

## Formulation and Evaluation of Liquid Based Face Wash

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**ABSTRACT:** . Cosmetics designed for skin care can be used to cleanse, exfoliate and protect the skin, as well as replenishing it, through the use of cleansers, toners, serums, moisturizers, and balms; cosmetics designed for more general personal care, such as shampoo and body wash, can be used to cleanse the body; cosmetics designed to enhance one's appearance (makeup) can be used to conceal blemishes, enhance one's natural (such as the eyebrows and eyelashes), add colour to a person's face and, in the case of more extreme forms of makeup used for performances, fashion shows and people in costume, can be used to change the appearance of the face entirely to resemble a different person, creature or object. A facewash is a facial care product that is used to remove makeup, dead skin cells, oil, dirt, and other types of pollutants from the skin of the face. This helps to unclog pores and prevent skin conditions such as acne. A facewash can be used as part of a skin care regimen together with a toner and moisturizer. Face wash is the products which are used to cleanse face without drying it out. Face wash is also commonly known as "cleanser".

**KEYWORDS:** Serum, moisturizers, blemishes, toner, cleanser

### I. COSMETICS

[1]. Cosmetic is a Greek word which means to 'adorn' (addition of something decorative to a Person or a thing). Cosmetics are constituted from a mixture of chemical compounds derived from either natural sources or synthetically created

ones. Cosmetics designed for skin care can be used to cleanse, exfoliate and protect the skin, as well as replenishing it, through the use of cleansers, toners, serums, moisturizers, and balms; cosmetics designed for more general personal care, such as shampoo and body wash, can be used to cleanse the body; cosmetics designed to enhance one's appearance (makeup) can be used to conceal blemishes, enhance one's natural (such as the eyebrows and eyelashes), add colour to a person's face and, in the case of more extreme forms of makeup used for performances, fashion shows and people in costume, can be used to change the appearance of the face entirely to resemble a different person, creature or object. Cosmetics can also be designed to add fragrance to the body. Even in earlier days, men and women used to decorate their bodies for improvement of appearance. Men used leaves of vegetables and parts of animals whereas women used to wear coloured stones and flowers round their neck and wrist. Gradually they start using coloured earth and ointments on their face and body. Even bangles and necklace made of baked earth materials became very common among the people.

[2]. Now days, cosmetics are considered as essential components of life. They not only, attract the people towards it but also impart psychological effects. It has gained popularity in the last 3-4 decades and its use has been increased exponentially both in males and females. The most popular cosmetics are hair dyes, powders, creams.



Fig no 01: cosmetics

### TYPE OF COSMETICS

[3]. All cosmetics are typically intended to be applied externally. These products can be applied to the face (on the skin, lips, eyebrows and eyes), to the body (on the skin, in particular the hands and nails), and to the hair. These products may be intended for use as skincare, personal care or to alter the appearance.

The cosmetics have been different types

1. Skin cosmetics
2. Hair cosmetics
3. Nail cosmetics

### SKIN COSMETICS

[4]. The purposes, functions and roles of skin care cosmetics such as face cleansing cosmetics, lotions, milky lotions, creams, gels, essences (beauty lotions), packs and masks, shaving cosmetics, and several other products (for example, powder and cleansing oil). The purposes of skin care cosmetics include cleaning the skin, preserve the skin's moisture balance, stimulate skin metabolism, and protect the skin from harmful ultraviolet radiation. Skin care cosmetics contain substances which enable the skin to function properly. They support its homeostasis function so that it is maintained in a beautiful and healthy condition or regains such a state if it is not. The basic functions include cleansing, anti-drying, ultraviolet damage prevention, antioxidation and invigoration but they can also clear up skin problems, have a whitening effect to combat skin aging-associated troubles (liver spots and freckles due to the sun's rays), prevent wrinkles, sagging skin and acne. The roles played by skin care cosmetics include maintaining homeostasis in the skin and restore it if it has been lost (keep the skin

healthy and beautiful), delay aging in the skin, and provide a solution to skin problems. They must also be safe when used constantly over long periods.

