



# FORMULATION AND EVALUATION OF ANTI-ACNE FOAMING FACE WASH

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**Abstract:** Exfoliation, deep pore cleansing agents, and skin care products are formulated all beneficial to treat acne as the buildup leads to the formation of cysts, black and white heads, and other skin-damaging growths. A foam cleansing composition is enhanced in cleaning as the foams are generated actively, despite the need for an additional physical force. As a result, the daily routine necessitates fewer efforts. Based on the chemical characteristics, natural ingredients such as aloe vera, turmeric, neem oil, and rosehip oil have been chosen. They have strong antibacterial, anti-inflammatory, antioxidant, and antimicrobial properties, based on recent research. These substances are deemed to have the active compounds that can successfully resolve the problem in daily lives. The principle behind the creation of the face wash was that it should be used responsibly, because of its transparency skin disruption or scarring are prevented. Various constituent concentrations are used to create formulations, which are then analysed. According to our research, our product performs well without creating allergies or agitation and is stable at room temperature (spreads well throughout a pH range of 5-7).

**Index Terms - Acne, Exfoliation, Face Wash, Dermis, Epidermis, Hypodermis.**

## I. INTRODUCTION

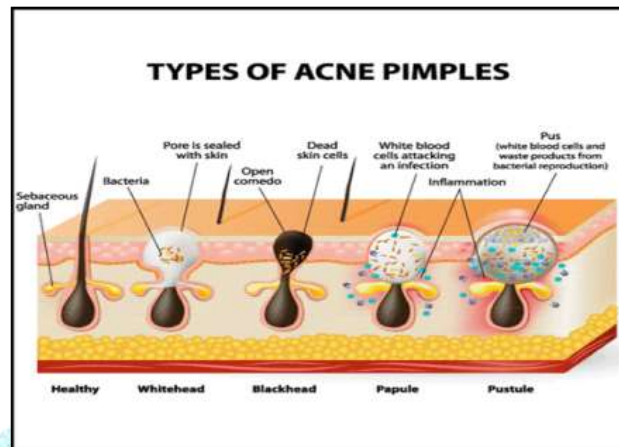
The exposure to sun, pollution and dirt leads the skin to oxidize and generate blackheads, whiteheads, pimples, acne and other facial defects. Face washes are designed to cleanse faces and remove the filth. Cleaning is a vital part of maintaining a healthy skin as it eliminates impurities and assist the skin to prepare itself for topical application. However, this may damage the skin surface as it inhibits natural moisturizing factors and disrupts the skin barrier.

Foaming agent is a surfactant which, when present in small amounts, facilitates the formation of a foam, or enhances its colloidal stability by inhibiting the coalescence of bubbles.

**Acne:** Acne is an inflammation of sebaceous glands that usually begins at puberty, when the sebaceous glands are stimulated by androgens. Acne occurs predominantly in sebaceous follicles that have been colonized by bacteria, some of which thrive in the lipid-rich sebum. The infection may cause a cyst or sac of connective tissue cells to form, which can destroy and displace epidermal cells. This condition, called cystic acne, can permanently scar the epidermis.

Treatment consists of gently washing the affected areas once or twice daily with a mild face wash, topical antibiotics (such as clindamycin and erythromycin), topical drugs such as benzoyl peroxide or tretinoin, and oral antibiotics (such as tetracycline, minocycline, erythromycin, and isotretinoin).

The acne vulgaris, is a prevalent dermatological condition. It is caused due to clogging of hair follicles under dermis which is a persistent inflammatory ailment of the pilosebaceous unit. Acne is characterized by aberrant follicle desquamation and excessive sebum production by the sebaceous glands of the skin.



### Face wash: -

A face wash is a product formulated specifically for cleaning facial skin surface. It aids in pore cleaning and guards against skin issues. It contains substances called surfactants, that assist in reducing the surface tension between the impurities and the skin so that they may be cleaned off. The accumulation of pollutants, dead skin cells, dirt, and excess sebum on the skin's surface can clog pores and lead to skin problems. An ideal face wash helps to cleanse the skin of accumulated impurities, oil, and filth, leaving it clean, fresh, and prepared to absorb the benefits of other skincare products.

There are different types of face based on skin types:-

- Gel type
- Cream type
- Foam type
- Oil type
- Exfoliating type

### Foam face wash: -

They are lightweight and create a foamy lather, breaking down oil and impurities as you massage it on your skin. They are excellent for combination skin, balancing the skin's natural oils without over-drying. When combined with water, they produce a rich lather which is the key to their exceptional cleansing power.

