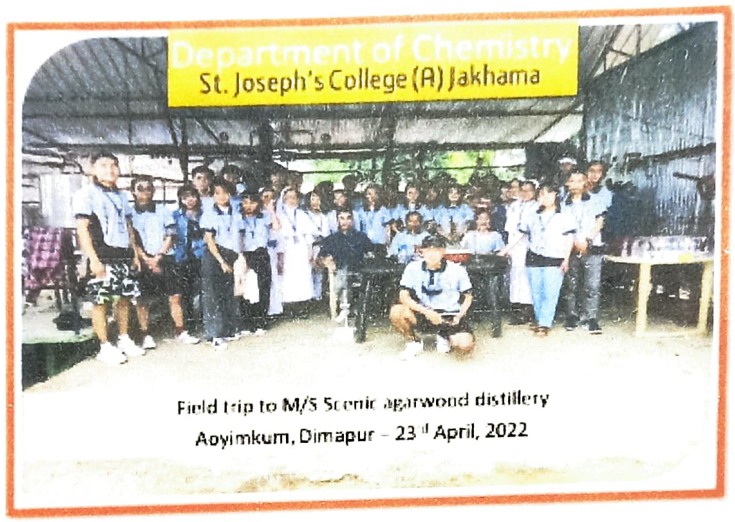
St. Joseph's College(A) Jakhama

Report on Fieldtrip



Submitted To:

Sir Madovi David (HOD)

Assistant Professor

Department of Chemistry

St. Joseph's College (A)

Jakhama

Submitted by:

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Rollno.: 19CHEM070

Department of Chemistry

FIELD TRIP REPORT ON THE VISIT TO AGAR WOOD FACTORY

Introduction

The students of 6th Semester BSc Department of Chemistry had gone for study tour to Agar wood micro - factory in Dimapur Nagaland on 23rd April 2022. It was a great initiative and support from the departmentto organize this event under the guidance of Mr. Madovi David, the Assistant Professor and HOD of the Department of Chemistry and Dr. Miss. Aola Supong, the assistant Professor of St. Joseph's College Autonomous Jakhama. There were thirty six (36) students.

The factory is owned and run by Mr. Imchainba. The objective of this micro – plan Agar wood Factory is to produce the original extract of the perfume and incense from the Agar wood / Agar plant. There are seventeen (17) species of Agar plantfound in all over the world out of which two (2) species are found in Nagaland. It is also found in the neighboring states of Manipur and Assam.

The value and the quality of the wood depends on the infection of the tree. There are two types of infections –

I). **Natural Infection**

II). Chemical Infection

I). **Natural infections:** Natural infections are caused by various agents such as worms or insects, natural calamities like thunder storm and lightning, by the action of animals etc.

II). **Chemical Infection:**Chemical infections are those caused by thr injection of certain chemicals.

When the trees are infected through both the natural and chemical agents, the tree produces antibiotics as a resistance to the injury being caused by undergoing certain mechanism within the tree itself, thus produce the Agar wood. It is formed inside the tree in different shapes. The agar wood is used as Frankincense and Myrrh in religious ceremonies. The value agar depends on quality; commercial value of first grade agarwood is extremely high. It is sold in the form of woodchips, powder, wood pieces, oil, dust, incense ingredients and perfume.

The extraction of the oil from the Agar wood follow certain processes. They are –

i).Diesel distillation

ii). Fire distillation

iii). Water distillation

PROCESSES;

The most important thing in the first process is the good selection of the infected agar wood. It is chopped into small pieces, dried, grinded and soaked in water for a month in a huge plastic containers with a lid tight.For per cycle, 150 kilos of Agar wood is used. The further process are followed. After the completion, a pure oil is obtained with its magnificient perfume. The perfume lasts for twenty four (24) hours. One of the important characteristics and uniqueness of the perfume is that the perfume changes its aroma with the change in temperature. The pure extracted oil and the high quality wood are exported to Saudi Arabia and France for incense and perfume. It is used for various purposes like embalming etc.

