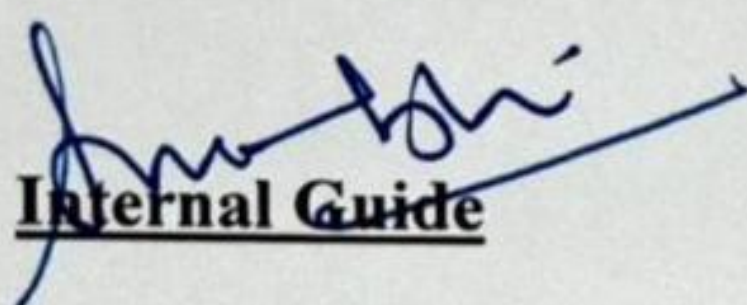
This is to certify that **Ms. C. Siva Dharshani** [Reg.No: 2020MSCC23] student of II. M.Sc., Chemistry, Department of Chemistry (PG), **Fatima College, Madurai- 18** carried out her M.Sc., Chemistry project work on “**Synthesis and characterization of  $\alpha$ -aminophosphonate using  $\text{FeCl}_3$  as catalyst**” in the **Organic and Material Chemistry Research Laboratory, Madurai- 02** from **1.12.2021- 30.04.2022**, for a period of four months, under the Guidance of **Dr. K. Karthik Kumar**, Assistant Professor, Department of Chemistry, The American College, Madurai- 02.



**Dr. K. Karthik Kumar**

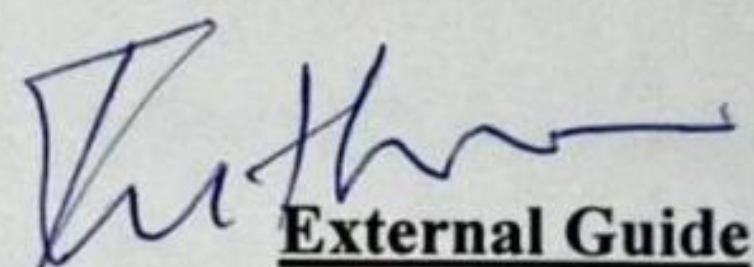
## CERTIFICATE

This is to certify that **Ms. C. SIVA DHARSHANI**, M.Sc., (Chemistry) student of Fatima College, Madurai has done the project work entitled " **Synthesis and characterization of  $\alpha$ - aminophosphonates using ferric chloride as catalyst**" the academic year 2021-2022 under the supervision of **Dr.K. Karthik Kumar**, Assistant professor, department of chemistry, The American college, Madurai-625002. This is to certify that no part of the work has been presented for any degree / diploma in any other form.