### SKIN

[5]. Skin is one of the largest organs of the body. Because of this, caring for your skin can directly affect your overall health. Your skin acts as a protective shield and is most vulnerable to outside elements. It's affected by more factors than you may think. For instance, the following can play a role in your overall skin health:

Exposure to UV radiation in tanning beds exposure to chemical toxins in tobacco unprotected sun exposure for long periods of time not getting enough rest, fluids, or nutrition aging.

There are steps you can take to ensure you have healthy skin. They include the following: Cleanse regularly, typically twice daily. Apply a toner after cleansing if you have oily skin. Apply a moisturizer if you have dry skin. [6]. Exfoliate to remove dead skin cells and brighten up your complexion. Besides a daily skin care routine, make it a habit to examine your own skin for abnormalities, discolorations, or any other changes on a regular basis. Have your skin examined by a doctor or dermatologist annually for any changes, or if: you have fair skin or many or large moles you are in the sun or use tanning beds you have a history of skin problems, irritations, or growths It's also important to protect your skin from too much sun and sun damage, which may increase wrinkles as well as lead to skin cancer. Cover your skin or use sunscreen to protect your skin from the damaging rays of the sun. See your doctor or dermatologist if any skin irritations or problems arise.

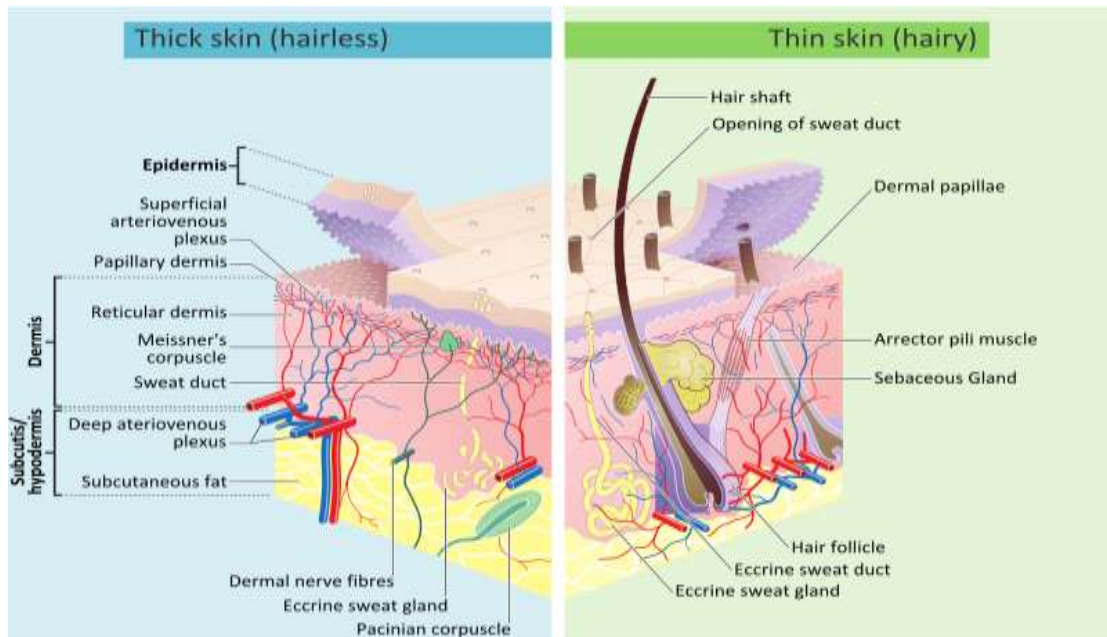


Fig no. 02 Skin structure

## LAYERS OF SKIN

### 1. EPIDERMIS

[7]. The epidermis is an elastic layer on the outside that is continually being regenerated. It includes the following:

**Keratinocytes** - the main cells of the epidermis formed by cell division at its base. New cells continually move towards the surface. As they move, they gradually die and become flattened.