The price of the agarwood depends on the quality of the infection and the year of existence I.e. the older the better. It begins from 3000 to 3 lakhs per kilo. The natural infection gives the best quality for the formation of agarwood. The price increases accordingly.

The chemically infected one gives poorer quality than the naturally infected agarwood. Therefore it is not encouraged. The best quality appears dark brown in color and is heavier. While the light brown or beach color and lighter for the poorer quality.

On completion of the various distillation processes for the extraction of oil, the by-products such as the liquid, the waste agarwood are used for the treatment of several diseases like breast's cancer, kidney etc. The waste agar wood is used as incense sticks as Agarbatti (hindi) in India etc.

CONCLUSION

Agarwood (*botanical name*: Aquillaria agollocha) is one of the most precious among all communities. In ancient times, it was used as burning sticks for incense but in the present era today have made great progress in extracting the precious oil which is considered as the most expensive oil of high demand in some countries as mentioned. It is highly valuable product for medicine. In the context of our state with rich natural resources is a good approach and provides a promising future scope in the developing society. This highly valued crop would benefit rural people and contribute greatly to the economy of the region.

REPORT ON

QUALITATIVE ANALYSIS OF RUNNING WATER IN WESTERN ANGAMI AREA UNDER KOHIMA DISTRICT

GROUP-5

5th SEMESTER

DEPARTMENT OF CHEMISTRY

Group members:

1. Neikesa Pienyű 19CHEM088
2. Neotola C 19CHEM089
3. Nudelű Vadeo 19CHEM090
4. Rukuvi Visa 19CHEM092
5. Sedeneino Seletsu 19CHEM093

Guide : Madovi David

(HOD)Chemistry Department

Date of Submission: 1- 11- 2021

ACKNOWLEDGEMENT

First and foremost, we would like to thank our Almighty God for the health and well being throughout the completion of our project work. We also express our sincere gratitude to the dean of Science **Father Peter Solo** for his permission and also the support we got from our parents and guardians.

We are feeling oblige to especially thank **Sir Madovi David (HOD Chemistry Department)** for his continuous support and guidance throughout, which has shaped the present work as it shows. Our special thanks to all the teaching faculty of Chemistry department for their guidance and encouragement.

It was an honour to be a part of this project as we got to learn and discover a variety of things.

Last but not the least, I express my gratitude to my fellow friends for the efforts in completion of the project work.

Group - 5

19CHEM088 – 093

Place : Kohima

Guide : Sir Madovi David

Designation : (HOD) Chemistry Department

Department : Chemistry

Institution : St Joseph College (Autonomous) Jakhama

CONTENTS

ABSTRACT

Freshwater is essential for our planet. Freshwater is vital for people and wildlife- it needs careful management because there's not always enough to go around.

Freshwater environments include rivers, lakes, wetlands, streams and underground aquifers. They store and clean the water that's crucial for people and wildlife.

Healthy freshwater environment supply water for drinking, growing crops, manufacturing, energy and transport. They also help to prevent erosion, dispose of waste and provide natural protection from flooding.

But we've been careless with this vital resource. Freshwater environments have been mismanaged, leading to pollution, drying rivers and damaged habitats. In the last century we've lost so many of the world's wetlands and their wildlife.

We believe it is possible to meet the freshwater needs of both people and nature – if water is managed wisely. That's why we're working hard to help protect and manage freshwater resources around the world.

REAGENTS AND MATERIALS REQUIRED

Reagents used:

- Standard Versanete solution (0.01 N)
- Ammonium Chloride buffer (pH 10)
- Trichrome Black T (EBT) indicator
- Sodium Chloride solution (0.02 N)
- Standard silver nitrate solution (0.02 N)
- Potassium Chromate indicator (5g)
- Standard H_2SO_4 (0.01N)
- Phenolphthalein indicator
- Methyl orange indicator

Materials required:

- Burette
- Conical flask
- Measuring cylinder
- Dropper
- Beaker

INTRODUCTION

Water quality or water analysis refers to the chemical, physical, and biological characteristics of water based on the standards of its usage. The most common standard used to monitor and assess water quality conveys the health of ecosystems, safety of human contact, extend of water pollution and condition of drinking water.

