



Formulation and Evaluation of Charcoal Based Herbal Peel Off Mask

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ABSTRACT

Peel off mask is the type of dosage form which is gently applied onto the facial skin surface and is peeled off after a few minutes of its application. It is used as the remedy to treat facial skin related problems such as wrinkles, ageing, and acne and mainly used to open the closed pores due to deposition of dust. Its main role is to stimulate the metabolism due to its occlusive effect. Activated charcoal is being added as an active ingredient in this formulation. The most important characteristic of an activated carbon is its adsorbent activity. Using it as an active ingredient in peel off mask, it adds to its value by enhancing the role of peel off mask by absorbing dust particles and opening the clogged pore. We have prepared activated charcoal with herbal peel of mask; aloe Vera is used as an antiaging properties and tea tree oil as anti -acne properties. Most of the peel-off masks are prepared by polymers which can form thin layer on skin.in this article, we have formulated herbal charcoal peel of mask and also evaluated it by using different test methods. The formulation showed amazing results after its application. This peel off masks have the advantage of being practical because of their peeling off property and it lift like an elastic membrane.

Keywords: Activated charcoal, Aloe Vera, Tea tree oil peel off mask.

INTRODUCTION

Herbal Cosmetics, here in after referred as Products, are formulated, using various permissible cosmetic ingredients to form the base in which one or more herbal ingredients are used to provide defined cosmetic benefits only, shall be called as Herbal Cosmetics. The herbal cosmetics are the preparations containing phytochemical from a variety of botanical sources, which influences the functions of skin and provide nutrients necessary for the healthy skin or hair 1 Now a days herb are widely used as remedial agents because herbs are easily available at less expensive and nontoxic so the people have good faith in such remedies. The skin masks usually have pseudo plastic properties for a handy application. Peel of masks are high-quality masks which have been developed specifically for cosmetic for cosmetic treatment in the beauty salon.

At the same time, the peel-off masks active substances and additional active substances, e.g. From ampoules, are able to penetrate particularly well into the skin and intensively supply the substances it requires within a short space of time. Peel off facial mask, based on poly vinyl alcohol are formulations that, after application and drying, form an occlusive film over the face.

After removal, they provide cleanness, tensor and moisturising effects, removing dead cells, residues and other materials deposited on the stratum corneum. When compared to the unfermented extract, providing benefits to the cosmetic formulations like anti-aging effect, moisture, tensor action and emollience. The skin smoothing and elasticity-enhancing effect is revealed after

just one application. Dead skin cells can be removed by applying a peel off mask. Mask can remain on the face for 15-20 minutes the duration can be varied depending on the ingredients.

It can be prepared with synthetic ingredients, Such as Activated charcoal and other ingredients like polyvinyl alcohol, polyethylene glycol, glycerine methanol, tween twenty, aloe Vera, tea tree oil and water. The preparation was evaluated for its physical characteristics and it was found to have the entire desired characteristics of a peel off mask. Activated Charcoal peel off mask show a very efficient effect on the skin. Aloe Vera and tea tree oil is used as an anti -acne and anti -aging property.

Benefits and Main Purpose of Facial Masks

Face masks, are considered occlusive - that is, they cover the skin - delivering nutrient-rich ingredients to enhance the look and consistency of the skin.

This allows sufficient time for the ingredients to reach the skin surface for optimum efficacy.

Facemasks can provide a concentrated shot of enriching ingredients to plump, moisturize as well as tone the face.

Charcoal/Clay Mask

Eliminate Pollutants and toxic Substances from the Skin Surface. These forms of facemasks are important cleansing products with a thick cream consistency in which charcoal and clay are incorporated which also tends to build the viscosity. Despite the reality that there is insufficient data to justify the usage of charcoal face masks, many people



do use them. The most significant property of activated carbon is its efficient adsorption ability.¹⁻¹⁰

MAERIALS AND METHODS

Ingredients: All the ingredients were purchased based on laboratory grade.

Table 1: Formulation ingredients

SL NO:	Ingredients	Category	Quantity
1	Polyvinyl alcohol (PVA)	Film former	15gm
2	Glycerine	Soothing agent	3ml
3	Polyethylene glycol (PEG)	Surfactant	1ml
4	Propyl paraben	Preservative	0.1ml
5	Activated charcoal	Absorbent	1gm
6	Bentonite	Antitoxin	1gm
7	Aloe Vera	Antiaging	7ml
8	Tea tree oil	Anti-Acne	1ml
9	Distilled water	Base	100ml

Plan of action

The procedure involves addition of seven different phases.

