



Department : Chemistry		
Academic Year : 2019-20		
Sr. No.	Programme Code	Name of the Programme
01.	104	B. Sc. (Hons)

Following students have carried out their Project work/ Internship/
Field Project/Industrial Training for the academic session 2019-20

Si.No.	Name of the Students	Page No To
1.	Aditi Verma	31-35
2.	Amisha Sahu	36-40
3.	Kiran Kumari	3-8
4.	Malwika Baghel	9-14
5.	Garima Dewangan	41-45
6.	Shrishtishree Mahapatra	21-25
7.	Shubham Mahto	15-20

गुरु घासीदास विश्वविद्यालय
(केन्द्रीय विश्वविद्यालय अधिनियम 2009 क्र. 25 के अंतर्गत स्थापित केन्द्रीय विश्वविद्यालय)
कोनी, बिलासपुर - 495009 (छ.ग.)



Guru Ghasidas Vishwavidyalaya
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)
Koni, Bilaspur - 495009 (C.G.)

8.	Supriya Acharya	26-30
9.	Sejal Sen	46-51

अध्यक्ष/Head
Signature **अध्यक्ष/Head**
Dept. of Chemistry
गुरु घासीदास विश्वविद्यालय,
Guru Ghasidas Vishwavidyalaya,
बिलासपुर 495009 (छ.ग.)
Bilaspur 495009 (C.G.)



GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

(A Central University Established by the Central Universities Act, 2009 No.25 of 2009)

DEPARTMENT OF CHEMISTRY

A

Project

ON

“STUDY OF RECEPTORS AND ITS RECOGNITION PROPERTIES”

BACHELOR OF SCIENCE (VI SEM)

(Session: 2019-20)

GUIDED BY:-

Dr NEERAJ KUMARI

Assistant professor

Department Of Chemistry

Guru Ghasidas Central University

Bilaspur (C.G.)

SUBMITTED BY :-

Ms. KIRAN KUMARI

ROLL NO:- 17210247

B.Sc VI SEM



Department of chemistry

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A Central University Established By Central Universities Act 2009
No. 25 of 2009)

Forwarding Certificate

This is to certify that Ms. Kiran Kumari has carried out the project in the department of chemistry, Gru Ghasidas Vishwavidyalaya (A Central University), Bilaspur (C.G.) on the topic “Study of receptors and it’s recognition properties”. This project is submitted for the patrial fulfillment of requirements for the degree of B.Sc. in Chemistry. I wish her every success in her life.

मुख्य/Head
रसायन शास्त्र विभाग
Dept. of Chemistry
गुरु घासीदास विश्वविद्यालय,
Guru Ghasidas Vishwavidyalaya,
बिलासपुर 495009 (छ.ग.)
Bilaspur 495009 (C.G.)

Dr. Tanmay Ghorai

Head of Department

Department of Chemistry

Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.)



Department of chemistry

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A Central University Established By Central Universities Act 2009 No. 25 of 2009)

Certificate from the supervisor

This is to certify that Ms. Kiran Kumari has carried out the project on the topic "Study of receptors and its recognition properties" in the Department of chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur , (C.G.) under my supervision.

She has worked diligently, meticulously and methodically and collected the literature. To the best of my knowledge the work presented in this project has been performed solely by the candidate. I wish her all the success in life.

Neeraj Kumar

Dr. NEERAJ LUMARI

Assistant professor

Department of Chemistry

Guru Ghasidas Vishwavidyalaya

Bilaspur (C.G.) - 495009



Department of chemistry

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

(A Central University Established By Central Universities Act 2009 No. 25 of 2009)

Declaration

*I hereby declare that the work present in the project entitled “**Study of receptors and recognition properties**” submitted as partial fulfillment of B.Sc. Chemistry has been performed in the Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur under the supervision of **Dr. Neeraj Kumari** Assistant Professor, Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.).*

The work presented in this project dissertation is performed by me in the Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.).

Date:

place: Bilaspur, C.G.

