

**A Project Report  
On**

**“Reuse Recycle, Recover and Reduce of  
Household Waste”**



**SUBMITTED TO**

**DEPARTMENT OF CHEMISTRY, D.R. COLLEGE, GOLAGHAT,  
UNDER DIBRUGARH UNIVERSITY, DIBRUGARH  
(As Per Syllabus of 6th Semester, Major Course, DU)**

**BY**

**Sri Debanga Batcha**

**Roll No: 20220022**

**Year: 2020**

## CERTIFICATE

This is to certify that the project entitled “**Reuse, Recycle, Recover and Reduce of Household Waste**” submitted by **Sri Debanga Batcha**, a student of 6th semester bearing Roll No: 20220022 of D.R. College, Golaghat, has been completed under my guidance. The project report is the result of his own investigations and he has fulfilled all the requirements prescribed under the project regulations of Dibrugarh University syllabus of 6th semester.

*Dr. Mridul Chetia*  
31/10/2020

Dr. Mridul Chetia  
Assistant Professor  
Chemistry

Date: 31/10/2020  
Place Golaghat

**A Project Report  
On**

**“Reuse Recycle, Recover and Reduce of  
Household Waste”**



**SUBMITTED TO**

**DEPARTMENT OF CHEMISTRY, D.R. COLLEGE, GOLAGHAT,  
UNDER DIBRUGARH UNIVERSITY, DIBRUGARH  
(As Per Syllabus of 6th Semester, Major Course, DU)**

**BY**

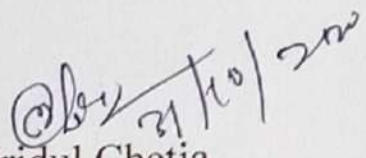
**Sri Swagot Protim Bora**

**Roll No: 20220078**

**Year: 2020**

## CERTIFICATE

This is to certify that the project entitled "**Reuse, Recycle, Recover and Reduce of Household Waste**" submitted by **Sri Swagot Protim Bora**, a student of 6th semester bearing Roll No: 20220078 of D.R. College, Golaghat, has been completed under my guidance. The project report is the result of his own investigations and he has fulfilled all the requirements prescribed under the project regulations of Dibrugarh University syllabus of 6th semester.

  
Dr. Mridul Chetia  
Assistant Profesor  
Chemistry

Date: 31-10-2020

Place Golaghat

A Project Report

On

# “Reuse, Recycle, Recover and Reduce of Household Waste”



**SUBMITTED TO**

**DEPARTMENT OF CHEMISTRY, D.R. COLLEGE, GOLAGHAT,  
UNDER DIBRUGARH UNIVERSITY, DIBRUGARH  
(As Per Syllabus of 6<sup>th</sup> Semester, Major Course, DU)**

**BY**

**Miss Trinoyana Kolita**

**ROLL NO: 10520145**

**YEAR: 2019**

**Under the Guidance of**

**Prof. Debendra Chandra Baruah**

**Dept. of Energy**

**Tezpur University, Tezpur-784028, Assam**

**&**

**Dr. Suvangshu Dutta**

**Dept. of Chemistry**

**D.R. College, Golaghat-785621, Assam**

## CERTIFICATE

This is to certify that Ms. Trinoyana Kolita, a TDC 4<sup>th</sup> semester, Chemistry (major) student of Debraj Roy College, Golaghat has undertaken a study on Reuse, Recycle, Recover and Reduce on Household Waste during one month(4-6-18 to 3-7-18) Summer Internship Programme of Tezpur University.

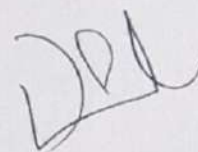
Ms. Trinoyana Kolita has conducted her study under supervision and guidance of Prof. Debendra Chandra Baruah, Department of Energy, Tezpur University.