Phase 1: The phase involves the addition of 15gm of polyvinyl alcohol to 100ml of distilled water and kept it for 24 hours.

Phase 2: After 24hrs the polyvinyl alcohol dissolved in water. To this add Glycerine and PEG in the ratio 3:1

Phase 3: Add 0.1ml propyl paraben

Phase 4: Add 1gm activated charcoal and 1gm bentonite

Phase 5: Add 7ml aloe Vera extract and 1ml tea tree oil.

Phase 6: After adding all the ingredients, blend the mixture 5 to 10 mints.

Phase 7: After mixing the product and kept for 24hours.¹¹⁻²⁰

Evaluation of herbal charcoal peel off mask

1 Physical evaluation

Physical parameters such as Colour, appearance and consistency and feel of the prepared formulation was checked.

Colour - The Colour of the formulation was checked out against white background.

Consistency - The consistency was checked by applying on cellophane membrane.

Greasiness - The greasiness was assessed by the application on the cellophane membrane.

2. Wash ability: Formulations were applied on the cellophane membrane and then ease and extent of washing with water were checked manually.

3. Determination of pH: The pH of formulation was determined using digital pH meter. One gram of gel was dissolved in 100 ml of demineralized water and stored for two hours. The measurement of pH of formulation was done in triplicate. Instrument was calibrated before use with standard buffer solutions at pH 4, 7, and 9.

4. Spreadability: A total of 1 g of peel off preparation is placed on a glass with size 20x20cm and covered with another glass. Then a weight is placed on it until it reaches a weight of 50g and its diameter is measured after 1 minute. This test aims to determine the speed at which the gels spreads on the skin on its application. The dispersion requirements are 5-7cm.

$$S = \frac{d^2\pi}{4}$$

S= Spreadability; d=diameter

5. Drying time test: The time of the preparation test for dry was carried out by applying 0.1 gram of face mask on the cellophane membrane evenly over an area of 2.5 x 2.5 cm. The time required for the preparation to dry was counted by a stopwatch. The times were measured starting from the applying the face mask until a dry and elastic layer formed elastic that can be exfoliated without leaving a gel mass.

6. Status of the peel-off film: 0.1g of formulation was applied on cellophane membrane and allowed to dry. Dried film was peeled off from the membrane and checked for consistency.

7. Thickness measurement: Thickness of the film was measured at different points using Vernier caliper. The average of 3 readings was taken.

8. Folding Endurance: The folding endurance was measured manually for the prepared films. Peel off gel was applied on the surface of cellophane membrane. After its drying a strip of film (3x3 cm) was cut evenly and repeatedly folded at the same place till it broke. The number of times the film could be folded at the same place without breaking gave the exact value of folding endurance.

9. Thermodynamic Stability studies: This experiment was performed to see the stress effect and stability on formulations at low and high temperature of prepared peel off gel. Six cycle between refrigerator temperature (4°C) and accelerated temperature (40°C) with storage at each temperature for not less than 24 hours performed. The formulation was found to be stable at these temperatures were subjected to Freeze thaw stress test found stable.

10. Peel Test: The peel gel was applied on the cellophane membrane surface uniformly. The peel was allowed to dry. After 15 min the peel was removed from the skin surface.



11. Stability testing: of the formulation Stability Testing was done at various temperatures of 10°C, 20°C, 30°C, 40°C, 50°C, 60°C. The visual testing was done at each temperature. The formulation was found to be stable and good till 40°C. The formulation was found to be unstable at 50°C and 60°C.

Phytochemical test for *Aloe vera*

Table 2: Phytochemical test for *Aloe vera*

SI No:	Experiments	Observation	Inference
1	Borax test	Green colour observed	Presence of aloe emodinanthranol.
2	Modified anthraquinonoid test	Pinkish red colour is observed	Presence of anthraquinonoid.
3	Bromine test	Bulky yellow precipitate is observed	Presence of tetrabromaloin.
4	Nitrous acid test	Pink or purplish colour is observed.	Presence of nitrous acid.

Phytochemical test for tea tree oil

Table 3: Phytochemical test for tea tree oil

SI No:	Experiments	Observation	Inference
1	Salkowski test:	Reddish brown colour at the junction of two layer is observed	Presence of terpenoids.
2	Liebermann test:	Formation of deep red colour is observed	Presence of triterpenoids
3	Volatile oil test:	Red colour is observed	Presence of volatile oil

13. Antimicrobial evaluation

The minimum inhibition concentration determines the lowest concentration of an antimicrobial agent that prevents the visible growth of the microorganisms. Formulation was tested for antibacterial activity against test organism *Staphylococcus aureus* using Agar well plate method. *Staphylococcus aureus* is an aerobic bacteria and were obtained from microbial type culture collection centre.