The quality of any body of surface of ground water is a function of either both natural influences and human influences

Without human influences water quality would be determined by the weathering of bedrock minerals, by the atmospheric processes of evapotranspiration and the deposition of dust and salt by wind, by the natural leaching of organic matter and nutrients from soil, by hyrological factors that leads to run-off, and by biological processes within the aquatic environment that an alter the physical and chemical composition of water

Globally, the most prevalent water quality problem is eutrophication, a result of high-nutrient loads, which substantially impairs beneficial uses of water, major nutrient sources includes agricultural runoff, domestic sewage, industrial effluents and atmospheric inputs from fossil fuel burning and bush fires. Lakes and reservoier are particularly susceptible to the negative impacts of eutrophication because of their role as an integrating sink for pollutants from their drainage basins. Poor water quality has a direct impact on water quality in a number of ways.

Polluted water that cannot be used for drinking, bathing, industry or agriculture effectivity reduces the amount of useable water within a given area.

Today water analysis in water samples is a formidable problem of source water production and water scarcity as well as how to outplace an aging infrastructure. Changes in how much a charge for water will become increasingly important as water becomes an even more valuable commodity. The challenges of supplying increasingly higher quality of water to an increasing human population on the planet with limited fresh water utilities and advanced treatment processes in the 21st Century.

EXPERIMENT AND OBSERVATION

EXPERIMENTS:

1. Test for Calcium and Magnesium

Principle : The extent of sodium hazard in irrigation water in terms of the sodium concentration in relation to Ca^{2+} and Mg^{2+} For the determination of both of them together, the versenate titration method is most popular in which EDTA-disodium salt solution is used to chelate them. The two cations can also be precisely estimated using AAS, but for all practical purposes the versate method is good enough. Calcium alone can also be estimated by versenate method using ammonium purpurate(murexide) indicator and thus Mg^{2+} can be obtained by substracting Ca^{2+} from Ca^{2+} + Mg^{2+} content. Calcium estimation can also be done on a flame photometer but the precision is not very high.

A number of cations include Ca2+ and Mg^{2+} are known to form stable complexes with versenate at different pH values. The formation of Ca and Mg complexes at pH 10 is achieved by using ammonium hydroxide / ammonium chloride buffer. A number of polyvalent ions are preferentially complexed by versenate as there are less dissociated than those of Ca and Mg and thus included in the titration. Fortunately the concentration of such interfering metals eg. Fe, Cu, Pb, Cd, Zn, Co, Mn is quite low and negligible in most waters and can be ignored. However, the interference, if high, can be prevented by using 2% solution of NaCN.

- **Procedure**

i. Transfer 5ml of the water sample to a 10ml porcelain dish and add about 20ml of distilled water.
ii. Add 1ml of ammonium hydroxide-ammonium chloride buffer and 3 to 4 drops of EBT indicator
iii. Take versenate solution in a burette and titrate the contents into the dish. The wine red colour changes to light/sky blue at the end point
iv. Swirl the contents in the dish to ensure the disappearance of the red colour.

- **Calculation:**

Ca + Mg concentration in water (mcL^{-1}) = 2V

Where V is the value of 0.01N EDTA solution used (titre value) for 5ml of water sample.

The factor '2' is arrived at from the expression given by

$$N_1V_1 = N_2V_2$$

Where N_1 and N_2 stand for the concentration in mc L^{-1} for water and EDTA solution used, respectively and V_1 and V_2 for the volumes of water (5ml) and EDTA solution consumed (V)

(Normality of the EDTA solution is 0.01N i.e, 10mcL^{-1})

2. Test for Carbonates and Bicarbonates

Principle: Carbonates and bicarbonates in water can be conveniently determined by titrating a known volume of water against standard H_2SO_4 using phenolphthalein and methyl orange indicators, respectively. When a drop of phenolphthalein is added in water, the pink colour developed will indicate the presence of carbonates. In good quality water generally pink colour will not appear, as carbonates are absent. On titration, the pink colour disappears because all the carbonates are converted to bicarbonates as shown below.