### Advantages of foam face wash: -

- Removes dirt and impurities: Effectively removes dirt, oil, makeup, and pollutants, preventing clogged pores and breakouts.
- Prevents acne: By keeping the pores clean and free from excess oil, face wash benefits your face by reducing acne and blemishes.
- Prevents post-wash dryness: Specially formulated face washes help maintain the skin's natural moisture balance, preventing dryness and irritation.
- By deeply cleansing the layers of your skin, a face wash allows serums, moisturizers, and other skincare products to penetrate better, enhancing their effectiveness.
- Refreshes and rejuvenates: Washing your face with a face wash leaves your skin feeling refreshed and rejuvenated.

- Mild Exfoliation Alpha hydroxy acids (AHAs) or beta hydroxy acids (BHAs) are two examples of the mild exfoliating ingredients included in many foaming face washes. These substances support a smoother complexion by helping to slough off dead skin cells.
- Oil Control People with oily skin benefit the most from foaming face washes. The foaming lather lessens shine and the chance of acne outbreaks by controlling the overproduction of oil.
- Prepping for Other Products Serums and moisturisers can enter the skin more efficiently and provide more advantages when used after a foaming face wash.
- Post-workout Cleansing: Skin may have a grimy, sweaty coating after working out. Using a foaming face wash will instantly revive your skin and stop post-workout breakouts.

## II. RESEARCH METHODOLOGY

**Plant materials:** Aloe vera, turmeric, neem oil and rosehip oil are extracted from following processes.

1) Extraction of aloe vera jelly (manual method): Take slices of raw aloe vera leaves and gently scope out the jelly part and then transfer it into a mixer grinder. Filter it and remove the large particles. Add considerable amount of xanthum gum into it and leave the filtrate for 4 hours, this will increase the consistency of the extraction.

2) Extraction of neem oil (boiling method): 20 grams of dried neem leaves are taken and crushed in a mixer grinder. The obtained powder is taken and 100ml of olive oil is added. Boil the mixture in a water bath for 30 minutes. Filter out solid residue by using cheese cloth.

3) Extraction of rosehip oil (sub-critical solvent extraction): The cleaned raw material is transported to dehulling machine and flaker. After pre-treatment they are transported to low temperature extraction. This works under pressure 0.1 -0.6 MPa, and room temperature. The solvent within extracted crude oil and meal will be desolventized under low temperature and vacuum condition. The solvent is processed within this system for recycling.

4) Extraction of curcumin from turmeric: Raw turmeric was taken, the skin was peeled out and grated by using stainless steel grater. Reduce the moisture by keep it in oven for 10 min. Turmeric was blended to reduce its size and filter it to have uniform size. 5gm of turmeric was taken, added 75ml of ethanol in to it. Stirred to increase the mass transfer, this will increase the contact of solid and solvent. Leave it for 1 hour. Filter out the extract from the raffinate using filter.

**Chemical agents:** Sodium lauryl ether sulphate, Glycerol, Sodium benzoate, Sorbitol.

## METHOD OF FORMULATION

The process of preparation of the formulation can be well illustrated by dividing the ingredients various stages as follows.

- a) Phase A (glycerol, distilled water) - Base ingredients
- b) Phase B (turmeric, neem oil, aloe vera, rose hip oil) - Active ingredients
- c) Phase C (sodium lauryl ether sulphate) - Foaming agent
- d) Phase D (sodium benzoate, sorbic acid) - Preservative
- e) Phase E (rose essence) - Perfume

- The Phase A ingredients are weighed and transferred into a small beaker.
- The Phase B ingredients are weighed accurately and transfer into a beaker. The beaker is kept on water bath until uniformity is attained.
- Both Phase A and Phase B was blended with a glass rod.
- The Phase C was measured and added to the mixture. Stir gently to avoid foam.
- Apparently Phase D was weighed out and added to mixture for obtain enhanced shelf life.
- Further 2-3 drops of rose essence was added.

SLNO.	INGREDIENTS	PERCENTAGE	WEIGHT	USE
1	Glycerol	52.5	35ml	Humectant
2	Distilled water	q. s	q. s	Diluent
3	Aloe vera	45%	30gm	Moisturizing agent
4	Turmeric	7.5%	5gm	Antioxidant agent
5	Neem oil	6%	4ml	Antibacterial agent
6	Rosehip oil	7.5%	5ml	Anti-inflammatory agent
7	Sodium lauryl ether sulphate	45%	30ml	Foaming agent
8	Sodium benzoate	0.75%	0.5gm	Preservative
9	Sorbic acid	0.37%	0.25gm	Preservative
10	Rose essence	q. s	q. s	Perfume

