



## FORMULATION, DEVELOPMENT AND EVALUATION OF SELF FOAMING BUBBLE FACE MASK

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Communicated : 23.01.2023

Revision : 28.02.2023 & 08.03.2023

Published : 30.05.2023

Accepted : 03.04.2023

### ABSTRACT:

The healthy glowing skin reflects our origin, lifestyle, age and state of health. Now a days using face mask have become popular for men and women for relaxing, cleansing and rejuvenating the skin. Face mask is a skin care product that deeply cleanses excess of dirt, make up and grime from skin. It provides hydration and moisture to the skin. Bubble face mask was designed to add joyful feeling while applying face mask leaving behind fresh and rejuvenating after feel effects. So, basically bubble face mask with Methylperfluorobutylether as an active material introduce some oxygen to the skin, this improves circulation and bring nutrition to the skin cells. Methylperfluorobutylether is colourless, odourless, non-flammable and non-toxic material. It shows self-foaming and cleansing property. Self-foaming face mask was developed by using different concentrations of active, and final formulation with 10% of an active was evaluated for functional parameters such as pH, colour, odour, appearance, cleansing effect, foaming ability, spreadability, ease of removal, and irritancy on skin. Product was subjected to stability study and subjective evaluation on panel of human volunteers. The study showed that the self-foaming face mask gives good cleansing effect on skin with no harsh effects.

**Keywords:** - Self-Foaming, Methylperfluorobutylether, Rejuvenating, Bubble face mask, Cleansing Effect, foaming ability.

### INTRODUCTION :

Cleansing gives the sense of relaxation at the end of the occupied day. Skin determines one's personality. As healthy, flawless and radiant skin has been an object of desire since ages [1]. The main function of skin is to protect body from external physical, chemical and biological assailants to keep dirt out and water in during its evolution. The skin also protects us from microbes and helps to regulate body temperature and permit the sensation of touch, heat and cold [2]. Thus, skin care cosmetics are getting more and more important in daily life. Since the physical key to cosmetic usages is product performance and physiological key is enhanced sense of wellbeing [3]. Today modern skin care includes cleansing, soothing, restoring, reinforcing and protecting. There are various kinds of skin care products available in market

such as cleansers, exfoliators, toners, face mask, serum, moisturizers etc. [4]. The face masks are formulated to hydrate skin, remove excess oil, improves the appearance of pores, provide relaxation and healthy skin [5]. The face mask are formulated in the form of cream, ointment, lotion, serum or sheet and they act as a vehicle that delivers active to skin with the main objective of enhancing appearance and quality of skin [6]. They are allowed to dry or set after application, gives warmth and tightening effect and produce stimulating sensation of a rejuvenated face [5]. Bubble face mask is tightly packed mixture of ingredients which forms bubbles on application to the skin. The bubble face mask can be the way to enjoy cleaning of skin along with a lot of bubble to make it fragrant, relaxing and removing all dirt, dust and other impurities. The theory behind that is

the bubbling action, removes impurities from skin and infuses it with oxygen giving fresher, brighter, complexion after use [7]. Methylperfluorobutylether is clear, colorless, odorless, non-toxic liquid having molecular formula  $C_4F_9OCH_3$ . It consists of carbon and fluorine atom having ability to dissolve significant quantity of most gases such as oxygen. It has cleansing capacity 0.01 to 20% by weight and is preferable usage level for Methylperfluorobutylether for cosmetic formulations [8].

### **MATERIALS AND METHODS :**

#### **Analysis of Methylperfluorobutylether**

Methylperfluorobutylether was procured for the present study from Chemico Health and Beauty India Pvt. Ltd. Thane, along with Certificate of Analysis. The procured sample was validated for parameters such as appearance, odour, purity and boiling point. (Table No. 3)

#### **Formulation of Self Foaming Bubble Face Mask**

Three different trials (T-1, T-2, and T-3) of Self Foaming Bubble Face Mask base with different concentrations of ingredients were formulated and summarized in Table no.1.

All the ingredients were weighed accurately and taken in clean and dried beaker. Sodium Lauryl Ether Sulphate was taken in a beaker after that all the ingredients were added one by one and mixed well. The base of self-foaming bubble face mask was transferred to a suitable container. All the three base formulations were evaluated with respect to the parameters like appearance, color, consistency, thermal stability, feel, spreadability and pH. From the results it was observed that the Trial-3 base gave satisfactory characteristics, (Table No. 4), hence it was selected as a suitable self-foaming bubble face mask base for incorporation of Methylperfluorobutylether. Three different concentrations of Methylperfluorobutylether (i.e., 5%, 7%, and 10%) were incorporated in selected base

formulation Trial-3 and summarized in Table no.2.