$$2Na_2CO_3 + H_2SO_4 \longrightarrow 2NaHCO_3 + Na_2SO_4$$

The neutralization of carbonate is only half way. The bicarbonates thus obtained along with the already present ones are then determined by continuing the titration using methyl orange indicator which gives yellow colour in present of bicarbonates. On complete neutralization of bicarbonates the yellow colour will change to red. The second stage neutralization takes place as follows:

$$2NaHCO_3 + H_2SO_4 \longrightarrow Na_2SO_4 + 2H_2O + 2CO_2$$

After completing the first titration (if pink colour appears) either the same aliquot is used for bicarbonate titration or a fresh sample is taken for it

Procedure :

i. Transfer 5ml of water sample to a 100ml porcelain dish.
ii. Add about 20ml of distilled water and 5 to 6 drops of potassium chromate indicator.
iii. Titrate the contents against 0.02N $AgNO_3$ solution till the brick red colour just starts appearing.

Calculation:

Chloride content in mcL^{-1} = 4V

Where V denotes the titre value in ml

(1 ml of 0.02N or 20 mcL^{-1} $AgNO_3$ = 0.00071 g of chloride)

3. Test for Chloride

Principle: Chlorides being soluble are present in all waters, but the amounts are often very low in natural waters. However, their contents may be appreciable when the electrical conductivity is high. Chlorides can be easily determined by $AgNO_3$ titration (Mohr's titration) method in which silver reacts with chloride forming white AgCl precipitate. When all the chlorides are precipitated, potassium chromate shows the brick red colour at the end point due to the formation of silver chromate.

Procedure :

i. Transfer 5ml of water sample to a 100mL porcelain dish
ii. Add about 20ml of distilled water and 5 to 6 drops of potassium chromate indicator.
iii. Titrate the contents against 0.02N $AgNO_3$ solution till the brick red colour just starts appearing.

Calculation :

Chloride contents in $mcL^{-1} = 4V$

Where V denotes the titre value in ml

(1ml of 0.02N or 20 mcL^{-1} $AgNO_3$ = 0.00071g of chloride)

OSERVATION:

On performing the above experiments for the presence of Chloride, carbonates and bicarbonates , calcium and magnesium in the water samples collected from different sources, we observe the following results.

- The light blue colour indicates the presence of calcium and magnesium

- For the test of carbonate and bicarbonates, carbonates were absent in all source of water. The red colour indicates the presence of bicarbonates in the water sample

- The brick red colour indicates the presence of Chloride in the water samples

RESULTS AND DISCUSSON

Table 1: Test for the presence of Cl, CO_2, HCO, Ca and Mg in water sample

Sources	Chloride	Carbonate and Bicarbonates	Calcium and Magnesium	pH
1. Jotsoma	0.3	A- absent B- 0.9	1	7.10
2. Khonoma	0.2	A- absent B- 0.7	1	7.17
3. Dzűleke	0.1	A- absent B- 0.5	2	7.25
4. Jakhama	0.9	A- absent B- 0.7	2	7.18
5. Dzűkou point	0.7	A- absent B- 0.6	3	7.40
6. Kohima	0.5	A- absent B- 0.5	2	7.60

Where, A= carbonate in water sample

B= bicarbonate in water sample

CALCULATIONS:

a) **For chloride:**

Source 1 {Jotsoma}: $4V = 4 \times 0.3$

$= 1.2$

Source 2 {Khonoma}: $4V = 4 \times 0.2$

$=0.8$

Source 3 {Dzűleke} : $4V = 4 \times 0.1$

$= 1.2$

Source 4 {Jakhama : $4V = 4 \times 0.9$

$= 3.6$

Source 5 {Dzűkou point : $4V = 4 \times 0.7$

$= 2.8$

Source 6 {Kohima}: $4V = 4 \times 0.5$

$= 2$

b) <u>For Carbonates and Bicarbonates</u>

Here, A indicates carbonate and B indicates bicarbonates

Carbonates were found to be absent in all sources whereas, bicarbonates were found to be present in the water samples collected.