### III. EVALUATION TESTS

- Physical evaluation:**  
 The organoleptic and physical properties such as colour, appearance, odour, texture, consistency was assessed.
- Determination of pH:**  
 A calibrated digital pH meter was used to measure the pH of the formulation's 1% aqueous solution at a fixed temperature.
- Grittiness:**  
 The product was checked for the presence of any gritty particles by applying it on the skin.
- Spreadability:**  
 A slide of ground glass mounted on a wooden block was used. The prepared gel, 2 grams in weight, were put on this glass slide. Then another glass slide with the same dimensions as fixed ground side was put between it and the gel preparation. A hook is provided on the second glass slide. Afterward, for five minutes, a weight of 500 mg was loaded in order to remove air and generate uniform gel film between these two slides. An identified weight was added into the pan connected to the pulley. The time (in seconds) for motion of uppermost slide over 5 cm distance was recorded. Spreadability was calculated by using the following formula,
 
$$S = M \times L / T$$
 S- Spreadability, M -Weight tied to the upper slide, L- Length of the glass, T- Time in sec
- Washability:**  
 The product will be painted by hand and was observed under running water.
- Foamability test:**  
 The preparation was observed for grease on application to skin.



## 7. Homogeneity test:

Under visual inspection the prepared formulation was evaluated for lumps, colour dispersion and any fibre particles.

## 8. Extrudability test:

To determine extrudability a closed foam pump bottle containing formulation was pressed firmly at the crimped end. When the cap was removed, formulation extruded until the pressure dissipated.

## 9. Greasiness test:

The preparation was observed for grease on application to skin.

## 10. Patch test:

A patch test refers to a diagnostic exam that people can use to determine whether specific products result in skin irritation or an allergic reaction. Substances that can cause a skin reaction, chemicals, preservatives, perfumes, and cosmetics were analysed. It involves applying a small amount of a substance or product to the skin and leaving it on to see if a reaction develops.

## IV. TEST RESULT

			
Foamability	pH	Spreadability	Uniformity

Sl.no	Test	Result
1	Color	Yellowish green
2	Odour	Pleasant
3	State	Liquid
4	pH	5.9
5	Grittiness	Nil
6	Spreadability	Good
7	Washability	Good
8	Foamability	Good
9	Homogeneity	Uniform
10	Extrudability	Good
11	Greasiness	Nil
12	Irritancy	Nil

## V. PACKAGING AND LABELLING:

A package is a manufactured article which partially or totally encloses a quantity of products. Packaging is the art and science of operation involved in the safe delivery of product to the ultimate consumer in sound condition at minimum overall cost.

Purpose of packaging and labelling: Products are packed in a suitable package to facilitate transportation and storage, guard against contamination, prevent accidental spoilage, prevent from pilferage, minimize spoilage, identify the product quality, proclaim the manufacturer of the product contained, explain how the product should be used, attract the customers to buy, add convenient information (distribution, handling, stacking, display, sale, opening, reclosing, use, dispensing, reuse, recycling) and to have portion control.

Container: Foaming face wash could be packaged in white PET bottles with matching foaming pumps. The specialized foaming pumps mix the face wash formula with air through a quick stroke of the pump, producing a light, gentle foam. Dispense skin care products cleanly and evenly without the use of added gas propellants with these white plastic face wash bottles.



## VI. SUMMARY AND CONCLUSIONS

A study on formulation and evaluation of anti-acne foaming face wash may conclude that the formulation made was a safe and effective therapeutic action. Natural therapies are preferred to synthetic ones like any other drug. Based on a survey done on natural skin care products, consumers prefer Ayurvedic herbal or semi-synthetic facewashes such as those produced by Patanjali Ayurvedic Ltd. Herbal face washes encompass vital ingredients which nourish the skin while maintaining its continued health. It looks after both the outside and inside of the skin at once keeping it nourished. Herbal cosmetics have always outperformed the artificial cosmetic over time due to its side effects. Thus, herbal constituents helped in formulating cosmetics with less harmful properties that can cure various skin diseases. Due to this reason, the cost of preparation will be lower compared to synthetic products because it is available in market.

Allopathic medicines are associated with some side effects like contact allergy, local irritation, scaling, photosensitivity, itching and redness of the skin etc., thus for acne treatment herbal medicines are considered much safer than allopathic medicines which should be avoided since they do not pose any danger to human lives.

Finally, it may be apparently concluded that the formulation prepared with ingredients like aloe vera extract (aqueous), neem oil, turmeric rose hip seed essential oil and glycerine have subtle therapeutic efficacy on various skin conditions.

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