Kiran Kumari

Ms. KIRAN KUMARI

Department of Chemistry

Guru Ghasidas Vishwavidyalaya

Bilaspur (C.G.) - 495009



ACKNOWLEDGEMENT

Completion of the project work which start with initial planning , literature search from various libraries (websites) than reading , understanding and compilation of material into the present project from is definitely a herculean task.

*It is my great pleasure to express my sincere gratitude to my esteem supervisor **Dr. Neeraj Kumari** , Assistant Professor, Department of Chemistry ,Guru Ghasidas Vishwavidyalaya , Bilaspur (C.G.) under whose guidance , the present project work has been brought to completion my leaps up in Thankfulness for the benevolent , time , constant help and valuable suggestions throughout the project .*

*I wish to acknowledge **Dr. Tanmay Ghorai** (Head, Department of Chemistry, Guru Ghasidas Vishwavidyalaya) who gave me opportunity to undergo project work and her valuable suggestion during my B.Sc. In Chemistry course.*

I would also like to Thank all the faculty members of the Department ,The librarian , Clerk and lab assistants and Heartily big Thanks to all my dear friends who are directly and indirectly helped me in my completion of project works.

Finally, I would also express my deep sense gratitude to my parents and family members for their encouragement and support throughout, which always inspired me .

kiran kumari

Ms. KIRAN KUMARI

Department of Chemistry

Guru Ghasidas Vishwavidyalaya

Bilaspur (C.G.)-495009



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➤ CONCLUSION & REFERENCE	(23-24)



Department of Chemistry
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) India
(A central University Established by the Central Universities Act 2009 No. 25 of 2009)

A
Project Report
On
“ ORGANOMETALLIC COMPOUNDS ”

Submitted for
Partial Fulfillment of the requirement for the Degree of

Bachelor of Science
in
CHEMISTRY

Under the Guidance
Dr. Suryabhan Singh

Assistant Professor
Department of Chemistry
Guru Ghasidas Vishwavidyalaya,
Bilaspur (C.G.), 495009, INDIA

Submitted by
Malwika Baghel

B.Sc. (Chemistry) VI Semester
Roll No. - 16210127
Enrollment No.- GGV/16/7090

Session: 2019-20



Department of Chemistry
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) India
(A central University Established by the Central Universities Act 2009 No. 25 of 2009)

DECLARATION

I hereby declare that the work presented in the project entitled “**ORGANOMETALLIC COMPOUNDS**” submitted to the partial fulfillment of Bachelor of Science (Hon’s) in Electronic has been performed in the Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.), 495009 under the Guidance of **Dr. SURYABHAN SINGH** is truly carried out by me.

The work presented in this project is original and remain intellectual property of Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.), 495009, INDIA.

MALwika Baghel
Malwika Baghel

Date:

B.Sc. (Chemistry) VI Semester
Roll No. – 16210127
Enrollment No. – GGV/16/7090



Department of Chemistry
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) India
(A central University Established by the Central Universities Act 2009 No. 25 of 2009)

CERTIFICATE

This is to certify that the thesis entitled, “**ORGANOMETALLIC COMPOUND**” submitted by **MALWIKA BAGHEL** in the partial fulfillment for the requirements for the award of Bachelor of Science Degree in Chemistry at Department of Chemistry, Guru Ghasidas Vishwavidyalaya (A Central University), Bilaspur (C.G.), 495009, INDIA is an authentic work carried out by her under my supervision and guidance.

Date: 01/07/2020.

Dr. SURYABHAN SINGH
Assistant Professor
Department of Chemistry



Department of Chemistry
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) India
(A central University Established by the Central Universities Act 2009 No. 25 of 2009)

APPROVAL CERTIFICATE

This is the certify that the project entitled “ **ORGANOMETALLIC COMPOUND** ”
submitted by **MALWIKA BAGHEL** is approved for the award of Bachelor of Science
(Hon's) in Chemistry.

Date:

Prof. TANMAY GHORAI
Head
राज्य/Head
रसायन शास्त्र विभाग
Department of Chemistry
Deptt. of Chemistry
Guru Ghasidas Vishwavidyalaya, Bilaspur
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Guru Ghasidas Vishwavidyalaya.
बिलासपुर 495009 (छ.ग.)
Bilaspur 495009 (C G.)



