PROJECT REPORT
(BSCC1351)
on

Formulation of Antiperspirant Deodorant and Stability Test

Submitted in Partial Fulfilment of the Requirement for the Degree of
B.Sc. (Hons) Chemistry

Submitted by

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CERTIFICATE

This is to certify that **Mr. Akash Gahlaut** has carried out his Project work entitled **"Formulation of Antiperspirant Deodorant and Stability Test"** under my supervision. This work is fit for submission for the completion of project for bachelor Degree in Chemistry.

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I hereby declare that the dissertation entitled **"Formulation of Antiperspirant Deodorant and Stability Test"** 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 of any other Universities for the award of diploma or degree.

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Akash Gahlaut

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List of Abbreviations

S.No.	Abbreviation	Full Form
1	FDA	Food & Drug Administration
2	OTC	Over the Counter
3	CFC	Chloroflorocarbon
4	HH	Hyperhidrosis
5	ACH	Aluminium Chloride Hexahydrate
6	BH	Bromhidrosis
7	BIS	Bureau of Indian Standard
8	FTIR	Fourier Transform Infrared

Abstract

Abstract

Cosmetics and personal care products are blends of chemicals derived from natural or synthetic sources that are intended to improve the human body's look or scent. Colored hair, curly hair, and hair straightening products; depilatories; hair sprays; shampoos and conditioners; lips; nail care products; perfumes, perfumes, toilet water, and other fragrance products; bath arrangements; lubricating oils and creams for body, face, and hands; dental products; deodorants and antiperspirants; and other products. The ingredients in this collection of items are substantially more diverse. Although cosmetics are generally deemed non-toxic under normal or intended usage conditions, depending on the degree of exposure, certain substances may play a role in a person's youth.Because the majority of these products are applied topically, skin exposure is a major factor. There is a possibility of breathing or being exposed to air in some items. In this post, we'll go over the stability of the antiperspirant deodorant product's components and important constituents under regular use settings.

There is also an overview of the testing methodologies, as well as control features and standards.

Nowadays, the evaluation of scents is a critical criterion in determining or confirming a product's good performance, particularly when the product is devoted to beauty. Fine fragrance, personal care, home care, and oral care are all part of the fragrance industry. To validate a change in the formula (perceptible or not), characterise the scent, or develop correlations between sensory and consumer data, odour quantification or characterisation may be required, depending on the research aims.

This review discusses the exposure to aluminum from antiperspirants.

Keywords:- **Cosmetics; Personal care products; Deodorants and antiperspirants;**

1.0 Introduction

1.0 Introduction

A deodorant is a product that is applied on body parts to prevent body odor but do not reduce wetness. Body odor is caused by the bacterial breakdown of perspiration in under arms, feet, and other body parts. An antiperspirant affects odor as well as prevent sweating by affecting sweat glands. Antiperspirants usually applied to the armpits, while deodorants can be on feet and other body parts in spray form.

The Food and Drug Administration (FDA) classifies and regulates most deodorant as cosmetics but classifies antiperspirants as over-the-counter (OTC) drugs.

Antiperspirant are classified as drugs because their mode of action affect a body function.

Antiperspirant have a coagulating effect on skin protein so they block the opening of sweat ducts on the skin surface. Aluminium crystals were used by ancient Egyptians as antiperspirants. The mixture of goat fat and charcoal were used as deodorant by ancient Romans.[1]

Aluminum and zinc salts, as well as aroma, are used in deodorants to hide the odour of perspiration. Most antiperspirants use aluminium compounds, such as aluminium trichlorohydrex gly, to clog sweat ducts and prevent sweat from reaching the skin's surface.[2] Many aluminium compounds are neurotoxic, cause skin irritation, and interfere with oestrogen, which increases the risk of breast cancer, according to some studies. Deodorants with crystals are a popular alternative to antiperspirants and deodorants. They usually have active components like potassium alum or aluminium alum, which are thought to be less allergic than other substances with similar functions.[3][4]

Many of the products in this category have a lot of aroma. The toxicity of the propellant and its impurities is a factor in the formulation and use of aerosol goods. Isobutane, a propellant used in aerosol sprays, for example, can be contaminated with the carcinogen butadiene. Aerosol sprays produce extremely small particles that can be inhaled more deeply, potentially amplifying their hazardous effects.[4][5][6]

1.1 History of Antiperspirant Deodorant

The first modern commercial deodorant, Mum, was developed in 1888 and patented by a U.S. inventor in Philadelphia, Pennsylvania, Edna Murphey.[7] This little company was bought by Bristol-Myers in 1931-1940s, Helen Barnett Diserens created an under arms applicator based on the ball-point pen mechanism.[8][9] The company began marketing the product under the name Ban Roll-On in 1952.[8][9][10] The product was briefly removed from the market in the U.S., perhaps once again available at retail points in the U.S. under the brand Ban. It is sold under the names Mum Solid and Mum Pump Spray in the United Kingdom.[7] Chattem acquired Ban deodorant brand in 1998 and later sold it to Kao Corporation in 2000.[11][12]

The first commercial antiperspirant was Everdry which comes in market in 1903. The advance formulation of the antiperspirant was patented by Jules Montenier on Jan 28, 1941.[13] This patent raised the problem of the high acidity of aluminum chloride and its high irritation of the skin, by mixing it with a soluble nitrile or a similar compound.[13] This formulation was first found in "Stopette" deodorant spray, which Time Magazine called "the best-selling deodorant of the early 1950s". "Stopette" earned its dominance as the first and long-time sponsored game show What's My Line?, and was later surpassed by many other brands as the 1941 patent expired.

