

# **SODIUM ALGINATE BASED PROTON CONDUCTING MEMBRANES FOR FUEL CELLS**

A project report submitted in partial fulfillment of the requirements for the award  
of the degree of the

## **MASTER OF SCIENCE IN CHEMISTRY**

**Submitted by**

**S.ANUSUYA**

**21PSC01**

**Under the guidance of**

**Dr. S. ALWIN, M.Sc., Ph.D.,**



**Post Graduate and Research Department of Chemistry**

**The American College**

**Madurai – 625 002**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

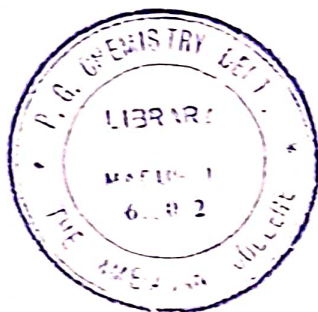
**MAY – 2023**

## CERTIFICATE

This is to certify that the project report entitled "SODIUM ALGINATE BASED PROTON CONDUCTING MEMBRANES FOR FUEL CELLS" is submitted to the post graduate and research department of chemistry for the partial fulfillment of Master of Science degree is a record of research work carried out by S.ANUSUYA (21PSC01) under my supervision during the academic year 2022 – 2023 and this work has not been submitted elsewhere for the award of any degree

Place: Madurai

Date: 18.05.2023.



*C.D. Sheela*

Dr. C. DOROTHY SHEELA, M.Sc.,  
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*S. Alwin*

18.05.2023.

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# REMOVAL OF METHYLENE BLUE DYE USING DOLICHANDINE FALCATA BIOCHAR

A project report submitted in partial fulfilment of the requirements for the  
award of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

Submitted by

**V. BENADICT PRAKASH**

**21PSC02**

Under the guidance of

**Dr. S. JOHNSON RAJA, M.Sc., Ph.D.,**



Postgraduate and Research Department of Chemistry

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(An Autonomous Institution Affiliated to Madurai Kamaraj University)

**Madurai – 625 002**

**JUNE – 2023**

## CERTIFICATE

This is to certify that the project report entitled “**REMOVAL OF METHYLENE BLUE DYE USING DOLICHANDINE FALCATA BIOCHAR**” is submitted to the postgraduate and research department of chemistry for the partial fulfilment of Master of Science Degree is a record of research work carried out by BENADICT PRAKASH.V (21PSC02) under my supervision during the year 2022 – 2023 and this work has not been submitted elsewhere for the award of any degree.

**Place: Madurai**

**Date:** 18/5/23



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**Dr. S. JOHNSON RAJA, M.Sc., Ph.D.,**

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Madurai.



# **AN ATTEMPT TO SYNTHESIZE LOW VALENT $\text{Cu(I)}$ COMPLEXES FROM $\text{Cu(II)}$ PRECURSORS USING VITAMIN C AS GREEN REDUCTANT**

A project report submitted in partial fulfillment of the requirements for the  
award of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

**SUBMITTED BY**

**BIBIJA J**

**21PSC03**

Under the guidance of

**Dr. I. AVINASH M.Sc., Ph.D.,**



Post graduate and research department of chemistry

The American College

Madurai – 625002

(An Autonomous Institution Affiliated To Madurai Kamaraj University)

May 2022-2023

## CERTIFICATE

This is to certify that the project report entitled "AN ATTEMPT TO SYNTHESIZE LOW VALENT Cu(I) COMPLEXES FROM Cu(II) PRECURSORS USING VITAMIN C AS GREEN REDUCTANT" is submitted to the post graduate and research department of chemistry for the partial fulfillment of master of science degree is a record of research work carried out by BIBIJA J (21PSC03) under the supervision of Dr. I. AVINASH during the year 2022-2023 and this work has not been submitted elsewhere for the award of any degree.

PLACE: Madurai

DATE: 18-05-2023



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Dr. C. DOROTHY SHEELA M.Sc., Ph.D.,  
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**CORROSION INHIBITION OF MILD CARBON STEEL IN WELL  
WATER MEDIUM BY L-GLUTAMIC ACID -  $Zn^{2+}$  System**

A project report submitted in partial fulfilment of the requirements for the award  
of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

Submitted by

**DEEPIKA. A**

**21PSC04**

Under the guidance of

**Dr. J. Angelin Thangakani, M.Sc., B.Ed., Ph.D.,**



**Post Graduate and Research Department of Chemistry**

**The American College**

**Madurai – 625 002**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

**MAY – 2023**

**ACTIVATED BIOCHAR FROM THE MORINDA  
TINCTORIA LEAVES AS A GREEN ADSORBENT FOR  
THE REMOVAL OF HEXAVALENT CHROMIUM.**

A project report submitted in partial fulfilment of the requirements for the  
award of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

Submitted by

**ENOCH IRAIANBU C**

Under the guidance of

**Dr. J. Dhavethu Raja, MSc., Ph.D.,**



Post Graduate and Research department of Chemistry

**THE AMERICAN COLLEGE**

**MADURAI – 625 002**

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**MAY – 2023**

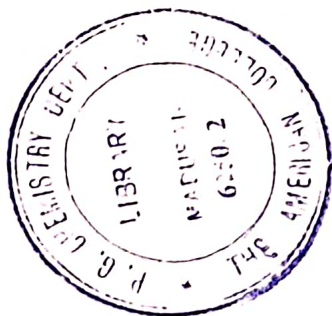


## CERTIFICATE

This is to certify that the project report entitled "ACTIVATED BIOCHAR FROM THE MORINDA TINCTORIA LEAVES AS A GREEN ADSORBENT FOR THE REMOVAL OF HEXAVALENT CHROMIUM" is submitted to the post graduate and research department of chemistry for the partial fulfilment of Master of Science degree is a record of research work carried out by Enoch Iraianbu C. (21PSC06) under my supervision during the year 2022 – 2023 and this work has not been submitted elsewhere for the award of any degree.