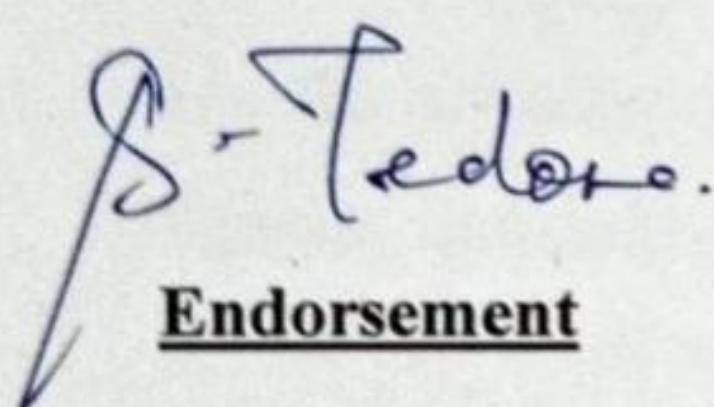
Internal Guide

**Dr. K. R. SUBIMOL**  
Assistant Professor  
Department of Chemistry  
Fatima College  
Madurai- 625018



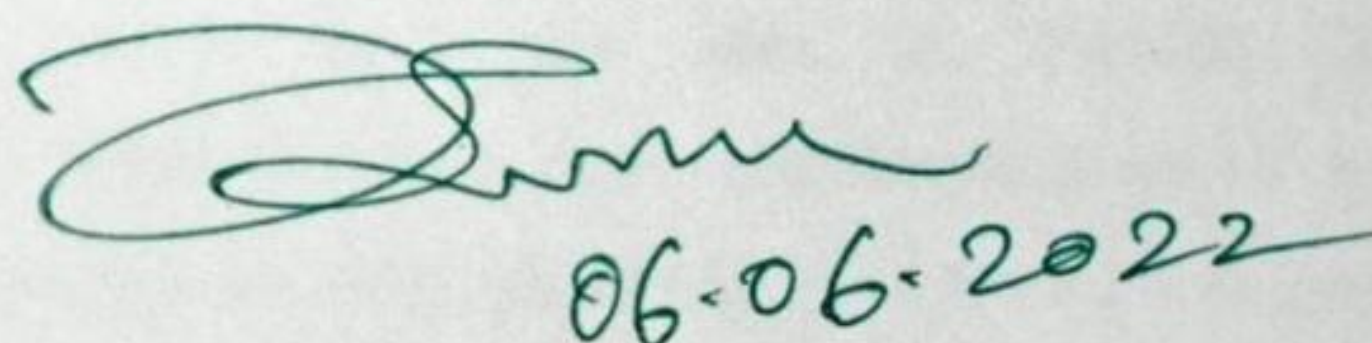
External Guide

**Dr.K. Karthik Kumar**,  
Assistant Professor,  
Department of Chemistry,  
The American college  
Madurai-625002



Endorsement

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



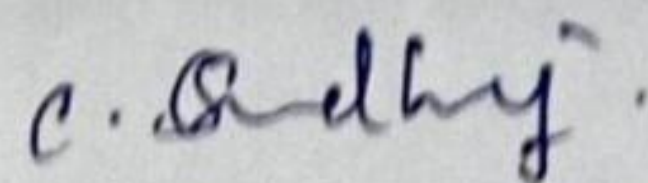
06.06.2022

## DECLARATION

I do here by declare that this dissertation entitled "**Synthesis and characterization of  $\alpha$ -aminophosphanates using ferric chloride as catalyst**" submitted to Fatima College in partial fulfilment 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 - 18.

**Date:**



**Signature of the Candidate**

**C. SIVA DHARSHANI  
(2020MSCC23)**

## 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 **Dr. Rev. Sr. G. CELINE SAHAYA MARY**, Fatima College, Madurai for giving me permission to do the project work in Kamaraj University, Madurai.

With great pride and pleasure, I express my deep sense of gratitude to my beloved mentor Madurai-21 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, Department of Chemistry, Fatima College for permitting to carry out the project work in American college, Madurai.

I record my sincere thanks to my internal guide **Dr. K. R. SUBIMOL** Assistant Professor, Department of Chemistry, Fatima College for her guidance and support for the successful completion of the project work.

I express my heartfelt gratitude and sincere thanks to the **Dr. K. KARTHIK KUMAR**, Professor and Madurai for granting permission and providing a congenial environment with excellent lab facilities.

I express my sincere and soulful thanks to **Mrs. P. PANDI SUDHA**, **Ms. R. SHOBANA**, Research Scholar, CSIR-Research Associate, Department of Materials Science, and School of Chemistry. Especially I am very grateful to them for their help rendered in the final proof-reading of the thesis.

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, love and unfailing support and encouragement.

(C. SIVA DHARSHANI)

**CuO/CoO/PEG NANOCOMPOSITE AS HIGH PERFORMANCE  
NON-ENZYMATIC ELECTROCHEMICAL GLUCOSE SENSOR**

*A Project report submitted for partial fulfillment of the Requirement for the degree of*

**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted By**

**Ms. S. SOUNDARIYA DEVI**

**(Register No: 2020MSCC24)**



**DEPARMENT OF CHEMISTRY  
FATIMA COLLEGE (AUTONOMOUS)**

**(Re-Accredited with A++ Grade by NAAC (CGPA: 3.61) Cycle-IV)**

**MARYLAND, MADURAI-625018**

**Under the Guidance of**

**Dr. Jamespandi ANNARAJ**

**Assistant Professor & Head (i/c)**

**Department of Materials Science**

**School of Chemistry**

**Madurai Kamaraj University**

**University with potential for excellence**

**(Re-Accredited with A++ Grade by NAAC (CGPA: 3.54) in the fourth cycle)**

**Madurai-625021.**

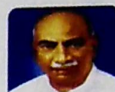


**May-2022**



# MADURAI KAMARAJ UNIVERSITY

*(University with Potential for Excellence)*



Dr. Jamespandi Annaraj  
Assistant Professor & Head (i/c)  
Department of Materials Science  
School of Chemistry


