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FORMULATION AND EVALUATION OF ACTIVATED CHARCOAL PEEL OFF MASK

Sweta Kulkarni*, Deepika Bairagee, Neetu Choudhary

School of Pharmacy, Dr.A.P.J.Abdul Kalam University, Indore, India.

ABSTRACT

Skin is a very sensitive and protective layer of the human body which is exposed to environmental pollution hence, it is very essential to protect the skin. The facial skin can be protected by applying various cosmetics intended specially for facial application, It can be a cream, lotion face mask or peel off mask etc. Peel off mask is the type of dosage form which is gently applied onto the facial skin surface and is peeled off after few minutes of its application. It is used as the remedy to treat facial skin related problems such as wrinkles, ageing, 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 adsorbant 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 pores. Literature survey reveals many papers related to formulation of herbal peel off masks, but no any reported paper was found on Activated Charcoal peel off mask. In this paper, we have formulated Activated Charcoal peel off mask and Evaluated it by using various tests methods. The formulation showed overwhelming results after its application on healthy female volunteers.

Keywords: Activated Charcoal, Peel off masks.

INTRODUCTION

Peel of mask are high-quality powder masks which have been developed specifically for cosmetic treatment in the beauty salon. They are mixed with Ocean Mineral Activator and are immediately applied onto the face and neck, but also the neckline and e.g. hands, where they form something akin to a second skin and impress with their intensive effect. Whilst the mask slowly hardens, moisture collects in the horny layer beneath the elastic mask film, which is impermeable to air and water [1-4]. At the same time, the peel-off masks' active substances and additional active substances, e.g. from ampoules, are able to penetrate particu-larly well into the skin and intensively supply the substances it requires within a short space of time. Peel off facial masks, based on polyvinyl alcohol (PVA), are formulations that, after application and drying, form an occlusive film over the face. After removing, they provide cleanness, tensor and moisturizing effects, removing dead cells, residues and other materials deposited on the stratum corneous. 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 [5].

Peel off Mask gently stimulates the metabolism due to its occlusive effect. Waste products and accumulated tissue fluid are rapidly transported away. A significantly improved skin profile is rapidly achieved. Skin is the protective layer of the body exposed to environmental pollution hence, it is essential to protect the skin [6]. Peel off mask can be used as the remedy to treat facial skin related problems such as wrinkles, ageing, acne and it can also be used to close the pores as the open pores can cause deposition of dust and result in white heads[7,8].

Peel off mask can be used for cleansing and moisturizing the skin. Most of the face peel off mask is prepared by polymers which can fro thin layer on face. Peel off mask is available in gel form and as dry form .Dead skin cells can be removed by applying peel off mask. Mask can remain on the face for 15-20 minutes the duration can be varied depending on the ingredients used. Some peel off mask required whole night for better result. It can be prepared with synthetic ingredients. Such as Activated charcoal and other ingredients like polyvinyl alcohol, polyethylene glycol, glycerine methanol, tween twenty,ascorbic acid 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

Corresponding Author: **Sweta V. Kulkarni Email:-** sweket@gmail.com

Activated Charcoal peel off mask show a very efficient effect on to the skin. The most important characteristic of an activated carbon is its adsorption capacity.It removes a wide variety of organic based contaminants, as well as some inorganic contaminants. 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 pores [9,10, 11, 12].

The objective of this study was to formulate and evaluate Activated charcoal peel off mask by using various tests methodsas there was no any reported paper found on Activated Charcoal peel off mask [13].

MATERIAL AND METHODS

Ingredients

Polyvinyl Alcohol(PVA),Glycrine, Polyethylene gycol(PEG),Polysorbate (tween twenty), Methanol, Distilled water,Ascorbic acid.

Procedure

The procedure involves addition of six different phases

Phase I

This phase involves the addition of 14%) of polyvinyl alcohol to distilled water (60%) in the beaker at 80°C temperature with a constant vigorous stirring.Further this mixture is allowed to cool down at 40°C

Phase II

In this phase a mixture of Glycerine and PEG in the ratio of 3:1 is added to phase I at 40°C temperature and mix well.

Phase III

Add (0.5%) polysobate (tween – twenty)

Phase IV

Add Methanol 1ml and add (0.5) distilled water with (0.1%) ascorbic acid into the phase III mixture and mixed well.

Phase V

Add activated charcoal and stirred well and cooled for few minutes

EVALUATION PARAMETERS

Color

The mask is black in color .

Consistency

It is smooth and light to spread.

Odour

It is odourless which last long even after washing the face with water.

Thickness measrement

Thickness of the film was measured at different points using digimaticvernier caliper.The average of 3 readings was noted. The results are tabulated in table no:2.