Place: Madurai

Date: 20/05/23



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20/05/23

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**SYNTHESIS, CHARACTERISATION, DFT, DNA BINDING, AND  
ANTIMICROBIAL STUDIES OF 3,4-DIAMINO BENZOPHENONE  
DERIVED SCHIFF BASE LIGAND AND ITS METAL COMPLEXES.**

A project report submitted in partial fulfilment of the requirements for the award  
of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

Submitted by  
**P. GIFTSON**  
**21PSC07**

Under the guidance of

**Dr. T. CHRISTOPHER JEYAKUMAR, M.Sc., Ph.D.,**  
Post Graduate and Research Department of Chemistry



**The American College**  
**Madurai-625002**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

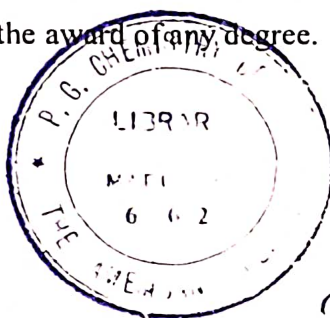
**MAY – 2023**

## CERTIFICATE

This is to certify that the project report entitled “SYNTHESIS, CHARACTERISATION, DFT, DNA BINDING, AND ANTIMICROBIAL STUDIES OF 3,4-DIAMINO BENZOPHENONE DERIVED SCHIFF BASE LIGAND AND ITS METAL COMPLEXES” is submitted to the post graduate and research department of chemistry for the partial fulfillment of Master of Science degree is a record of research work carried out by **P. GIFTSON** (21PSC07) under my supervision during the year (2022 – 2023) and this work has not been submitted elsewhere for the award of any degree.

**Place: Madurai**

**Date:**



*C.D. Sheela*

*T. C.*

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# **SYNTHESIS AND CHARACTERISATION OF Ce (IV) INCORPORATED ISOPOLYMOLYBDATE**

A project report submitted in partial fulfilment of the requirements for the award of  
the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

Submitted by

**GUNASEELAN P**

**21PSC08**

Under the guidance of

**Dr. S. JEMIMA BALASELVI JULIANA M.Sc., Ph.D.**



Since 1881

**Post Graduate and Research Department of Chemistry**

**The American college**

**Madurai – 625 002.**

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**MAY-2023**

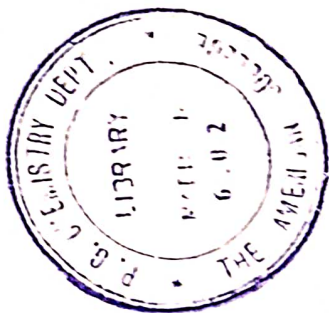


## CERTIFICATE

This is to certify that the project report entitled "SYNTHESIS AND CHARACTERISATION OF Ce (IV) INCORPORATED ISOPOLYMOLYBDATE" is submitted to the Post Graduate and Research department of Chemistry for the partial fulfilment of Master of Science degree, is a record of research work carried out by GUNASEELAN P (21PSC08) under my supervision during the year 2022-2023 and this work has not been submitted elsewhere for the award of any degree.

PLACE: Madurai

DATE: 22 / 5 / 23



*C.D. Sheela*

C. DOROTHY SHEELA M.Sc., Ph.D.,  
Associate Professor & Coordinator (SF),  
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*S. Jemima Balaselvi*  
Dr. S. JEMIMA BALASELVI JULIANA,  
M.Sc., Ph.D., Project Supervisor  
Associate Professor  
Department of Chemistry  
The American College, Madurai



**DENSITY FUNCTIONAL STUDY OF DONOR SUBSTITUTED  
TRIPHENYLAMINE BASED ORGANIC DYES FOR DSSC  
APPLICATIONS**

A project report submitted in partial fulfillment of the requirements for the award of  
the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted by**

**E. HARINEE**

**21PSC09**

Under the guidance of

**Dr. P. Pounraj, M.Sc., M. Phil., Ph.D.,**



Post Graduate and Research Department of Chemistry

**The American College**

**Madurai – 625 002**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

**May 2023**



## CERTIFICATE

This is to certify that the project report entitled "DENSITY FUNCTIONAL STUDY OF DONOR SUBSTITUTED TRIPHENYLAMINE BASED ORGANIC DYES FOR DSSC APPLICATIONS" is submitted to the post graduate and research department of chemistry for the partial fulfillment of Master of Science degree is a record of research work carried out by HARINEE E (21PSC09) under my supervision during the year 2022 – 2023 and this work has not been submitted elsewhere for the award of any degree

**Place: MADURAI**

**Date: 18.05.2023**



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**Dr. C. DOROTHY SHEELA, M.Sc., Ph.D.,**

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*P. Pounraj*

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**SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL STUDIES OF Cu(II), Co(II)  
METAL COMPLEX DERIVED FROM (E)-4-(2-HYDROXY-3-METHOXYBENZYLIDENE)AMINO-  
1,5-DIMETHYL-2-PHENYL-1,2-DIHYDRO-3H-PURAZOL-3-ONE**