Bicarbonates = 2(B-A) , since A is absent

Bicarbonates = 2B

Source 1: $2 \times 0.9 = 1.8$

Source 2: $2 \times 0.7 = 1.4$

Source 3: $2 \times 0.5 = 1$

Source 4: $2 \times 0.7 = 1.4$

Source 5: $2 \times 0.6 = 1.2$

Source 6: $2 \times 0.5 = 1$

c) <u>For Calcium and Magnesium</u>

$$N_1V_1 = N2V2$$

N_1 = 1 ml of EDTA indicator

N_2 = ?

V_1 = amount of water sample used

V_2 = volume of EDTA solution used b different water sources

Source 1: $N_2 = \frac{N1V1}{V2}$

$= \frac{1 \times 5}{1} = 5$

Source 2: $N_2 = \frac{1 \times 5}{1} = 5$

Source 3: $N_3 = \frac{1 \times 5}{2} = 2.5$

Source 4: $N_4 = \frac{1 \times 5}{2} = 2.5$

Source 5: $N_5 = \frac{1 \times 5}{3} = 1.67$

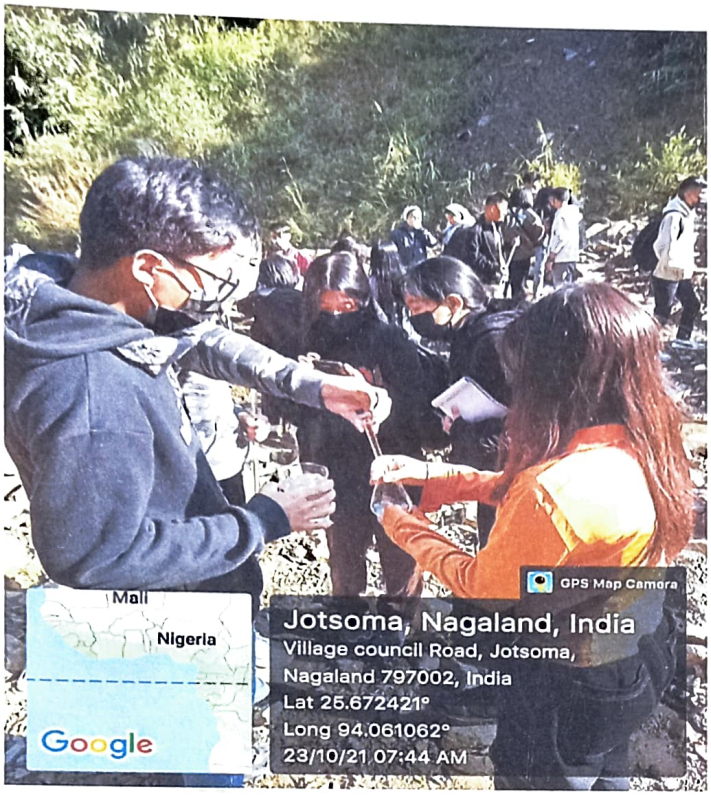
Source 6: $N_6 = \frac{1 \times 5}{2} = 2.5$

The amount of the dissolved minerals present in the sources of water are shown in the table given below:

