

Juveria project report

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Chemical Analysis of Body Wash and its formulation

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ABSTRACT

The formulation of body wash is examined in this project. All of the raw materials used are detailed, along with their functions and the testing performed on them to ensure their quality. Only a few tests on raw materials are performed in laboratories, and the rest is done by suppliers, who furnish results. Raw material IR scans are obtained in the laboratory using FTIR. Like IUPAC names, raw materials used in cosmetics have an INCI name that is unique for each individual worldwide. Bulk testing is also carried out in the laboratory to determine the pH, viscosity, and specific gravity of the bulk sample. The body washes produced by oriflame are of high quality. The formulation of body wash was found to be stable at all the three stability condition making sure that this body wash can stay good at all over the world i.e. varying temperature conditions. Chemicals used in making of body wash are all approved for use, they have undergone tests which makes them safe to use. Impurities were found to be within the minimum range required. Hence these raw materials can be used to make safe product. Body washes have grown popular among teenagers since they do not leave behind any soapy residue that is difficult to remove. Body washes are gentler on the skin than soaps, therefore the risks of developing dry skin are greatly reduced. Even though these liquid cleansers are mild on the skin, they may not be as effective at removing dirt, oil, and odour from your body.

1. INTRODUCTION

The word cosmetics comes from the Greek word “kosmeticos” which means “to decorate and prepare”. It is defined as an external preparation of the body, such as colouring, softening, cleansing, nourishing, preservation, removal, and protection of skin “Resolving or dividing a thing into its pieces or components” is how analysis is defined. Cosmetics are substance used to improve the appearance of

the human body. There is significant evidence that beauty is an effective sell, regardless of cultural shifts in its definition. The Federal Food , Drug and Cosmetic Act (FD&C Act) defines beautifiers as “a substance that is meant to be used for a specific purpose” articles proposed to be scoured, poured, sprinkled or splashed on the human body for cleansing, improving, increasing attractiveness or modifying look” [FD&C Act, sec 201(i)]. Since Cleopatra’s wonderful milk shower over 2,000 years ago, the primary purpose of beauty has been to revive and protect a youthful appearance.[Julius Caesar by William Shakespeare 1599].

1.1. History of Body Wash

The body wash is a liquid cleansing product for use on the body. The Oriflame company manufacturers a variety of body washes that varies in smell, raw materials, and moisture content. The body wash is a personal care item that has grown in popularity during the previous years. Despite the fact that people have been washing for centuries with both synthetic and natural ingredients, body washes most closely follow their set of experiences to the late 1800s. William Sheppard certified first fluid cleanser in 1865. Regardless of the invention, it wasn’t until B.J Johnson selling Palmolive fluid cleanser in 1898 that it becomes well known. It became so well known that he had to rebrand his company, B.J Johnson cleanser organization, to Palmolive.[Madhura Bhalerao, 2019]

1.2. Chemistry of Body Wash

The basic science of body wash is generally the same. Most skin cleansing products are divided into two sections: a lipophilic part that dissolves the fat and a hydrophilic part that dissolves water [Christopher Boyd, August 2014]. The earth is lipophilic in nature indicates that it will not dissolve in water. Basically rinsing yourself with water after getting dirt on your body will not clean you. Something oily will break down the dirt and lift it away from your skin. The mixture of lipophilic and hydrophilic fixings is known as surfactants. A surfactant removes dirt. Because the lipophilic component disintegrates the soil on your skin while the hydrophilic part washes it away from your

skin. Body washes ordinary contain mineral oil or petrol-based subordinates as their lipophilic part and water as the hydrophilic part.