A project report submitted in partial fulfilment of the requirements for

the award of the degree of the

**Master of Science in Chemistry**

Submitted by

**A. KARTHICK RAJA**

**21PSC10**

Under the guidance of

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Since 1881

**Post Graduate and Research Department of Chemistry  
The American College**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

Re-accredited (3<sup>rd</sup> cycle) by NAAC with grade A<sup>+</sup>, CGPA-3.47 on 4 point scale

**Madurai – 625002**

**APRIL – 2023**

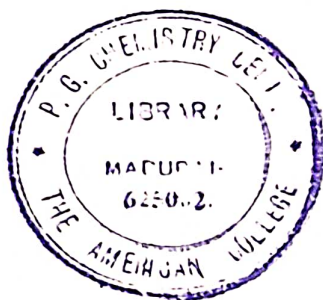


## CERTIFICATE

This is to certify that the project report entitled is "SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL STUDIES OF Cu(II), Co(II) METAL COMPLEX DERIVED FROM (E)-4-(2-HYDROXY-3-METHOXYBENZYLIDENE)AMINO-1,5-DIMETHYL-2-PHENYL-1,2-DIHYDRO-3H-PURAZOL-3-ONE" submitted to the post graduate and research department of chemistry for the partial fulfillment of master of science degree is a record of research work carried out by A. KARTHICK RAJA (21PSC10) under my supervision during the year 2022-2023 and this work has not been submitted elsewhere for the award of any degree.

Place: Madurai

Date: 19-05-2023



C.D. Sheela-

Dr.C.DOROTHY SHEELA M.Sc.,Ph.D.,

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Dr.A. SELVAN, M.Sc., M.Phil., Ph.D.,

Project Supervisor,  
Assistant Professor,  
Post Graduate & Research  
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Madurai.

**SYNTHESIS AND SPECTRAL CHARACTERISATION OF ACETOGUANAMINE  
BASED SCHIFF BASE LIGAND AND THEIR METAL COMPLEXES**

A project report submitted in partial fulfillment of the requirements for the award  
of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

Submitted by

**LOGESH M**

**21PSC12**

Under the guidance of

**Dr. M. VATHANARUBA, M.Sc., M.Phil., B.Ed., Ph.D.,**



Post Graduate and Research Department of Chemistry

**The American College**

**Madurai – 625 002**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

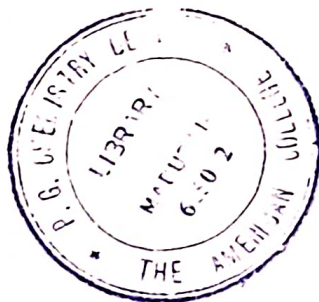
**MAY – 2023**

## CERTIFICATE

This is to certify that the project report entitled "SYNTHESIS AND SPECTRAL CHARACTERISATION OF ACETOGUNAMINE BASED SCHIFF BASE LIGAND AND THEIR METAL COMPLEXES" is submitted to the Post graduate and Research Department of Chemistry for the partial fulfillment of Master of Science degree is a record of research work carried out by LOGESH M (21PSC12) under my supervision during the year 2022 – 2023 and this work has not been submitted elsewhere for the award of any degree

Place: Madurai

Date: 23/05/2023



*C. D. Sheela*

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The American College, Madurai

*M. Vath* 23/5/23

**Dr. M. Vathanaruba, M.Sc., M.Phil., Ph.D.,**  
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# **EFFICIENCY OF MANGO LEAF BIOCHAR IN THE REMOVAL OF HEXAVALENT CHROMIUM**

A project report submitted in partial fulfillment of the requirements for the award  
of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

Submitted by

**K.D. OMKUMAR**

**21PSC13**

Under the guidance of

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Post Graduate and Research Department of Chemistry

**The American College**

**Madurai – 625 002**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

**MAY – 2023**

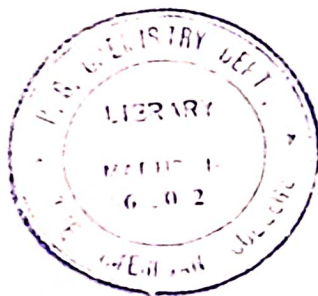


## CERTIFICATE

This is to certify that the project report entitled "EFFICIENCY OF MANGO LEAF BIOCHAR IN THE REMOVAL OF CHROMIUM" is submitted to the post graduate and research department of chemistry for the partial fulfillment of Master of Science degree is a record of research work carried out by Omkumar. K.D. (21PSC13) under my supervision during the year 2022 – 2023 and this work has not been submitted elsewhere for the award of any degree.

Place: Madurai

Date: 20/05/23



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*J. Dhaweethu Raja*  
20/5/23

Dr. J.DHAVEETHU RAJA,  
M.Sc., Ph.D.,  
Project Supervisor,  
Assistant Professor,  
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Madurai

**SYNTHESIS OF TEREPHTHALDEHYDE BASED BIO-CONJUGATES : A  
HIGHLY SENSITIVE AND SKELETON SELECTIVE MULTI-  
RESPONSIVE CHEMOSENSOR FOR Cu(II)**

A project report submitted in partial fulfillment of the requirements for the award of the  
degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted by**

