IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

EVALUATION AND TESTING OF MARKETED FRENCH GREEN CLAY FACE PACKS AS PER BUREAU OF INDIAN STANDARDS

[1]Salomi Makhija, [2]Sangeeta Saharabuddhe

[1]Student, [2]Professor
Post-Graduation Department of Cosmetic Technology, LAD and Smt. R P College for Women, Seminary Hills, Nagpur, Maharashtra, India

Abstract: The skin is the largest organ of human body and is essential to care for it as it is in direct contact with external environment. The purpose of skincare cosmetics is to cleanse, preserve its moisture balance, stimulate its metabolism and protection from ultraviolet radiation. It is essential to have high grade of ingredients in it, otherwise the product may cause an adverse effect. Addition of natural ingredient, herb or clay may enhance the effect of cosmetic. French Green Clay is composed of iron oxides and kelp seaweed or other algae, along with other decomposed plant matter. The study of "Evaluation of marketed French Green Clay Face packs" is an attempt to explore the standards and compare different properties of five marketed face packs and one face pack made in laboratory.

***Index Terms* - Face pack, Evaluation and testing, marketed products, microbiological testing, product usage.**

INTRODUCTION

Acne, blackheads, pimples, dark circles, and tanned skin are all too common nowadays. (1) Skin has 3 layers: Epidermis, Dermis and Sub cutaneous tissue. It is sensitive and a barrier of human body that is exposed to pollutants.(2) Face skin indicates an individual's health. Face pack is used for facial application. (3) These are applied to the face as a liquid or paste, and then allowed to dry and set to form a film that tightens, strengthens, and cleanses the skin.(4) Face packs are one of the most ancient and attractive ways to cleanse your skin. (5)

Advantages of using Face Pack:

1. It hydrates the skin and eliminates dead skin cells.
2. Depending on the components, it can help to minimise acne, pimples, scars, and markings. Acne, pimple, and blackhead face packs usually regulate excessive sebum production from the sebaceous glands and remove dangerous germs from the acne lesion.
3. Face packs are used to eliminate dead skin cells.
4. Face packs can be used to successfully battle the damaging effects of pollution and harsh weather.
5. They are used to effectively cleanse the face while eliminating the keratinous layer's outer layers. This type of deep cleansing does have a "peeling" effect, but it is very superficial, and the degree of peeling is insignificant when compared to a medical skin peeling operation performed by a skilled physician. (6)
6. They provide a relaxing impact and helps in rapid restoration of skin's lost glow.
7. They improve skin texture and appearance. (6)
8. They can effectively limit the formation of wrinkles, fine lines, and skin sagging.(7)

Characteristics of Face pack:

1. It should be a smooth paste with no gritty particles or an aroma that is 'earthy' or similar.
2. When applied to the face, it should dry quickly to form an adherent coating on the skin, but this coating should be able to be removed later without causing discomfort, either by peeling off the face or by gentle washing.
3. It should provide the skin a distinct tightening sensation following application.
4. It must be non-toxic and dermatologically safe. (4)

Precautions when using a Face Pack:

1. Choosing a face pack according to skin type.
2. Not leaving it on for more than 15 to 20 minutes. Keeping for an extended period of time might cause wrinkles, sagging skin, and growth of open pores.
3. Avoiding scratching or peeling the dried face pack and not scrubbing face too hard.
4. When using a face pack, applying it away from the "eye zone." (7)

Types of Face Packs:

Masks that peel off and Packs that rinse off**.** According to Bureau of Indian Standards, these have been classified as Type 1: Pastes and Type 2: Powder. There are new types of face pack taking over the market Souffle face pack, Bubble Face pack. [8] There are five face pack systems: wax, rubber, vinyl resins, hydrocolloids, and earth.[4]