Table2 : Amount of minerals present in the water samples

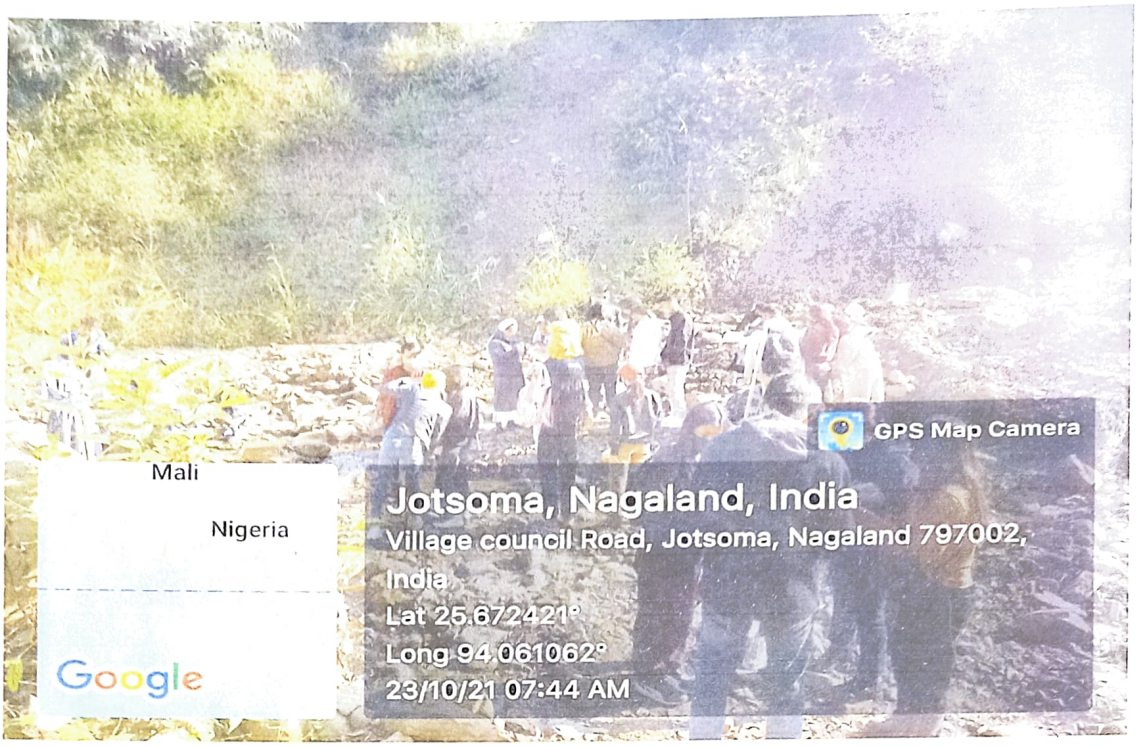
Sources	Chloride	Carbonates and Bicarbonates	Calcium and Magnesium
1. Jotsoma	1.2	1.8	5
2. Khonoma	0.8	1.4	5
3. Dzűleke	0.4	1	2.5
4. Jakhama	3.6	1.4	2.5
5. Dzűkou point	2.8	1.2	1.67
6. Kohima	2	1	2.5