ACKNOWLEDGEMENT

Completion of the project work which start with initial planning literature search from various libraries (website) then reading, understanding and completion of material into the present project from is definitely task, which doesn't semesters to be possible without grace of God.

I wish to express my deep sense of gratitude and indebtedness to **Dr. SURYABHAN SINGH, Assistant professor** and of department of Chemistry, Guru Ghasidas Vishwavidyalaya Bilaspur (C.G.) for introducing the present topic and for his inspiring guidance, constructive criticism and valuable suggestion throughout this project work.

I would like to express my gratitude to **Prof. TANMAY GHORAI** (Head of Department) for his constant support and encouragement. I am also thankful to all staff members of Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur.

I big thank to my dear friends who are directly and indirectly helped me in completion of my project works. Finally my deep appreciation goes to my parents and family members for their encouragement and support throughout, which always inspired me.

MALWIKHA BAGHEL

MALWIKA BAGHEL



CONTENTS

- INTRODUCTION
- HISTORICAL DEVELOPMENTS
- STRUCTURE
- DEFINING CHARACTERISTICS
- PROPERTIES
- IMPORTANCE
- CONCEPT And TECHNIQUES
- ORGANOMETALLIC COMPOUNDS And REACTION
- STABILITY And REACTIVITY
- S And P BLOCK ORGANOMETALLIC COMPOUNDS
- D And F BLOCK ORGANOMETALLIC COMPOUNDS
- APPLICATIONS
- CONCLUSION
- REFERENCES

गुरु घासीदास विश्वविद्यालय
(केन्द्रीय विश्वविद्यालय अधिनियम 2009 क्र. 25 के अंतर्गत स्थापित केन्द्रीय विश्वविद्यालय)
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Guru Ghasidas Vishwavidyalaya
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Koni, Bilaspur - 495009 (C.G.)



GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

(A Central University Established by the Central Universities Act, 2009 No.25 of 2009)

DEPARTMENT OF CHEMISTRY

A

Project

ON

“METALLORECEPTORS”

BACHELOR OF SCIENCE (VI Sem)

(Session: 2020-21)

Guided by :

Dr. NEERAJ KUMARI

Assistant professor

Department Of Chemistry

Guru Ghasidas Central University

Bilaspur (C.G.)

Submitted by :

Mr. SHUBHAM MAHTO

Roll No. :- 17210263

B.Sc VI, SEM



Department of chemistry

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

(A Central University Established by the Central Universities Act, 2009 No.25 of 2009)

Forwarding Certificate

This is to certify that **Mr. Shubham Mahto** has carried out the project
in the department of chemistry,
Guru Ghasidas Vishwavidyalaya

(A Central University), Bilaspur (C.G.) on the topic

“Study of metelloreceptors and their properties”

This project is submitted for the partial fulfillment of requirements
for the degree of B.Sc. in Chemistry and forwarded to examiner for
evolution. I wish him every success in his life.

शुभम/Head
स्नातक शास्त्र विभाग
Deptt. of Chemistry
गुरु घासीदास विश्वविद्यालय,
Guru Ghasidas Vishwavidyalaya,
बिलासपुर 495009 (छ.ग.)
Bilaspur 495009 (C.G.)

Dr. Tanmay Ghorai
Head of Department
Department of Chemistry
Guru Ghasidas Vishwavidyalaya
Bilaspur (C.G.)



Department of chemistry

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

(A Central University Established by the Central Universities Act, 2009 No.25 of 2009)

Certificate from the supervisor

This is to certify that **Mr. Shubham Mahto** has carried out the project on the topic **“Study of metalloreceptors and their properties”** in the Department of chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur , (C.G.) under my supervision.

He has worked diligently, meticulously and methodically and collected the literature very sincerely and carefully. To the best of our knowledge the work presented in this project has been performed solely by the candidate. I recommended the project report to be forwarded to the respective examiner for evaluation. I wish him all the success in his carrier and life.