#### **Study of functional parameters of Bubble face mask**

The study of functional parameters like appearance, color, odour, consistency, spreadability, feel, thermal stability, foaming ability and pH was carried out for all the three self-foaming bubble face mask formulations i.e., for T-I (Methylperfluorobutylether 5%), T-II (Methylperfluorobutylether 7%), and T-III (Methylperfluorobutylether 10%). The results are summarized in Table no.5. From the observation it was found that the Formulation T-III with 10% Methylperfluorobutylether shows satisfactory results with respect to consistency, foaming and bubble formation. So, it was selected as final formulation for further study.

#### **Accelerated stability study**

Stability of the product is an integral part of its development. Stability study ensures the product quality, safety and efficacy throughout its shelf life [9, 10]. Stability testing analyzes the effect of environmental factor specifically on quality of the product which is used for predication of its shelf life, determines proper storage condition [11]. Besides this the data which generated during stability testing is an important requirement for regulatory approval for any formulation. Accelerated stability study is preferred as it requires shorter test time [12]. The selected bubble face mask formulation T-III was subjected to accelerated stability study for parameters like color, odor, and pH changes in at three different temperatures (i.e., in oven at  $45 \pm 2^\circ C$  in refrigerator at  $4 \pm 2^\circ C$  and at room temperature at  $28 \pm 2^\circ C$ ) for 28 days. The results are summarized in Table no.7.

#### **Patch test**

This test was performed on bend of elbow of human volunteers with their consent. The site of patch was inspected after 24 hours from the time of application. The results were noted.

### Subjective evaluation

The selected bubble face mask formulation (T-III) with 10% active material was given to 24 subjects (human volunteers) of age group 20-45 years to evaluate the functional parameters like cleansing effect, bubble formation, ease of removal, ease of spreading. The results are shown in Graph no.1.

### RESULT AND DISCUSSION :

A regular routine of cleansing can give healthy, flawless and radiant skin hence skin care cosmetics are getting more important in daily life. Bubble face mask with Methylperfluorobutylether as an active ingredient was formulated to provide cleansing effect with lot of cool and fun elements. The product foams by itself after rubbing on skin and cleanses it with formation of bubbles. From the analysis of Methylperfluorobutylether it was observed that procured sample passed the test as per Certificate of Analysis and hence was used to incorporate in base formulation (Table no. 3)

Three different trials (T-1, T-2, and T-3) of self-foaming bubble face mask base were prepared and evaluated with respect to parameters like appearance, color, consistency, thermal stability, feel, spradability and pH (Table No. 4). Trial-3 was selected as it gave satisfactory consistency for incorporation of Methylperfluorobutylether.

Three different concentrations of active (i.e., 5% Methylperfluorobutylether, 7% Methylperfluorobutylether, and 10% Methylperfluorobutylether) were added in selected base formulation (T-3), to formulate T-I, T-II and T-III face mask formulations respectively, and it was observed that T-III (with 10% active) shows more bubble formation and gave satisfactory cleansing effect.

From the result of analysis of T-III with 10% Methylperfluorobutylether, it was observed that

it is a good formulation with satisfactory consistency and formation of foam. (Table No. 6) From the result of stability study, it was observed that formulation (T-3) and T-III with 10% Methylperfluorobutylether was stable with respect to colour, odour and pH and the results are summarized in Table no.7.

From the results of patch testing on human volunteers, it was found that no reaction was occurred after removal of product immediately and even after 24 hours from application of product. Hence T-III was selected for subjective evaluation. Since, the final formulation T-III gave satisfactory cleansing and self-foaming effect, it was used for subjective evaluation. From the results of subjective evaluation, it was observed that bubble face mask T-III with 10% Methylperfluorobutylether was well appreciated. It caused no irritation to the skin during the usage and removal. It shows good cleansing effect in joyful manner with lots of bubbles. (Graph No. 1)

### CONCLUSION :

From the above study, it can be concluded that the self-foaming bubble face mask formulation T-III with 10 % Methylperfluorobutylether is a good formulation in terms of appearance, colour, cleansing, foaming, ease of spreading, ease of removal, and bubble formation ability. It cleanses the skin in a gentle joyful way along with cool and fun elements.