Determination of antibacterial activity of peel off mask

The antibacterial activity of herbal peel off mask by well diffusion method using ciprofloxacin as standard.

Procedure

Agar well diffusion method

→ The bacteria *Staphylococcus aureus* was inoculated by swabbing on the surface of Muller Hinton agar media plate.

→ Wells of 6-8mm in diameter was performed in the MHA media and each well filled with 50 microliter of peel of gel, control, standard respectively.

→ The plate were kept in laminar air flow for 30 minutes for proper diffusion of the gel and thereafter incubated for 24 hrs. The radius for the zone of inhibition was measured and compared against standard (ciprofloxacin) and recorded.

RESULTS AND DISCUSSIONS

1. Physical evaluation

Colour: The Mask is black in colour.

12. Phytochemical evaluation

Stock Solution

Take 4ml of the sample solution and dilute with 20ml of distilled water and filter through the man filter paper.



Figure 1: Formulated Herbal charcoal peel off mask

Consistency: It is smooth and light to spread.

2. Wash ability: Washable with water.

3. P H: The pH value of topical peel off gel was determined by using digital pH meter. The measurements of pH of the formulation were done in triplicate and average value was found to be 7.4.

4. Spreadability: Spreadability of the peel-off gel was found to be 1.7cm.

Table 4: Spreadability result

Parameter	Spreadability	Weight (g)	Diameter (cm)	Time (sec)
Peel off gel	1.7	50g	1.5	60



Figure 2: Spreadability test

5. Drying time test: Drying time of peel off mask was found to be 15 minutes

6. Status of peel off film: After drying film was able to remove from applied site.

7. Thickness measurement: Thickness of the film was measured at different points using Vernier caliper. The average of 3 readings was taken as 0.14 mm.



Figure 3: Vernier caliper

8. Folding Endurance: The number of times the film could be folded at the same place without breaking gave the exact value of folding endurance which was found to be 200 times.



Figure 4: Folding Endurance

9. Thermodynamic Stability studies: Six cycle between refrigerator temperature (4°C) and accelerated temperature (40°C) with storage at each temperature for not less than 24 hours performed. The formulation was found to be stable at these temperatures were subjected to Freeze thaw stress test found stable.

10. Peel off Test: It was observed that the peel was removed easily without breaking (Peeling property)

11. Stability testing of the formulation: Stability Testing was done at various temperatures of 10°C, 20°C, 30°C, 40°C, 50°C, 60°C. The visual testing was done at each temperature. The formulation was found to be stable and good till 40°C. The formulation was found to be unstable at 50°C and 60°C.⁵

Table 5: stability test.

SL. No.	Temperature	Physical appearance	pH
1	10°C	Good	6.8
2	20°C	Good	6.8
3	30°C	Good	6.8
4	40°C	Good	6.8
5	50°C	More viscous	6.3

12. Antimicrobial evaluation

Table 6: Result of antimicrobial evaluation

SL.No.	Samples	Zone of Inhibition (mm) (<i>Staphylococcus aureus</i>)
1	Ciprofloxacin	25
2	Herbal peel off mask	10

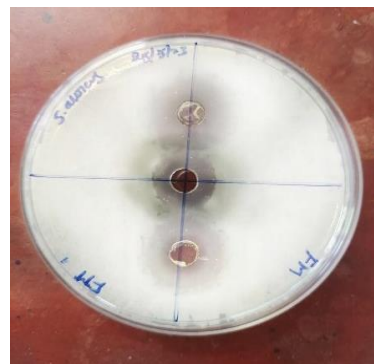


Figure 6: After incubation

CONCLUSION

The perception that herbal formulations are safer and have fewer side effects than synthetic ones make them more acceptable.

Powder of aloe Vera and tea tree oil were purchased and their pre formulation studies were done.

And herbal charcoal peel of mask was prepared with the help of other ingredients and we got the best formulation and show good stability.

The herbal peel off mask prepared has anti-acne, pore opening dead skin cell removal, and anti-inflammatory, anti-ageing and antibacterial properties.

The aim of formulating Herbal charcoal peel off mask was found to successful with good results.

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