Neeraj Kumari

Dr. NEERAJ KUMARI
Assistant professor
Department of Chemistry
Guru Ghasidas Vishwavidyalaya
Bilaspur (C.G.) - 495009



Department of chemistry

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR

(A Central University Established by the Central Universities Act, 2009 No.25 of 2009)

Declaration

I hereby declare that the work present in the project entitled “Study of metalloreceptors and their properties” submitted as partial fulfillment of B.Sc. Chemistry has been performed in the Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur under the supervision of **Dr. Neeraj Kumari** Assistant Professor, Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.).

The work presented in this project dissertation is performed by me in the Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.).

shubham mahto

Date :

Place: Bilaspur, C.G.

Mr. SHUBHAM MAHTO

Department of Chemistry

Guru Ghasidas Vishwavidyalaya

Bilaspur (C.G.) - 495009



ACKNOWLEDGEMENT

Completion of the project work which start with initial planning, literature search from various libraries (websites) than reading, understanding and compilation of material into the present project from is definitely a herculean task.

It is my great pleasure to express my sincere gratitude to my esteem supervisor **Dr. Neeraj Kumari**, Assistant Professor, Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) under whose guidance, the present project work has been brought to completion my leaps up in Thankfulness for the benevolent , time , constant help and valuable suggestions throughout the project.

I wish to acknowledge **Dr. Tanmay Ghorai** (Head, Department of Chemistry, Guru Ghasidas Vishwavidyalaya) who gave me opportunity to undergo project work and her valuable suggestion during my B.Sc. In Chemistry course.

I would also like to Thank all the faculty members of the Department, the librarian, Clerk and lab assistants and heartily big thanks to all my dear friends who are directly and indirectly helped me in my completion of project works.

Finally, I would also express my deep sense gratitude to my parents and family members for their encouragement and support throughout, which always inspired me.

Date :

Place: Bilaspur, C.G.

shubham mahto

Mr. SHUBHAM MAHTO

Department of Chemistry

Guru Ghasidas Vishwavidyalaya

Bilaspur (C.G.) - 495009



CONTENT

- INTRODUCTION
- METALLO-RECEPTORS
- METALLOHOSTS AND MOLECULAR RECOGNITION
- CATION BINDING
- ANION BINDING
- MOLECULAR RECOGNITION BY METALLOCYCLIC SUPRAMOLECULES VIA NON-COVALENT INTERACTIONS
- CONCLUSION & REFERENCE



Department of CHEMISTRY
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) India
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)

SYNTHETIC FOOD COLORS AND THEIR TOXICITY

SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS OF DEGREE OF
BACHELOR OF SCIENCE
IN
CHEMISTRY
SESSION 2019-2020

Under the supervision of:

Dr. MANORAMA SINGH
Assistant Professor

Department of CHEMISTRY
Guru Ghasidas Vishwavidyalaya
Bilaspur (C.G.)

Submitted by:

SRISHTISHREE MAHAPATRA
B.Sc. (CHEMISTRY) VI Semester

Roll No. - 17210266
Enrolment No. – GGV/17/7197



Department of CHEMISTRY
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) India
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)

DECLARATION

I hereby declare that the work present in the project entitled “SYNTHETIC FOOD COLORS AND THEIR TOXICITY” submitted as partial fulfilment of B.Sc. chemistry have been performed in the Department of chemistry, GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR under the supervision of Dr. Manorama, Department of chemistry GGV BILASPUR CHHATTISGARH. The work present in the project dissertation is original and will remain intellectual property of the department.

Srishtishree

SRISHTISHREE
MAHAPATRA

Roll No.- 17210266

B.Sc. VI SEMESTER
(CHEMISTRY)

Date: 11.07.2020

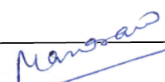


Department of CHEMISTRY
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) India
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)

CERTIFICATE

This is certify that SRISHTISHREE MAHAPATRA bearing Enrolment no.- GGV/17/7197 has developed this project titled “**SYNTHETIC FOOD COLOURS AND THEIR TOXICITY**” for GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.) as partial fulfilment for the award of the degree of Bachelor of science in Chemistry.