From 1942 to 1957, the market sale for deodorants increased 600 times to become a $70 million market. Deodorants were originally marketed mainly to women, but by 1957 the market had explored to men, and estimates were that 50% of male user were using deodorants by that time. The Ban Roll-On product dominant the market in sales.[14]

The first aerosol antiperspirant in the marketplace was Gillette's Right Guard in the early 1960s, which brand was later sold to Henkel in 2006.[15] Aerosols were popular because they allow the user dispense a spray without coming in contact with the armpits.Half of all the antiperspirants sold in the U.S. were aerosols by the late 1960s, and continued to grow in all sales to 82% by the early 1970s. However, the late 1970s saw 2 developments which greatly lowers the popularity of deodorant & antiperspirant products. Initially, in 1977 the U.S. Food and Drug Administration banned the active ingredient used in aerosols, aluminium zirconium chemicals, because of safety concerns over long period inhalation. Second, the U.S. Environmental Protection Agency limited the use of chlorofluorocarbon (CFC) propellants used in aerosols due to effect that these gases can cause in depleting the ozone layer. As the popularity of aerosols slightly lowered, stick antiperspirants became more popular.

2.0 Literature Review

2.0 Literature Review

The process of sweating and the mode of action of antiperspirants and deodorants will be discussed in this chapter, with a focus on topically prescribed antiperspirant formulations and their mode of action. Hyperhidrosis (HH) occurs when the amount of sweat produced far exceeds the amount required for thermoregulation. Sweating, regardless of the amount, is considered a normal physiological phenomena that should be appreciated, despite the fact that it can cause a great deal of social shame and occupational impairment.[16] HH has been a neglected subject in the literature, which may explain why it is so underserved, if not completely ignored, by many physicians who continue to ignore its presence. HH is frequently detected by chance at the doctor's office during appointments for other ailments. In the United States, more than 90% of adult customers consistently use an antiperspirant or deodorant.[17]

Roll-ons, deodorant and antiperspirant sticks, gels, and other formulations are available. The majority of these are designed to be worn underarm. Despite the fact that antiperspirants and deodorants have become one of the most popular health and cosmetic aids in the United States, they are of little or no use to HH patients.[18]

The cosmetic industry is unlikely to be interested in the modest market size of the HH population, which is estimated to be 0.6 to 1% of the population.

The most common treatment for HH in the previous century was 20 percent aluminium chloride hexahydrate (ACH) in 100% ethanol. Although any pharmacist could construct the formulation, it took up to 3 weeks for ACH to dissolve in ethanol at room temperature , therefore same-day formulations that could only be obtained by adding water were neither suitable nor acceptable.[19][20]

Today's pharmacists should be able to dissolve drugs in ethanol in less than one hour.

Controlling HH would aid in the prevention of a variety of dermatological conditions. Bromhidrosis (BH), also known as osmidrosis, is a disorder in which a foul odor is produced by sweat. The axillae and foot are the most commonly affected areas. Plantar BH has an apocrine origin, whereas axillary BH has an eccrine origin.[22]

Apocrine sweat is sterile and odourless when it is first released.[23] Odor develops only when axillary microorganisms, such as corynebacteria, act on apocrine sweat components and release malodorous chemicals. Plantar BH, on the other hand, is induced by bacterial action on an overly hydrated stratum corneum caused by concurrent plantar HH.[24]

This overhydrated stratum corneum also becomes a popular breeding ground for fungi and viruses. Unlike plantar BH, axillary BH is rarely associated with HH because eccrine sweat wipes out any traces of apocrine sweat before bacteria can breakdown it. Body odour is caused by a variety of factors, including sweat, sebum, and genetic aminoacidurias[25]. Exogenous BH can be produced by some foods (fish, egg yolk, liver, kidney) or medications (amitriptyline, amoxapine, bupropion, carbidopa, desipramine, methaqualone, retinoids, zidovudine).

2.1 Chemical action of Antiperspirant Deodorant

Deodorants and antiperspirants both help fight body odour but they both do so in different ways. This review takes a look at what each of them do to prevent body odour, how they do it, and some of the different chemical compounds that they employ to keen you from smelling terrible.

Deodorants and antiperspirants are products that the majority of us make use of everyday. The two terms aren't interchangeable, however; there is a difference in the manner in which they act to reduce body odour.

Deodorant:- Deodorants help to eliminate body odour by focusing on the bacteria that create the foul-smelling substances under your arms. Some people use triclosan, an antibacterial chemical. Both deodorants and antiperspirant often use cyclomethicones, which are fast drying silicon compounds, as solvents.[26]

Antiperspirant:- Antiperspirants fight body odour by cutting down on sweating. The do this by including aluminium or zirconium-based compounds that form a polymeric plug that physically blocks perspiration from being able to escape sweat glands. This plug slowly breaks down over time, so reapplication can be required.[26]

Triclosan, in particular, has received a lot of attention in recent years. Although the FDA does not classify it as a human-hazardous substance, they do note that a number of studies have been published since their last evaluation of the ingredient that need additional investigation. Some animal research have revealed that triclosan may affect hormone regulation, although animal studies do not always imply that human results will be the same. Furthermore, there are worries that triclosan use may contribute to antibiotic resistance in bacteria.[26]

In both deodorants and antiperspirants, the solvent is frequently cyclomethicone-based; these are cyclic, silicon-containing compounds that are employed because they evaporate fast and easily. This permits them to transfer deodorant or antiperspirant substances onto the skin, but then evaporate, leaving the skin feeling 'tacky.' Alcohols were (and in some cases still are) widely employed as solvents before the development of cyclomethicones, but they were sluggish to dry and might irritate the skin.[26]