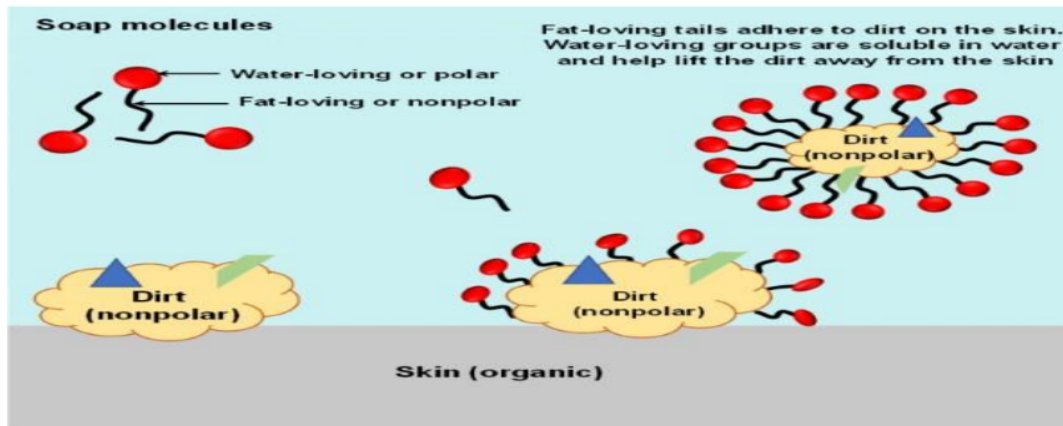


Fig: 1 Chemical action of body wash

1.3. Body wash and skin types

The type of body wash you use will be determined by your skin type, just as it is with a skin chemical, ordinary, slick, dry and touchy are four basic skin types. The best way to figure out what skin type you have and which body wash is best for you is to experiment. If at all possible try out free samples of body wash or purchase the smaller sizes until you find the one that best suits your skin type. If you have a dry skin, a solid cleanser may be too harsh for your skin, as it removes a lot of the oils that your skin needs. All the things considered, use a soft cleansing product that contains the terms “cream” or “oil” in the labels. Search for body washes that contain glycolic or lactic corrosive ingredients, as these are saturating.

2. REVIEW OF LITERATURE

2.1. Benefits of an emollient body wash for patients with a chronic winter dry skin

In this research 5-week study compared to the clinical effects of a high-emollient body wash to a regular bar cleanser for treating people who have winter dry skin. When compared to initial level, people who washed daily with a high-emollient body wash had a major decrease in all dermatologist-assessed dry skin properties as well as improvements in self-evaluated skin condition after 4 weeks. When compared to the beginning, those who used a normal bar cleanser saw a minor to major

improvement in dermatologist and self assessed dry skin features. This study revealed that showering with a high- moisturised body wash instead of a conventional bar cleanser decrease xerosis symptoms and enhance skin health and appearance without the need for a moisturizer. [Laura Hoffman, Kumar Subramanyam, 6 oct 2008]

2.2. **Application of coconut oil from Ben Tre Provinve (Vietnam) as the main detergent for body wash products**

In this study, many people in tropical areas use coconut oil as an active element as a moisturizer. Coconut oil can also help to reduce the effects of skin conditions by hydrating and relaxing the skin. An ideal content research is used to create a body wash solution that contains coconut oil and is based on the saponification process. To examine various concentrations, a mixture of supplementary ingredients such as detergents, foaming agent, moisturizing agent and preservative was used. Products are stored to check appearance, viscosity, pH value, and stability. Products containing 20% crude soap, 5% detergent, 3% glycerine and other ingredients to have good physical properties in terms of pH and viscosity as well as no irritation when applied to the skin. Research shows that coconut oil body wash formulas can be used in to new body wash products. [TTK Nagan, TT Hein,2020]

2.3. **Role of macromolecules in the safety of use of body wash cosmetic**

Surfactant's ability to cause skin irritation is one of the most difficult issues associated with their use in body wash cosmetics. Surfactants can interact with living skin cells bind with protein, remove lipids from the skin surface, contribute to the breakdown of liquid crystal formations in intercellular lipids and bind with protein. These activities can irritate the skin and lead to the inflammation, as well as compromise the epidermal barrier properties. The purpose of this research is to see how polymers and dissolved proteins in body wash cosmic composition affect product attributes. Polyvinyl pyrrolidone (PVP), Hydrolyzed wheat protein (HWP) and Polyvinyl pyrrolidone/ hydrolyzed wheat protein cross polymer (PVP/HWP) molecules studied. The incorporation of the chemicals under research enhanced the foaming capabilities of body wash cosmetics, increased their stability during storage and greatly improved product safety by lowering the irritating

potential. The composition enhanced with the PVP/HWP cross polymer was shown to have the best ability to lessen skin irritation potential. [Tomasz Bujak, Zofia Niziol- Lukaszewska, November 2015]

3. OBJECTIVE

3.1. Raw material testing

- To study the properties of the raw materials used in the preparation of cosmetic products.
- To examine the products whether they are free of adulteration and moisture or not.
- To check the viability of the products.