SUPERVISED BY



Dr. MANORAMA SINGH
Assistant Professor
Department of Chemistry
GGV, BILASPUR (C.G.)

Date: 13/07/2020
Place: BILASPUR



Department of CHEMISTRY
Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) India
(A Central University Established by the Central Universities Act 2009 No. 25 of 2009)

ACKNOWLEDGEMENT

Completion of project started with initial planning of literature from books and websites. Reading, understanding and compilation of this project is definitely a hard task to undertake which doesn't seem to be possible without the grace of God. It is my great pleasure to express my sincere gratitude towards my esteemed supervisor Dr. MANORAMA SINGH, Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur under whose guidance, the project work has been brought to completion my leaps up in thankfulness for the benevolent, time, constant help and valuable suggestions throughout the project. It is wise to acknowledge Prof. Tanmoy Ghorai (Head of Department of Chemistry, GGV Bilaspur), who gave me an opportunity to undergo project work during my B.Sc. in Chemistry. I would also like to thank all teachers, librarians, clerks of chemistry department and department itself to provide us with all kinds of facilities. Finally I would like to express my deep gratitude to my parents and family members for their encouragement and support throughout, who always inspired me.



Content

- ❖ What are food additives ?
- ❖ Food color types and why do we need them
- ❖ Synthetic food colors
- ❖ Toxic effect of Synthetic food color
- ❖ Substitution of synthetic food color with color of natural origin
- ❖ conclusion .

What are food additives ?

Many types of food additives are being used since age to enhance food color, taste and in order to preserve it. Varieties of food additives are as follows-

- i. Taste enhancer
- ii. Preservatives
- iii. Stabilizers
- iv. Emulsifiers
- v. Antioxidants
- vi. Coloring agents

What Food colors do - They have conjugated double bonds that create a delocalized electron system. Number of conjugated double bond is indicative of the wavelength of light emitted.

अध्यक्ष/Head
रसायन शास्त्र विभाग
Deptt. of Chemistry
गुरु घासीदास विश्वविद्यालय,
Guru Ghasidas Vishwavidyalaya,
बिलासपुर 495009 (छ.ग.)
Bilaspur 495009 (C.G.)



GURU GHASIDAS VISHWAVIDYALAYA

BILASPUR (C.G.)

A Project report on

“USES OF RADIOACTIVE SUBSTANCES”

A project submitted to GGV for the degree of B.Sc. in Chemistry



Department of Chemistry
Guru Ghasidas Vishwavidyalaya
2019-2020

SUPERVISED BY-
Dr. MANORAMA
DEPT. OF CHEMISTRY, GGV, BILASPUR

SUBMITTED BY-
SUPRIYA ACHARYA
B.Sc. VI SEM



DEPARTMENT OF CHEMISTRY



GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A CENTRAL UNIVERSITY ESTABLISHED BY CENTRAL UNIVERSITIES
ACT 2009)


CERTIFICATE

This is to certify that SUPRIYA ACHARYA has carried out the project in the Department of chemistry, **Guru Ghasidas Vishwavidyalaya** (A central University), Bilaspur (C.G.) on the topic “USES OF RADIOACTIVE SUBSTANCES” under my supervision.

She has worked diligently, meticulously and methodically.

To the best of our knowledge the work presented in this project is original and she has not been submitted anywhere.

I wish her all the success in her carrier and life.

SUPERVISOR

Dr. MANORAMA
(Department of Chemistry)



DEPARTMENT OF CHEMISTRY



GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR (C.G.)
(A CENTRAL UNIVERSITY ESTABLISHED BY CENTRAL UNIVERSITIES
ACT 2009)

DECLARATION

I hereby declare that the work present in the project entitled “USES OF RADIOACTIVE SUBSTANCES” submitted as partial fulfillment of B.Sc. in Chemistry has been performed in the department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur under the supervision of Dr. Manorama. The work presented in this project dissertation is original.

A handwritten signature in blue ink that reads "Supriya Acharya".