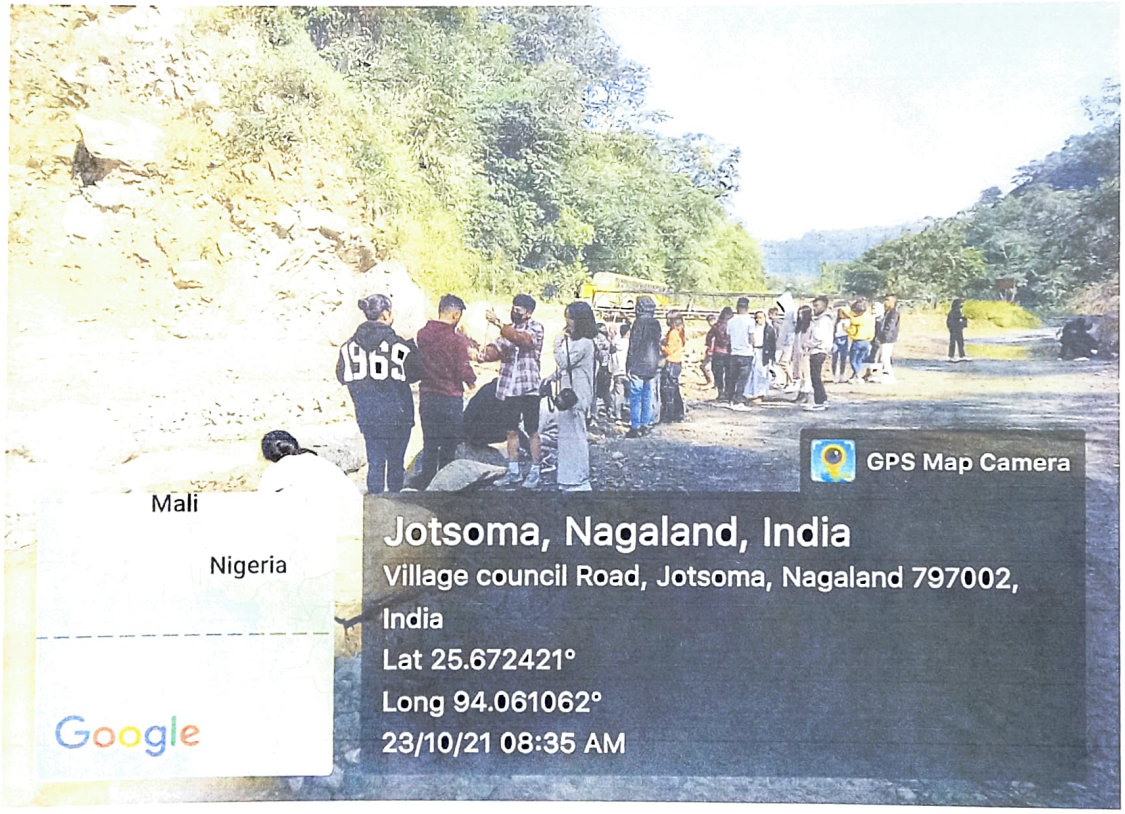
GALLERY



Group members performing the experiment

Site 1 for experiment (Jotsoma)





Site 2 for experiment

CONCLUSION

From the qualitative analysis of running water in and around Kohima, test were runned on the six samples collected from different sources, of which, all the six samples were found to be neutral, falling under the pH around 7.10 which is considered to be neutral level.

Thus, indicating the water from the sources as pure and can be used for consumption and other purposes. The water source are uncontaminated, clean and fresh

REFERENCE

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DEPARTMENT OF CHEMISTRY

Field Report
On Industrial tour to Dimapur

In partial fulfillment of the Nagaland university

Syllabus of B.sc Chemistry Honours

Submitted to:
Sir. Madovi David
Head of the department

Submitted by:
Lithangtsala l sangtam
B.sc VI semester
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SH17010070

ACKNOWLEDEMENT

Through this column I would like to take the pleasure in conveying my sincere graduate to Mr. Madovi David (Head of the department), and the department of chemistry for giving us the opportunity and also encouraging us and helping me to complete my project on Dimul and plywood factory.

The experience of it all has helped me understand and realized the process that take place in the manufacturing a product and its value.

I also would like thank the Principal, Vice principal Dean of science, HOD of Chemistry Department, for giving us the opportunity to explore and learn more about the manufacturing process of various items.

Lithangtsala L Sangtam

Lithangtsala

CONTENTS

INTRODUCTION

The Department of chemistry in accordance with the Nagaland university's syllabus went for an industrial tour to Dimapur.

The head of the department Mr. Madovi David guided 33 students of B.sc V semester for the industrial tour on 7th September 2019

INTRODUCTION TO DIMUL FACTORY, DIMAPUR

A study on economics and decision pattern of milk production in Dimapur district of Nagaland were conducted by adopting stratified random sampling method. The Dimul fsactory in DIMAPUR is one of the most known factories in Nagaland . This factory produces products like Lassi, Milk, Ice-creams, Curd etc. The data on decision pattern and cost-return aspect of milk production were collected from the dairy farm. The milk is tested before the manufacture and after being tested, the pure milk is now ready to make the required products. The final product are sold in and around the neighbourhood states and within itself.

1. MANUFACTURE OF LASSI

Materials Required: Milk, sugar, water, curd.

Process of making Lassi: The manufacture of making lassi involves standardization, heating and cooling of milk to inoculation been pasteurized temperature, addition of stanten culture and selling of milk. Chill the curd well and transfer to a blended jar. Pour chilled water, add sugar to suit the taste. Next salt too to suit the taste. Blend until frothy and smooth.

2.MANUFACTURE OF ICECREAM

Raw materials; 1). Dairy products (milks, butterfats, cream) 2). Sugar flavouring. 3). Approved addititives that prevent creation of ice crystals during production process . 4). Eggs.