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**Table No.1. Formulation of Self Foaming Bubble Face Mask Base (T-1, T-2, T-3)**

S. N.	Ingredients	Quantity in % (w/w)			Use
		Trial-1(ml)	Trial-2(ml)	Trial-3(ml)	
1.	Sodium Lauryl Ether Sulfate	30	32	33	Primary Surfactant
2.	Cocobetaine	2.5	3	3.5	Foam Booster
3.	Glycerin	4	5	5	Humectant
4.	Cocodiethanol amide	2.5	2.8	3	Foam Stabilizer
5.	Methyl paraben	0.15	0.15	0.15	Preservative
6.	Water	60.35	56.55	54.85	Vehicle, Solvent
7.	Orange oil	0.5	0.5	0.5	Perfume

**Table No.2. Formulation of Self Foaming Bubble Face Mask with Methylperfluorobutylether (Active)**

S.N.	Ingredients	Quantity in %		
		T-I	T-II	T-III
1	Self-Foaming bubble face mask base (T-3)	95%	93%	90%
2	Methylperfluorobutylether	5%	7%	10%

**Table No.3. Results of Analysis of Methylperfluorobutylether**

S. N.	Characteristic	Requirement as per Certificate of Analysis of Methylperfluorobutylether	Result	Inference
1	Appearance	Colorless transparent liquid	Colorless transparent liquid	Passes the test
2	Purity	> 99.5%	99.90%	Passes the test
3	Odor	Slight Characteristic	Slight Characteristic	Passes the test
4	Boiling Point	-----	38.7° C	Passes the test

**Table No. 4. Observation of trials of self-foaming bubble face mask base**

S. N.	Parameters	Trial-1 (T-1)	Trial-2 (T-2)	Trial-3 (T-3)
1	Appearance	Good	Good	Satisfactory
2	Color	Good	Good	Good
3	Consistency	Unsatisfactory	Unsatisfactory	Satisfactory
4	Thermal Stability	Stable	Stable	Stable
5	Feel	Unsatisfactory	Better	Satisfactory
6	Spreadability	Good	Better	Satisfactory
7	pH	6.60	6.70	6.70

**Table No. 5. Result of analysis of bubble face mask base with different concentrations of active**

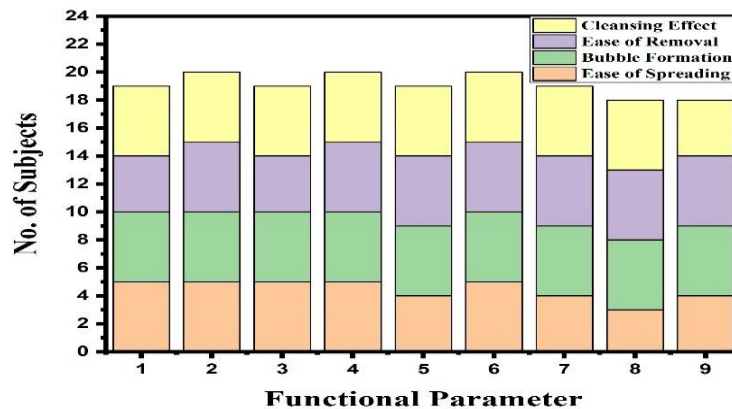
S.N.	Parameters	Formulation		
		T-I Base+5% active	T-II Base+7% active	T-III Base+10%active
1	Color	Transparent	Transparent	Transparent
2	Odour	Pleasant	Pleasant	Pleasant
3	Consistency	Unsatisfactory	Good	Satisfactory
4	Spreadability	Good	better	Best
5	Feel	Good	Good	Good
6	Thermal stability	Stable	Stable	Stable
7	Foaming ability	Less than satisfaction	Good foam formation	Satisfactory foam formation
8	pH	6.59	6.62	6.70

**Table No.6.Result of analysis of bubble face mask T-III with 10% Active**

S.N.	Parameters	Base+10% Methylperfluorobutylether
1.	Appearance	Good
2.	Thermal Stability	Stable
3.	Spreadability	Satisfactory
4.	Foam Formation	Satisfactory
5.	Consistency	Satisfactory

**Table No.7. Result of Accelerated stability study of T-3 and T-III**

S. N.	Formulation	Parameter	Oven 45° C	Refrigeration 4 ° C	Room Temperature
1	Trial Base (T-3)	Color (Pink)	No Change	No Change	No Change
		Odor	No Change	No Change	No Change
		pH	6.67	6.62	6.4
2	Selected bubble face mask (T-III) (with 10 % of Methylperfluorobutylether)	Color (Pink)	No Change	No Change	No Change
		Odor	No Change	No Change	No Change
		PH	7.1	6.95	6.7



**Graph No.1. Graphical representation of subjective evaluation of bubble face mask T-III with 10% Methylperfluorobutylether**