SUPRIYA ACHARYA
17210268
B.Sc. Chemistry (VI Sem)

DATE: 12/07/2020
PLACE: Bilaspur



ACKNOWLEDGEMENTS

Completion of the project work which started with initial planning, search from various libraries (websites) then reading, understanding and compilation of result observed into the present project form is definitely a herculean task. It is my great pleasure to express my sincere gratitude to my esteem supervisor, **Dr. Manorama**, Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) under whose guidance, the present project work has been brought to completion my leaps up in thank-fullness for the benevolent, time, constant help and valuable suggestion throughout the project. I wish to acknowledge **Prof. Tanmay Ghorai (Head, department of Chemistry, Guru Ghasidas Vishwavidyalaya)** who gave me opportunity to undergo project work and his valuable suggestion during my B.Sc. in Chemistry course.

I would also like to thank all the Teachers, Librarian, and Clerk of the Chemistry Department. I thank to all my dear friends who indirectly helped me in completion of my project works.

Finally, I would also express my deep sense of gratitude to my parents and family members for their encouragement and support throughout, which always inspire me.

SUPRIYA ACHARYA



CONTENTS

1. Introduction.....
2. Effects of Radiation
3. Applications of Radioactive Substances
• Medical use	
• Carbon Dating	
• Other uses	
4. References.....

अध्यक्ष/Head
रसायन शास्त्र विभाग
Deptt. of Chemistry
गुरु घासीदास विश्वविद्यालय,
Guru Ghasidas Vishwavidyalaya,
बिलासपुर 495009 (छ.ग.)
Bilaspur 495009 (C.G.)



**GURU GHASIDAS
VISHWAVIDYALAYA, BILASPUR
(C.G.)**

(A CENTRAL UNIVERSITY ESTABLISHED BY THE CENTRAL UNIVERSITIES ACT ,2009 No .25 of 2009)

Department of Chemistry

A

Project On

“ A PERSPECTIVE ON GREEN CHEMISTRY ”

BACHELOR OF SCIENCE (VIth Sem)

(Session : 2019 -20)

SUPERVISED BY -

Dr. MANORAMA

Assistant Professor

Department Of Chemistry

Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.)

SUBMITTED BY-

ADITI VERMA

B.Sc. VI Sem

ROLL.No. - 17210222



**GURU GHASIDAS VISHWAVIDYALAYA ,
BILASPUR (C.G.)**

(A CENTRAL UNIVERSITY ESTABLISHED BY CENTRAL UNIVERSITIES ACT , 2009)

Department of Chemistry

CERTIFICATE OF THE GUIDE

This is to certify the project work entitled " **A PERSPECTIVE ON GREEN CHEMISTRY** " is a record of work carried out by **ADITI VERMA** , under my guidance for the award of DEGREE OF B.Sc . (BACHELOR OF SCIENCE) Hons . in CHEMISTRY in GURU GHASIDAS VISHWAVIDYALAYA , BILASPUR (C.G.)

She has worked diligently , meticulously and methodically .

To the best of our knowledge the work presented in this project is original and she has not been submitted anywhere .

I wish her all the success in her life and carrier .

SUPERVISOR

Dr. *Manorama*
MANORAMA

Assistant Professor

Department of Chemistry



**GURU GHASIDAS VISHWAVIDYALAYA
,BILASPUR (C.G.)**

(A CENTRAL UNIVERSITY ESTABLISHED BY CENTRAL UNIVERSITIES ACT 2009)

Department of Chemistry

DECLARATION OF THE CANDIDATE

I hereby declare that the work present in the project entitled “ **A PERSPECTIVE ON GREEN CHEMISTRY** ” submitted as partial fulfillment of B.Sc.in chemistry has been performed in the Department of Chemistry . Guru Ghasidas University , Bilaspur under the supervision of **Dr. MANORAMA** . The work presented in this project dissertation is original .