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## CERTIFICATE

This is to certify that the dissertation work entitled “CuO/CoO/PEG Nanocomposite as High Performance Non-enzymatic Electrochemical Glucose Sensor” has been carried out by **S. SOUNDARIYA DEVI (2020MSCC24)** under my supervision during the academic year 2021-2022. The dissertation has not been submitted in full or part for any diploma, degree or other similar title in this or any other Universities.

Place: Madurai-18

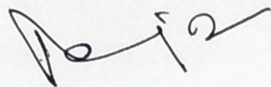
Date: 13.05.2022

  
Dr. Jamespandi Annaraj

Supervisor

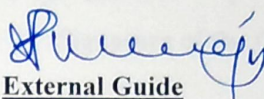
## BONAFIDE CERTIFICATE

This is to certify that **Ms. S. SOUNDARIYA DEVI (2020MSCC24)**, M.Sc., (Chemistry) student of Fatima College, Madurai has done the project work entitled **"CuO/CoO/PEG Nanocomposite as High Performance Non-enzymatic Electrochemical Glucose Sensor"** during the academic year 2021-2022 under the supervision of **Dr. Jamespandi ANNARAJ**, Assistant Professor & Head i/c, 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

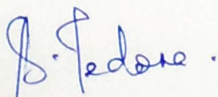
**Dr. A. RAJESWARI**  
Assistant Professor  
Department of Chemistry  
Fatima College  
Madurai-625018



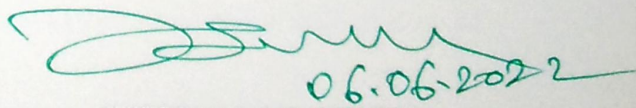
External Guide

**Dr. Jamespandi ANNARAJ**  
Assistant Professor & Head i/c  
Department of Materials Science  
School of Chemistry  
Madurai Kamaraj University  
Madurai-625021

Endorsement



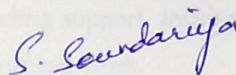
**Dr. B. MEDONA**  
Head & Associate Professor,  
Department of Chemistry,  
Fatima College,  
Madurai-625018.

  
06.06.2022

**EXTERNAL EXAMINER**

## DECLARATION

I do here by declare that this dissertation entitled "**CuO/CoO/PEG Nanocomposite as High Performance Non-enzymatic Electrochemical Glucose Sensor**" 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 -18.

Signature of the Candidate

Date: 13.05.2022

S. SOUNDARIYA DEVI  
(2020MSCC24)

## 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 **Dr. Rev. 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. Jamespandi ANNARAJ**, Assistant Professor & Head i/c, Department of Materials Science, Madurai Kamaraj University, 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 own my sincere thanks to **Dr. M. JEYANTHINATH**, Assistant Professor, Department of Materials Science, Madurai Kamaraj University for his valuable help and guidance.

I express my deep respect and gratitude to **Dr. B. MEDONA** Associate Professor and Head, Department 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. A. RAJESWARI**, Assistant Professor, Department of Chemistry, Fatima College, for her guidance and support for the successful completion of the project work.

I express my heartfelt gratitude and sincere thanks to the **Dr. V. S. VASANTHA**, Professor and Head Department of Industrial Chemistry, Madurai Kamaraj University, Madurai for granting permission and providing a congenial environment with excellent lab facilities.

I express my sincere and soulful thanks to **Mr. P. ANANTHAPPAN** and **Mr. E. ABEL NOELSON** Research Scholars, School of Chemistry, for their valuable help, kind cooperation and encouragement during the course of this 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 am deeply indebted my parents for their understanding, care, love and unfailing support and encouragement.

