

# “Design and Performance Evaluation of a Hair Removal Bar”

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## ABSTRACT:-

1. This abstract examines the notion of a hair removal establishment, with a particular emphasis on a hair removal bar. The introduction of hair removal powder has proven to be a practical and efficient solution for attaining smooth, hair-free skin. The hair removal bar signifies a groundbreaking advancement within the beauty and grooming industry. This article underscores the distinctive features of this establishment, including its commitment to hygiene, user accessibility, and the potential for a more comfortable hair removal process. In crafting the hair removal bar, a formulation comprising turmeric powder, barium sulfate, bentonite powder, and rose water, among other components, will be utilized. A soap base will be employed to convert this formulation into bar form.

**KEYWORDS:-** Barium sulphate , glycerol, iodine solution, soap base , turmeric, rose water .

## I. INTRODUCTION:-

Hair is a thin, flexible structure composed of cornified cells that grow from the hair follicle, which is an invagination of the epidermis. It primarily consists of amino acids, including sulphur-containing ones like cysteine, which is the most abundant amino acid in hair. These amino acids are often referred to

as keratin. Products used for the removal of unwanted hair are commonly known as depilatories. The requirements of a depilatory are that it should be non-irritating, harmless, efficient, and either odourless or have a pleasant scent. During the times hair growth in the face is a concerning aspect among teenage girls and women. Generally, when compared to men, women won't get facial hairs; however, due to improper food diet and hormonal imbalance, nowadays, women are at high risk of having facial hairs. Hair is a resistant material that is not readily dissolved or destroyed and hence requires careful consideration for removing it. If it is pulled out, it grows and regains its shape again. If it is destroyed by X-Ray, the tissues are adversely affected, and hence, this method is not in practice nowadays. Electrolysis is a suitable method for permanent removal but is slow and costly. When chemical removal is used, there is a danger of irritation. So, our main aim of the review is to find herbal depilatories, ensuring they will be safe for use and do not produce any side effects. During ancient times, turmeric was applied daily by women during baths, but in this century, amidst the busy world, this is not possible, and due to its staining property, most of them are avoiding it. However, aside from turmeric, there are many herbs and essential oils that play a crucial role in inhibiting hair growth.

## Material Sources:

Equipment	Source
Water bath	HV-135-WB
China dish	SL-CD22
Induction stove	SA 3071 IN
Glass rod	IS:5955
Barium sulphate	SRL PVT.LTD
Glycerol	Agrom healthcare Pvt.Itd
Iodine solution	Alpha chemika
Soap base	Swara marketing and manufacturing
Turmeric powder	Organic powder
Rose water	Dabar

## FORMULATION:-

Sr no.	Ingredients	Formulation 1	Formulation 2	Formulation 3	Formulation 4	Uses

1	Barium sulphate	15gm	15gm	10gm	10gm	Removing of the hair
2	Iodine solution	5ml	5ml	5ml	5ml	Antiseptic, prevent to infection, Reduce skin irritation or inflammation
3	Soap base	23gm	15gm	10gm	10gm	Cleanse the skin, removing dirt and oil
4	Glycerol	3ml	3ml	3ml	3ml	Moisturizing property, keep skin hydrated, preventing dryness and irritation
5	Turmeric	10gm	---	10gm	10gm	Anti-inflammatory and antioxidant
6	Rose water	---	4ml	5ml	5ml	Reduce redness, astringent and fragrance

## II. METHODOLOGY:-

### I. Gather ingredients:

Collect ingredients or components such as turmeric powder, bentonite powder, rose water, barium sulphate, and soap base, etc. for the preparation of hair removal bar.

### II. Measure components:

Precisely measure each component to maintain the right balance for effectiveness and safety.

### III. Infusion:

Determine the precise quantity of soap base. Gather a double boiler or a makeshift setup using a heat-safe container placed over a China dish with simmering water. This setup ensures even and controlled melting of a soap base. Place the measured soap base in the top part of the double boiler. Gently heat the soap base using the double boiler setup, ensuring that the bottom of the top container does not come into direct contact with the heat source. Stir occasionally to facilitate even melting. Continue heating and stirring until the soap base has completely melted and transformed into a liquid form (liquefy soap base).

### IV. Blending:

Combine turmeric powder, bentonite powder, and barium sulphate in a suitable container. Mix them thoroughly until they are evenly distributed. To transform the dry mixture into a paste, gradually add

rose water or milk while stirring continuously. Keep adding the liquid until the desired consistency is reached, where the mixture is smooth and free of lumps. Once the soap base is in liquid form, carefully add the prepared paste to it. Begin stirring the mixture immediately after adding the paste to the melted soap base. Continue stirring until the paste is evenly distributed and fully incorporated into the soap base. This process may take some time.