**Corneocytes** - the flattened dead keratinocytes that together make up the very outer layer of the epidermis is called the stratum corneum or horny layer. This protective layer is continually worn away or shed.

**Melanocytes** – produce the pigment melanin that protects against UV radiation and gives skin its colour.

### 2. DERMIS

[8]. The dermis is the inner layer that includes the following:

**Sweat glands** – produce sweat those travels via sweat ducts to openings in the epidermis called pores. They play a role in temperature regulation.

**Hair follicles** – are pits in which hairs grow. Hairs also play a role in temperature regulation.

**Sebaceous glands** – produce sebum (an oil) to keep hairs free from dust and bacteria. Sebum and sweat make up the 'surface film'.

### 3. SUBCUTANEOUS TISSUE

[9]. The **deeper subcutaneous tissue** Is made of fat and connective tissue

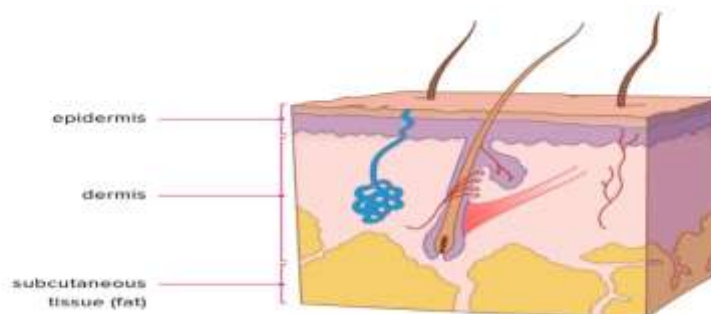


Fig no.03 Skin layer

## FUNCTIONS OF SKIN

[10]. The skin of human body has various functions. Some of these are below:

1. **Protection:** one of the main functions of the skin protection from invasion by microbes, chemicals, physical agents
2. **Sensory function:** free nerve ending on the skin are sensitive to pain, touch, heat and cold, resulting either voluntary or reflex activities.
3. **Excretion:** skin excrete sodium chloride in sweat, urea when kidney function is impaired and atomic substances
4. **Regulation of body temperature:** regulation of body temperature about  $36.9^{\circ}\text{C}$  with variation of  $0.5^{\circ}\text{C}$  and  $0.75^{\circ}\text{C}$  is one of the important functions of skin
5. **Production:** production of vitamin D from the sunlight

## II. FACEWASH

[11]. A facewash is a facial care product that is used to remove makeup, dead skin cells, oil, dirt, and other types of pollutants from the skin of the face. This helps to unclog pores and prevent skin conditions such as acne. A facewash can be used as part of a skin care regimen together with a toner and moisturizer. Face wash is the products which are used to cleanse face without drying it out. Face wash is also commonly known as "cleanser". Face wash product found to be equally good for all skin type. Face wash is very helpful in removing dirt, oil and provide moisture to the dry skin. Both face washes & cleansers are used to rid your face of dirt, oil, pollution etc. A cleanser dissolves away excess oil makeup and grime from your face. These are oil soluble impurities. They can be removed by a face wash too, but that might be not 100% effective. Facial skin is the delicate and ordinary soaps can cause it to lose moisture. A face wash is a mild cleanser that does the vital job of keeping skin clean, germ free smooth and fresh and moisturizes the horny layer without any harshness to the skin. So that skin looks young and energetic. The purpose of face wash may be to impart cleansing, anti-wrinkle effect, anti-acne property, moisturizing effect and fairness of skin. Skin whitening agents are believed to act on the production and metabolism of melanin of the skin by inhibiting melanin production in melanocytes, reducing extent of melanin. The agent which inhibits melanin production, such as propanediol, Evodia rutaecarpa fruit extract, arbutin, kojic acid, vitamin C and its derivatives are used in the

