



Evaluation of silicon resin in color cosmetic

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ABSTRACT

Cosmetics are care substances used to enhance the appearance of the human body. Lipsticks, lipbalm, pomades are the cosmetic preparations used for lips. They may be derived from natural sources and many being synthetics. Lipsticks have become an almost universal constituent of makeup kits. Lipsticks put skillfully can substantially alter and enhance the apparent characteristics of the users lips.

Key Words: Color Cosmetic, Silicon Resin, Lipstick, Dimethicone Trimethyl Siloxysilicate, Stay On

INTRODUCTION

Lipsticks are commonly used for decorative effect on lips. Lipsticks the lip cosmetics moulded into sticks are essentially dispersions of coloring matter. It consists of a suitable blend of oils, fats and waxes. [1-3] The term stick refers to cosmetics composition having a consistency such that they can be moulded into the form of a stick by being heated until melted and then the molten mass is poured into a mould and cooled. [4]

The lipsticks contain waxes like beeswax, carnauba wax etc to make them solid and addition of lanolin, castor oil etc for pigment dispersing flavor and fragrances. [5] Lipsticks are used to impart an attractive color and appearance to the lips. The purpose of applying lipsticks is to color the lips to camouflage, to protect from wind etc. Such aim may be achieved in a number of ways. The main purpose of lipstick is to color and enhance the appearance of the lips. [6]

The lipsticks must be sufficiently convenient for handling it during preparation, use and storage. It should be free from blemishes, air holes, sweating, cracking etc. [7] The stick must be firm enough to draw clear lines. It must impart sufficient and uniform film of colour to the skin surface under modest pressure. [8] On application it should adhere well to the skin of the lips remaining substantially intact for several hours. It should not transfer readily to other surface such as tea cups, glasses, clothes etc. [9]

Lipstick belongs to the category of stay-on products. Stay on means after the application it should persist well to the skin of the lips remaining substantially intact up to 6-8 hours. It should not transfer readily to other surfaces such as tea cups, glasses, clothes etc unless something oily have been eaten or applied. [10]

The main objective of this study is to use silicon resin for lip preparations. This study emphasizes use and suitability of silicon resins for lip sticks. Silicon resins are the versatile ingredient in personal care products and show their impact on modern cosmetic formulations. [11]

MATERIALS

- Dimethicone Trimethyl Siloxysilicate (DMTMS)
- Pigments D & C Red No.6 (Lithol Rubin B, Ba Lake)
- D & C Red No.7 (Lithol Rubin B, Ca Lake)

METHODS

The silicon resin was selected for the study is Dimethicone Trimethyl Siloxysilicate (DMTMS) DMTMS is a 100% resins in dimethicone fluid.

PROPERTIES OF SILICON RESIN

- It improves water repellency [12]
- Long lasting emolliency [13]
- It does not get absorbed by the skin [14]

- It can enhance the durability of makeup^[15]
- It has potential for providing long wearing products
- In hot pour formulation they reduce tackiness and improve spreading of the product.^[16]

USES

Silicon resin have excellent potential for use in formulation like blushes, eye make, foundation etc because of their smooth, soft feel on the skin.^[17]

FORMULATION OF LIPSTICK

Lipstick is composed of coloring materials dispersed in blend of oils and waxes.^[18] The percentage of oils and waxes was adjusted to get the required formulation of the lipstick. The raw materials which were used in formulation are oils, waxes, pigments, DMTMS etc. Considering all above properties and uses of active, formulation of lipstick was selected. After various trial and errors made formulation as per Table 1 was selected as final formulation.

TABLE 1

S. No	Ingredients	Quantity (gm)
1	White Beeswax	8.5
2	Candellila Wax	4.0
3	Lanolin	3.0
4	Iso Propyl Myristate	9.5
5	Ozokerite wax	7.0
6	Paraffin wax	3.2
7	Carnauba Wax	3.0
8	Tocopherol	0.1
9	Propyl Paraben	0.1
10	Dimethicone Trimethyl Siloxysilicate	1.5
11	D & C Red No 6	0.5
12	D & C Red No 7	2.5
13	Castor oil	55.1
14	Titanium dioxide	2.0

EVALUATION OF STABILITY PARAMETERS OF ACTIVE IN LIPSTICK^[19]

The stability of final formulation was observed at three different temperatures that is $45 \pm 2^\circ\text{C}$, $25 \pm 2^\circ\text{C}$ and $4 \pm 2^\circ\text{C}$. Various parameters such as separation, sweating, softening, shape change was observed for 8 weeks. There was no significant change observed in above mentioned parameters of the product at $45 \pm 2^\circ\text{C}$, $25 \pm 2^\circ\text{C}$ and $4 \pm 2^\circ\text{C}$ temperatures. Accelerated stability studies showed that formulation with active was stable during the period of study.

