

Formulation & Evaluation of Activated Charcoal Peel off Mask

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Abstract: Over the past few years, activated charcoal has been used as an active ingredient in cosmetic products. Due to its adsorbing properties, it is well being used in all kinds of beauty products from face masks to cleansers and also even soaps. Activated charcoal is used as an active ingredient in this formulation. Natural remedies are more acceptable in the belief that they are more safe with fewer side effects than the synthetic formulations. Herbal formulations have growing demand in the world market. Herbal face masks are applied to increase the blood circulation, rejuvenates and helps to maintain the skin elasticity and it also remove the dirt from skin pores. It is a very good endeavor to establish the herbal face mask containing various herbal powders. The main advantage of herbal cosmetics is its non-toxic nature, and it reduces the allergic reactions. In this article, we have formulated activated charcoal peel off mask and also evaluated it by using different test methods. The formulation showed amazing results after its application. The use of these face masks include cleansing, moisturizing and nourishing facial skin. 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, peel off mask, film forming, mask, dead skin

I. INTRODUCTION

The cosmetics are the utility product used extensively throughout the world for maintaining and improving general appearance of face and other parts of body e.g. skin, eye, hair, hand, etc. herbal cosmetics are the preparation which represent cosmetics associated with active bio- ingredients, nutraceuticals and pharmaceuticals. Peel-off mask have been developed especially for cosmetic treatment which is used in beauty salon. Our mask is applied directly on the skin because our

formulation is in ready to use form. When it applied on skin and it slowly hardens, moisture collects in the horny layer under the elastic mask film, through which air and water is not allowed to permeate. At the same time on other the hand, the main active substances and other active substances of the formulation, are able to penetrate well into the skin and intensively supply the substances within a short space of time. [2] In Solid film peel off mask film forming ingredients used is named as tragacanth gum which is responsible for forming a film on face after drying for few minutes. After removal, it provides clean, fresh and moisturized skin, removes dead skin layer and other debris deposited on the facial skin.

The skin cleansing and smoothening effect is revealed after using it. [3] vPeel off Mask gently stimulates the metabolism because of its occlusive effect. Waste products and accumulated tissue fluid are quickly transported away. So that, A significantly improved skin profile is quickly achieved. The outer most layer of the body is skin that's why it is easily get contaminated from outer environment hence, it is necessary to protect the skin. [4] Peel off mask can be used as a remedy in treatment of facial skin related problems such as black hairs, dark spots, dead skin, white heads and especially used to open the closed pores then remove dirt and closing it. Its main role is to Stimulate the metabolism because of its occlusive effect heads. The most important feature of this peel off mask is its adsorption capacity. It removes a large variety of particulates or contaminants, which can be either organic or inorganic contaminants.



History:

The Charcoal has been used since 3750 B.C., when the Egyptians utilized it extensively to cure a variety of intestinal issues, including diarrhea, bloating, and constipation, in addition to masking the smells of mining. More emphasis is now focused on using activated charcoal as soon as possible. Patients who have consumed a potentially dangerous amount of a poison (which is known to be adsorbed to charcoal) up to 60 minutes prior should be evaluated for using activated charcoal (Position statement 1997). In the meanwhile, some writers contend that administering activated charcoal within two hours of an overdose would make sense. Nevertheless, despite sporadic studies suggesting improved removal of specific toxins, there is no proof that activated charcoal truly enhances therapeutic result. Furthermore, there is a dearth of evidence to support the efficacy of charcoal used in repeated doses. Charcoal was originally used to cure poisoning victims over 150 years ago. Even though activated charcoal is now almost universally accepted, the focus on treating poisoned patients with gastric emptying first has obscured the significance of activated charcoal. We go over how activated charcoal is currently used and new research that indicates it could be the only treatment that works best for a variety of poisonings. Enterohepatic loop disruption and „back diffusion“ are two new theories about the mechanisms of action. Clinical evidence supports activated charcoal’s novel and proactive function in treating poisoned and overdosed individuals.

Benefits of Applying peel off Mask:

1. It nourishes the skin.
2. It helps to reduce acne, and blackheads depending on its herbal ingredients.
3. Face masks usually remove dead cells of skin.
4. These face masks provide a soothing and relaxing effect on skin.
5. They help to restore the lost shine and glow of skin in short span of time.

Advantages of charcoal peel off Mask :

1. Deep Cleansing: Activated charcoal helps draw out impurities, dirt, and excess oil from deep within pores.
2. Unclogs Pores: The peeling action removes blackheads, whiteheads, and dead skin cells, reducing pore congestion.
3. Oil Control: Helps absorb excess sebum, making it effective for those with oily or combination skin.
4. Smoother Skin Texture: By removing surface debris and dead skin, it leaves the skin feeling softer and smoother.
5. Brightening Effect: With regular use, it can improve skin clarity and give a fresher, more radiant appearance.
6. Temporary Tightening: The mask can give a short-term tightening effect, making the skin feel firmer.