Date:

3.7.18

Place: Tezpur

(Signature)



**Prof. Rupam Kataki**

Head of Department  
Department of energy  
Tezpur University

for

A Project Report

On

**“Conversion of Raw Sugarcane Bagasse into  
Nanocellulose and its Characterization”**



Submitted to

DEPARTMENT OF CHEMISTRY, D.R. COLLEGE, GOLAGHAT,  
UNDER DIBRUGARH UNIVERSITY, DIBRUGARH

BY

Saranga Bhuyan

ROLL:202

NO: 20073

YEAR: 2020

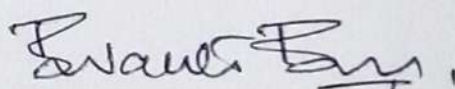


## CERTIFICATE

This is to certify that the project entitled **“Conversion of Raw Sugarcane Bagasse into Nanocellulose and its Characterization”** submitted by Saranga Bhuyan, a student of 6<sup>th</sup> semester bearing Roll: 202 , No: 20073 of D.R. College centre, Golaghat has been completed under under my supervision at D.R. College, Golaghat. The project report is the result of his own investigations and he has fulfilled all the requirements prescribed under the project regulations of Dibrugarh University syllabus of 6<sup>th</sup> semester.

Date:

Place: Golaghat

  
Mr. Bedanta Kumar Bora  
Associate Professor



A Project Report

On

**“Conversion of Raw Sugarcane Bagasse into  
Nanocellulose and its Characterization”**



Submitted to

DEPARTMENT OF CHEMISTRY, D.R. COLLEGE, GOLAGHAT,  
UNDER DIBRUGARH UNIVERSITY, DIBRUGARH

BY

Daisie Buragohain

ROLL:202

NO: 20094

YEAR: 2020

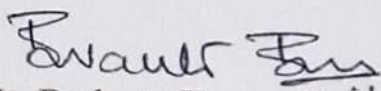


## CERTIFICATE

This is to certify that the project entitled **“Conversion of Raw Sugarcane Bagasse into Nanocellulose and its Characterization”** submitted by Daisie Buragohain, a student of 6<sup>th</sup> semester bearing Roll: 202 , No: 20094 of D.R. College centre, Golaghat has been completed under under my supervision at D.R. College, Golaghat. The project report is the result of her own investigations and she has fulfilled all the requirements prescribed under the project regulations of Dibrugarh University syllabus of 6<sup>th</sup> semester.

Date:

Place: Golaghat

  
Mr. Bedanta Kumar Borā  
Associate Professor



## CERTIFICATE

This is to certify that the project entitled “Conversion of Raw Sugarcane Bagasse into Nanocellulose and its Characterization” submitted by Diksha Thengal, a student of 6<sup>th</sup> semester bearing Roll: 202 , No: 20095 of D.R. College centre, Golaghat has been completed under under my supervision at D.R. College, Golaghat. The project report is the result of her own investigations and she has fulfilled all the requirements prescribed under the project regulations of Dibrugarh University syllabus of 6<sup>th</sup> semester.

Date:

Place: Golaghat

Mr. Bedanta Kumar Borá

Associate Professor

A Project Report

On

**“Conversion of Raw Sugarcane Bagasse into  
Nanocellulose and its Characterization”**



Submitted to

DEPARTMENT OF CHEMISTRY, D.R. COLLEGE, GOLAGHAT,

UNDER DIBRUGARH UNIVERSITY, DIBRUGARH

BY

Shabreen Khanam

ROLL:202

NO: 20133

YEAR: 2020




## CERTIFICATE

This is to certify that the project entitled “Conversion of Raw Sugarcane Bagasse into Nanocellulose and its Characterization” submitted by Shabreen Khanam, a student of 6<sup>th</sup> semester bearing Roll. No. 202 , No: 20133 of D.R. College centre, Golaghat has been completed under my supervision at D.R. College, Golaghat. The project report is the result of her own investigations and she has fulfilled all the requirements prescribed under the project regulations of Dibrugarh University syllabus of 6<sup>th</sup> semester.

