

**PROJECT REPORT  
(BSCC3151)**

ON

**Chemical Analysis of Hair Oil**

Submitted in partial fulfilment of the requirement for the degree of  
B.Sc. (Hons) Chemistry

Submitted by

**Shiril Kumar**

**Admission No.19SBAS1020010**

B.Sc. (Hons) Chemistry (VI<sup>th</sup> Semester)

Under the supervision of

**Dr. Anjali Gupta**

**Professor**

**(Galgotias University)**



Division of Chemistry  
Department of Basic Sciences  
School of Basic & Applied Sciences  
GALGOTIAS UNIVERSITY  
Uttar Pradesh

**May2022**



SCHOOL OF BASIC AND APPLIED SCIENCES

**CERTIFICATE**

This is to certify that **Mr. Shiril Kumar** has carried out his Project work entitled “**Chemical Analysis of Hair Oil** ” under my supervision. This work is fit for submission for the completion of project for bachelor Degree in Chemistry.

(Signature)  
**Dr. Anjali Gupta**  
Professor  
Division of Chemistry  
Department of Basic Sciences  
Galgotias University  
Greater Noida

(Signature)  
**Dr. A. K. Jain**  
Dean  
School of Basic & Applied Sciences  
Galgotias University

## Certificate from Oriflame

**ORIFLAME**  
— SWEDEN —

Date: 31<sup>st</sup> May 2022


### TO WHOMSOEVER IT MAY CONCERN

This is to certify that Mr Shiril Kumar a 6<sup>th</sup> semester student of B.SC (Hons) Chemistry from Galgotias University, Greater Noida has undergone in training from **24/01/2022 to 24/05/2022** as a part of fulfillment of his course, at our factory located at B-44, Phase II, NOIDA(U.P.) in Quality Control and Quality Assurance department.

During his training period he had undertaken a project on "**Chemical Analysis of Hair Oil**"—**An HR Perspective.**" He was found to be taking keen interest and has put in his efforts to work on the project very sincerely.

The project he has undergone has really helped us in identifying many strengths and areas of improvement in our working environment.

We wish him all the best in his future endeavors.

**Oriflame India Pvt Ltd**  
  
**Authorized Signatory**

### Oriflame India Private Limited

Factory Address : B-44, Phase-II  
NOIDA-201 305 (U.P.) INDIA  
Tel.: +91-120-2567949/50/51/52/53-692/95/96

Web : [www.oriflame.com](http://www.oriflame.com)  
CIN : U74899DLI994PTC061083

Regd. Office : M-10, Ground Floor  
South Extension Part-II  
New Delhi - 110 049, INDIA  
Tel.: +91-11-4366 5500

## **CANDIDATE DECLARATION**

I hereby declare that the dissertation entitled “ **Chemical Analysis of Hair Oil** “ by me in the partial fulfillment for the degree of B.Sc.(Hons) in Chemistry to the Division of Chemistry; Department of Basic Sciences, School of Basic & Applied Sciences, Galgotias University, Greater Noida, Uttar Pradesh, India is my original work. It has not been submitted in part or full to this University or any other Universities for the award of diploma or degree.

**(Signature)**

**Shiril kumar**

## **ACKNOWLEDGEMENT**

I would like to take this pleasant opportunity to express my heartfelt thanks to all the individuals who have immensely contributed in many ways in the success of this study. Firstly I must thank the Almighty for his gracious blessing and safe guarding me throughout this B.Sc. project and expertise and skilful training which have helped me in development of my scientific skills and have also taught me the art of learning and doing science. Indeed, I would like to express my sincere thanks to my guide **Dr. Anjali Gupta** whose moral discussions have always been very resourceful and instrumental. Thanks for giving me an opportunity to do my project work under your guidance and helping me to understand and enrich my knowledge in this particular area. I am obliged to my all the project committee members for their scientific inputs while during various presentations and his timely assistance in various formal stages of my B.Sc. work. I would like to express my sincere gratitude and to my dean sir **Dr. A. K. Jain** for supporting and extending all the necessary facilities for carrying out the research work and helping in completion of the formalities for the project work. Beside the key contributions of all my project guides thanks and all faculties which has been kept on track and have been seen through to completion with the support and encouragement of numerous people including my well-wishers, friends and my colleagues. The most crucial part of my acknowledgement note is my heartfelt gratitude to all my family members. None of this would have been possible without the unconditional love and care of my family throughout my life. I would whole heartedly would like to convey my sincere thanks to my parents. All of them have constantly stood by me and have given me the inner peace required for completion of my project work. Training and to achieve the goals of my life by providing me various emotional and monetary help to overcome various obstacles of my life

## TABLE OF CONTENT

S.No.	Title	Page No.
1	Introduction	1-2
2	Literature Review	3 - 6
3	Method and Methodologies	08- 15
4	Result and Discussions	16
5	Conclusion	17
6	References	18-19