Disadvantages of charcoal peel off mask:

1. Skin Irritation and Sensitivity: The strong adhesive nature of peel-off masks can cause redness, irritation, or even microtears in the skin, especially for sensitive or dry skin types.
2. Strips Away Natural Oils: These masks can remove not only dirt and blackheads but also beneficial oils, leading to dryness, flakiness, and disrupted skin barrier.
3. Painful Removal: The peeling process can be uncomfortable or painful, particularly if the mask sticks to facial hair or fine vellus hair on the skin.
4. May Worsen Acne: For some, the harsh nature of these masks can aggravate acne or cause breakouts by disrupting the skin's natural balance.
5. Temporary Results: While these masks can provide an immediate "clean" look, they often don't address the root causes of blackheads or clogged pores, so the effects are short-lived.
6. Risk of Allergic Reaction: Some charcoal masks contain synthetic fragrances, preservatives, or alcohols that can trigger allergic reactions or worsen eczema and dermatitis.

Literature Review:

1) Patel et al. (2019) formulated a herbal charcoal peel-off mask using polyvinyl alcohol (PVA) as the film-forming agent and glycerin as a humectant. The formulation showed effective spreadability, uniform film formation, and



acceptable drying time. The study concluded that the mask was cosmetically elegant and provided satisfactory cleansing effects.

2) Rani et al. (2020) developed a charcoal-based face mask and evaluated its physicochemical properties including pH, viscosity, and drying time. Their findings indicated that a formulation with a pH close to the skin's natural level (5.5–6.5) minimizes the risk of irritation while maintaining effective application and peel-off properties.

3) Singh et al. (2018) focused on the use of activated charcoal in skincare formulations. Their study highlighted the adsorptive capacity of charcoal and its ability to bind to oil, dirt, and other skin impurities, making it beneficial for acne-prone and oily skin.

4) Khan et al. (2020) prepared and evaluated a charcoal face mask incorporating herbal extracts like neem and aloe vera. They reported enhanced antimicrobial and anti-inflammatory effects along with favorable film-forming characteristics. Evaluation parameters included organoleptic properties, peel-off efficiency, skin compatibility, and consumer acceptability.

5) Sharma and Gupta (2021) studied the safety aspects of peel-off masks containing activated charcoal. Their research stressed the importance of dermatological testing and the inclusion of soothing agents to prevent adverse effects such as redness or irritation after use.

6) Facial masks are topical formulations widely used in dermatology and cosmetology for cleansing, exfoliating, and rejuvenating the skin. Among these, activated charcoal masks have gained substantial popularity due to their deep-cleansing properties and ability to adsorb impurities from the skin. Several studies have been conducted to investigate the formulation strategies, physicochemical properties, and evaluation parameters of such masks to enhance their efficacy, safety, and user compliance.

7) Pateletal.(2019)developedaherbapeel-offfacemaskincorporatingactivated charcoal, polyvinyl alcohol (PVA), glycerin, and plant extracts. The study aimed to evaluate its cosmetic acceptability, spreadability, and skin cleansing potential. PVA acted as the

8) primary film-forming agent, providing the peel-off effect, while glycerin helped maintain skin hydration. Their results showed that the optimized formulation exhibited satisfactory organoleptic properties, good film-forming capacity, and acceptable drying time. This study emphasized the importance of balancing film-forming polymers with moisturizing agents for optimal user experience.

9) Rani et al. (2020) conducted a study on the formulation and assessment of a charcoal- based facial mask focusing on physicochemical and performance parameters. Their evaluation included pH, viscosity, spreadability, drying time, and consumer perception. The ideal formulation showed a pH range of 5.5–6.5, suitable for skin application. The study also reported that the peel-off mask effectively removed surface impurities and provided a smooth skin texture post-application. They highlighted the importance of maintaining appropriate rheological properties to ensure ease of application and removal.

10) Khan et al. (2020) formulated a polyherbal charcoal mask using activated charcoal in combination with herbal extracts such as neem, tulsi, and aloe vera. The primary objective was to enhance the antimicrobial and anti-inflammatory effects of the mask. The researchers observed that the mask showed significant microbial inhibition against common skin pathogens and reduced inflammation, which is beneficial for acne-prone skin. Furthermore, their evaluation included sensory testing and dermatological assessments, which showed minimal irritation and good user satisfaction.

11) Singh et al. (2018) reviewed the role of activated charcoal in cosmetic and dermatological products. The review discussed the high adsorptive surface area of activated charcoal, which makes it effective in trapping sebum, dirt, and toxins from the skin. They pointed out that charcoal is often combined with botanical agents to enhance its therapeutic value. The study also mentioned that improper formulation could result in over-drying of the skin, indicating the need for careful formulation balance.