DATE: 12/07/2020

PLACE : Bilaspur

ADITI VERMA

B.Sc. Chemistry (VIth Sem)



ACKNOWLEDGEMENTS

Completion of the project work which started with initial planning , search from various libraries then reading , understanding and compilation of result observed into the present project from is definitely a herculean task. It is my great pleasure to express my sincere gratitude to my esteem supervisor . **Dr. MANORAMA** , Department of Chemistry , Guru Ghasidas Vishwavidyalaya , Bilaspur (C.G.) under whose guidance , the present project work has been brought to completion my leaps up in thank –fullness for the benevolent , time , constant help and valuable suggestion throughout the project . I wish to acknowledgement **Dr. TANMAY KUMAR GHORAI** (Head , Department of Chemistry , Guru Ghasidas Vishwavidyalaya) who gave me opportunity to undergo project work and his valuable suggestion during my B.Sc. in Chemistry course .

I would also like to thank all the teachers , librarian and clerk of the Chemistry Department . I thank to all my friends who indirectly helped me in completion of my project works .

Finally , I would also express my deep sense of gratitude to my parents and family members for their encouragement and support throughout ,which always inspire me .

ADITI VERMA



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GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR
(A Central University Established by the Central Universities Act, 2009 No.25 of 2009)

DEPARTMENT OF CHEMISTRY
A
PROJECT
ON
“NANO GEL: DRUG DELIVERY SYSTEM”

BACHELOR OF SCIENCE (VI SEM)

Session--2019-2020

GUIDED BY:-

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Assistant Professor
Department Of Chemistry
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SUBMITTED BY : -

AMISHA SAHU
Roll No. - 17210227



Department of Chemistry
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CERTIFICATE

This is to certify that **Amisha Sahu (B.Sc. Chemistry VIth semester)** has submitted the project report entitled “Nanogel: Drug Delivery System” or partial fulfillment of requirement of B.Sc.Chemistry.

I hereby recommend to forward the project report to the University for the Award of B.Sc. Chemistry during the academic 2019-2020.

I wish her every success in her future life.

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FORWARDING CERTIFICATE

Miss Amisha Sahu has completed her project entitled “**Nanogel: Drug Delivery System**” under the supervision and guidance of Dr. Arti Srivastava in partial fulfillment for degree of B.Sc. in Chemistry.

I wish her every success in her future life.

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DECLARATION

I hereby declare that the work present in the project entitled “**Nanogel: Drug Delivery System**” submitted as partial fulfillment of B.Sc. Chemistry has been performed in the Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur under the supervision of **Dr. Arti Srivastava** Assistant Professor, Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.).
The literature work presented in this project/dissertation is performed by me in the Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.).

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ACKNOWLEDGEMENT

It is my great pleasure to express my sincere gratitude my esteem supervisor **Dr. ARTI SRIVASTAVA**, Assistant Professor, Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) under whose guidance, the present project work has been brought to completion my leaps up in thankfulness for the benevolent, time, constant help and valuable suggestions throughout the project.

I wish to acknowledge Professor & Head **Dr. Tanmay Ghorai** and Dean- **Dr. G. K. Patra** & all respected teachers, librarian, lab assistant Department of Chemistry, Guru Ghasidas Vishwavidyalaya who give me opportunity to undergo project work and his valuable suggestion during my B. Sc. in Chemistry course.

I would also like to thank all my teachers of Department of Chemistry, Departmental Library and Central library. I big thanks to all my dear friends who are directly and indirectly help me in my completion of project works.

I want to express my thanks to Prachi Sahu, Shraddha Sahu for her support in this project.

AMISHA SAHU
B.Sc. CHEMISTRY VIth SEM



A

PROJECT REPORT

ON

“ADVANCES IN POLYMER CATALYST”

Submitted in partial fulfillment for the Award of degree of

B. Sc. CHEMISTRY

2019-2020

Submitted by:-

Ms. Garima Dewangan
Roll No. 17210241
Enroll. No. GGV/17/7206

Supervised by:-

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Asst. Professor
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**DEPARTMENT OF CHEMISTRY
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INDIA**



CERTIFICATE

This is to certify that *GARIMA DEWANGAN* (B.Sc. Chemistry VIth semester) has submitted the project report entitled “**ADVANCES IN POLYMER CATALYST**” for partial fulfillment of requirement of B.Sc.Chemistry.