## LIST OF ABBREVIATIONS

<b>S.No</b>	<b>Abbreviations</b>	<b>Full Form</b>
1	RM	Raw Material
2	FG	Finished Good
3	IR	Infra red
4	FTIR	Fourier Transform Infrared
5	SAP	Saponification
6	IPA	Isopropyl Alcohol
7	BIS	Bureau of Indian Standard

## **ABSTRACT**

Hair maintenance and style are very essential in people's physical appearance and self-perception nowadays. Hair cosmetics are divided into two groups: those that have a temporary effect on the hair, such as shampoos, conditioners, oil, sprays, and temporary colours, and those that have a permanent influence on the hair, such as permanent waves, relaxers, bleaches, and permanent colours. In this report we discussed about Hair oil which has a temporary effect on hair. Hair oils come in a variety of forms, including coconut hair oil, almond drops hair oil, and dabur amla hair oil, among others. We will just address coconut hair oil and its chemical analysis in this study. This experiment investigates the composition of coconut hair oil. All of the raw materials used are listed, along with their functions and the quality testing that was done on them.



## **1. INTRODUCTION**

## **Introduction**

The word cosmetics comes from the Greek word "kosmetikos" which means "kosmetikos," which means "to decorate and prepare." It is defined as an exterior preparation of the body, such as colouring, softening, cleansing, nourishing, waving, setting, preservation, removal, and protection of the nails, hair, and skin. According to another definition, "Resolving or splitting a thing into its pieces or components" is how the term analysis is defined.

Cosmetics contain both natural and manmade chemical ingredients. Cleansers, toners, serums, moisturisers, and balms can be used to wash, exfoliate, protect, and renew the skin. Shampoo and body wash designed for a variety of personal care needs can also be used to cleanse the body.[1][2]

### **Analysis of cosmetics include :**

#### **Chemical analysis of cosmetics:**

The identification of components present in samples is the focus of qualitative chemical analysis, a discipline of chemistry. Depending on the sample, different sample, different methodologies are used in qualitative analysis.

Acidic testing, iodine testing, viscosity testing, pH value, specific gravity, saponification value, peroxide value, and other chemical tests are included in the chemical analysis. Cosmetics and other dermatological formulas benefit from this. Unfortunately dangerous substances are regularly found in cosmetics, but spectrophotometers can assist in detecting impurities and other harmful compounds. Because chemical analysis may offer rapid results, it is simple, effective, and time efficient.

#### **Microbiological analysis of cosmetics:**

Microbiology is the study of microscopic organisms, which are defined as any living entity with single cell, a cluster of cells, or no cells at all (acellular). This comprises both eukaryotes and prokaryotes, such as fungi and protists. Virology, mycology, parasitology, bacteriology, immunology, and other disciplines of microbiology are included. Microbiological operations are typically aseptic, and they include a number of equipment, including a light microscope with a variety of stains and dyes, agar plates in petri dishes, biochemical testing, and performing tests against specific growth parameters. [3] [4]

## **1.1 Role of Coconut Hair oil**

Coconut oil can help preserve your hair from damage. Coconut oil is a lauric acid triglyceride with a strong affinity for keratin protein in the hair. Coconut oil can aid in the restoration of lipids in the hair shaft while also acting as a mechanical barrier over the hair. Coconut oil can penetrate the hair shaft because of its linear polymer chain structure and low molecular weight. The oil penetrates the hair. As a result, the oil fills the internal crevices in the hair and prevents dust, debris, pollutants, and chemicals from entering the hair shaft, avoiding hair damage. Before the festival of colours, Holi, and the celebrations with fireworks during Dussera and Diwali, it's also a good idea to oil your hair properly. Protection against winter smog is the same. If you don't have access to coconut oil, a decent leave-on conditioner can help coat the hair shaft and prevent damage.[5][6]

### **3. REVIEW LITERATURE**

## Review Literature

We are exposed to a variety of substances in our environment, whether we are aware of it or not. These poisons infiltrate our bodies and cause harm to many organs. The hair is one of the organs that gets damaged. Hair loss is caused by damage to the hair, which weakens it and causes it to fall out. To cure this damage, hair must be nourished again, which can be accomplished by improving blood circulation to the scalp and massage with oils that supply external nutrients. Hair oils are tonics that are used to treat hair problems such as dandruff, hair loss, and hair dryness. Hair oil, when used regularly, prevents breakage and split ends, adds lustre and gloss to hair, and hydrates the scalp. Hair oils also serve as a vehicle for delivering necessary nutrients to the root of the hair, allowing it to grow properly.

Coconut oil extracted from the kernel or meat of *Cocos nucifera* (Arecaceae) fruits. India, Sri Lanka, Indonesia, Malaysia, Australia, and South America are all home to this species. It can be used for a variety of things, including deep conditioning, dandruff control, hair development, and as a base for hair colour. Oil is prepared in two ways:

- (a) A dry technique that uses coconut pulp that has been dried. Crude oil is extracted by pressing it. Impurities are removed from the crude oil before it is processed.
- (b) Extraction of oil from raw coconut using a wet technique. Due to the inclusion of proteins, the oil obtained is initially in the form of an emulsion. Boiling, centrifugation, or pre-treatment with salts, enzymes, or acids are used to break up the emulsion and extract the oil.