Date: 21/10/20

Place: Golaghat

  
Mr. Bedanta Kumar Bora  
Associate Professor

A Project Report

On

**“Conversion of Raw Sugarcane Bagasse into  
Nanocellulose and its Characterization”**



Submitted to

DEPARTMENT OF CHEMISTRY, D.R. COLLEGE, GOLAGHAT,  
UNDER DIBRUGARH UNIVERSITY, DIBRUGARH

BY

Priyakshi Bora

ROLL:202

NO: 20124

YEAR: 2020



## CERTIFICATE

This is to certify that the project entitled "Conversion of Raw Sugarcane Bagasse into Nanocellulose and its Characterization" submitted by Priyakshi Bora, a student of 6<sup>th</sup> semester bearing Roll: 202 , No: 20124 of D.R. College centre, Golaghat has been completed under under my supervision at D.R. College, Golaghat. The project report is the result of her own investigations and she has fulfilled all the requirements prescribed under the project regulations of Dibrugarh University syllabus of 6<sup>th</sup> semester.

Date:

Place: Golaghat

Mr. Bedanta Kumar Bora

Associate Professor

**A Project Report**  
**On**  
**“Separation and characterization of cellulose from  
pineapple leaf”**



Submitted to  
DEPARTMENT OF CHEMISTRY, D.R. COLLEGE, GOLAGHAT  
UNDER DIBRUGARH UNIVERSITY, DIBRUGARH  
(As per syllabus of 6<sup>th</sup> Semester, Major Course, DU)

**BY**

Miss Pompi Sinha

Roll : 202

No : 20121

Year : 2020





Dr. Suvangshu Dutta, M.Sc. (GU), Ph.D. (TU)  
Sr. Asst. Professor, Dept. of Chemistry  
D.R. College, Golaghat  
Email : [suvangshu@rediffmail.com](mailto:suvangshu@rediffmail.com)

---

## CERTIFICATE

This is to certify that the project entitled “*Separation and characterization of cellulose from pineapple leaf*” submitted by Miss Pompei Sinha, a student of 6<sup>th</sup> semester bearing Roll : 202, No:20121 of D.R College centre (Centre Code : 202 under DU), Golaghat has been completed under my supervision at D.R College, Golaghat. The project report is the result of her own investigation and she has fulfilled all the requirements prescribed under the project regulation of Dibrugarh University syllabus of 6<sup>th</sup> semester.

Date :

(Dr. Suvangshu Dutta)

Place : Golaghat

**A Project Report  
On**

**“Reuse Recycle, Recover and Reduce of  
Household Waste”**



**SUBMITTED TO**

**DEPARTMENT OF CHEMISTRY, D.R. COLLEGE, GOLAGHAT,  
UNDER DIBRUGARH UNIVERSITY, DIBRUGARH  
(As Per Syllabus of 6th Semester, Major Course, DU)**

**BY**

**Sri Indra Mohan Saikia**

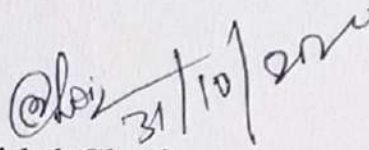
**Roll No: 20220037**

**Year: 2020**

## CERTIFICATE

This is to certify that the project entitled “**Reuse, Recycle, Recover and Reduce of Household Waste**” submitted by **Sri Indra Mohan Saikia**, a student of 6th semester bearing Roll No: 20220037 of D.R. College, Golaghat, has been completed under my guidance. The project report is the result of his own investigations and he has fulfilled all the requirements prescribed under the project regulations of Dibrugarh University syllabus of 6th semester.

Date: 31-10-2020  
Place Golaghat

  
Dr. Mridul Chetia  
Assistant Professor  
Chemistry

**A Project Report  
On**

**“Reuse Recycle, Recover and Reduce of  
Household Waste”**

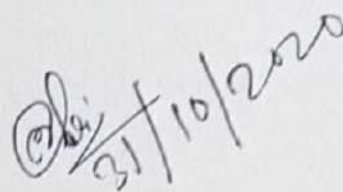


**SUBMITTED TO**  
**DEPARTMENT OF CHEMISTRY, D.R. COLLEGE, GOLAGHAT,**  
**UNDER DIBRUGARH UNIVERSITY, DIBRUGARH**  
**(As Per Syllabus of 6th Semester, Major Course, DU)**

**BY**  
**Sri Bichitra Biswa Borah**  
**Roll No: 20220013**  
**Year: 2020**

## CERTIFICATE

This is to certify that the project entitled "**Reuse, Recycle, Recover and Reduce of Household Waste**" submitted by **Sri Bichitra Biswa Borah**, a student of 6th semester bearing Roll No: 20220013 of D.R. College, Golaghat, has been completed under my guidance. The project report is the result of his own investigations and he has fulfilled all the requirements prescribed under the project regulations of Dibrugarh University syllabus of 6th semester.