3.2. Bulk testing

- To determine the viscosity of the bulk sample.
- To determine the specific gravity of the bulk sample.
- To determine the pH value of the bulk sample.

4. MATERIALS AND METHODS

4.1. Formulation of Body wash

Table 1: Table showing formulation of body wash

ORDER	INCI NAME	FUNCTIONS
1.	Glycerin	Humectant
2.	D&C Green solution	Color liquid
3.	FD&C Yellow solution	Color liquid
4.	Sodium Laureth sulfate / Cocamidopropyl betaine	Surfactant
5.	Citric Acid	pH Adjuster
6.	Sodium benzoate	Preservative
7.	Citrus Aurantium Amara flower water	Extract
8.	Green Mandarin and orange blossom	Flavor

4.2. Procedure

The quantity of raw materials used in each phase is confidential information.

- Weigh accurately all the raw materials on weigh balance.
- Add water in vessel and raise temperature to 45°C.
- Then add sodium benzoate in it.
- Then add all the color liquids with perfect measurement and then start milling.
- Then add glycerin in it.
- Then heat all the ingredients to 45°-50°C.
- Then add sodium laureth sulfate into vessel for 45°-50°C.
- After 10 minutes milling at 45°-50°C add citric acid for another 10 minutes milling at 45°-50°C.
- Then let the content of vessel cool down below 40°C. Make sure batch is substantially free of air.
- Then add citrus aurantium amara flower water at 30°-35°C.
- Then add green mandarin and orange blossom in it.
- Then bulk is ready.

4.3. Chemical analysis of cosmetics



The identification of elements contained in a sample is the focus of qualitative chemical analysis, a branch of chemistry. The technique employed in qualitative analysis varies according to the sample. Chemical analysis includes viscosity, pH value, specific gravity, acidic test, iodine test, saponification value and peroxide value. This helps to ensure the quality of products. Unfortunately, dangerous substances are regularly found in cosmetics, however spectrophotometer can help in the detection of impurities in products.

4.4 Tests Performed

4.4.1. Raw material testing

A variety of basic materials are used in the production of corrective products and the crude materials used must be of acceptable quality to maintain the items quality. Various physical-synthetic and microbiological tests are carried out to determine the composition of crude materials.

4.4.2. Moisture Content

The FTIR method is used to determine the moisture content of raw materials such as normal chemicals, scents, wax, some synthetic mixtures and so on.

Fourier transform Infrared Spectroscopy (FTIR) is a method used to recognize natural (and at times inorganic) material. This method calculates the frequency of infrared radiation assimilation by the example material. The atomic pieces and structure are identified by the infrared absorption groups.

4.4.3. Principal of FTIR

By producing an infrared absorption range, FTIR detects chemical bonds in a particle. The spectra generate an example profile, a sub-atomic unique figure impression that may be used to filter and output tests for various segments. FTIR is an effective logical tool for identifying useful gatherings and defining covalent holding data.

4.4.4. Procedure

The little amount of the glycerine, citric acid and sodium benzoate sample is taken at a time and then crushed into very fine particles with the help of mortar and pestle, the crushed powder is then mixed with KBr and is transformed into a circular pallet and then this pallet is transferred to the FTIR machine and then the computer program runs.