Coconut oil is one of the richest sources of medium chain fatty acids and contains saturated fatty acids. Lauric acid, myristic acid, and capric acid are the three primary fatty acids. It also contains phenolic acids as well as antioxidants such as tocopherol.[7]

### Benefits for Hair

Coconut oil protects hair from protein loss. It's commonly used as a conditioner before washing. It also prevents water from penetrating the hair shaft, causing swelling and chipping of the hair cuticle. It also stops hair from losing moisture, giving it a hydrating effect. It aids in the control of dandruff.

For the sake of writing, we shall go over each of the four mixes that were linked to the creation of Coconut hair oil.

- Cocos Nucifera Oil
- Propyl Paraben
- Tocopheryl Acetate
- Synthesis Perfume

## 1. Cocos Nucifera Oil

Cocos nucifera oil, more often known as coconut oil, is a well-known skin component. This raw material is used as an emollient for the formation of coconut hair oil. Its moisturizing properties and vital fatty acids, such as lauric acid, have propelled it into the cosmetic business in recent years, making it a key element in keeping the skin moisturized, moisturized, and healthy. Regularly made into topical solutions that are acclaimed for enhancing the appearance of skin with indications of eczema and excessive dryness. Although cocos nucifera oil claims to treat the acne-causing bacterium P.acnes, it is a comedogenic component, which means it can clog pores and cause breakouts like blackheads and spots.

CAS NO.	-	(8001-31-8)
APPEARENCE	-	Yellow liquid or semi solid
SYNONYMS	-	Coconut fat , copra oil
SOLUBILITY	-	Practically insoluble in Water; Freely soluble in Dichloromethane, Light Petroleum; Soluble in Ether, Carbon Disulfide, Chloroform.
STORAGE	-	at room temperature
BOILING POINT	-	Greater than 450 °C
MELTING POINT	-	23-26 °C
DENSITY	-	0.903 g/mL at 25 °C

## 2. Propylparaben

This raw material is used as a preservative for the formation of coconut hair oil. Propylparaben is the propyl ester of 4-hydroxybenzoic acid's benzoate ester. Many water-based cosmetics, such as creams, lotions, shampoos, and bath treatments, include this preservative. It's also a food additive. It works as both an antifungal and antibacterial agent. It is produced by esterifying p-hydroxybenzoic acid with n-propanol with the help of an acid catalyst like sulfuric acid and a lot of propanol. The ingredients are heated under reflux in a glass-lined reactor. After that, the acid is neutralised with caustic soda, and the result is cooled to crystallise. To avoid metallic contamination, the crystalline product is centrifuged, washed, vacuum-dried, milled, and blended in corrosion-resistant equipment. Propylparaben is frequently utilized in cosmetics, culinary goods, and pharmaceutical formulations as an antibacterial preservative.

It can be used alone, in conjunction with other paraben esters, or in conjunction with other antimicrobials. It's one of the most common preservatives found in cosmetics.

The parabens are antimicrobials that work across a wide pH range and have a broad spectrum of activity, although they are particularly efficient against yeasts and mould. [8][9]

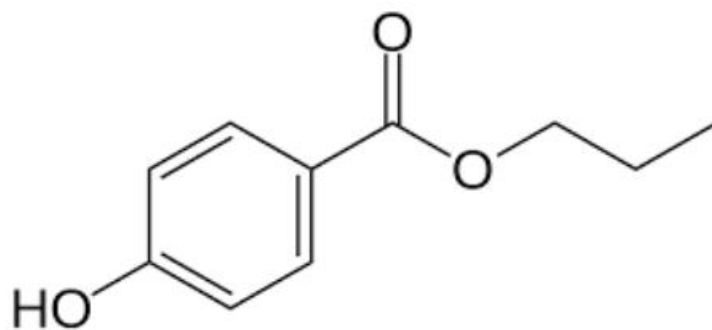


Fig:1 PROPYLPARABEN

CAS NO.	-	94-13-3
APPEARENCE	-	Crystalline Powder
SYNONYMS	-	Propyl 4-hydroxybenzoate, 4-Hydroxybenzoic acid propyl ester
SOLUBILITY	-	Soluble in ethanol, ethyl ether, acetone and other organic solvents, slightly soluble in water.
STORAGE	-	sealed in dry, room temperature
BOILING POINT	-	Greater than 130 °C
MELTING POINT	-	95-98 °C
DENSITY	-	1.0630 g/mL at 25 °C