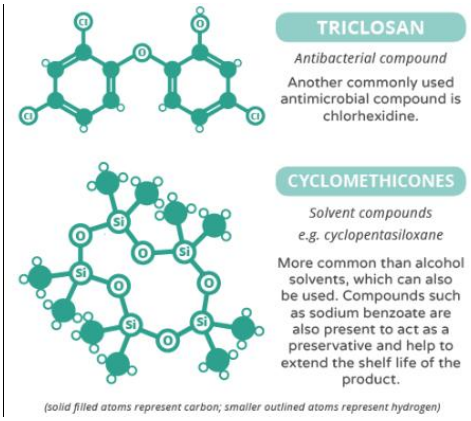

Fig: 1 Deodorant

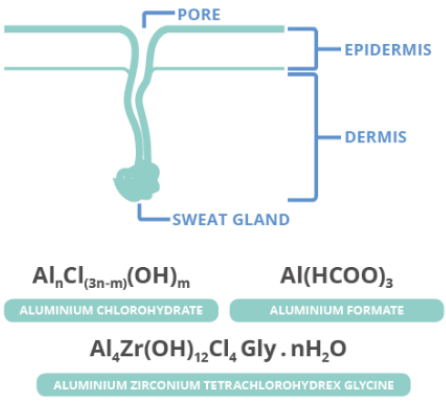

Fig: 2 Antiperspirant

Objective

Raw material's testing

- To study the properties of raw materials used in the preparation of antiperspirant deodorant.
- To ensure that the raw material is free from contamination.

Formulation and Evaluation

- To prepare an effective and non irritating antiperspirant deodorant together.
- The objective of this project is to know the physically stable deodorant preparations during storage and to obtain the preparations.
- Comparison and evaluation charts will be made.

3.0 Material and Methodologies

3.1 Raw Materials

3.1.1 Active

3.1.1.1 Aluminium Chlorohydrate 50%($Al_2ClH_7O_6$):- Aluminum Chlorohydrate is a simple form of a group aluminum-based salts that can be used to reduce underarm wetness in underarm antiperspirant products. Aluminum Chlorohydrate works by forming a temporary plug within the sweat duct that helps reduce the flow of sweat to the skin's surface. The success of antiperspirant deodorants is dependent on aluminium compounds. Aluminum ions are pulled into the epidermis by the epidermis. According to HowStuffWorks, this causes cells to fill with water and expand, clogging sweat ducts. Aluminum chlorohydrate, aluminium zirconium tricholorohydrex glycine, aluminium chlorohydrate, and aluminium hydroxybromid are all common active components in antiperspirants.[27] Some people have been critical of the use of aluminum in antiperspirants because it may be absorbed into people's systems and lead to negative health effects, such as Alzheimer's disease. But, as the American Chemical Society explained, this correlation between antiperspirants and Alzheimer's is not true. "In the 1970s, researchers started to state that aluminum in antiperspirants could cause Alzheimer's disease," the ACS explained. "Subsequent studies have convinced the American Alzheimer's Association, a patient advocacy group, and the [U.S.] Food & Drug Administration, which regulates antiperspirants, that the connection between aluminum in antiperspirants and neurodegeneration is a myth."

Lab Test Performed on it:- Following lab test are performed on Aluminium Chlorohydrate

- Specific Gravity:- 1.341 at 25°C
- pH:- 4.1 (30g in 100g diln.)

3.1.2 EMOLLIENT

3.1.2.1 PPG-15 Stearyl Ether:- PPG-15 Stearyl Ether works as a lubricant on the skin's surface, making it appear soft and smooth. PPG Stearyl Ethers are primarily used in the formulation of moisturisers and cleansing products; as a solvent for organic UV filters and a good carrier for essential oils and oil soluble active ingredients in cosmetics and personal care products; and to prevent salt crystallisation in antiperspirant formulations. Rabbits' eyes were almost unaffected by PPG-15 Stearyl Ether, however rabbit skin was somewhat irritated.[28]

Lab Test Performed on it:- Following lab test are performed on PPG-15 Stearyl Ether

- IR Scan:- As per 97.5% similar to the standard scan according to BIS.
- Acid Value(mg KOH/g):- Maximum 1 according to BIS.

3.1.2.2 COSMACOL ELI (C12-13 ALKYL LACTATE):- C12–13 Alkyl Lactate is an ester of lactic acid with monobranched pure fatty alcohols. It acts as an emollient. Used in deodorants, moisturizing shower gel, skin care products, lipsticks, bath and body oils and after shave products. COSMACOL ELI is a multi-purpose polar emollient that can be used in personal care and skin care formulations. Because this ester demonstrates some of the unique properties of lactic acid derivatives, such as moisturising and mild keratolytic activity, it is appropriate for skin care products aimed at a variety of skin types, from dry to greasy. COSMACOL ELI has a thickening impact on the SLES-Betaine system and anti-irritant qualities, making it suitable for a variety of personal care products, including lines for sensitive and atopic skin.[29]

Lab Test Performed on it:- Following lab test are performed on C12–13 Alkyl Lactate

- IR Scan:- As per 97.5% similar to the standard scan according to BIS.
- Acid Value(mg KOH/g):- Maximum 3 according to BIS.