I hereby recommend to forward the project report to the University for the Award of B.Sc. (Chemistry) during the academic 2019-2020

I wish her every success in her future life.

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FORWARDING

Ms **GARIMA DEWANGAN** has completed her project entitled
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and guidance of **Dr. Arti Srivastava** in partial fulfillment for degree
of B.Sc. in Chemistry.

I wish her every success in her future life.

Prof. Tanmay Ghorai

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DECLARATION

I hereby declare that the report presented in this dissertation entitled **“ADVANCES IN POLYMER CATALYST”** has been done by me.

Submitted by:-

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Supervised by:-

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ACKNOWLEDGEMENT

It is my great pleasure to express my sincere gratitude to my Supervisor **Dr. ARTI SRIVASTAVA**, Assistant Professor, Department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) under whose guidance, the present project work has been brought to completion. My leaps up in thankfulness for the benevolent, time, constant help and valuable suggestions throughout the project.

I wish to acknowledge **Prof. Dr. Tanmay Ghorai**, Head and **Dr. G. K. Patra** Dean, Department of Chemistry, Guru Ghasidas Vishwavidyalaya who give me opportunity to undertake during my project work and his valuable suggestion in my B. Sc. in Chemistry course.

I would also like to thank **Professors of Department of Chemistry, Departmental Library and Central library**.

Garima Dewangan



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**A
PROJECT
ON**

“ELECTRON SPIN RESONANCE SPECTROSCOPY”

SESSION : 2019-20

GUIDED BY

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Forwarding Certificate

This to certify that Sejal Sen has carried out the project in the department of Chemistry, Guru Ghasidas Vishwavidyalaya (A Central University),

Bilaspur (C.G.) on the topic "ESR Spectroscopy". This project is submitted for partial fulfillment of requirements for the degree of B.Sc. in Chemistry and forwarded to examiner for evolution.

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Certificate From The Supervisor

This to certify that Sejal Sen has carried out the project in the department of Chemistry, Guru Ghasidas Vishwavidyalaya (A Central University),

Under my literature very sincerely and carefully. To the best of our knowledge the work presented in this project has been performed solely by the candidates. I recommended the project report to be forwarded to the respective examiner for evaluation. I wish her all the success in her carrier and life.

Dr. Ashish Kumar Singh

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Declaration

I hereby declare that the work present in the project entitled "ESR Spectroscopy" submitted as partial fulfillment of B.Sc. Chemistry has been performed in the Department of Chemistry has been performed in the supervision of Dr. Ashish Kumar Singh Associate Professor, Department of Chemistry, Guru Ghasidash Vishwavidyalaya, Bilaspur (C.G.).

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Acknowledgement

Completion of the project work which start with initial planning, literature search from various libraries (website) than reading, understanding and compilation of material into the present project from is definitely a task.

It is my great pleasure to express my sincere gratitude to my esteem supervisor Dr. Ashish Kumar Singh, Associate Professor, department of Chemistry, Guru Ghasidas Vishwavidyalaya, Bilaspur (C.G.) under whose guidance, the present project work has been brought to completion my leaps up in thankfulness for the benevolent, time, constant help and valuable suggestions throughout the project.

I wish to aknolwdge Dr. Tanmay Ghoral (Head, Department of Chemistry, Guru Ghasidas Vishwavidyalaya) who gave me opportunity to undergo project work and her valuable suggestions during my B.Sc in Chemistry course.

I would also like to thanks all the faculty members of the department, The librarians, clerk and lab assistants and heartily big thanks to all my dear friends who are directly or indirectly helped me in my completion of project works.

Finally, I would also express my deep sense gratitude to my parents and family members for their encouragement and support throughout, which always inspired me.

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CONTENT

- INTRODUCTION
- HISTORY OF ESR
- PRINCIPAL
- THEORY
- INSTRUMENTATION
- APPLICATION OF ESR
- LIMITATIONS
- CONCLUSION
- REFERENCE

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