12) Sharma and Gupta (2021) conducted safety and irritation testing on a series of peel-off facemasks containing activated charcoal. Their work focused on skin compatibility, with a particular emphasis on reducing adverse effects such as erythema, dryness, or itching. The study showed that the inclusion of soothing agents such as



chamomile extract or allantoin significantly reduced irritation potential, suggesting their incorporation as a good practice in charcoal mask formulation.

13) Moreover, Ali et al. (2021) explored consumer preferences and acceptability of various charcoal masks in the market. Their study showed that consumers prefer products that offer a balance between fast drying time, ease of removal, and skin-softening effects. Products that caused discomfort during peeling or had overly strong fragrances were less favored, highlighting the importance of optimizing not just the functional but also the sensory properties of the formulation.

14) Overall, the literature suggests that while activated charcoal is a powerful detoxifying agent, the success of a charcoal mask lies in the careful selection and optimization of excipients, film-forming agents, moisturizers, and herbal components. Evaluation parameters such as drying time, pH, spreadability, viscosity, and irritation potential are critical to ensure both safety and consumer satisfaction. Future studies should focus on long-term effects, clinical trials, and advanced delivery systems for improved efficacy.

Aim & Objective :

Aim:

Formulation & Evaluation of Charcoal Based Herbal Peel-off Mask

Objectives:

1. To develop a peel-off face mask formulation using activated charcoal along with suitable film-forming agents and excipients.
2. To optimize the formulation based on key parameters such as spreadability, viscosity, pH, and drying time.
3. To evaluate the physical characteristics of the formulated mask including color, texture, consistency, and ease of application.
4. To assess the performance of the mask with regard to peel-off efficiency and cleansing effect (e.g., removal of impurities, blackheads, or oil).
5. To perform skin irritation and safety testing to ensure dermatological compatibility of the product.
6. To analyze user acceptability through a small-scale consumer feedback or survey.

MATERIALS AND METHODS:

Plant material: All the ingredients used in the

formulation i.e., tragacanth powder, orange peel, neem powder, nutmeg powder, babool gum, turmeric powder and aloe vera were purchased from local market and also some ingredients were obtained from plants (garden). [11] The details of all ingredients used in peel off mask formulation are mentioned below;



Figure 1. Ingredients used in formulation



(a) Activated charcoal powder:

Activated charcoal powder was prepared in laboratory, Lucknow Model College Of Pharmacy, sadrauna, lucknow. It was prepared by burning the bark of neem in muffle furnace and absorbing dust particles and opening the blocked pores.



Figure2. (a)Charcoal



Neembark

(b) Tragacanth powder: Firstly, gum was purchased from market. After then, powder was prepared by crushing the gum by the use of mixer grinder. It used as an emollient in cosmetic.

(c) Orange peel powder: Orange peel was purchased from the juice shop. Peel was dried in sunlight for 2 or 3 days. When the peel was dried properly then grind it. Finally, powder was obtained. It shows an Anti-oxidant, anti-inflammatory, anti-microbial activity. The properties of orange peel can maintain the natural balance of skin oils and tighten the skin by absorbing excess oils and removing dead skin cells. Orange is a citrus fruit that contains various sources of nutrition such as vitamin C, calcium, potassium and magnesium.



(d) Neem powder: Leaves of neem were dried in sunlight for 24 hours and then ground by using a mixer grinder. Finally, powder was obtained. It contains antibacterial, anti-fungal, anti-inflammatory, antiseptic properties and also it is highly beneficial for oily and acne-prone skin.



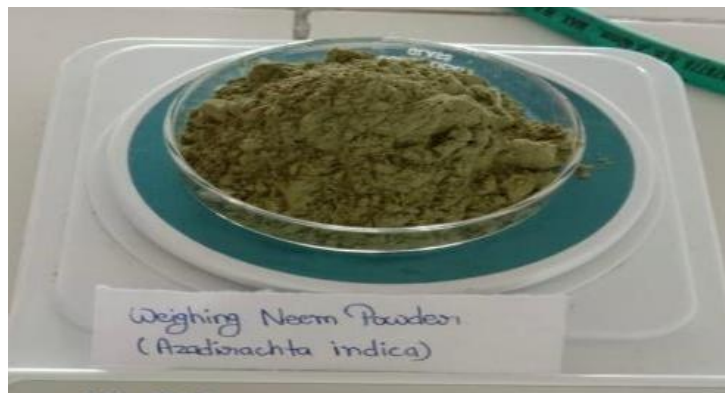


Figure4.Neempowder

(e) Aloe vera: Aloe vera was obtained from the garden Peel off the outer layer of aloe vera and get the pulp. Lastly aloe vera gel was obtained by grinding the pulp in a grinder. Aloe vera rejuvenates skin, moisturizes it and keeps the skin fresh all time. Aloe vera has anti-microbial property making it ideal for treating acne and pimples.