**PRAVEEN S**

**21PSC14**

Under the guidance of

**Dr. S. JOSEPH PONNIAH**



**SINCE 1881**

Post Graduate and Research Department of Chemistry

**The American College**

**Madurai – 625 002**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

**MAY – 2023**

## CERTIFICATE

This is to certify that the project report entitled **SYNTHESIS OF TEREPHTHALDEHYDE BASED BIO-CONJUGATES: A HIGHLY SENSITIVE AND SKELETON SELECTIVE MULTI- RESPONSIVE CHEMOSENSOR FOR Cu(II)** is submitted to the post graduate and research department of chemistry for the partial fulfillment of Master of Science degree is a record of research work carried out by Praveen S. (21PSC14) under my supervision during the year 2022 – 2023 and this work has not been submitted elsewhere for the award of any degree

Place: Madurai

Date: 20.05.2023



*C.D. Sheela*

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*S. Joseph Ponniah*

**Dr. S. JOSEPH PONNIAH , M.Sc., Ph.D.,**  
Project supervisor,  
Assistant Professor,  
Post Graduate and Research,  
Department Of Chemistry,  
The American College,  
Madurai.

**SYNTHESIS AND CHARACTERISATION OF  $Ce^{IV}$  INCORPORATED MIXED  
VALENCE ISOPOLYMOLYBDATE**

A project report submitted in partial fulfilment of the requirements for the award of the  
degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

Submitted by

**PRIYADHARSAN R R**

**21PSC15**

Under the guidance of

**Dr. S. JEMIMA BALASELVI JULIANA M.Sc., Ph.D.**



Since 1881

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**MAY-2023**

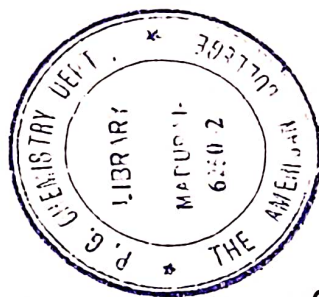


## CERTIFICATE

This is to certify that the project report entitled "SYNTHESIS AND CHARACTERISATION OF  $\text{Ce}^{\text{IV}}$  INCORPORATED MIXED VALENCE ISOPOLYMOLBDATE" is submitted to the Post Graduate and Research Department of Chemistry for the partial fulfilment of Master of Science degree is a record of research work carried out by PRIYADHARSAN R R (21PSC15) under the supervision of Dr. S. JEMIMA BALASELVI JULIANA during the year 2022-2023 and this work has not been submitted elsewhere for the award of any degree.

PLACE: Madurai

DATE: 22/5/23



*C.D. Sheela*

Dr. C. DOROTHY SHEELA, M.Sc., Ph.D.,

Coordinator

Post Graduate and Research Department of Chemistry

The American College, Madurai.

*S. Jemima Balaselvi*  
Dr. S. JEMIMA BALASELVI  
JULIANA, M.Sc., Ph.D.,

Project Supervisor

Associate Professor

Department of Chemistry

The American College, Madurai

**SYNTHESIS, CHARACTERIZATION, AND ANTIMICROBIAL STUDIES OF Cu (II),  
Co (II) COMPLEXES DERIVED (E)-4-((3,4-DIMETHOXYBENZYLIDENE)AMINO)-  
1,5-DIMETHYL-2-PHENYL-1, 2-DIHYDRO-3H-PYRAZOL-3-ONE**

Thesis submitted in partial fulfillment of the requirements

for the award of the degree of

**MASTER OF SCIENCE IN CHEMISTRY**

Submitted By

M.RAMYA

21PSC17

Under the guidance of

Dr . A. SELVAN, MSc ., M.Phil., B.Ed., Ph.D.,



SINCE 1881

**POST GRADUATE AND RESEARCH DEPARTMENT OF CHEMISTRY,  
THE AMERICAN COLLEGE.**

(An autonomous institution affiliated to Madurai Kamaraj University)

Re-accredited (3rd cycle) by NAAC with Grade "A+", CGPA-3.47 on a 4-point scale

MADURAI.

APRIL-2023

## CERTIFICATE

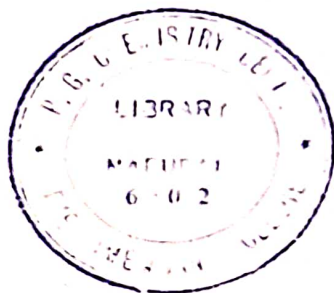
This is to certify that the project report entitled "SYNTHESIS, CHARACTERIZATION AND ANTIMICROBIAL STUDIES OF Cu(II), Co(II) COMPLEXES DERIVED (E)-4-((3,4-DIMETHOXYBENZYLIDENE)AMINO)-1,5-DIMETHYL-2-PHENYL-1, 2-DIHYDRO-3H-PYRAZOL-3-ONE" is submitted to the Post Graduate and Research Department of Chemistry for the partial fulfilment of master of science degree is a record of research work carried out by **M.RAMYA (21PSC17)** under the supervision of **Dr. A. SELVAN, MSc., M.Phil., B.Ed., Ph.D.**, during the year 2021-2023 and this work has not been submitted elsewhere for the award of any degree.