EVALUATION OF LIPSTICK CONTAINING 1.5 % ACTIVE AS PER Indian standard S 9875:1990

Lipstick was evaluated for softening, breaking load value and as per specification of IS 9875:1990^[20]

Softening Point – It is done to check the temperature at which the stick softens and loss its shape. This is done to check the temperature up to which the stick is in stable form.

Microbiological Examination –The test consist of plating known mass the sample on two selected culture media specifically suitable for the growth of

bacteria and fungi. Incubating them for a specified period to permit the development of visual colonies for counting.^[21]

Breaking Load point –This test gives the value of maximum load a lipstick can withstand before it breaks.^[22]

Peroxide value – The peroxide value is the number of milliequivalents of active oxygen that express the amount of peroxide contained in 1000 gm of the substance.^[23]

Pay Off test – This test gives the idea of mass release from the lipstick salves^[24]

Arsenic Test-The stain obtained in sample is compared with 0.004 gm of arsenic trioxide.^[23]

Heavy Metals Test – The color produced with sodium sulphide solution is matched against that obtained with standard lead solution.^[25]

Thermal Stability – To test that formulation is stable at accelerated temperatures.^[26]

SUBJECTIVE EVALUATION OF LIPSTICK

Subjective evaluation of transfer resistant property of lipstick having DMTMS was done by checking the transfer of lipstick on tissue paper. The amount of product transfer from lips was determined

through the initial and final weight difference of the tissue paper.^[27]

The subjective evaluation of the product was done on the group of 20 peoples. The volunteers were between the age group of 25 to 35 years. The subjects were asked to press their lips on pre weighted tissue paper and the amount transferred was calculated through the weight gain of tissue

paper. Evaluation of the property the following abbreviations are used:

Excellent – E, Good – G, Average – A, Satisfactory – S, Bad- B

RESULTS AND DISCUSSION

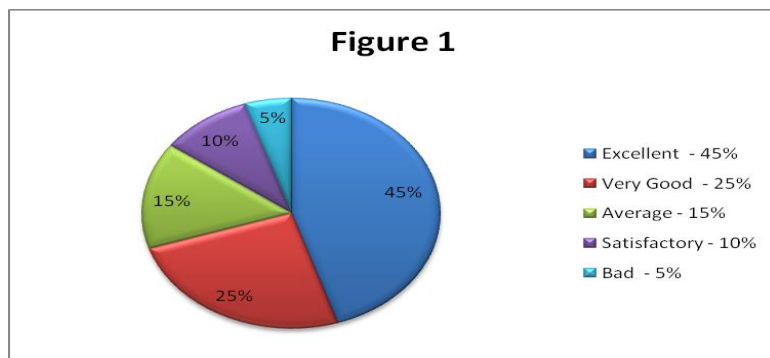
Analysis of lipstick was carried out as per IS 9875:1990 and the result were recorded in Table 2.

TABLE 2

S. No	Tests	Standards	Results	Inference
1	Softening point	Min 55 C	61.3	Passes
2	Microbiological Examination	NMT 100	Pass the test	Passes
3	Breaking load value	Min 200 gm	618.50 gm	Passes
4	Peroxide value	Max 10	0.83636	Passes
5	Pay Off test	To pass the test	0.00447 g/cm ²	Passes
6	Arsenic Test	Max 2 ppm	Pass	Passes
7	Heavy Metals Test	Max 20 ppm	Pass	Passes
8	Thermal Stability	Stable	Stable	Passes

SUBJECTIVE EVALUATION

From the subjective evaluation the result obtained are represented in Figure 1



During the evaluation of this product the softening point observed is 61.3 °C which shows that the stick retains the shape properly. The breaking load value indicates that it is stiff also. Moreover the peroxide value as per BIS shows that the product is not easily prone to oxidation inspite of use of waxes and oils.

The payoff test shows the controlled release of the product. The microbiological testing also shows the occurrence of organism within limit. Arsenic and heavy metal test shows safety of the product with respect to toxicity of these elements. At last but not the least the accelerated stability study confirm the stability of lipsticks over a period of use i.e.

minimum six months. The subjective evaluation was done on the group of 20 subjects. It was found that 95% of volunteers were showing that they were satisfied with the transfer resistance property of the lipstick. The volunteers were comfortable during the application and study.

CONCLUSION

Finally it can be concluded that-

- The product is stable.
- It gives a satisfactory transfer resistance property after application.
- The silicon resine i.e DMTMS can be satisfactorily used in lipstick preparation.

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