### 3. Tocopheryl Acetate

The vitamin E form alpha-tocopheryl acetate (ATA) is commonly found in skin care products and dietary supplements. Tocopheryl acetate, tocopherol acetate, and vitamin E acetate are all synonyms for the same substance. It is a clear, slightly greenish yellow, viscous, oily liquid. Antioxidant properties are well-known for vitamin E. Antioxidants help in the protection of your body against free radicals, which are harmful substances. When your body turns food into energy, free radicals are created. UV radiation, cigarette smoke, and air pollution, on the other hand, can all produce free radicals. Vitamin E is found in nature as tocopheryl or tocotrienol. Alpha, beta, gamma, and delta are the four types of tocopheryl and tocotrienol, respectively. In humans, the most active form of vitamin E is alpha-tocopheryl (AT). ATA is more stable than AT, which means it can tolerate more stresses from the environment, such as heat, air, and light. Because it has a longer shelf life, it is appropriate for use in supplements and fortified foods.[10]

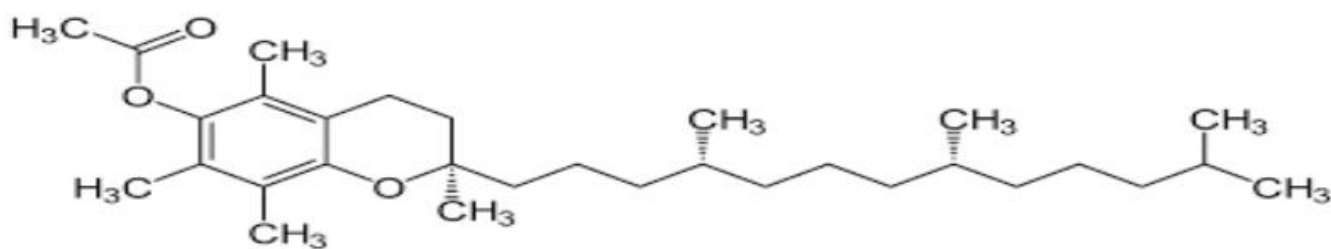


Fig:2 TOCOPHERYL ACETATE

CAS NO.	-	7695-91-2
APPEARANCE	-	Slightly greenish yellow viscous liquid
SYNONYMS	-	Propyl 4-hydroxybenzoate, 4-Hydroxybenzoic acid propyl ester
SOLUBILITY	-	Particularly insoluble in water, freely soluble in acetone, in anhydrous ethanol and in fatty oils.
STORAGE	-	Store at 2-8 °C temperature
BOILING POINT	-	485.3 °C
MELTING POINT	-	-28 °C
DENSITY	-	0.96 g/mL at 20 °C



# **OBJECTIVE**

## **1. Raw material testing**

- To study the properties of the raw materials used in the formation of coconut hair oil.
- To determine the refractive index of raw materials.
- To determine whether the products are free of adulteration and dampness.

## **2. Bulk testing**

- To determine the acid value of the bulk sample.
- To determine the specific gravity of the bulk sample.

### **3. MATERIAL AND METHODOLOGIES**

## Material and Methodologies

### 3.1 SAMPLING OF RAW MATERIALS

Before it can be used in the products, each raw material must fulfill the company's criteria. As a result, it's important that the materials being sampled aren't affected or polluted during the process. The goal of this technique is to ensure that every delivery of raw materials is sampled and that the raw materials are not contaminated throughout the sampling process.

- Take GRN (Good receipt Note received from warehouse), enter consignment details from GRN to the quality app ( search code and lot number as per GRN details) and consider lot number to be the same for all raw materials .
- Verify approved manufacturer name from active raw material list.
- Ensure that the sampling basket which is stored in a warehouse contains the following:
  1. Disposable scoops and spoons
  2. Disposable pipettes, rubber bulbs or dispenser
  3. Disposable gloves
  4. 70% IPA
  5. Sample container with lids and labels
  6. Cable ties
  7. Drum spanner
  8. Tissue rolls
  9. Raw material active list
- Locate the material to be sampled in sampling area of raw materials in the warehouse.
- Check that the material details on the good receipt note matches that on the supplier/manufacturer label on container and well note if any discrepancy found.
- If any container is damaged make a note on worksheet.
- Put on clean disposable gloves.
- Mark the sample container with necessary information like product code , batch no. , lot no. and manufacturing date.
- Depending on the container and the nature of sample, spray the relevant sampling tools with 70% IPA and wipe dry.
- Conduct the sampling on the basis of formula  $\sqrt{n+1}$  where n stands for number of containers.
- Open the drum carefully and take sample from different locations.
- Close the drum/containers properly.
- Clean any spillage that occurred during sampling and leave area tidy.
- Discard gloves.[11]

### 3.2 TESTING OF RAW MATERIALS

After the sampling of raw materials, raw material testing is done. In general, all tests are carried out based on the type of raw material. Various tests were carried out on various raw materials.

### 3.2.1 FTIR SPECTROSCOPY

Infrared spectroscopy is an important technique in organic chemistry. It is an easy to identify the presence of functional groups in a molecule. Also, one can use the unique collection of absorption bands to confirm the identity of a pure compound or to detect the presence of specific impurities.