Place: Madurai

Date: 19.05.2023

*C.D. Sheela*

**Dr. C. DORATHY SHEELA**



**Coordinator (SF) ,  
Associate Professor,  
Post Graduate and Research  
Department of Chemistry,  
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Madurai.**

*A. Selvan*

**Dr. A. SELVAN**

**Project supervisor,  
Assistant professor,  
Post Graduate and Research  
Department of Chemistry,  
The American College  
Madurai.**

**SYNTHESIS AND SPECTRAL CHARACTERIZATION  
OF TRANSITION METAL COMPLEXES OF SCHIFF  
BASE DERIVED FROM 4-METHOXYBENZALDEHYDE  
AND 4-NITROANILINE**

A project report submitted in partial fulfillment of the requirements  
for the award of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

Submitted By

**SIVA KUMAR S**

**21PSC18**

Under the guidance of

**R. EBENEZER M.Sc., Ph. D.,**



**Post graduate and research department of chemistry**

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**May 2022-2023**

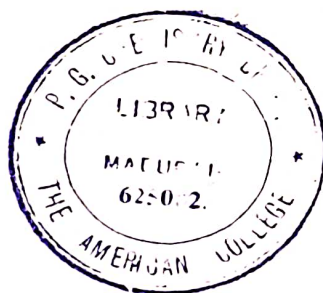


## CERTIFICATE

This is to certify that the project report entitled "SYNTHESIS AND SPECTRAL CHARACTERIZATION OF TRANSITION METAL COMPLEXES OF SCHIFF BASE DERIVED FROM 4-METHOXYBENZALDEHYDE AND 4-NITROANILINE" is submitted to the post graduate and research department of chemistry for the partial fulfillment of Master of Science Degree is a record of research work carried out by **SIVA KUMAR S (21PSC18)** under the supervision of **R. EBENEZER M.Sc., Ph. D.**, during the year 2022-2023 and this work has not been submitted elsewhere for the award of any degree.

**PLACE: Madurai**

**DATE: 19-05-2023**



*C.D. Sheela*

**Dr. C. DOROTHY SHEELA**

**M.Sc., Ph.D.,**

Head of the department,  
Post graduate and research,  
Department of Chemistry,  
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*R. Ebenezer*

**R. EBENEZER**

**M.Sc., Ph. D.,**

Project supervisor,  
Assistant professor,  
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Madurai.

**SYNTHESIS AND CHARACTERIZATION OF TERPOLY  
(FORMALDEHYDE, RESORCINOL  
AND ANILINE BLUE)**

A project report submitted in partial fulfillment of the requirements for the  
award of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

SUBMITTED BY

**SRITHAR M**

**21PSC20**

Under the guidance of

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**Madurai – 625002**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

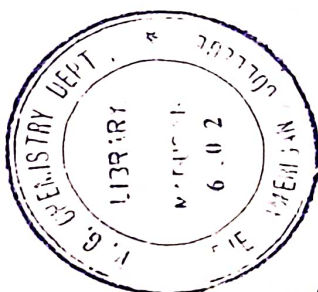
**May 2023**

## CERTIFICATE

This is to certify that the project report entitled "SYNTHESIS AND CHARACTERIZATION OF TERPOLY (FORMALDEHYDE, RESORCINOL AND ANILINE BLUE)" is submitted to the post graduate and research department of chemistry for the partial fulfillment of master of science degree is a record of research work carried out by **SRITHAR M (21PSC20)** under the supervision of **Dr. JANCIRANI.A** during the year 2022-2023 and this work has not been submitted elsewhere for the award of any degree.

**PLACE:** Madurai

**DATE:** 22/05/23



*C.D. Sheela*

**Dr. C. DOROTHY SHEELA M.Sc., Ph.D.,**  
Associate Professor & Coordinator (SF),  
Post graduate and research,  
Department of Chemistry,  
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*A. Jancirani*

**Dr. A. JANCIRANI M.Sc., M.Phil., Ph. D.,**  
Assistant professor,  
Project supervisor,  
Department of Chemistry,  
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Madurai.



**CORROSION INHIBITION OF MILD CARBON STEEL IN WELL  
WATER MEDIUM BY L-METHIONINE -  $Zn^{2+}$  System**

A project report submitted in partial fulfilment of the requirements for the award  
of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

Submitted by

**S. SUSMITHA RUBAVATHI**

**21PSC21**

Under the guidance of

**Dr. J. Angelin Thangakani, M.Sc., B.Ed., Ph.D.,**



**Post Graduate and Research Department of Chemistry**

**The American College**

**Madurai – 625 002**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

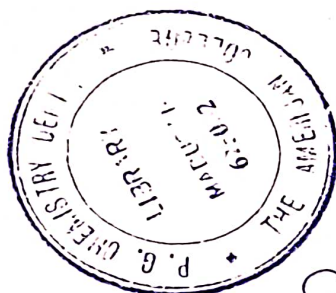
**MAY – 2023**

## CERTIFICATE

This is to certify that the project report entitled “CORROSION INHIBITION OF MILD CARBON STEEL IN WELL WATER MEDIUM BY L-METHIONINE –  $Zn^{2+}$  SYSTEM” is submitted to the post graduate and research department of chemistry for the partial fulfilment of Master of Science degree is a record of research work carried out by S. SUSMITHA RUBAVATHI (21PSC21) under my supervision during the year 2022 – 2023 and this work has not been submitted elsewhere for the award of any degree

**Place: Madurai**

**Date: 22-05-23**



*C.D. Sheela*

**Dr. C. DOROTHY SHEELA, M.Sc., Ph.D.,**  
Coordinator (SF),  
Associate professor,  
Post Graduate and Research  
Department of Chemistry,  
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Madurai.

*Dr. J. Angelin Thangakani*

**Dr. J. ANGELIN THANGAKANI, M.Sc., B.Ed., Ph.D.,**  
Project Supervisor,  
Assistant professor,  
Post Graduate and Research  
Department of chemistry,  
The American College,  
Madurai.