Figure5.(a)Aloe vera plant (b)Aloe vera pulp

(f) Nutmeg powder: Nutmeg fruit was purchased from market and break the fruit in small pieces in mortar pestle. Powder was prepared by grinding the small pieces of fruit in mixer grinder. Nutmeg powder has Antibacterial, anti-inflammatory, antiseptic, bactericidal activity. It is used to reduce wrinkles, fine lines and other signs of aging.

Nutmeg powder

whole turmeric. It protects the skin from many skin infections and also adds glow to the face. Turmeric is mainly used to revive the skin. It reduces the signs of aging like wrinkles and also contains other properties like antibacterial, antiseptic and anti-inflammatory.



Turmeric powder



Method of preparation:

1. Firstly, weighed all the ingredients accurately.
2. Took mortar and pestle and put turmeric powder and nutmeg powder in it.
3. Triturate the above mixture properly.
4. After then, add neem powder, orange peel powder, and tragacanth gum one by one respectively and also triturate the mixture after every addition for proper mixing.
5. Add aloe vera to the powder mixture.
6. Finally charcoal was added to the above preparation and formulation was prepared.
7. Perfuming agent was added to the formulation to enhance the odour of product.



Herbal peel off activated charcoal face mask.

Tableno. 1 Ingredients list with their quantity



| Sr. No. | Ingredients | Quantity (100gm) |
|---------|--------------------|------------------|
| 1 | Neem Powder | 10 gm |
| 2 | Nutmeg Powder | 3 gm |
| 3 | Orange Peel Powder | 10 gm |
| 4 | Turmeric Powder | 2 gm |
| 5 | Tragacanth Gum | 10 gm |
| 6 | Charcoal | 10 gm |
| 7 | Aloevera Gel | 55 gm |
| 8. | Perfuming agent | q.s. |

Evaluation:

1. Organoleptic properties: We have done the visual inspection of product and observed that it was of:- Colour:-Black

Odour:-Scented State:-Semisolid

Consistency:-Smooth and thick.

2. pH: The pH value of this purely herbal peel off mask was determined by using digital pH meter and pH value of this activated charcoal peel off mask was found to be

3. Irritancy test: The irritation test was done by applying a formulation on hand's back skin and leave it for 15 minutes to check irritation reaction such as swelling, itching and redness effect on the skin.

4. Spreadability test: Placed 1 gm formulation on a butter paper and on the formulation put watch glass. After that 5gm weight was placed on watch glass for 2 minutes to compress the sample to uniform thickness and its diameter was measured.



Spreadability test



5. Peel off test: The formulation film of 4x4mm was spread on backside of the hands skin. Leave it for 15-20 minutes to dry properly. After 15-20 minutes, peel off the dry film from the skin surface. Easy removal of peel without any complications was observed.

6. Folding endurance: The formulation film was applied onto the skin. After drying, a portion of film (3x3cm) was cut and folded it at the same place until it was broken. Folding endurance can be defined as the value of number of times the film can be folded without breaking.

RESULT:

Table 2: The prepared peel off face mask was evaluated and data was reported in table 2.

| Sr.No. | Test | Result |
|--------|--------------------|--|
| 1 | Color | Black |
| 2 | Odour | Scented |
| 3 | Consistency | Smooth and thick |
| 4 | State | Semi solid |
| 5 | pH | 5.9 |
| 6 | Irritancy test | No irritation effect shown |
| 7 | Spreadability test | Smooth and light to spread |
| 8 | Peel off test | Peel removed from skin easily without breaking |
| 9 | Folding endurance | 20 |

II. CONCLUSION

Presently, people need cure for various types of skin related problems without side effects. Herbal ingredients provides an opportunity to formulate cosmetics product without any harmful effect. Herbal formulations are more acceptable in the belief that they are more safe and having less side effects as compare to synthetic formulations. This peel off mask are believed as a sustaining and productive way to advance the appearance of skin. Thus in the present work study, formulation shows good

attempt to formulate the herbal peel off mask containing naturally available ingredients like activated charcoal, turmeric, aloe-vera, orange peel, neem and nutmeg, tragacanth. In present study we found that the formulation was much more stable at room temperature and had good flow properties. This formulation shows compatibility with all types of skin and shows no irritation effect. This peel off

mask showed a good spreadability also which helps to make people comfortable during application. A good peel off property is shown by the formulation on human skin without causing skin edema or irritation. The study of this activated charcoal solid film peel-off mask revealed that it is capable of removing the dirt from skin-pores and increasing the cleanliness of the skin by removing dead

skin cells from the surface. And it also nourish and protect the skin from the outer environment.

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