French Green Clay: French green clay is a skin-soothing miracle product also known as Sea Clay or Illite Clay, is the finest fraction of sediments made up of various minerals and organic matter.[9] It offers a lot of advantages for all skin types. Illite clays are typically created by weathering or by alterations brought about by heat and acidic ground water in aluminium-rich minerals. They frequently coexist with kaolinite clays. French rock quarries held a virtual monopoly on its production up until comparable Illite clay resources were discovered in China, Montana, and Wyoming, which is how French green clay got its moniker. French green clay is a fusion of algae, iron oxides, and other naturally decaying substances like chlorophyll that is obtained from natural resources. The iron oxides and decayed plant debris, primarily, kelp seaweed and other algae give the clay its green color. Clays with a grey-green color are less desirable than those with a brighter color. Montmorillonite, dolomite, magnesium, calcium, potassium, manganese, phosphorus, zinc, aluminium, silicon, copper, selenium, and cobalt are among the other elements that make up French green clay.

Processing: It is crushed and sun-dried and made a dry powder.[10]

Uses: It exfoliates dead skin cells. It's gentle on skin but tough on extraneous substances. One of the most beneficial results of using French green clay is the healing of blemishes. It also helps to remove dirt and grime while constricting pores and making them less noticeable. One of the most common reasons of outbreaks and stubborn acne is excessive sebum. It lowers oiliness without damaging the natural hydration of your skin. [11]

MATERIAL AND METHOD: In this experiment, five marketed products are selected and one product is made in the laboratory which are compared and tested. The formulation is made by minimal use of raw materials and selecting Kaolin as base with other ingredients like French green clay, Glycerine, Magnesium aluminium silicate, Polysorbate 80, Polyethylene Glycol 4000, Ethylenediamine Tetraacetic Acid and Sodium benzoate. Testing is done according to the Bureau of Indian Standards along with some additional tests which are important in evaluating the parameters of the face packs.

PREPARATION OF FACE PACK ON LABORATORY SCALE:

Formulation of Face pack: The very first step is selecting the base and type of face pack to be prepared; paste or powder. The marketed products selected were paste type. Kaolin, one of the mildest and most gentle clay, is selected as the base. Other ingredients are incorporated which give the pack its texture, consistency and properties like forming a non-gritty, easily removable film which does not dry the skin.

METHOD OF MANUFACTURING: All the ingredients are weighed. Powder ingredients are sterilised in oven at 105 ± 2℃. Kaolin, Magnesium aluminium silicate, French green clay, EDTA and Sodium benzoate are added to water slowly with constant mixing. It is allowed to swell for some time and Glycerine, PEG 4000, Polysorbate 80 and Propylene glycol are added. It is then transferred to a container. The formulation of Face pack is shown in Table no. 1 below.

Table no. 1 – Formulation table for Face pack

Ingredients	Quantity Taken (100 gm)
1. Kaolin	30 gm
2. Magnesium Aluminium silicate	5 gm
3. Glycerine	6 ml
4. French green clay	4.5 gm
5. Sodium benzoate	0.5 gm
6. Distilled water	46.8 ml
7. PEG 4000	3 ml
8. Polysorbate 80	2 ml
9. EDTA	0.2 gm
10. Propylene glycol	2 ml

TESTS PERFORMED AS PER BIS:

1. Determination of pH
2. Determination of stability at 45 +/- 1ºC for 48 h phase separation
3. Residue on evaporation, percent by mass, Min
4. Loss on drying, percent by mass
5. Ash content, percent by mass, Min
6. Microbial purity: (a) Total viable count, CFU/g (b) Gram negative pathogens, CFU/g

ADDITIONAL TESTS:

7. Sensitivity
8. Grittiness
9. Drying time
10. Spreadability

Requirements for Face pack as per Bureau of Indian Standards are shown in Table no.

Table no. 2 - Requirements for Face pack as per Bureau of Indian Standards (12)

Sr. No	Characteristics	Requirements Type 1	Type 2	Method of Test, Ref. to Annex no.
1.	pH	5-9	5-9	A
2.	Stability at 45 ± 1°C for 48-hour phase separation	Stable, not noticeable	-	B
3.	Solid content (residue on evaporation), percent by mass, Min	10	-	C
4.	Loss on drying, percent by mass, Max	-	5	C
5.	Ash content, percent by mass, Min	-	85	D
6.	Microbial purity:(a) Total viable count, CFU/g (b) Gram negative pathogens, CFU/g	Not more than 1000 Less than 10		14648 (E) 14648

Table no. 3 shows results of the tests performed.