**Experimental and theoretical studies of Schiff base ligand and complex  
formation with transition metal ion and their biological studies**

A project report submitted in partial fulfilment of the requirements for the award  
of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

Submitted by

**VEERAPANDIYAN G**

**21PSC23**

Under the guidance of

**Dr. T. CHRISTOPHER JEYAKUMAR, M.Sc., Ph.D.,**



Post Graduate and Research Department of Chemistry

**The American College**

**Madurai – 625 002**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

**MAY – 2023**

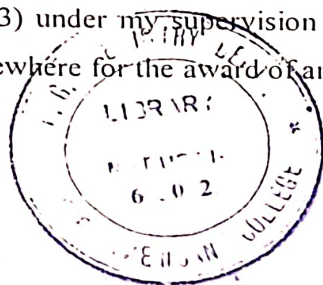


## CERTIFICATE

This is to certify that the project report entitled “**Experimental and theoretical studies of Schiff base ligand and complex formation with transition metal ion and their biological studies**” is submitted to the post graduate and research department of chemistry for the partial fulfilment of Master of Science degree is a record of research work carried out by VEERAPANDIYAN G(21PSC23) under my supervision during the year 2022 – 2023 and this work has not been submitted elsewhere for the award of any degree.

Place: Madurai

Date: 20.05.2023



C. D. Sheela.

Dr. C. Dorothy Sheela, M.Sc., Ph.D.,  
Coordinator (SF),  
Associate Professor,  
Post Graduate and Research  
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The American College,  
Madurai

T. C.

Dr. T. Christopher Jeyakumar, M.Sc., Ph.D.,  
Project Supervisor,  
Assistant Professor,  
Post Graduate and Research  
Department of chemistry,  
The American College,  
Madurai

# **SYNTHESIS AND CHARACTERISATION OF VITAMIN-C BASED IONIC LIQUID**

A project report submitted in partial fulfillment of the requirements for the  
award of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

**SUBMITTED BY**

**VETRI P**

**21PSC24**

Under the guidance of

**Dr. I. AVINASH M.Sc., Ph.D.**



Post Graduate and Research Department Of Chemistry

**The American College**

**Madurai – 625002**

**(An Autonomous Institution Affiliated To Madurai Kamaraj University)**

**MAY 2022-2023**

## CERTIFICATE

This is to certify that the project report entitled "SYNTHESIS AND CHARACTERISATION OF VITAMIN-C BASED IONIC LIQUID" is submitted to the post graduate and research department of chemistry for the partial fulfillment of master of science degree is a record of research work carried out by VETRI P (21PSC24) under the supervision of Dr. I. AVINASH during the year 2022-2023 and this work has not been submitted elsewhere for the award of any degree.

PLACE: Madurai

DATE: 19-05-2023



*C.D. Sheela*

**Dr. C. DOROTHY SHEELA M.Sc., Ph.D.,**  
Coordinator (SF),  
Post graduate and research department  
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Madurai.

**Dr. I. AVINASH M.Sc., Ph.D.,**  
Project supervisor,  
Assistant professor,  
Post graduate and research department  
of chemistry,  
The American College, Madurai.

**LIMONIA ACIDISSIMA. L LEAVES BIOCHAR PREPARED  
THROUGH PYROLYSIS USING  $H_3PO_4$  AS CHEMICAL ACTIVATOR  
FOR SEQUESTRATION OF METHYLENE BLUE DYE**

A project report submitted in partial fulfillment of the requirements for the  
award of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

Submitted by

**G.VIGNESH**

**21PSC25**

Under the guidance of

**Dr. S.JOHNSON RAJA M.Sc., Ph.D.,**



**Post Graduate and Research Department of Chemistry**

**The American College**

**Madurai – 625 002**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

**JUNE – 2023**



## CERTIFICATE

This is to certify that the project report entitled "LIMONIA ACIDISSIMA. L LEAVES BIOCHAR PREPARED THROUGH PYROLYSIS USING  $H_3PO_4$  AS CHEMICAL ACTIVATOR FOR SEQUESTRATION OF METHYLENE BLUE DYE " is submitted to the post graduate and research department of chemistry for the partial fulfillment of Master of Science degree is a record of research work carried out by Vignesh G. under my supervision during the year 2022 – 2023 and this work has not been submitted elsewhere for the award of any degree

Place: Madurai

Date: 18/5/23



*C.D. Sheela.*

Dr. C. DOROTHY SHEELA, M.Sc., Ph.D.,  
Coordinator (SF),  
Post Graduate and Research  
Department of chemistry,  
The American College,  
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*S. Johnson Raja.*

Dr. S. JOHNSON RAJA, M.Sc., Ph.D.,  
Project Supervisor,  
Assistant Professor,  
Post Graduate and Research  
Department of chemistry,  
The American College,  
Madurai

**SYNTHESIS AND CHARACTERISATION OF IODIDE ION  
DOPED AND UNDOPED POLY(VINYL CHLORIDE)-GRAFT-  
POLY(ETHYLENE GLYCOL) POLYMERS**

A project report submitted in partial fulfillment of the requirements for the  
award of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

SUBMITTED BY

**VIJAYALAKSHMI B**

**21PSC26**

Under the guidance of

**Dr. A. JANCIRANI M.Sc., M.Phil., Ph.D.**



Since 1881

**Post Graduate and Research Department of Chemistry**

**The American College**

**Madurai – 625002**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

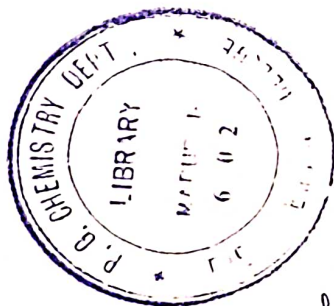
**May 2023**

## CERTIFICATE

This is to certify that the project report entitled "Synthesis and characterisation of Iodide ion doped and undoped poly(vinyl chloride)-graft-poly(ethylene glycol) polymers" is submitted to the post graduate and research department of chemistry for the partial fulfillment of master of science degree is a record of research work carried out by **VIJAYALAKSHMI B (21PSC26)** under the supervision of **Dr. A. JANCIRANI** during the year 2022-2023 and this work has not been submitted elsewhere for the award of any degree.