3.1.2.3 Cyclopentasiloxane:- Cyclopentasiloxane is a silicone compound with the formula $[(CH_3)_2SiO]_5$. It is a colorless, odorless liquid that has a low viscosity. It gives a silky and smooth feel when used on skin and hair. It is commonly used in antiperspirants, sun's creams, hair and skin care products. Cyclopentasiloxane-containing products can be used on your hair and skin with no risk to your health. It aids in the drying and spreading of skin and hair products. It has the ability to make hair silky without weighing it down.[30]

Lab Test Performed on it:- Following lab test are performed on Cyclopentasiloxane

- IR Scan:- As per 97.5% similar to the standard scan according to BIS.
- Specific Gravity:- 0.956 at 25°C

3.1.3 HUMECTANT

3.1.3.1 Glycerin:- Glycerin is the polyhydric alcohol whose molecular formula is $C_3H_8O_3$. Glycerin (we also known as glycerol) is a simple triol, meaning it has three hydroxyl groups. Glycerin is a syrupy, transparent liquid. Water and simple aliphatic alcohols have similar solvent characteristics as glycerin. Water, methanol, ethanol, and propanol, butanol, and pentanol isomers are all totally miscible with it. When fats and oils are hydrolyzed, natural glycerin is produced as a byproduct. Glycerin can be synthesized using a variety of techniques. Glycerin is synthesized using allyl chloride, acrolein, propylene oxide, sugars, certain polyalcohols, lipids, or epichlorohydrin as starting ingredients.[28]

Lab Test Performed on it:- Following lab test are performed on Glycerin

- IR Scan:- As per 97.5% similar to the standard scan according to BIS.
- Refractive Index:- 1.471 @20°C.

3.1.3.2 Panthenol:- Panthenol, often known as vitamin B-5, is a chemical compound generated from pantothenic acid. It is found in nature and can be made from both plant and animal sources. It aids in the formation of a barrier between your skin and irritation and water loss.[28]

Lab Test Performed on it:- Following lab test are performed on Panthenol

- Refractive Index:- 1.497 @20°C.
- Water Content:- Maximum 1.0 (BIS).

3.1.4 EMULSIFIER

3.1.4.1 Steareth-21:- Steareth 21 is a stearic acid-based polyethylene glycol ether. It's utilised as an emulsifier in makeup, lotions, personal hygiene products, and deodorants, as well as sun, scent, skin, eye, and hair care products. The Steareths are "made by reacting ethylene oxide with stearyl alcohol, with the numerical value in the name corresponding to the average number of ethylene oxide units." Steareth 21 is made up of an average of 21 units of ethylene oxide reacting with stearyl alcohol, and it's a lot more liquid than higher steareth values, which turn into waxy solids.[28]

Lab Test Performed on it:- Following lab test are performed on Steareth

- IR Scan:- As per 97.5% similar to the standard scan according to BIS.
- Acid Value(mg KOH/g):- Maximum 2.0 according to BIS.
- pH 5% aq. Solution:- 6.3 @20°C.

3.1.5 FRAGRANCE

3.1.5.1 PEG-20 Glyceryl Triisostearate:- PEG-20 Glyceryl Triisostearate is a triester of Isostearic Acid (q.v.) and a polyethylene glycolether of glycerin.[28]

Lab Test Performed on it:- Following lab test are performed on PEG-20 Glyceryl Triisostearate

- pH:- 3.6 @25°C.
- Concentration %:- 32 (as Fragrance Content)

3.1.5.2 Multicomponent Mixture Of Synthetic Or Natural Fragrance Ingredients:- It is an aroma compound, also known as an odorant, aroma, fragrance or flavoring, is a chemical compound that has a smell or odor.[28]

Lab Test Performed on it:-

- Refractive Index:- 1.4460 @25°C.
- Specific Gravity:- 0.9890 at 25°C.
-

3.2 Raw Material's Testing

3.2.1 FTIR spectroscopy:- Fourier Transform Infrared (FTIR) spectroscopy is used to check the composition of the raw materials. By this we can check that the raw material is up to the standard specification. Testing of PPG-15 Stearyl Ether, C12–13 Alkyl Lactate, Cyclopentasiloxane, Glycerin and Steareth-21 is done using FTIR.

4.2.1.1 Principal of FTIR

FTIR spectrophotometers depend on the principle that a lot of gases absorb IR radiation at species-specific frequencies. The FTIR uses interferometry to record information about a material placed within the IR beam. The Fourier Transform leads to spectra that analysts can use to identify the material. An FTIR spectrum rises from interferograms being 'decoded' into recognizable spectra.[28]

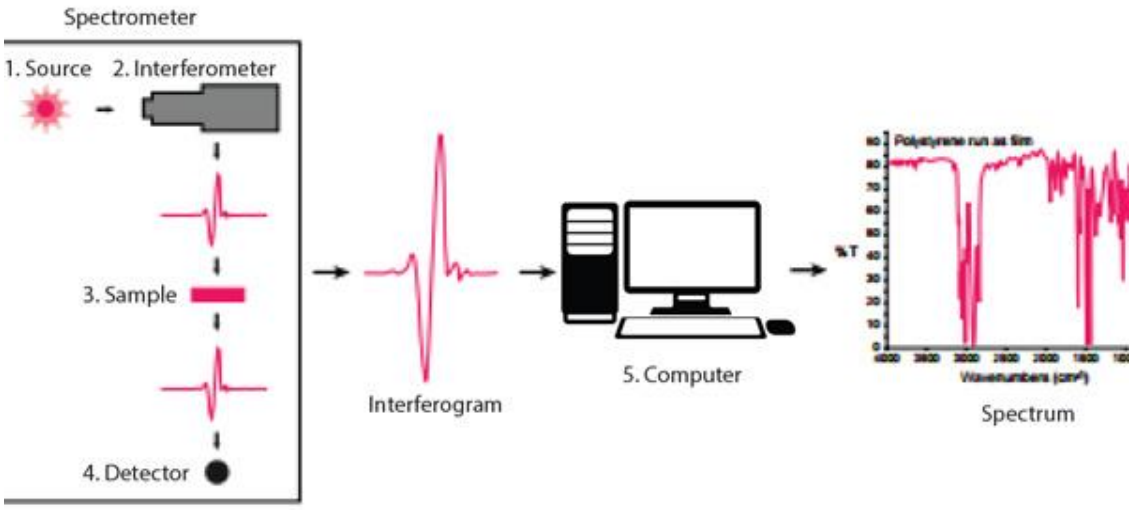

Fig: 3 Block Diagram of FTIR spectrophotometer

3.2.1.2 Procedure of FTIR

Take a small amount of KBr and crush it into fine particles with the help of mortar and pestle. Then take the RM and completely crush and mix it with the KBr with mortar and pestle. When mixing is completed, make pellet of that mixture with the help of Hydraulic Press and then place the pellet inside the FTIR spectrophotometer & scan the sample.[28]