whitening cosmetic because of their low toxicity to melanocyte

### Advantages of facewash

- [12]. It helps to remove dead skin cells that helps new skin cells replace old one
- It helps to keep skin fresh and healthy.
- It makes the skin to look radiant
- The mixture of dead skin cells and excessive oil clog pores, which can lead to acne white heads, blackheads and total weary appearance. Exfoliating the pores regularly, avoids all the above skin problems.
- Removing dead skin cells that means your skin will develop wrinkles at a slower pace.
- Keep the skin hydrated, soft, supple, and youthful looking
- Stimulate blood circulation, boosting blood flow to your face for glowing skin
- [13]. Make the skin younger and help to fight any signs of aging
- Help other skin care products penetrate properly into the skin

### Disadvantages

- [14]. Itching
- Skin rashes
- A sensation of feeling warm

### Uses of facewash

- [15]. To remove all traces of makeup every day.
- For cleansing the skin.
- Anti-aging.
- Bath and renewal keeping the skin clean and shiny.
- Stimulates their generation of the skin cells and their renewal.
- Help plug the pores clear.

### Properties of facewash

- [16]. The exfoliation accelerates the blood circulation and promotes skin regeneration and rejuvenation.
- Facial pores and Oily skin are caused by over secretion of sebum by sebaceous glands which clogs the makes the skin oilier.
- Oily skin requires cleansers with herbs and botanicals which will clean the pores and reduce oil build-up. These exfoliating cleansers contain anti-inflammatory agents and antioxidants that improve and nourish the damaged skin.
- Known for its beneficial properties, herbal face wash is used to treat acne and pimples.

Containing rich plant-based ingredients like neem, herbal face wash removes excess oil without removing nutrients from the skin.

- It should be stable and should have a good appearance.
- It should soften on application to the skin.
- It should spread easily without dragging.
- During application it should not have oily or greasy feel.
- After evaporation of water the cream residue should not become viscous.
- Its physical action should be that of flushing on the skin and pore opening rather than absorption.
- A thin emollient film should remain on the skin after its use.

## FORMS OF FACE WASH

1. Cream based face wash
2. Gel based face wash
3. Liquid based face wash

### 1. Cream based facewash

[17]. A cream-based facewashes as well as moisturizes your skin. A cream based facewash is usually thick, creamy, and contains essential moisturizing elements like botanical oils. It will help you in getting rid of any dirt, sweat, makeup, or bacteria. Cream based facewashes creamy cleansers work best for dry skin. They leave the skin void of all impurities without further stripping it of essential natural oils.



Fig no.04 cream-based facewash

### 2. Gel based facewash

[18]. Gel facewash are water-based facewash with a gel-like texture that are typically made from the extracts of flowers and essential oils. Gel facewash that can help balance your skin's PH. Gel facewash is recommended for sensitive and irritative or itchy skin types. Although many gel facewash remove extra oil, they do not bear

your skin of all its oil and thus are good for dry skin as well. Gel facewash is the facewash for you if you are in need of deep cleansing. By unclogging your pores with a mild formula that causes little irritation to the skin, it allows for a thorough cleansing of your pores and removes dirt and excess oil off the surface of your skin at the same time.



Fig no.05 gel-based facewash

### 3. Liquid based facewash

[19]. Liquid based facewash have been widely used in pharmaceuticals due to their high dosing flexibility, ease of swallowing, and quick onset of action. Typically, they are categorized as monophasic and biphasic formulations, wherein within these two broad categories lies a wide range of dosage forms. In a monophasic liquid the active pharmaceutical ingredient (API) is completely

dissolved within the vehicle, while in the case of biphasic liquids, the API does not completely dissolve and instead is suspended or dispersed within the vehicle, forming two phases. Indeed, the choice of liquid dosage form is dependent upon various factors, where the type of API and the desired therapeutic effect are considered the major elements.