5). Air which improves ice-cream;ability to absorb flavoring and removes the feeling of overy soggy and heavy material.

Process of making ice-cream: The basic steps in the manufacturing of ice cream are generally as follows: 1Blend the Ice-cream mixture- The milk fat source, nonfat solids, stabilizers and emulsifiers are blended to ensure comlete mixing of liquid and dry ingredients. 2.Pasteurize mixture. 3.Homogenization 4.Add liquid flavors and colors. 5.Age the mixture. 6.Freezing. 7.Add fruits, nuts and bulky flavorings (candy pieces, etc) 8..Package. 9.handing.

INTRODUCTION ON PLYWOOD FACTORY, DIMAPUF

The Plywood factory produces products which is tbe most important for the manufacture of furnitures. Plywood is a staple material for professional builders, architects etc. plywood in most of the local stores offers wide selection and specialty.

MANUFACTURE OF PLYWOOD

The manufacture of plywood consist of nine main processes: Log storage, log debarking and bucking, heating the logs, peeling the logs to veneers, drying the veneers, gluing the veneers together, pressing the veneers in a hot press, plywood cutting and finishing processes such as sanding.

The various production processes is explained below:

1.Log storage:These steps involve felling of trees, transportation of logs to the mill and are stored in the log pond.

2.Log debarking and bucking: Before the logs are cut and peeled,the bark must be removed.

3.Peeling the logs: Logs are peels using a rotary lathe.The blade used for peeling is parallel to the log at the time of cutting.

4.Sizing and grading: Once thay have been peeled the resultant sheets are fed to the next step on a conveyor.

5. Drying the veneers: The veneers must be dried for protecting the wood from fungal decay.

6.Repairing defects: Splits in veneers on plywood can also be filled in and mis-sized veneers can be finger-jointed together.

7.Application of glue and lay-up.

8.Cold pressing:This process occurs after gluing the veneers together to prepare the veneers for hot pressing.

9.Quality control and delivery:The final product has to be assessed for quality for efficient production.The finished products is then stacked up and banded together. They are ready for delivery.

CONCLUSION

The industries has progress to a very great extend. It has helped in providing and fulfilling the needs of the people. The industries of the industries in Nagaland has helped in boosting the economy of the state.

With the use of more developed technologies in the future, the industries are expected to rise to a greater and higher standard.

ST. JOSEPH'S COLLEGE JAKHAMA

Department of Chemistry

Field Report on Industrial tour to Guwahati

Submitted by;
L.Surotsaba Sangtam
Roll No: SH15011030
Registration No. 1501272 of 2015

Submitted to;
Sir Sanjib Katuwal
HOD
Deptt. Of Chemistry

ACKNOWLEDGEMENT

Firstly I would like to thank our almighty God for his grace and guidance in completion of my field trip report.

At the outset I would like to thank the college authority for the privilege and also for granting to carry out the field work for the completion of my B.Sc degree.

I would like to thank our supervisor Sir. Sanjib Katuwal Head of Department of Chemistry, St.Joseph's College Jakhama, for his constant inspiration, support, guidance, encouragement, advice and extending his valuable time in assisting me throughout the preparation and completion of this report.

I would also like to express my heartfelt gratitude to the staffs of the department of Chemistry St.Joseph's College Jakhama for their immense help and support during preparation of my field report.

My sincere acknowledgement goes to my Dad and Mom, my siblings and other family members for their constant love and support in every field of my life.

I extent my heartfelt gratitude to my friends who had assisted me help me out getting enough materials in working out my report.

Lastly I would like to extent my acknowledgement to the respondents who help me obtain the primary data through the available information they could provide.

INTORDUCTION

The Department of Chemistry in accordance with the Nagaland University's syllabus went for an industrial tour to Guwahati.

The Head of Department Mr. Sanjib Katuwal and Asst. Professor Madovei David guided 39 students of B.sc Vth semester for the Industrial tour from 24th to 27th August, 2018.

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BREAD MAKING

STEEL STRUCTURE ASSEMBLY

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