FTIR stands for Fourier Transform Infrared Spectroscopy, and it's a technique for identifying natural (and sometimes inorganic) materials. This method determines how often the example material absorbs infrared radiation. Infrared absorption groups are used to identify the atomic components and structure.

The method by which I have prepared IR sample is pressed pellet technique which is described below:

- KBr disks/pellets (for solid samples): To create a KBr pellet, follow the processes detailed below:
- The sample concentration in KBr should be between 0.2 percent and 1 percent. Pellets require a lower concentration in the sample than liquid films because they are thicker. When the concentration is too high, finding low-cost pellets can be difficult. The substance absorbs or scatters the beam completely, resulting in very noisy spectra.
- After adding the sample to KBr, crushing it into very fine powder with a mortar and pestle.
- Take two stainless steel disks out of the desiccator. Place a piece of the precut cardboard (in the tin can next to the oven) on top of one disk and fill the cutout hole with the finely ground mixture. Put the second stainless steel disk on top and transfer the sandwich onto the pistil in the hydraulic press.
- Move the hydraulic pump handle downward with a pumping motion. When the pistil reaches the top of the pump chamber, it will begin to climb upward. Then, raise the pump handles and pump until the pressure hits more than 10 tons. Allow a few seconds before releasing the pressure with the small handle on the left side (hold until the sample and pistil are completely down). Pull separate the discs after removing them.

Remove the film, which should be uniform in appearance and transparent. Using scotch tape, secure the sample in the IR sample holder. Run through the spectrum.[11]



Fig: 3 Hydraulic / pellet press



Fig:4 FTIR spectrophotometer

## FTIR GRAPHS

### 1. Spectrum of Cocos nucifera oil

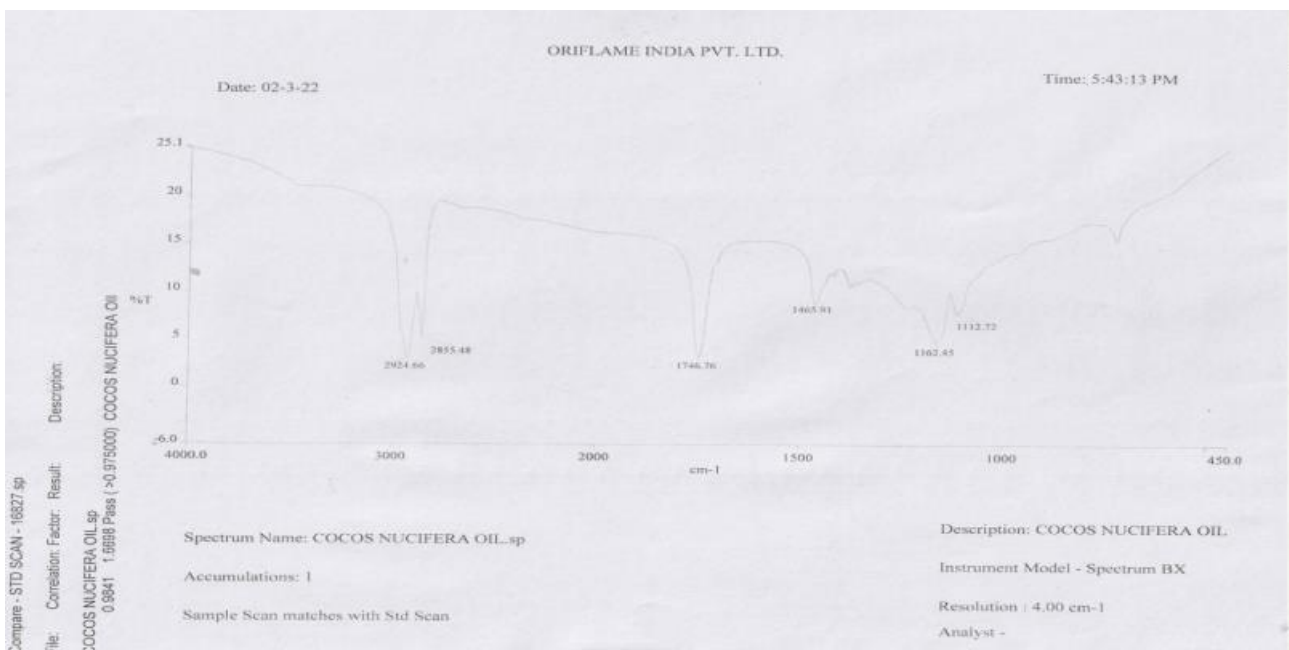


Fig:5 SPECTUM OF COCOS NUCIFERA OIL

- The peaks at 1746.76, 1112.72, 2855.48 gives indication of presence of -C-O-C- group, C-H group and C=C group respectively.
- Peak at 2925.53 cm<sup>-1</sup> signify the presence of O-H