Fig no.06 liquid based facewash

### III. MATERIALS AND METHODS

The liquid-based facewash was prepared using the following chemicals, apparatus and instruments. Most of the chemicals are taken from laboratory suppliers of Trivandrum. Chemicals used are stearic acid, sodium phosphate, liquid paraffin, propyl paraben, propylene glycol, potassium hydroxide, sodium lauryl sulphate, sorbitol, methyl paraben, water, charcoal and

perfume. Charcoal is purchased from S.S Laboratory suppliers, Thampanoor. Apparatus such as beaker, mortar and pestle, glass rod, funnel, measuring cylinder are available in the laboratories of college. Instruments such as weighing balance, mechanical stirrer, PH meter and Broke field viscometer are available in the laboratories of college.

### MATERIALS USED FOR THE PREPARATION

Ingredients	Uses of ingredients
Stearic acid	Emulsifying agent
Sodium phosphate	Emulsifying agent
Liquid paraffin (light)	Emollient
Propyl paraben	Preservative
Propylene glycol	Humectant
Potassium hydroxide	Emulsifier
Sodium lauryl sulphate	Conditioning agent
Sorbitol	Moisturing agent
Methyl paraben	Preservative
Water	Vehicle
Charcoal	Skin whitening agent
Perfume	Fragrance

Table no 1 materials

### METHOD OF PREPARATION

Liquid based facewash was prepared by the following ways:

#### Preparation of Mixture A

Take a clean and dried mortar and pestle



Add stearic acid and sodium phosphate in to the mortar and pestle and triturate properly



To this add gram of propyl paraben and continue trituration.

### Preparation of Mixture B

Take another clean and dried mortar and pestle and add propylene glycol, potassium hydroxide and triturate.



sodium lauryl sulphate, sorbitol, methyl paraben was added to the above mixture and triturate well.



Mixture A and Mixture B was mixed together and triturate until a proper consistency is obtained.



To this add of water and charcoal and mix well.



To this perfume was added. Properly mix all the above ingredients.

### IV. FORMULATION

Sl No	Ingredients	Trail 1	Trail 2	Trail 3
<b>Part A</b>				
1.	Stearic acid	12 gm	12 g	12 g
2.	Sodium phosphate	3 gm	3 g	3 g



3.	Liquid paraffin (light)	3 ml	3 ml	3 ml
4.	Propyl paraben	0.1 g	0.1 g	0.1 g
<b>Part B</b>				
5.	Propylene glycol	6.5 ml	6.5 ml	6.5 ml
6.	Potassium hydroxide	0.06 g	0.06 g	0.06 g
7.	Sodium lauryl sulphate	15 g	15 g	15 g
8.	Sorbitol	5 g	5 g	5 g
9.	Methyl paraben	0.1 g	0.1 g	0.1 g
10.	Water	55.5 ml	55 ml	54.5 ml
11.	Charcoal	1.5 g	2 g	2.5 g
12.	Perfume	q.s	q.s	q.s

Table no 2. formulation

## V. EVALUATION STUDIES

### 1. Organoleptic Properties:

The prepared facewash evaluated for its appearance, colour and odour. It produces characteristics floral odour. The results shown in the table 03.

Sl No.	Parameter	Trial 1	Trial 2	Trial 3
1.	Colour	Grey	Greyish black	Dark black
2.	Odour	pleasant fragrance	pleasant fragrance	pleasant fragrance
3.	Texture	Smooth, slippery	Smooth, slippery	Smooth, slippery
4.	State	liquid	Liquid	Liquid

table no 03 result of organoleptic properties

### 2. Consistency:

The prepared formulation produces liquid consistency. This was confirmed by visual observation. The result shown in the table no 04

SI No.	Formulation	Consistency
1.	Trial 1	Liquid
2.	Trial 2	Liquid
3.	Trial 3	Liquid

Table no 04 result of consistency

**3. Greasiness:**

The prepared formulations are does not greasiness upon application to the skin. The result shown in table no 04

SI No.	Formulation	Greasiness
1.	Trial 1	No
2.	Trial 2	No
3.	Trial 3	No

Table no 05 result of greasiness

**4. pH:**

The pH of formulation was found to be satisfactory of range in 5.5-5.7. It is new to the skin pH which indicates that prepared formulation can be compatible with skin. The result shown in table no 06.