**PLACE:** Madurai

**DATE:** 24-05-2023



*C.D. Sheela*

**Dr. C. DOROTHY SHEELA M.Sc., Ph.D.,**  
Associate Professor & Coordinator (SF),  
Post graduate and research,  
Department of Chemistry,  
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*A. Jancirani*

**Dr. A. JANCIRANI M.Sc., M.Phil., Ph. D.,**  
Assistant professor,  
Project supervisor,  
Department of Chemistry,  
The American College,  
Madurai.

**SYNTHESIS AND SPECTRAL CHARACTERIZATION OF  
TRANSITION METAL COMPLEXES OF SCHIFF BASE  
DERIVED FROM 4-METHOXYBENZALDEHYDE AND  
4-NITROANILINE**

Thesis submitted in partial fulfilment of the requirement for the award of the degree

**MASTER OF SCIENCE IN CHEMISTRY**

**SUBMITTED BY**

**S. VIMALA**

**21PSC27**

Under the guidance of

**R. EBENEZER M.Sc., Ph.D.**

Post graduate and research department of chemist



SINCE 1881

**POST GRADUATE AND RESEARCH DEPARTMENT OF CHEMISTRY,  
THE AMERICAN COLLEGE,  
MADURAI.**

(An autonomous institution affiliated to Madurai Kamaraj University)

**May 2022-2023**



## CERTIFICATE

This is to certify that the project report entitled "SYNTHESIS AND SPECTRAL CHARACTERIZATION OF TRANSITION METAL COMPLEXES OF SCHIFF BASE DERIVED FROM 4-METHOXYBENZALDEHYDE AND 4-NITROANILINE" is submitted to the post graduate and research department of chemistry for the partial fulfillment of master of science degree is a record of research work carried out by VIMALA.S (21PSC27) under the supervision of EBENEZER.R during the year 2021-2023 and this work has not been submitted elsewhere for the award of any degree.

Place: Madurai

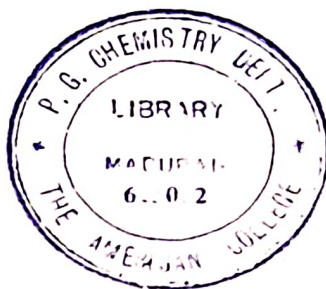
Date : 19.05.2023

*C.D. Sheela*

Dr. C. DOROTHY SHEELA

M.Sc., Ph. D

Head of the department,  
Post graduate and research,  
Department of chemistry,  
The American college,  
Madurai.



*E. Ebenezer*

R. EBENEZER M.Sc.,

Ph. D

Project supervisor,  
Assistant professor,  
Post graduate and research,  
Department of chemistry,  
Madurai.

**A CONVENIENT ROUTE TO SYNTHESIZE COPPER(I) N-  
HETEROCYCLIC CARBENE COMPLEXES ADAPTING GREEN  
SYNTHETIC METHODOLOGY**

A project report submitted in partial fulfillment of the requirements for the award  
of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

**SUBMITTED BY**

**M. VISALAKSHI**

**21PSC28**

Under the guidance of

**Dr. I. AVINASH, M.Sc., Ph.D.,**



Post Graduate and Research Department of Chemistry

**The American College**

**Madurai – 625 002**

(An Autonomous Institution Affiliated to Madurai Kamaraj University)

**MAY 2022 – 2023**

## CERTIFICATE

This is to certify that the project report entitled "A CONVENIENT ROUTE TO SYNTHESIZE COPPER(I) N-HETEROCYCLIC CARBENE COMPLEXES ADAPTING GREEN SYNTHETIC METHODOLOGY" is submitted to the post graduate and research department of chemistry for the partial fulfillment of Master of Science degree is a record of research work carried out by Visalakshi M (21PSC28) under my supervision during the year 2022 – 2023 and this work has not been submitted elsewhere for the award of any degree.

Place: Madurai

Date : 19.05.2023



*C.D. Sheela*

Dr. C. DOROTHY SHEELA  
M.Sc., Ph.D.,  
Coordinator (SF),  
Post Graduate and Research,  
Department of Chemistry,  
The American College,  
Madurai.

A handwritten signature in blue ink, appearing to read "I. Avinash".

DR. I. AVINASH M.Sc., Ph.D.,  
Project Supervisor,  
Assistant professor,  
Post Graduate and Research,  
Department of Chemistry,  
The American College,  
Madurai.