Fig: 4 Hydraulic Press

Fig: 5 FTIR Spectrophotometer

4.2.1.3 Raw Material's Graphs

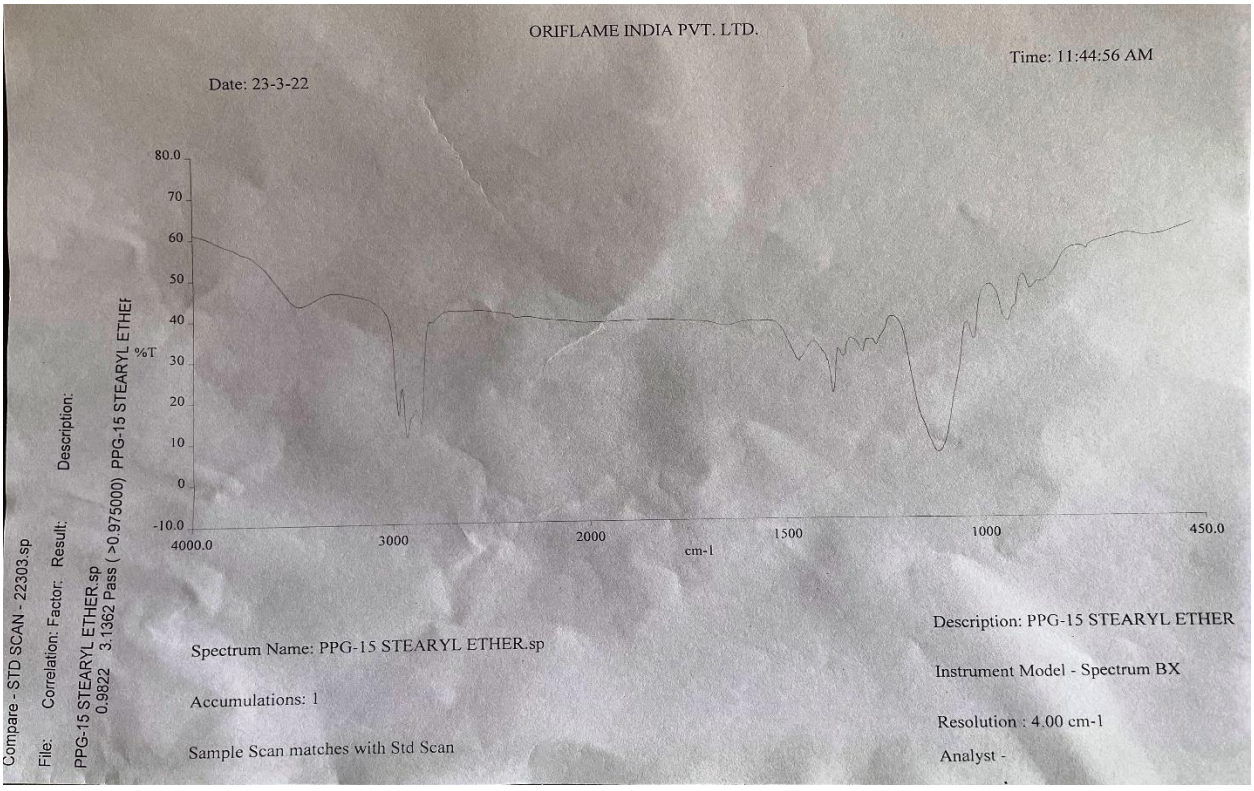

Fig: 6 Spectrum of PPG-15 Stearyl Ether

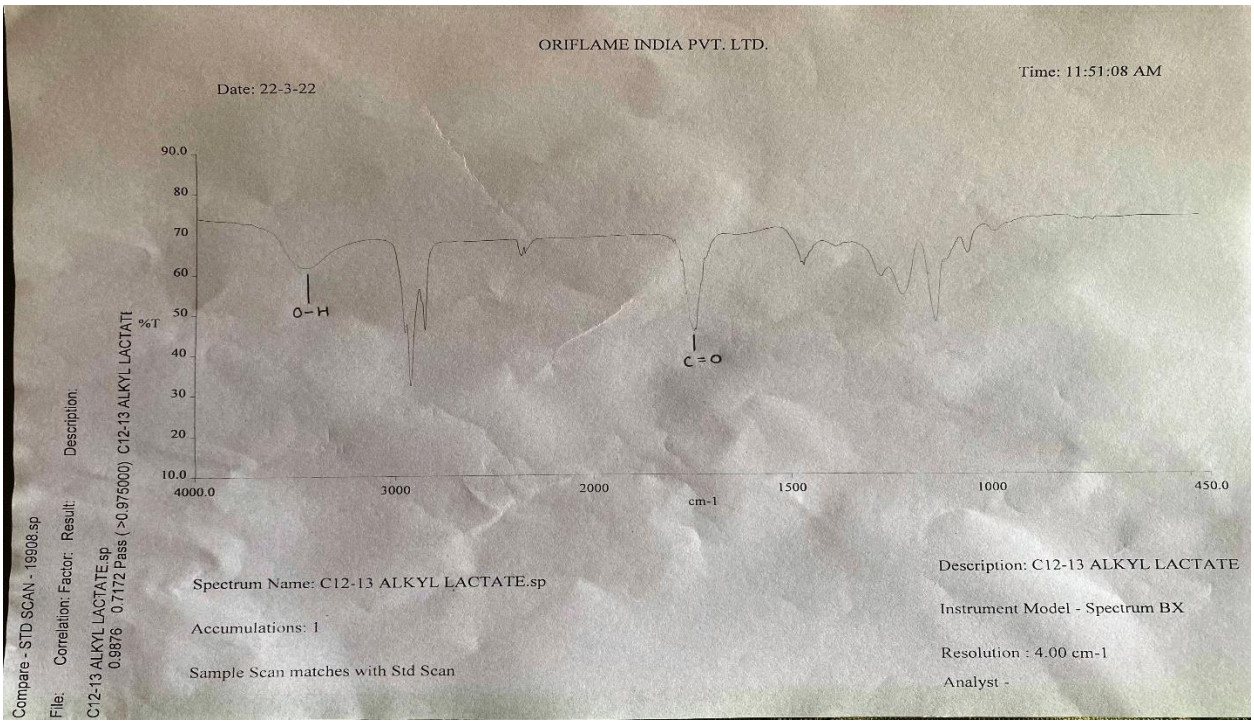

Fig: 7 Spectrum of C12–13 Alkyl Lactate

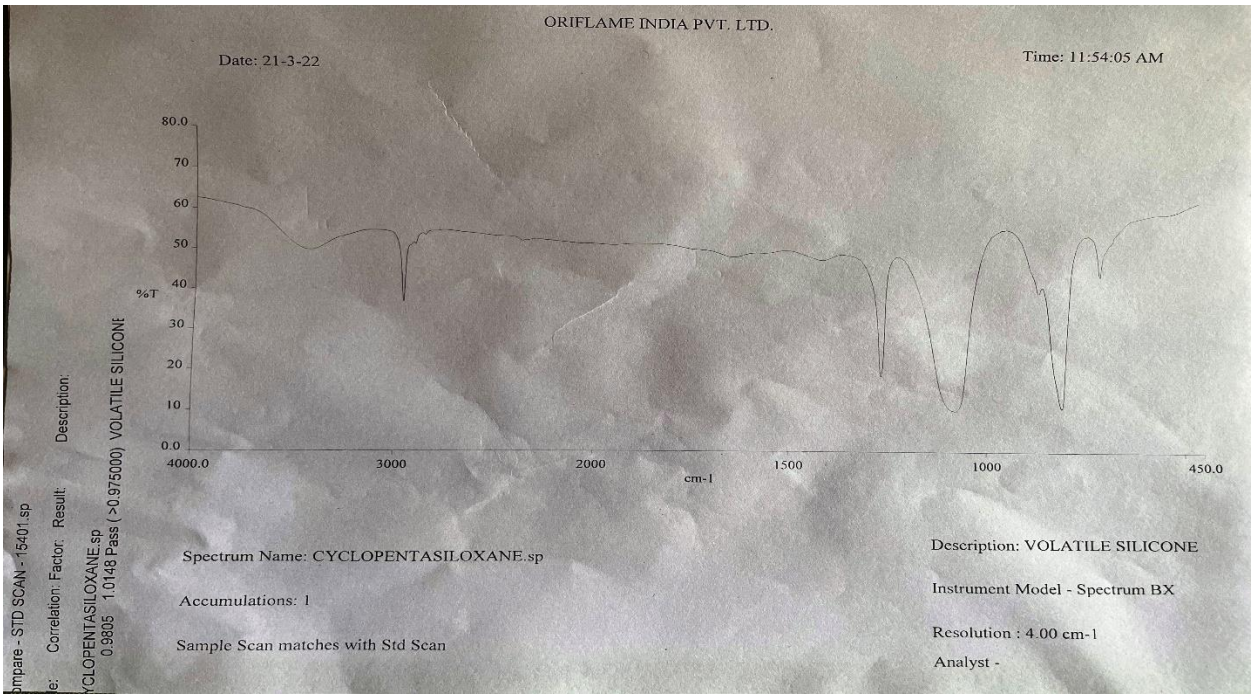

Fig: 8 Spectrum of Cyclopentasiloxane

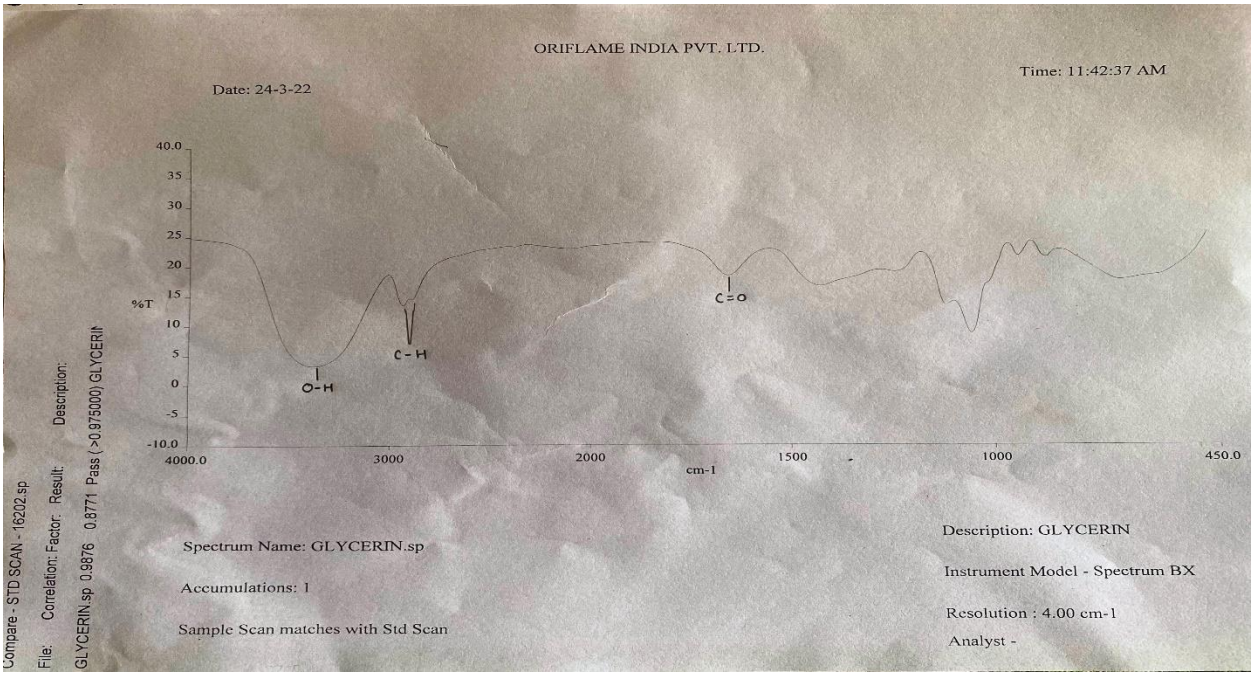

Fig: 9 Spectrum of Glycerin

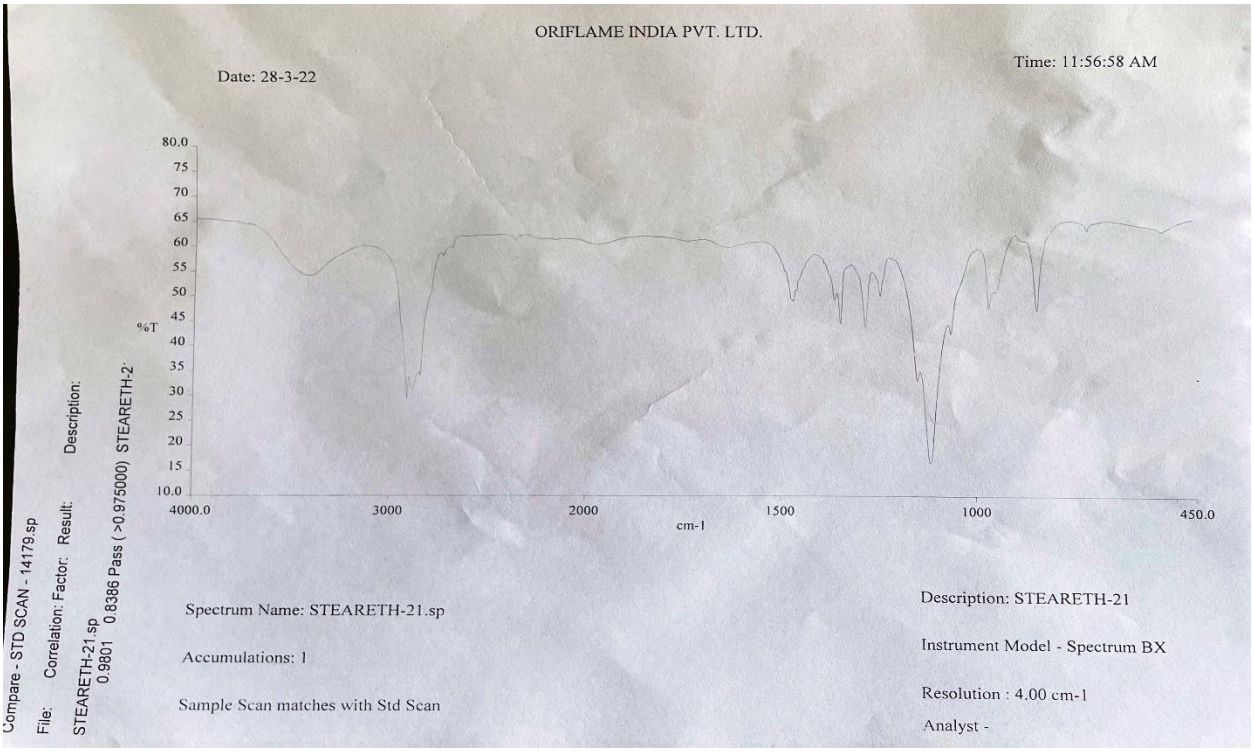

Fig: 10 Spectrum of Steareth-21

3.2.2 Acid Value Determination

3.2.2.1 Acid Value

The acid value is the number of milligrams of Potassium hydroxide used in neutralization of the free fatty acids present in 1gm of fat. It's a relative measure of ranciditybecause free fatty acids are generally formed during decomposition of triglycerides.[28] The value is also defined as % of free fatty acids calculated as oleic acid, lauric, ricinoleic and palmitic acids.

3.2.2.2 Procedure

Unless otherwise specified in the individual monograph, dissolve about 10 g of the substance under examination, accurately weighed, in 50 ml of a mixture of equal volumes of ethanol (95 per cent) and ether, previously neutralised with 0.1 M potassium hydroride to phenolphthalein solution. If the sample does not dissolve in the cold solvent, connect the flask with a reflux condenser and warm slowly, with frequent shaking, until the sample dissolves. Add 1 ml of phenolphthalein solution and titrate with O.1 M potassium hydroxide until the solution remains faintly pink after shaking for 30 seconds. Calculate the acid value from the expression[28]

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

where n= the no. of ml of 0.1M KOH required
w= the weight in gm of substance

3.2.2.3 RMs with Acid Value Determination test

- PPG-15 Stearyl Ether.
- C12-13 ALKYL LACTATE.
- Cyclopentasiloxane.
- Steareth-21

3.2.3 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.[28]
It is an important characteristic for identification because it represents the substance's purity.