(S. SOUNDARIYA DEVI)

**MICROWAVE ASSISTED SYNTHESIS AND PHOTOPHYSICAL STUDIES OF AXIALLY  
LIGATED Sn(IV) PORPHYRINS**

*A Dissertation submitted in partial fulfillment for the degree of*

**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted By**

Ms. M. SUSHMA

(Reg. No: 2020MSCC25)



UNDER THE GUIDANCE OF

**Dr. P. SILVIYA REETA**

ASSISTANT PROFESSOR

DEPARTMENT OF CHEMISTRY

FATIMA COLLEGE (AUTONOMOUS)

*(Re-Accredited with A++ Grade by NAAC (CGPA: 3.61)*

IN THE FOURTH CYCLE MARYLAND,

MADURAI - 625018.

**MAY 2022**

## CERTIFICATE

This is to certify that **Ms. M. SUSHMA, (Reg. No: 2020MSCC25)** M.Sc., (Chemistry) student of Fatima College, Madurai has done the project work entitled "**MICROWAVE ASSISTED SYNTHESIS AND PHOTOPHYSICAL STUDIES OF AXIALLY LIGATED Sn(IV) PORPHYRINS**" during the academic year 2021-2022 under the supervision of **Dr. P. SILVIYA REETA** Assistant Professor, Department of Chemistry, Fatima college, Madurai-625018. This is to certify that no part of the work has been presented for any degree/diploma in any other form.

Internal Guide



**Dr. P. SILVIYA REETA**

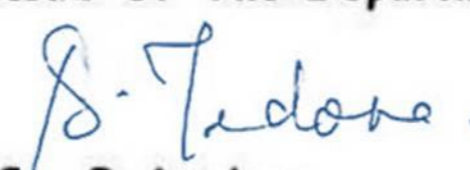
Assistant Professor

Department of Chemistry  
of Chemistry

Fatima College

Madurai-625018

Head Of The Department



**Dr. B. Medana**

Head & Associate Professor

Department

Fatima College

Madurai- 625018



**EXTERNAL EXAMINER**

## DECLARATION

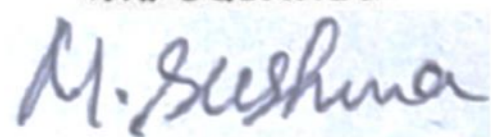
I hereby declare that this project work entitled "**MICROWAVE ASSISTED SYNTHESIS AND PHOTOPHYSICAL STUDIES OF AXIALLY LIGATED Sn(IV) PORPHYRINS**" has been originally carried out by me in the PG Chemistry laboratory during 2021-2022 under the guidance of **Dr. P. SILVIYA REETA**, Assistant Professor of Chemistry, Fatima College, Madurai and this work or any part of this has not been submitted elsewhere for any degree.

Place: Madurai

Signature of the Candidate

Date:

(M. SUSHMA)



## 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 play a key role in the completion of the work.

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

I express my deep respect and gratitude to my Internal Guide Dr. P. SILVIYA REETA, Assistant Professor Department of Chemistry, Fatima College for permitting me to carry out the project work at Fatima College, Madurai. For her sincere and compassionate advice, patience and insightful discussion for planning and execution of my research project. I owe a lot to her and express my deep sense of gratitude to her. I consider myself extremely fortunate to have worked under her guidance.

I am extremely grateful and highly thankful to Dr. B.MEDONA, HOD, Department of chemistry, Fatima college (Autonomous), Madurai- 625018 for her valuable help and support for the successful completion of this work.

I am extremely thankful to Dr. A. TAMIL SELVI, Assistant professor, PG and Research Department of Chemistry, Thiagarajar College, Madurai for her constant support in recording emission spectrum for all the synthesized compounds.

I extremely thankful to MRS. MU. ABIRAAMI lab technician for her support in recording IR spectrum for all the synthesized compounds.

I also extend my thanks to other faculty member in the department. I also thank all the staff members and lab technicians for their constant support and encouragement.

I would like to thank my relatives and family members for their moral support. And I am always thankful to the Lord Almighty for His blessings. Finally, I also thank my dear friends for their support, constant encouragement and caring.