**SYNTHESIS AND SPECTRAL CHARACTERISATION OF  
ACETOGUANAMINE-BASED SCHIFF BASE LIGAND AND THEIR  
METAL COMPLEXES**

A project report submitted in partial fulfillment of the requirements for the award  
of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

Submitted by

**A. KRITHIK**

**21PSC29**

Under the guidance of

**Dr. M. VATHANARUBA, M.Sc., M.Phil., B.Ed. Ph.D.,**



Post Graduate and Research Department of Chemistry

**The American College**

**Madurai – 625 002**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

**MAY – 2023**



## CERTIFICATE

This is to certify that the project report entitled "SYNTHESIS AND SPECTRAL CHARACTERISATION OF ACETOGUNAMINE BASED SCHIFF BASE LIGAND AND THEIR METAL COMPLEXES" is submitted to the Post graduate and Research Department of Chemistry for the partial fulfillment of Master of Science degree is a record of research work carried out by A. KRITHIK(21PSC29) under my supervision during the year 2022 – 2023 and this work has not been submitted elsewhere for the award of any degree

Place: Madurai

Date: 23.05.23



*C.D. Sheela*

**Dr. C. Dorothy Sheela, M.Sc., Ph.D.,**  
Coordinator (SF),  
Post Graduate and Research  
Department of chemistry,  
The American College,  
Madurai

*M. Vath* 23/5/23

**Dr. M. Vathanaruba, M.Sc., M.Phil., Ph.D.,**  
Project Supervisor,  
Associate Professor,  
Post Graduate and Research  
Department of Chemistry,  
The American College,  
Madurai

**COMPUTATIONAL STUDY OF D-D- $\pi$ -A STRUCTURED QUINOLINE BASED  
ORGANIC DYES FOR DSSC APPLICATIONS**

A project report submitted in partial fulfillment of the requirements for the award of the degree of  
the

**MASTER OF SCIENCE IN CHEMISTRY**

**Submitted by**

**S. RUDHRA**

**21PSC30**

Under the guidance of

**Dr. P. Pounraj, M.Sc., M.Phil., Ph.D.,**



Post Graduate and Research Department of Chemistry

**The American College**

**Madurai – 625 002**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

**MAY – 2023**

## CERTIFICATE

This is to certify that the project report entitled "COMPUTATIONAL STUDY OF D-D- $\pi$ -A STRUCTURED QUINOLINE BASED ORGANIC DYES FOR DSSC APPLICATIONS" is submitted to the post graduate and research department of chemistry for the partial fulfillment of Master of Science degree is a record of research work carried out by Rudhra S. (21PSC30) under my supervision during the year 2022 – 2023 and this work has not been submitted elsewhere for the award of any degree

**Place: MADURAI**

**Date: 18.05.2023**



*C.D. Sheela*

Dr. C. DOROTHY SHEELA, M.Sc., Ph.D.,

Coordinator (SF),

Post Graduate and Research

Department of chemistry,

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Madurai

*P. Pounraj*

Dr. P. POUNRAJ, M.Sc., M.Phil., Ph.D.,

Project Supervisor,

Assistant Professor,

Post Graduate and Research

Department of chemistry,

The American College,

Madurai

## CERTIFICATE

This is to certify that the project report entitled "COMPUTATIONAL STUDY OF D-D- $\pi$ -A STRUCTURED QUINOLINE BASED ORGANIC DYES FOR DSSC APPLICATIONS" is submitted to the post graduate and research department of chemistry for the partial fulfillment of Master of Science degree is a record of research work carried out by Rudhra S. (21PSC30) under my supervision during the year 2022 – 2023 and this work has not been submitted elsewhere for the award of any degree

**Place: MADURAI**

**Date: 18.05.2023**



*C.D. Sheela*

**Dr. C. DOROTHY SHEELA, M.Sc., Ph.D.,**

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Post Graduate and Research

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Madurai

*P. Pounraj*

**Dr. P. POUNRAJ, M.Sc., M.Phil., Ph.D.,**

Project Supervisor,

Assistant Professor,

Post Graduate and Research

Department of chemistry,

The American College,

Madurai



**SODIUM ALGINATE BASED PROTON CONDUCTING MEMBRANES  
FOR FUEL CELLS**

A project report submitted in partial fulfillment of the requirements for the award  
of the degree of the

**MASTER OF SCIENCE IN CHEMISTRY**

Submitted by

**P.KALAIARASI**

**21PSC31**

Under the guidance of

**Dr. S. ALWIN, M.Sc., Ph.D.,**

**Post Graduate and Research Department of Chemistry**



**The American College,**

**Madurai – 625 002**

**(An Autonomous Institution Affiliated to Madurai Kamaraj University)**

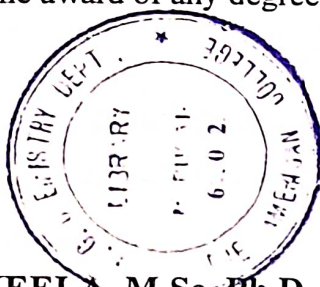
**MAY – 2023**

## CERTIFICATE

This is to certify that the project report entitled "SODIUM ALGINATE BASED PROTON CONDUCTING MEMBRANES FOR FUEL CELLS" is submitted to the post graduate and research department of chemistry for the partial fulfillment of Master of Science degree is a record of research work carried out by **KALAIARASI P (21PSC31)** under my supervision during the academic year 2022 – 2023 and this work has not been submitted elsewhere for the award of any degree

**Place: Madurai**

**Date: 18.05.2023.**



*C. D. Sheela*  
**Dr. C. DOROTHY SHEELA, M.Sc., Ph.D.,**  
Coordinator (SF),  
Post Graduate and Research  
Department of chemistry,  
The American College,  
Madurai

*S. Alwin*  
**Dr. S. ALWIN, M.Sc., Ph.D.,**  
Project Supervisor,  
Assistant Professor,  
Post Graduate and Research  
Department of chemistry,  
The American College,  
Madurai