3.2.3.1 Apparatus and Chemical

Refractometer ,Beaker, Spatula, Tissue paper, Ethanol, Process water.

3.2.3.2 Procedure

Check that the refractometer is calibrated. 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.[28]

Fig: 11 Refractometer

3.3 Methodology

3.3.1 Preparation Method of Antiperspirant Deodorant

Actual weight, temperature and raw material description is confidential information. So we will explain the procedure as considered phase and temperature range.

- Weight accurately all the raw materials on the weigh balance.
- Take deionized water in a 3000ml beaker and add phase A raw materials under homogenizer until mixture become homogenous.
- For phase A temperature should be 70-75°C and continue stirring should be done.
- Premix all the phase B (wax form) raw material in 100ml beaker with fast stirring and 70-75°C temperature.
- Ensure that all phase B raw materials are melted and formed a homogenous mixture.
- Mix all phase C raw material in a 100ml beaker at 30-35°C temperature with medium stirring.
- Add phase C raw material's homogeneous mixture into main beaker containing phase A.
- Now add phase D raw material which is active ingredient Aluminium Chlorohydrate at 30-35°C.
- After 2 minute medium stirring add phase B mixture into main beaker.
- After 5 minute of fast stirring when mixture become homogeneous add phase E raw materials which are fragrance substance and very important ingredient.
- Stir the mixture at 12RPM until the mixture become homogeneous.

3.3.2 Evaluation methods for prepared lab bulk batch

Quality assurance is the most important factor to be checked after preparation of desired product. To ensure the superiority of the prepared antiperspirant deodorant following assessment parameter were used;

1. Appearance: The physical appearance such as color, odor and nature of prepared batch were evaluated.
2. Viscosity: Viscosity of prepared antiperspirant deodorant was evaluated by Brookfield Viscometer.
3. pH: pH of prepared antiperspirant deodorant is measured by digital pH meter.
4. Homogeneity: Homogeneity was visually examined.
5. Irritability: Irritation is the most important factor to be evaluated for a antiperspirant deodorant. It is temporarily checked by the applying on body.
6. Specific gravity: Picnometer was filled with bulk and weighed by tarring it first then the weight obtained is divided by water factor.

3.3.3 Stability Test

Fragrance stability and chemical stability is the most important factor for a antiperspirant deodorant because deodorant should evaporate and make dry after applying on body but fragrance should be last longer.

Fragrance stability checked at different temperature and at different time interval.

Stability test for stored bulk at 20°C

Test	Specification	As Bulk Storage			
		Initial	24hr	15days	30days
Color	White	Complies	Complies	Complies	Complies
Fragrance	As Standard	Complies	Complies	Complies	Complies
Appearance	Fluid	Complies	Complies	Complies	Complies
Viscosity	1000-5000(cps)	1258	1328	1820	2036
pH	4.0-5.0	4.09	4.08	4.07	4.03
Specific Gravity	1.07-1.11	1.079	1.078	1.078	1.077

Table 1: Bulk storage specification

Fragrance Stability and Irritation test after applying on body at room temperature

Test	Specification	After Body Application			
		Initial	2hr	6hr	10hr
Color	White	Complies	Disappear	Disappear	Disappear
Fragrance	As Standard	Complies	Complies	Complies	Complies
Irritation	No	No	No	No	No

Table 2: Fragrance Stability after application

4.0 Result and Discussion

FDA and BIS set the standard specification values for the cosmetic products because cosmetics are applied on skin to enhance it's aroma. Skin is very important and sensitive part of our body any small deviation in standard specification can lead to big negative impact on our skin so it is the cosmetic industry's obligation to maintain product quality, which they ensure by conducting many tests at each stage of the manufacturing process. Here we talk about results of test which we have conduct on prepared bulk and make sure they complies with standard values or not.

Test	**Specification**	**Result**
Color	White	Complies
Odor	As Standard	Complies
Appearance	Fluid	Complies
pH	4.0-5.0	4.09
Viscosity	1000-5000	1258
Specific gravity	1.07-1.11	1.079

Table: 3 Results

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

5.0 Conclusion

Cosmetics and personal care items are defined and regulated differently around the world, as previously stated. The authors will give instances of some of the significant differences; the reader is directed to the Additional Reading and Web Site References for a more comprehensive examination. Cosmetics are "any substance or preparation intended to be placed in contact with various external parts of the human body such as (epidermis, hair system, nails, lips, and external genitals) and with the teeth or mucous membranes of the oral cavity with the sole or primary purpose of cleaning, perfuming, changing their appearance, and/or protecting or maintaining them in good condition," according to the EU definition. Cosmetics are defined as "articles to be rubbed, poured, sprinkled, or otherwise applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance, as well as articles intended for use as a component of any such articles" in the United States.

Individually for me working for a worldwide cosmetics brand was an incredible opportunity . Oriflame adheres to all FDA and BIS laws and recommendations. I acquired the industry's working style during my training, and I can tell you that the Quality Control and Assurance department is the backbone of any cosmetic manufacturing company. The quality team is in charge of the processing and movement of raw materials from start to finish. Safety and cleanliness are the two most critical aspects of the industry.

This project report is completely focused on the formulation and stability of antiperspirant deodorant, and the conclusion reached is that all of the products are of high quality, meaning they meet all standards and are free of contamination. The antiperspirant deodorant formulation was found to be stable even under three stability conditions, ensuring that this antiperspirant deodorant can be used anywhere in the world, regardless of temperature. The chemicals used to prepare antiperspirant deodorant have all been approved for usage and have passed 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 create safe goods.

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