Moisture Content

The moisture content of the films was determined using Sartorius moisture analyzer. The formulated film was exposed to moisture for 72 hrs and difference in initial and final weight was calculated. The results are given below.

Moisture content of formulated peel

Weight taken =0.721gm
Moisture, L =11.16%
Dry weight, R =82.85%
Ratio, LR =13.47%
Weight after drying =0.617gm

L-Moisture,R-Dry weight , R-Ratio

Folding Endurance

The folding endurance was measured manually for the prepared films. Peel off gel was applied on the surface of skin. 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. The results are tabulated in Table No: 3 below.

pH

The pH value of topical peel off gel was determined by using digital pH meter. One gram of gel was dissolved in 100 ml distilled water and stored for two hours. The measurements of pH of the formulation were done in triplicate and average values calculated.

Spreadability

Spreadability of the peel-off gel was found to be 1.9±0.4 cm respectively.

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 gell. 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.

Erythema and edema scoring method for skin reaction

Erythema and edema scoring method for skin reaction

From the results observed there was No Edema and No Erythema observed on the skin surface and the score was found to be zero in both cases.

Skin Irritation Study

The formulated peel off should not produce any skin irritation or skin sensitization, after its application on the skin or else it will be unsuitable for application on to

the skin. Hence the pactivated charcoal peel off gel formulation was subjected to skin irritation study using Draize modified scoring technique.
The score was found to be 0.0. Thus the formulation was found to non-irritant.

Peel Test

The peel gel was applied on the skin surface uniformly.The peel was allowed to dry. After 15 min the peel was removed from the skin surface. It was observed that the peel was removed easily without breaking as shown in the figure no. below

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.

Table 1. Formulation Ingredients

Sr.no.	Ingredients	Category	Optimised Concentration(%)
	PolyvinylAlcohol (PVA)	Film former	14%
1.	Water	Base	60%
2.	Glycerine	Smoothing agent	3%
3.	Polyethylene gycol	Surfactant	1%
4.	Tween twenty	Polymer	0.5%
5.	Methanol	Solvent	1%
6.	Ascorbic acid		0.1%
7.	Water	Base	0.5%
8.	Activated charcoal	Active ingredient	1%

Table 2. Thickness measurement

Sr.no.	Sample	Average thickness(mm)
1	Film -1	0.19mm
2	Film -2	0.17mm
3	Film -3	0.17mm

Table 3. Folding endurance of film

Sr.No	Folding endurance
1	160
2	180
3	200

Table 4. Measurement of pH of the formulation

Placebo peel-off gel	7.5	7.5	7.5	7.5 ±0.3
Activated Charcoal peel-off gel	7.4	7.5	7.5	7.5±0.3

Table 5. Spreadability of the Peel-off gel

Parameters	Spreadability	Weight (g)	Length (cm)	Time (sec)
Placebo Peel- off Gel	1.9	1	2.5	11

Table 6. Erythema and edema scoring method for skin reaction

Sr.no.	Skin Reaction		Score
	(A) Erythema and Eschar formation		
1	No erythema		0
2	Very slight erythema		1
3	Well defined erythema		2
4	Moderate to severe erythema		3
5	Severe erythema causing redness to eschar formation		4
	(B) Edema formation		
1	No edema		0
2	Very slight edema (barely perceptible)		1
3	Slight edema (edges of area well raised)		2
4	Moderate edema(raised approx. 1 mm)		3
11	Severe edema (raised more than 1 mm and extending beyond area of exposure)		4

Table 7. Evaluation of Primary Skin Irritation Index (PII)

Evaluations	Score
Non irritant	0.0
Negligible irritant	0.1-0.4
Slight irritant	0.41-1.9
Moderate irritant	2.0-4.9
Severe irritant	5.0-8.0

Table 8. Stability testing of the formulation

Sr.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
6	60˚C	Solidified	6.0

Fig 1. Formulated film on humanskin (Peeling property)

CONCLUSION

The aim of formulating Activated Charcoal peel off mask was found to successful with good results.The peel off mask showed a good spreadability.The formulation showed a good peel off property on human skin without causing skin irritation or edema.The study also revealed that the formulation is capable of enlarging the pores and enhancing the cleansing of the skin by removing dead skin on the surface. The skin pores were also observed to be retaining their normal size within an hour of treatment; thus retaining the moisture and nutrients within the skin. The formulation was subjected to stability and thermodynamic stability studies.The formulation showed good stability results and was found to be stable till 40^0C.The Erythma an skin irritation test were performed on healthy female volunteers .The erythma and edema score was found to be 0 and it was found to be non-irritant. The study revealed that the formulation is capable of enlarging the pores and enhancing the cleansing of the skin by removing dead skin on the surface.

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CONFLICT OF INTEREST

No interest

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