SI No.	Formulation	pH
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1.	Trail 1	5.6
2.	Trail 2	5.5
3.	Trail 3	5.5

Table no 06 result of Ph

**5. Washability:**

Prepared formulations were easily washed with water. The result shown in table no 07.

Sl no.	Formulation	Washability
1.	Trial 1	Good
2.	Trial 2	Good
3.	Trial 3	Good

Table no. 07 results of washability

**6. Homogeneity:**

Under visual inspection of the prepared formulation indicates no lumps and to hour uniform colour dispersion free from any fibre and particle. The results are shown in table no 08.

Sl no.	Formulation	Homogeneity
1	Trial 1	No aggregate
2	Trial 2	No aggregate
3	Trial 3	No aggregate

Table no.08 results of homogeneity

**7. Grittiness:**

The prepared formulation is shown no grittiness. The result shown in table no 09.

Sl no.	formulation	Grittiness
1.	Trial 1	No
2.	Trial 2	No
3.	Trial 3	No

Table no 09. Result of grittiness

**8. Extrudability:**

The prepared formulations shows that good extrudability of formulation. Result Shows Table no 07.

Sl No	Formulation	Extrudability
1.	Trail 1	Good
2.	Trial 2	Good
3.	Trial 3	Good

Table no 10. extrudability of formulation

**9. Skin irritability test**

Small amount of facewash applied on the skin and kept far few minutes and found to show redness, oedema, inflammation and irritation during studies. The formulation it's safe to use

Formulation	Irritability test			
	1 <sup>st</sup> hour	6 <sup>th</sup> hour	12 <sup>th</sup> hour	One day
<b>Trial 1</b>	Null	Null	Null	Null
<b>Trial 2</b>	Null	Null	Null	Null
<b>Trial 3</b>	Null	Null	Null	Null

Table no 11. result of irritability test

### 10. Foamability test

Small amount of facewash applied on the skin and rub the hand. The formulation was found to produce consistent foam



Fig no.07 result foamability test



Fig no 08 Trial I



Fig no 09 Trial II



Fig no 10 Trail III

## VI. PACKAGING AND LABELLING

**PACKAGE:** A package is a manufactured article which partially or totally encloses a quantity of products. [20].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. In fact, Packaging sells what it protects and protects what it sells.

### PURPOSE OF PACKAGING

Products are packed in a suitable package for the following purpose:

1. To facilitate transportation and storage.
2. To guard against contamination.
3. To prevent accidental spoilage.
4. To prevent from pilferage.
5. To minimize spoilage.
6. To identify the products contained and the quality.

7. To proclaim the manufacturer of the product contained.

8. To explain how the product should be used.

9. To attract the shopper's attention and

10. To convince the customers to buy.

11. To add convenience in distribution, handling, stacking, display, sale, opening, reclosing, use, dispensing, reuse, recycling, and ease of disposal.

12. To have portion control- Single serving or single dosage packaging has a precise amount

### CONTAINER

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



Fig no 11.container

## VII. CONCLUSION

The face wash was prepared keeping in mind that it suits all skin type as the formulation was kept mild. Having properties of activated charcoal clears the pores, remove dirt and nurtures the skin even in summers and gives pleasant feeling on the skin after every wash.

The face wash prepared such that they were fit for daily use. Various tests were conducted which proved that the pH of the face wash was the same as what ideally should be used in a facial product. Cleaning action of the face wash also tested to check the accuracy of the face wash. The goal of this study was to develop a liquid-based face wash that may be used on a daily basis by people of all ages. It aids in the maintenance and nourishment of skin. From this study it can be concluded that liquid-based face wash (trial III) is good containing charcoal 2.5gram in terms of appearance, odour, cleansing, spreadability and

foaming property. It did not give harshness and skin irritation. This face wash can be applied to the skin and was found to be very effective.

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