## 2. Spectrum of Propylparaben

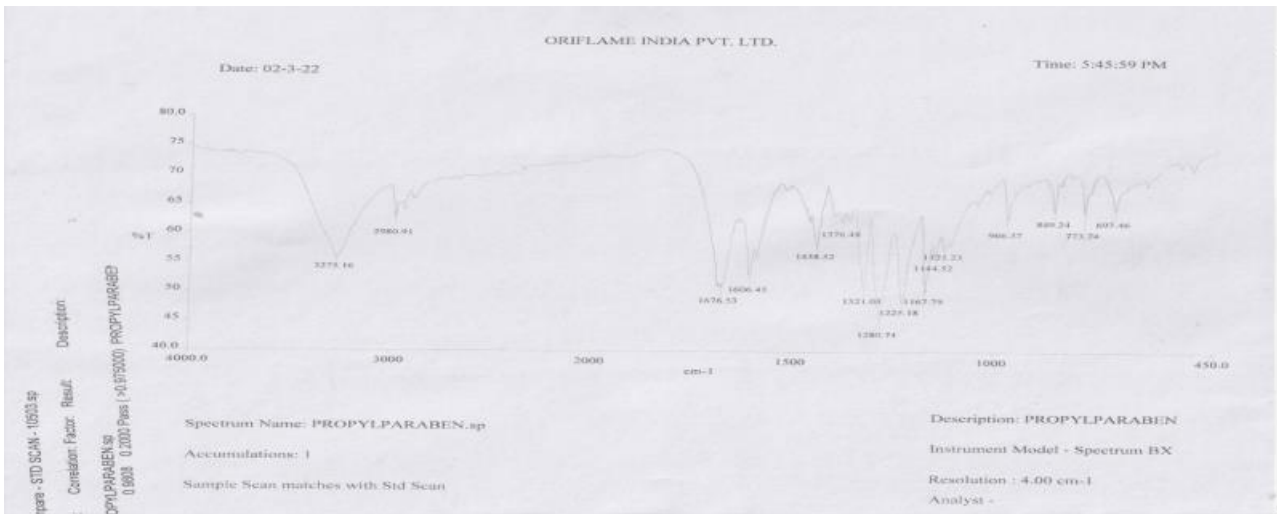


Fig:6 SPECTRUM OF PROPYLPARABEN

- The peaks at 1676.53 , 1600.45, gives indication of presence of -C-O-C- grp and C-H grp respectively.
- Peak at 2980.91  $\text{cm}^{-1}$  signify the presence of O-H