### V. Pour into Molds:

Pour the mixture into Molds of your choice. Allow it to cool and solidify. Cut the mixture into bars of suitable size for easy application.

### VI. Packaging:

Package the bars in airtight containers or wrap them securely to maintain freshness and efficacy.

### VII. Instruction:

Clean all unwanted hair, groom skin, make skin soft and silky smooth. After washing the area with water, apply the bar on that area and allow to air-dry for approximately 10 to 15 minutes, or until it becomes completely dry. After drying the area, it was cleaned by wet cloth or sponge in opposite direction.

### VIII. Testing:

Test the hair removal bar on a small skin area to ensure compatibility and effectiveness

## III. EVALUATION TEST:-

### 1. Organoleptic:

Evaluation aimed to saw physical appearance of bar soap which involves color, odor, texture.

parameters	F1	F2	F3	F4
Color	Dark green	Dark green	Light green	Light green

Odor	Pleasant	Pleasant	Pleasant	Pleasant
texture	Smooth	smooth	Smooth	Smooth

2. pH:  
 pH was measured by using pH paper.

formulation	pH
F1 batch	10.85
F2 batch	12.2
F3 batch	11.7
F4 batch	11.7

Normally, products having a pH of 11.5 will be slow acting, and products having a pH of 12.7 will irritate the skin when used.

Formulation	Time(sec) (cm/sec)	Spreadability
F1	7	32.8
F2	5	15.18
F3	11	19.6
F4	11	19.6

3. Determination of washability:  
 After applying the formulation to the skin, the extent and simplicity of water washing were manually assessed.

Formulation	Washability
F1	Good
F2	Good
F3	Good
F4	Good

4. Spread ability:  
 Spread ability apparatus was used to gauge the formulations' spread ability. Two slides measuring 6 x 2 cm each had 500 mg of the sample preparation placed between them. The apparatus's board held the lower slide in place, while the upper slide was fastened to a rigid string, on which a 20-g weight was imparted with the aid of a straightforward pulley. Under the pressure of weight, the higher slide took a certain amount of time to move 6 cm and separated from the lower slide. To determine spread ability, the following equation was used:  
 $\text{spread ability} = w \cdot l = t$   
 where,  
 w= weight tied to the upper slide,  
 l= length of the glass slide  
 t= time in seconds.

#### IV. RESULTS AND DISCUSSION:

The hair removal bar formulations tested (F1, F2, F3, F4) demonstrated varying properties based on the formulation's composition. Key parameters evaluated include pH, washability, organoleptic properties (colour, odour, texture), and spreadability.

1. pH Analysis: The pH values for F1 to F4 ranged from 10.85 to 12.2. Typically, products with a pH above 11 can act slowly, while a pH nearing 12.7 may irritate the skin. Formulations with lower pH (F1, F3, F4) were closer to the desired balance for effective hair removal with minimal irritation, whereas F2 showed a slightly higher pH of 12.2, which may require careful monitoring for user sensitivity.

2. Washability: All formulations showed good washability, indicating that the products could be easily rinsed off with water. This aspect is crucial for user comfort and convenience, ensuring residue-free application.

3. Organoleptic Properties: The hair removal bars exhibited pleasant organoleptic qualities, with F1 and F2 showing a darker green colour and F3 and F4 appearing light green. All formulations had a smooth texture and a pleasant odour, making them appealing for consumer use.

4. Spreadability: Spreadability tests demonstrated that F2 had the highest spreadability (15.18 cm/sec), which indicates better ease of application compared to other formulations. F1, F3, and F4 showed moderately lower spreadability values, suggesting slightly thicker consistency.

In conclusion, the hair removal bar formulations, particularly F2 due to its higher spreadability, effectively provided smooth and hair-free skin while maintaining good skin compatibility. The inclusion of barium sulphate, turmeric, and glycerol offered additional benefits such as hydration, anti-inflammatory effects, and infection prevention.

## V. CONCLUSION:-

The hair removal bar, formulated with a combination of barium sulphate, turmeric, glycerol, iodine solution, and a soap base, presents a novel and efficient approach to achieving smooth, hair-free skin. Each component plays a distinct role: barium sulphate facilitates the hair removal process, turmeric offers anti-inflammatory properties, glycerol hydrates the skin, iodine solution serves as an antiseptic, and the soap base allows for effortless application. Collectively, these ingredients produce a product that not only effectively eliminates hair but also nurtures the skin, resulting in a soft and healthy appearance

Rev. Res., ISSN: 0976 – 044X, 84(5) - May 2024; Article No. 16, Pages: 90-96 DOI: 10.47583/ijpsrr.2024.v84i05.016

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