Fig:2(a) Hydraulic/ Pellet press



Fig:2(b) FTIR Machine

4.4.5. Raw materials graph

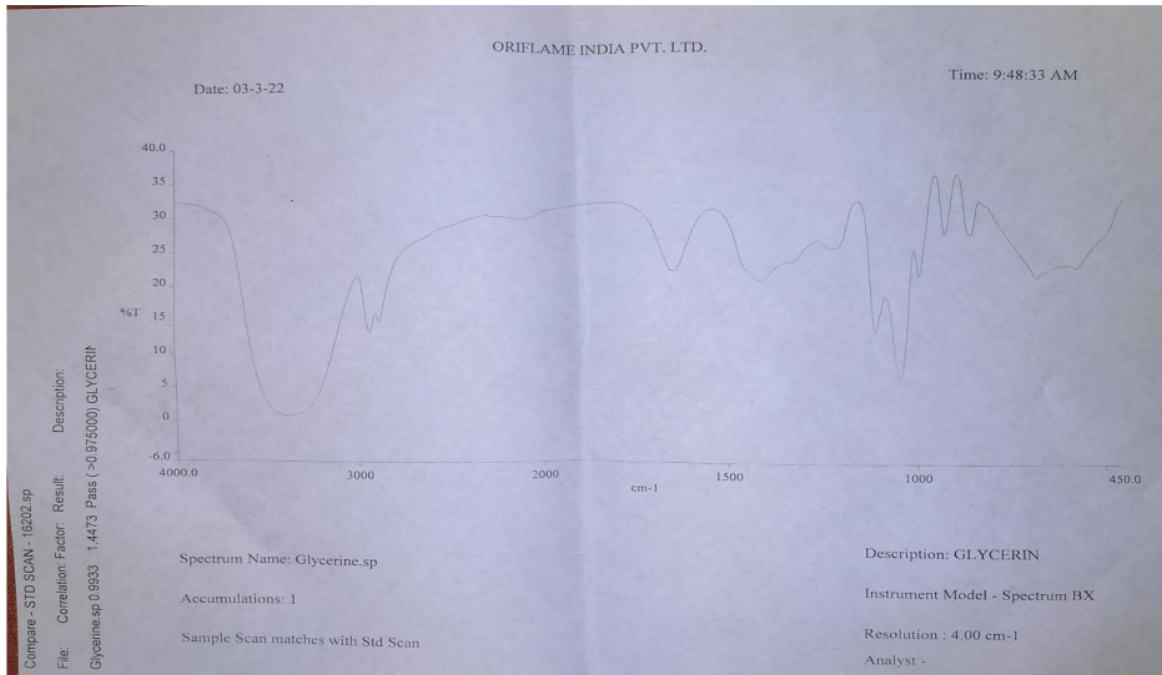


Fig: 3(a) Graph of Glycerine

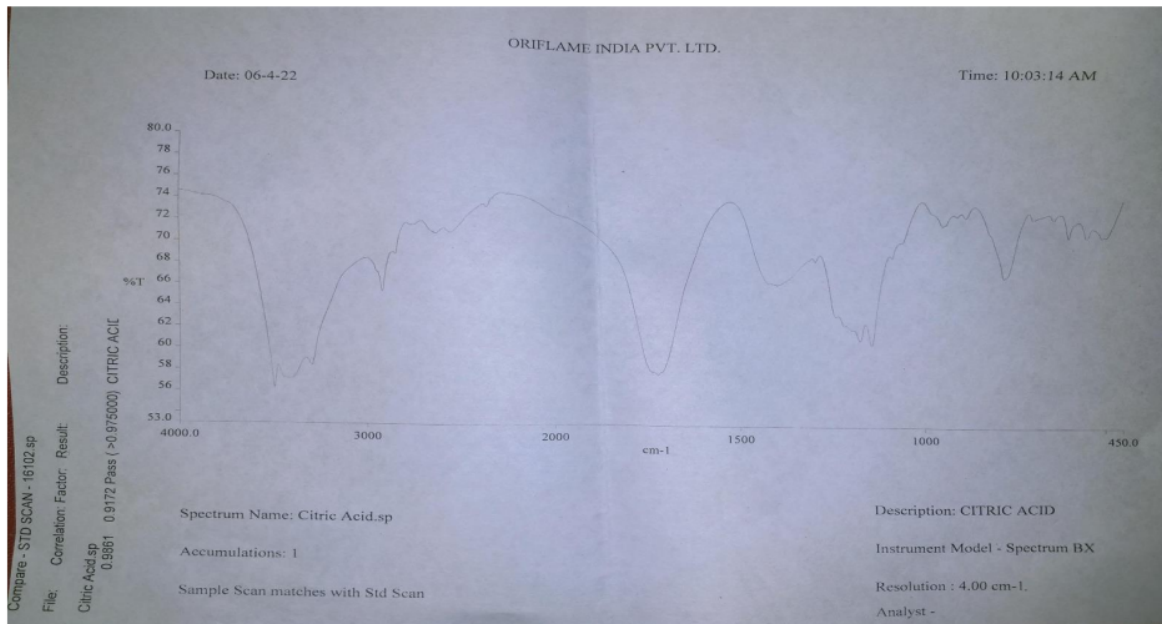


Fig: 3(b) Graph of Citric Acid

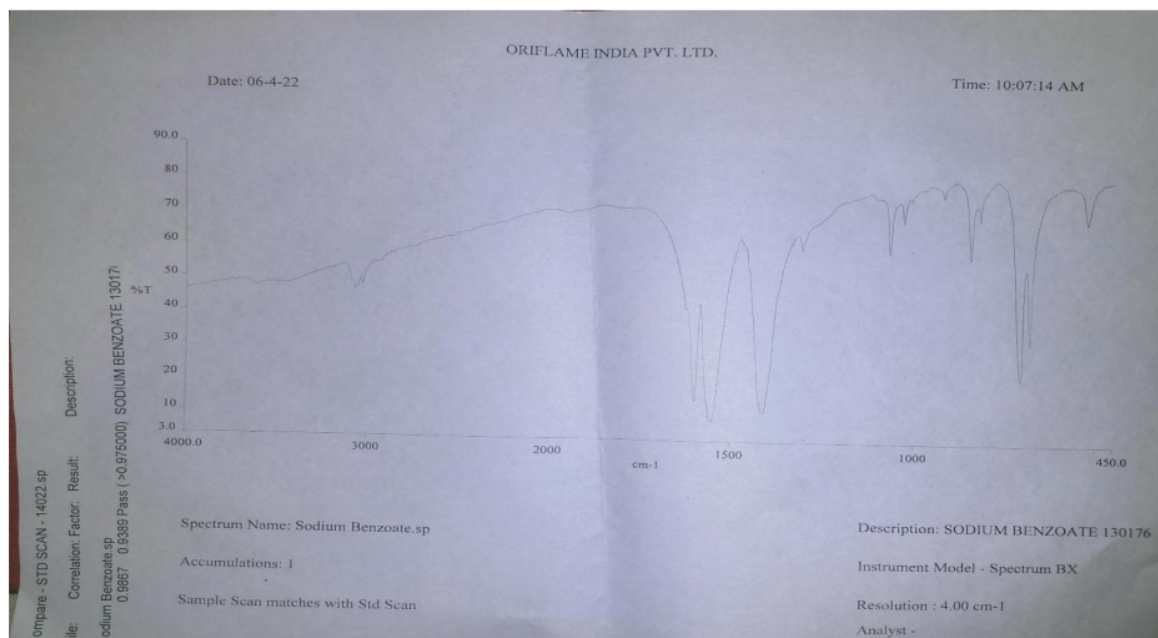


Fig: 3(c) Graph of Sodium Benzoate

4.5. Tests For Bulk

4.5.1. Determination of viscosity of sample

Apparatus used:

- LV Brookfield digital viscometer.
- S shaped spindle (from S1 to S5) depending on the thickness of the product (for liquid products, shampoo, toner).
- T- bar spindle (from TA to TF) for emulsion products, Creams and lotions.

Principle of Viscometer:

Viscometer works on the principle of 'rotational viscometry' which means they test viscosity by sinking a specially specified spindle in a sample of the bulk product and measuring the torque necessary to rotate the spindle at a fixed speed while immersed. Because the torque required is equal to the quantity of viscous forces on the spindle, the viscosity of bulk material is measured in centipoise units (cp).

Procedure:

The viscometer is turned on, the program is set up according to the standard parameters, and the spindle is fixed with the viscometer. Then 250 ml of body wash sample is adjusted to a temperature of 20°-25°C.

The spindle is carefully inserted within the jar containing the sample to ensure that no bubbles form in the sample, as this could delay the readings. When the spindle is fixed, the viscometer motor starts on and runs for the amount of time specified in the setup, giving the readings.