## 3. Spectrum of Tocopheryl Acetate

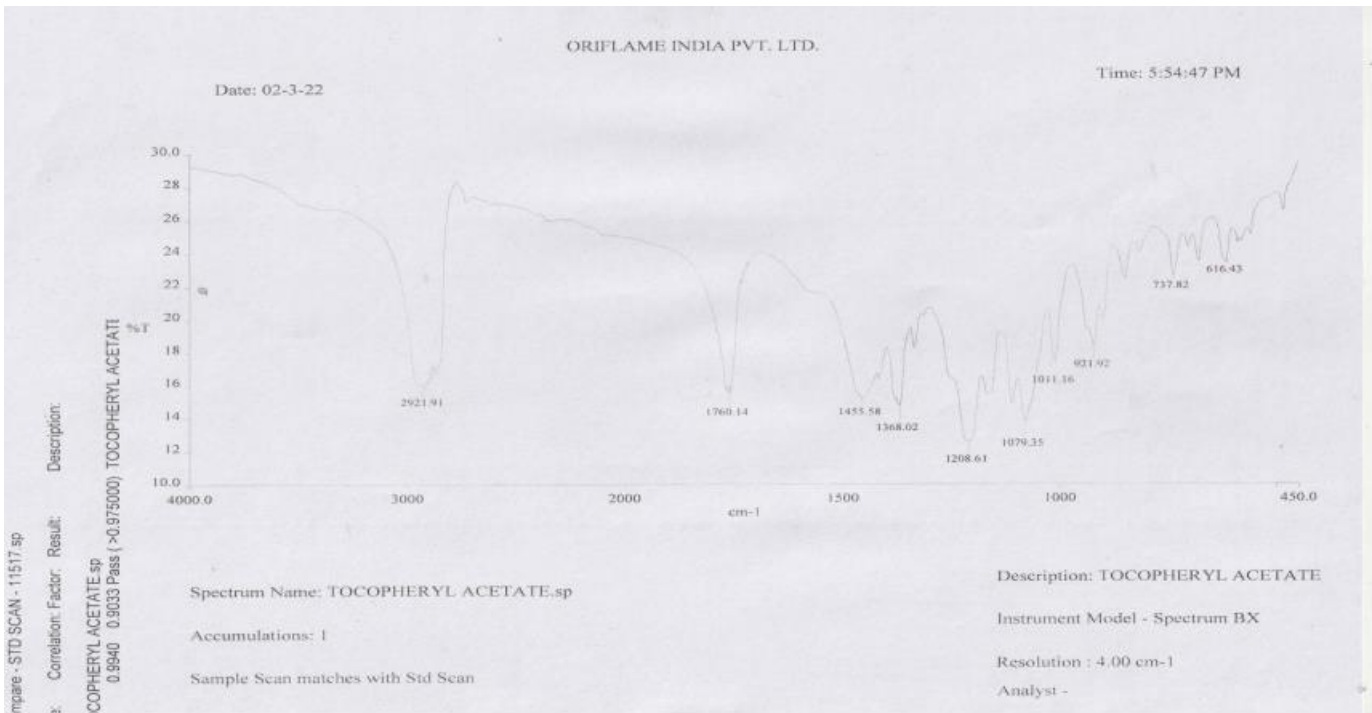


Fig:7 SPECTRUM OF TOCOPHERYL ACETATE

- The peaks at 1760.14, 1455.58 gives indication of presence of C=O, C-H respectively.
- Peak at 2921.91  $\text{cm}^{-1}$  signify the presence of O-H

### 3.3 Determination of Refractive Index of Raw Material:

One of a solution's most important characteristics is its refractive index. The refractive index of a material with reference to air is the ratio of the sine of the angle of incidence to the sine of the angle of refraction of a beam of light travelling from air into the substance.

It is an important characteristic for identification because it represents the substance's purity.

APPARATUS: Beaker, Spatula, Tissue paper

Chemicals used: Ethanol, Process water

Equipment: Refractometer

#### Procedure:

- Check that the refractometer is calibrated.
- Make sure the instrument is turned on.
- Remove the cover prism from the mounting and move it till it strikes the lighting window.
- Use ethanol and tissue paper to clean the glass prisms' surfaces.
- Place a few drops on the surface of the measuring surface that is covered with the sample with a spatula.
- Place the cover prism on the measuring surface and lower it.
- Take the measurements after waiting a few seconds for the sample and prisms to reach the same temperature.
- Place the cover prism's lighting window in the direction of maximum light intensity.
- Using the eyepiece and turning knob, get a sharp, distinct, colourless delimitation line exactly in the centre of the cross.
- Press the read button and wait a few seconds for the findings to appear on the screen.
- Clean the measuring surface with ethanol and water, then wipe it clean with tissue paper before applying it.[11]



Fig:8 REFRACTOMETER

S.NO	RAW MATERIAL	VALUES
1.	Cocos Nucifera Oil	1.448
2.	Tocopheryl Acetate	1.496
3.	Synthesis Perfume	1.453

The values of refractive index complies with the given range.

## FORMULATION OF COCONUT HAIR OIL

- Weigh accurately all the raw materials on weigh balance.
- Add cocos nucifera oil in manufacturing vessel and heat to 55°C to 60°C with stirring continuously.
- Add propylparaben to the wax vessel and heat to 70°C to 75°C.
- Then add little amount of cocos nucifera oil in wax vessel with stirring continuously.
- After that the solution from the wax vessel is transferred to the manufacturing vessel.
- Then add tocopheryl acetate to the manufacturing vessel at 35°C to 38°C temperature with stirring continuously.
- Then let the content of manufacturing vessel cool down below 35°C.
- Then add synthesis perfume to manufacturing vessel with stirring until continuously.
- Then bulk is ready.

## 4.3 TESTING OF BULK

### 4.3.1 Determination of specific gravity of bulk sample

Apparatus used:

- Pycnometer
- Spatula
- Weighing balance

### PROCEDURE:

- Select a thoroughly clean and dry pycnometer.
- Adjust the temperature of the sample to 20 degree and fill the pycnometer with it.
- Remove the tare weight of the pycnometer from the filled weight of pycnometer



- Determine the specific gravity of the sample by dividing the weight of sample, in grams, which fills the pycnometer at the specified temperature, by the capacity of the pycnometer when 4°C water is filled in it.

**Significance:**

The test is done to determine the weight in grams per ml (or c.c.) of a sample.[12]



Fig:9 PYCNOMETER ON WEIGHING BALANCE

### 4.3.2 Determination of acid value of bulk sample

Acid value (or neutralization number or acid number or acidity) is the mass of potassium hydroxide (KOH) in milligrams that is required to neutralize one gram of chemical substance. The acid number is used to quantify the amount of acid present.

**Required Reagents :**

- 
- 0.1M Potassium hydroxide solution.
- Mixture of equal volume of ethanol 95% and ether.
- Phenolphthalein indicator

**Procedure:**

- Using a 50ml mixture of Ethanol (95%) + Diethyl Ether, previously neutralise with 0.1M potassium hydroxide to phenolphthalein solution, dissolve around 10gm of the sample, carefully weighed.
- If the sample does not dissolve in the cold solvent, connect the flask to a reflux condenser and progressively warm the flask while shaking frequently until the sample dissolves.
- Add 1 mL phenolphthalein solution After 30 seconds of shaking, titrate with 0.1M potassium hydroxide until the solution is faintly pink.

**Calculation:**

$$\text{Acid Value} = 5.61 \frac{n}{w}$$

Where,  $n$  = the number of ml of 0.1 M potassium hydroxide required.