Table no. 3: Results of tests performed

Sr. No	Characteristics	Standards	Sample no.1	Sample no. 2	Sample no. 3	Sample no. 4	Sample no. 5	Sample no. 6 (Lab made)
1.	Determination of pH	5-9	8.09	8.07	7.85	8.24	8.11	8.13
2.	Determination of stability	Stable, not noticeable	Stable	Stable	Stable	Stable	Stable	Stable
3.	Determination of Residue on evaporation and Loss on drying	ROE: 10 (min) and LOD: 5 (max)	76 and 5.3	80 and 5.2	83 and 5.3	86 and 5.4	76 and 4.9	83 and 4.9
4.	Ash content	85 (min)	85	90	90	86	88	87
Additional Tests								
1.	Sensitivity	Absent	Absent	Absent	Absent	Absent	Absent	Absent
2.	Grittiness	Absent	Absent	Absent	Absent	Absent	Absent	Absent
3.	Drying time	10-15 min.	10 min.	10 min.	20 min.	15 min.	20 min.	15 min.
4.	Spreadability		Spread easily	Spread easily	Spread easily	Spread easily	Spread easily	Spread easily

Microbiological analysis: Below figures show results of Total viable count for all the samples.

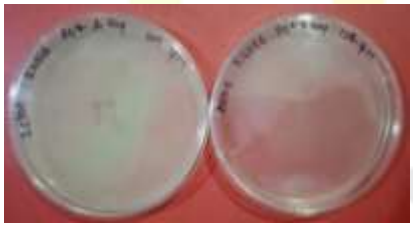

Fig. no. 1

Sample 1 Fig. no. 2

Fig. no. 3

Sample 2 Fig. no. 4

Fig. no. 5

Fig. no. 6

Sample 3

Fig. no. 7

Fig. no. 8

Sample 4

Fig. no. 9

Fig. no. 10

Sample 5

Fig. no. 11

Fig. no. 12

Sample 6

Table no. 4 below shows results for microbial analysis of all the samples according to BIS.

Table 4 - Standards and results for Microbial content according to the BIS

Microbial content/ limit	**Requirements**	**Sample 1**	**Sample 2**	**Sample 3**	**Sample 4**	**Sample 5**	**Sample 6 (Lab sample)**
a) Total viable count	Not more than 1000 cfu/g	<10	<10	<10	<10	<10	<10

RESULTS:

TESTS AS PER BIS

1. **Determination of pH:** The order of pH of the face pack samples is – Sample 4 > Sample 6 > Sample 5 > Sample 1 > Sample 2 > Sample 3
2. **Determination of stability:** All six samples are stable with no noticeable separation.
3. **Determination of Residue on evaporation:** The order for Residue on evaporation of samples is: Sample 4 > Sample 6 = Sample 3 > Sample 2 > Sample 5 = Sample 1
4. **Determination of Loss on drying:** The order for Loss on drying of face pack samples is: Sample 4 > Sample 1 = Sample 3 > Sample 2 > Sample 5 = Sample 6
5. **Determination of Ash content:** The order for Ash content of face pack samples is: Sample 2 = Sample 3 > Sample 5 > Sample 6 > Sample 4 > Sample 1
6. **Microbiological analysis:** The Total viable count of all the samples was found to be less than 10. They are all safe to use.

ADDITIONAL TESTS:

7. **Determination of Sensitivity:** No red patches were found after application of samples.
8. **Determination of Grittiness:** No gritty particles were found in any of the samples.
9. **Determination of Drying time:** The order of drying time of face pack samples is: Sample 5 = Sample 3 > Sample 4 = Sample 6 > Sample 2 > Sample 1
10. **Determination of Spreadability:** All the samples were found to be easily spreadable.