  
31/10/2020

Dr. Mridul Chetia  
Assistant Profesor  
Chemistry

Date: 31/10/2020  
Place Golaghat

**A Project Report  
On**

**“Reuse Recycle, Recover and Reduce of  
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**SUBMITTED TO**

**DEPARTMENT OF CHEMISTRY, D.R. COLLEGE, GOLAGHAT,  
UNDER DIBRUGARH UNIVERSITY, DIBRUGARH  
(As Per Syllabus of 6th Semester, Major Course, DU)**

**BY**

**Sri Jitu Gogoi  
Roll No: 20220039  
Year: 2020**

## CERTIFICATE

This is to certify that the project entitled "**Reuse, Recycle, Recover and Reduce of Household Waste**" submitted by **Sri Jitu Gogoi**, a student of 6th semester bearing Roll No: 20220039 of D.R. College, Golaghat, has been completed under my guidance. The project report is the result of his own investigations and he has fulfilled all the requirements prescribed under the project regulations of Dibrugarh University syllabus of 6th semester.

*(Signature)*  
21/10/2020

Dr. Mridul Chetia  
Assistant Profesor  
Chemistry

Date: 31.10.20

Place

**A Project Report  
On**

**“Reuse Recycle, Recover and Reduce of  
Household Waste”**



**SUBMITTED TO**

**DEPARTMENT OF CHEMISTRY, D.R. COLLEGE, GOLAGHAT,  
UNDER DIBRUGARH UNIVERSITY, DIBRUGARH  
(As Per Syllabus of 6th Semester, Major Course, DU)**

**BY**

**Sri Kangkan Phukan**

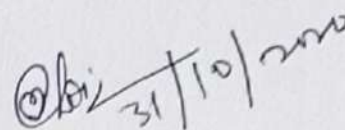
**Roll No: 20220044**

**Year: 2020**



## CERTIFICATE

This is to certify that the project entitled "**Reuse, Recycle, Recover and Reduce of Household Waste**" submitted by **Sri Kangkan Phukan**, a student of 6th semester bearing Roll No: 20220044 of D.R. College, Golaghat, has been completed under my guidance. The project report is the result of his own investigations and he has fulfilled all the requirements prescribed under the project regulations of Dibrugarh University syllabus of 6th semester.



Dr. Mridul Chetia  
Assistant Profesor  
Chemistry

Date: 21-10-2020  
Place Golaghat

**A Project Report  
On**

**“Reuse Recycle, Recover and Reduce of  
Household Waste”**



**SUBMITTED TO**

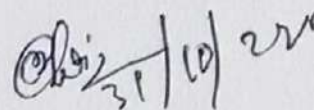
**DEPARTMENT OF CHEMISTRY, D.R. COLLEGE, GOLAGHAT,  
UNDER DIBRUGARH UNIVERSITY, DIBRUGARH  
(As Per Syllabus of 6th Semester, Major Course, DU)**

**BY**

**Sri Bitupan Das  
Roll No: 20220020  
Year: 2020**

## CERTIFICATE

This is to certify that the project entitled "**Reuse, Recycle, Recover and Reduce of Household Waste**" submitted by **Sri Bitupan Das**, a student of 6th semester bearing Roll No: 20220020 of D.R. College, Golaghat, has been completed under my guidance. The project report is the result of his own investigations and he has fulfilled all the requirements prescribed under the project regulations of Dibrugarh University syllabus of 6th semester.