Fig:4(a) Brookfield's Viscometer

**Significance:**

Viscosity is resistance to flow of a fluid hence it should be calculated to access the flowability of the product.

4.5.2. Determination of Specific gravity of bulk sample**Apparatus used:**

- Pycnometer
- Spatula
- Weighing balance

Procedure:

Drop the tare weight of the pycnometer from the filled weight of the pycnometer and divide the weight observed by the water component to determine the specific gravity of the sample. First take the body wash sample in pycnometer and then weigh it then divide the weight by water factor.



Fig: 4(b) Densitometer

Significance:

The test is done to determine the weight in grams per ml of a sample.

4.5.3. Determination of the pH value of the bulk sample**Apparatus used:**

- pH meter.
- Buffer solution of pH 4 and pH 7.
- Processed water.

Procedure:

Calibrate pH meter with a buffer solution of pH 4 followed by pH 7 and then after calibration first take the readings of processed water and after that take the reading of the sample.



Fig: 4(c) pH meter

Significance:

Acidity or alkalinity of a sample is determined by its pH.

4.6. Methods of Evaluation

To ensure the superiority of the prepared body wash, the following assessment parameters were used;

- Appearance: The formulation's physical appearance was observed. Color, odour, nature and consistency were all evaluated.
- Homogeneity: The formulation's homogeneity was visually examined.
- pH: A digital pH meter was used to measure the pH of the body wash made.
- Irritability: A small amount of the body wash was applied to the skin surface and left on for few minutes.
- Viscosity: The viscosity of the body wash was determined by Brookfield viscometer.
- Specific gravity: Specific gravity of the body wash was determined by using pycnometer.
- Stability study: Color, odour, appearance, pH, specific gravity and viscosity were all measured while the formulation was stored at various temperature.

5. RESULT AND DISCUSSION

Cosmetics are used to enhance a person's natural beauty, so it is the cosmetic industry's obligation to maintain product quality, which they do by conducting many tests at each stage of the manufacturing process. In this section, we'll talk about the materials' standard values, which are validated by the FDA and BIS, and which the industries follow.

TEST NAME	STANDARD VALUE	OBTAINED VALUE
Colour	Light green	Complies
Odour	Citrus	Complies
Appearance	Clear surfactant gel	Complies
pH	4.5 - 5.2	4.68
Specific gravity	1.00 - 1.04	1.02
Viscosity	4000 - 10000	4817 cps

Table 2: Table showing results of body wash

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.

6. CONCLUSION AND FUTURE SCOPE

Cosmetic goods help women appear more beautiful and confident, therefore they are more likely to spend a considerable percentage of their wages on them. The fact that women were more drawn to the "Because you are worth it" was also evidence of this.

Working for a global cosmetics company was a fantastic experience for me. Oriflame follows all FDA and BIS guidelines and regulations. During my training, I learned the industry's working style, and I can tell from that experience that the Quality Control and Assurance department is the backbone of any cosmetic manufacturing company. The quality team is responsible for the processing and passage of raw materials through to finished goods. The two most important features of the sector are safety and hygiene.

This project report is completely based on the manufacturing of body wash, the conclusion formed is that all the products are of good quality i.e. they fulfill all standards & are devoid of any sort of contamination. The formulation of body wash was found to be stable at all the three stability condition making sure that this body wash can stay good at all over the world i.e. varying temperature conditions. Chemicals used in making of body wash are all approved for use, they have undergone tests which makes them safe to use. Impurities were found to be within the minimum range required. Hence these raw materials can be used to make safe product.

4 These days, people not only want hygiene from their bath and shower products, but also wants skin-care and fragrance. They aid in the relaxation of tense muscles, the rejuvenation of the skin, and the maintenance of personal cleanliness. These hygiene solutions are in high demand in metropolitan areas since individuals living in large cities confront a lot of pollution. The days of using merely soap to clean the body are long gone. Liquid soaps, body washes, and gels are all available nowadays. Body washes have grown popular among teenagers since they do not leave behind any soapy residue that is difficult to remove. Body washes are gentler on the skin than soaps, therefore the risks of developing dry skin are greatly reduced. Even though these liquid cleansers are mild on the skin, they may not be as effective at removing dirt, oil, and odour from your body.

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