DISCUSSION AND CONCLUSION: Customers are not fully aware about the right products and usually buy the product which is popular in the market or the ones which are recommended by someone. They don't know the toxicity levels of the additives, the ideal concentration level for the basic materials, properties of the face pack offered by the basic raw materials and additives, as well as the restrictions of the standards that the business must uphold. Face packs are a unique method in which the preparation is put to the skin as a reasonably thick layer and then removed after a certain amount of time. In the present study, five samples were collected from the market and one laboratory sample was formulated using French green clay along with basic raw materials. It was evaluated on the basis of the qualitative and quantitative parameters. The various parameters like Residue on evaporation, Ash content, Spreadability, Microbial testing, Grittiness, etc of all the 6 samples of face packs were performed as per the Bureau of Indian Standards specification for Face pack. The pH of all the samples is within the given range thus safe to use. Loss on drying within the given range thus the amount of volatile matter and moisture present in the face packs is within range. Ash content determines the inorganic non-combustible material it contains. The microbiological examination concluded that all the samples are safe to use as the Total viable count is less than 10. Stability study showed no separation of face pack under given conditions. Stability study 2 concluded that all six face pack samples are stable under specific conditions along with their organoleptic properties for 28 days.

The subjective evaluation tests of all six face pack samples were carried out and none showed sensitivity and were free of gritty particles. The samples were easily spreadable, drying time was 10-15 minutes and caused no irritation after removal. Thus, all six samples were found to be useful and acceptable under the specification of Bureau of Indian Standard of Face pack specification. The role of a company during marketing a product is to make the consumers aware of the pros and cons of the product.

ACKNOWLEDGEMENT: Authors are thankful to the Principal, Dr. Deepali Kotwal, Dr. Deepak Wasule, Head - Department of Cosmetic Technology, Dr. Sangeeta Sahasrabuddhe and all the teaching and non-teaching faculty for providing facilities and sharing their knowledge. I would like to acknowledge Qualichem laboratory for their guidance.

REFERENCES

1. Yadav, N. and Yadav, R. 2015. Preparation and evaluation of Herbal face pack. International Journal of Recent Scientific Research, 6(5): 4334-4337.
2. Kulkarni, S. Arun, D. Gupta, K. and Abdul, A. 2019. Formulation and evaluation of Activated charcoal peel-off mask. International Journal of Pharmacy Research & Technology, 9(2): 1.
3. Sahare, A. Agrawal, T. Gupta, S. Panpaliya, D. and Dhoke, P. 2021. Formulation and Evaluation of Polyherbal Face Pack for Healthy Skin. International Journal of Innovative Research in Technology, 8(4):1-2
4. Harry, R. Harry's Cosmeticology, 1: 276.
5. Aglawe, S. Gayke, A. Mindhe, S. and Rane, V. 2018. Formulation and evaluation of herbal face pack. International Journal of Pharmacy and Biological Sciences, 8(4): 49-52.
6. Shai, A. Maibach, H. and Baran, R. 2009. Handbook of cosmetic skin care. Facial cleansing masks. Informa Healthcare, 2: 43.
7. Grace, X. Vijetha, R. Shanmuganathan, S. and Chamundeeswari, D. 2014. Preparation and evaluation of Herbal face mask. Adv J Pharm Life sci Res, 2(3): 1-6.
8. Saxena, S. 2021. Bubble mask: Saturates and gently exfoliates your skin, TOI.
9. Williams, L. and Haydel, S. 2010. Evaluation of the medicinal use of clay minerals as antibacterial agents, International geology review, 52(7/8): 4.
10. Encyclopedia team. French Green Clay. Encyclopedia.com, 1:3-6
11. Pierce, K. 2022. French Green Clay Benefits for Glowing Skin, Femmenordic, 1:1-2.
12. Corfman, K. Comparability and Competition Among Consumer Products: A Typology For Specifying Hierarchical Comparison Structures. Advances in Consumer Research, Association for Consumer Research, 14: 29-31.
13. Sharma, G. Gadhiya, J. and Dhanawat, M. 2018. Textbook of Cosmetic Formulations, 1:3.
14. BIS Face pack, IS 15153:2002.