Dr. Mridul Chetia  
Assistant Profesor  
Chemistry

Date: 31/10/2020  
Place Golaghat

**SUBMISSION OF PROJECT REPORT  
FOR PARTIAL FULFILLMENT OF B.Sc  
DEGREE WITH CHEMISTRY AS MAJOR  
SUBJECT**

**SYNTHESIS AND  
CHARACTERISATION OF  
PENTAAMMINENTROCOBALT(II)  
CHLORIDE  
 $[\text{Co}(\text{NH}_3)_5\text{NO}_2]\text{Cl}_2$**

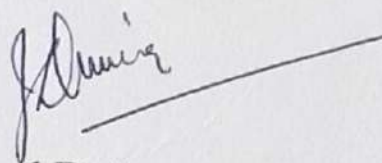


**Submitted by-  
Rubeena Rahaman  
Roll No.- 20220131  
B.Sc 6th Semester  
2020**

**Department of Chemistry, D.R. College, Golaghat**

## CERTIFICATE

This is to certify that the project work entitled "Synthesis and characterisation of pentaamminenitrocobalt(iii)chloride" which is being submitted by Rubeena Rahaman, of Dept. Of Chemistry, D.R. College, Golaghat for partial fulfilment of the B.Sc. degree with major in Chemistry, as mentioned in paper 608, is carried out by her under my supervision and guidance.



Date: 29-10-2020

Mr. Jyoti Prasad Dutta

Head of Department

Dept. of Chemistry

D.R. College, Golaghat

**SUBMISSION OF PROJECT REPORT  
FOR PARTIAL FULFILLMENT OF B.Sc  
DEGREE WITH CHEMISTRY AS MAJOR  
SUBJECT**

**SYNTHESIS AND  
CHARACTERISATION OF  
PENTAAMMINENITROCOBALT(III)  
CHLORIDE  
[Co(NH<sub>3</sub>)<sub>5</sub>NO<sub>2</sub>]Cl<sub>2</sub>**



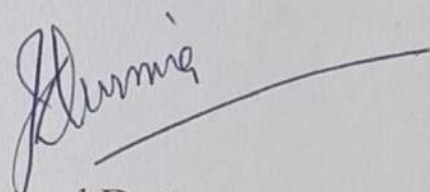
**Submitted by-  
Kashmiri Mech  
Roll No.- 20220105  
B.Sc 6th Semester  
2020**

**Department of Chemistry, D.R. College, Golaghat**

## CERTIFICATE

This is to certify that the project work entitled "Synthesis and characterisation of pentaamminenitrocobalt(iii)chloride" which is being submitted by Kashmiri Mech, of Dept. Of Chemistry, D.R. College, Golaghat for partial fulfilment of the B.Sc. degree with major in Chemistry, as mentioned in paper 608, is carried out by her under my supervision and guidance.

Date: 29.10.2020

  
Mr. Jyoti Prasad Dutta

Head of Department

Dept. of Chemistry

D.R. College, Golaghat

**SUBMISSION OF PROJECT REPORT  
FOR PARTIAL FULFILLMENT OF B.Sc  
DEGREE WITH CHEMISTRY AS MAJOR  
SUBJECT**

**SYNTHESIS AND  
CHARACTERISATION OF  
PENTAAMMINENITROCOBALT(III)  
CHLORIDE  
[Co(NH<sub>3</sub>)<sub>5</sub>NO<sub>2</sub>]Cl<sub>2</sub>**



**Submitted by-  
Shreya Sen  
Roll No.- 20220135  
B.Sc 6th Semester  
2020**

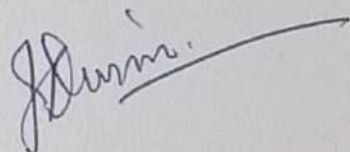
**Department of Chemistry, D.R. College, Golaghat**



## CERTIFICATE

This is to certify that the project work entitled "Synthesis and characterisation of pentaamminenitrocobalt(iii)chloride" which is being submitted by Shreya Sen, of Dept. Of Chemistry, D.R. College, Golaghat for partial fulfilment of the B.Sc. degree with major in Chemistry, as mentioned in paper 608, is carried out by her under my supervision and guidance.