$W$  = the weight in gram, of the substance.

**Significance:**

It gives information about age of oil sample, also it signifies due to attack of atmospheric oxygen, hot moist air or microorganisms how much generation of free fatty acid has taken place.[12]

## **4.RESULT AND DISCUSSION**

## Result and Discussion

Because cosmetics are designed to enhance a person's inherent beauty, it is the cosmetic industry's responsibility to ensure product quality, which they accomplish by conducting several tests at each stage of the manufacturing process. We'll talk about the materials' standard values in this section, which are validated by the FDA and BIS and followed by the industries.

Table 1: Table showing result of coconut hair oil

TEST NAME	STANDARD VALUE	OBTAINED VALUE
COLOUR	PALE YELLOW	COMPLIES
SMELL	COCONUT	COMPLIES
APPEARANCE	PALE YELLOW SEMI SOLID	COMPLIES
SPECIFIC GRAVITY	0.89-0.93	0.915
ACID VALUE	Max 1 mg KOH/kg	0.531

The S.G values and acid value of product in the table above are within the standard value range, indicating that it can be sold in the market. The standard values of the products are determined by Oriflame Sweden's research and development team based on FDA Schedule M guidelines.

## **5.CONCLUSION**

## **Conclusion**

The main aim of this project report is to conduct a chemical analysis of coconut hair oil, which included evaluating all raw materials used in the preparation, hair oil preparation, and hair oil specification analysis. The conclusion reached is that all of the products are of good quality, meaning they meet all criteria and are free of contamination. The lip balm formulation was proven to be stable in all stability criteria, including varying temperature conditions, ensuring that this lip balm can be used anywhere in the world. The raw components used to produce lip balm have all been certified for usage and have undergone testing to ensure that they are safe to use. The impurities were found to be within the acceptable limit. As a result, these raw materials can be used to manufacture products that are safe.

## **6.REFERENCES**

## References

- 1 Handbook of cosmetic science and technology, 1993, By W.A Poucher.
- 2 Preservatives for Cosmetics, 2nd Edition , Allured 2006.
- 3 Harry's Cosmeticology, J.B Wilkinson and R.J Moore.
- 4 N. Sanju, N. Arun and K. K. Roop, Cosmetic Technology, 1st Edition, Birla Publications Pvt. Ltd, Delhi (2006)
- 5 Ruetsch SB, Kamath YK, Rele AS, Mohile RB (2001) Secondary ion mass spectrometric investigation of penetration of coconut and mineral oils into human hair fibers: relevance to hair damage. J Cosmet Sci 52: 169-184.
- 6 Keis K, Persaud D, Kamath YK, Rele AS (2005) Investigation of penetration abilities of various oils into human hair fibers. J Cosmet Sci 56: 283-295.
- 7 Rele AS, Mohile RB (2003) Effect of mineral oil, sunflower oil, and coconut oil on prevention of hair damage. J Cosmet Sci 54: 175-192.
- 8 <https://pubchem.ncbi.nlm.nih.gov/compound/Propylparaben#section=Solubility>
- 9 [https://www.chemicalbook.com/ChemicalProductProperty\\_EN\\_CB0176673.htm](https://www.chemicalbook.com/ChemicalProductProperty_EN_CB0176673.htm)
- 10 <https://www.healthline.com/health/tocopheryl-acetate>
- 11 Indian Pharmacopoeia, Government of India, Ministry of Health and Family Welfare, Published by, The Controller of Publication, Edition, Vol. II (1996).
- 12 Pharmacopoeia of India ,2nd Edition, volume 3.



# plag chk/Shiril plag report.doc

---

## ORIGINALITY REPORT

---

# 12%

SIMILARITY INDEX

---

### PRIMARY SOURCES

---

1	<a href="http://idoc.pub">idoc.pub</a> Internet	83 words — 2%
2	<a href="http://www.chemicalbook.com">www.chemicalbook.com</a> Internet	78 words — 2%
3	<a href="http://www.mahanif.net">www.mahanif.net</a> Internet	58 words — 2%
4	<a href="http://www.niu.edu">www.niu.edu</a> Internet	58 words — 2%
5	<a href="http://www.papinet.org">www.papinet.org</a> Internet	40 words — 1%
6	<a href="http://www.answers.com">www.answers.com</a> Internet	32 words — 1%
7	<a href="http://www.ahealthylife.nl">www.ahealthylife.nl</a> Internet	26 words — 1%
8	<a href="http://link.springer.com">link.springer.com</a> Internet	19 words — 1%
9	<a href="http://sure.su.ac.th">sure.su.ac.th</a> Internet	16 words — < 1%
10	<a href="http://scipharm.at">scipharm.at</a> Internet	

15 words — < 1%

---

11 archive.org  
Internet

14 words — < 1%

---

EXCLUDE QUOTES ON

EXCLUDE SOURCES OFF

EXCLUDE BIBLIOGRAPHY ON

EXCLUDE MATCHES < 14 WORDS