Date: 27/10/2020



Mr. Jyoti Prasad Dutta

Head of Department

Dept. of Chemistry

D.R. College, Golaghat

**SUBMISSION OF PROJECT REPORT  
FOR PARTIAL FULFILLMENT OF B.Sc  
DEGREE WITH CHEMISTRY AS MAJOR  
SUBJECT**

**SYNTHESIS AND  
CHARACTERISATION OF  
PENTAAMMINENTROCOBALT(II  
CHLORIDE  
[Co(NH<sub>3</sub>)<sub>5</sub>NO<sub>2</sub>]Cl<sub>2</sub>**



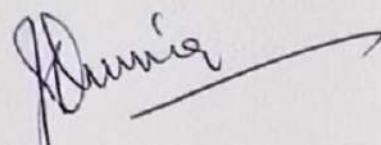
**Submitted by-  
Sagorika Devi Sarmah  
Roll No.- 20220132  
B.Sc 6th Semester  
2020**

**Department of Chemistry, D.R. College, Golaghat**

## CERTIFICATE

This is to certify that the project work entitled "Synthesis and characterisation of pentaamminenitrocobalt(iii)chloride" which is being submitted by Sagorika Devi Sarmah, of Dept. Of Chemistry, D.R. College, Golaghat for partial fulfilment of the B.Sc. degree with major in Chemistry, as mentioned in paper 608, is carried out by her under my supervision and guidance.

Date: 27/10/2020



Mr. Jyoti Prasad Dutta

Head of Department

Dept. of Chemistry

D.R. College, Golaghat

**SUBMISSION OF PROJECT REPORT  
FOR PARTIAL FULFILLMENT OF B.Sc  
DEGREE WITH CHEMISTRY AS MAJOR  
SUBJECT**

**SYNTHESIS AND  
CHARACTERISATION OF  
PENTAAMMINENITROCOBALT(III)  
CHLORIDE  
[Co(NH<sub>3</sub>)<sub>5</sub>NO<sub>2</sub>]Cl<sub>2</sub>**



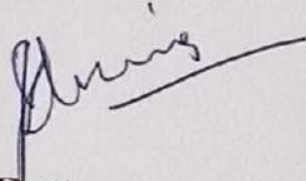
**Submitted by-  
Ananya Bortamuly  
Roll No.- 20220086  
B.Sc 6th Semester  
2020**

**Department of Chemistry, D.R. College, Golaghat**

## CERTIFICATE

This is to certify that the project work entitled "Synthesis and characterisation of pentaamminenitrocobalt(iii)chloride" which is being submitted by Ananya Bortamuly, of Dept. Of Chemistry, D.R. College, Golaghat for partial fulfilment of the B.Sc. degree with major in Chemistry, as mentioned in paper 608, is carried out by her under my supervision and guidance.

Date: 29/10/2020

  
Mr. Jyoti Prasad Dutta

Head of Department

Dept. of Chemistry

D.R. College, Golaghat

2020

**SUBMISSION OF PROJECT REPORT  
FOR PARTIAL FULFILLMENT OF B.Sc  
DEGREE WITH CHEMISTRY AS MAJOR  
SUBJECT**

**SYNTHESIS AND  
CHARACTERISATION OF  
PENTAAMMINENITROCOBALT(II)  
I)CHLORIDE  
 $[Co(NH_3)_5NO_2]Cl_2$**



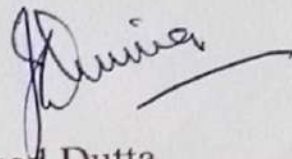
**Submitted by-  
Priyanus Hazarika  
Roll No.- 20220060  
B.Sc 6th Semester  
2020**

**Department of Chemistry, D.R. College, Golaghat**

# CERTIFICATE

This is to certify that the project work entitled "Synthesis and characterisation of pentaamminenitrocobalt(iii)chloride" which is being submitted by Priyanus Hazarika, of Dept. Of Chemistry, D.R. College, Golaghat for partial fulfilment of the B.Sc. degree with major in Chemistry, as mentioned in paper 608, is carried out by ~~him~~ under my supervision and guidance.

Date: 27/10/2020



Mr. Jyoti Prasad Dutta

Head of Department

Dept. of Chemistry

D.R. College, Golaghat