



Genti-Fol® SA

Substantive Keratolytic Complex



Assigned INCI Designation: Betaine Salicylate

SAP Code#: 136270

Key Product Attributes

- Substantive keratolytic complex
- Natural moisturizer
- Gentle exfoliant
- Skin smoothing agent

Background

Beta-hydroxy acids (BHAs) can enhance the rate of stratum corneum exfoliation in much the same way as alpha-hydroxy acids (AHAs), although with suggested improvements in the minimization of irritation often associated with AHAs. The benefits of salicylic acid, an aromatic b-hydroxy acid, in skin care are well established.¹⁻³ The use of salicylic acid in cosmetic products can improve the fine lines and wrinkles associated with intrinsic aging,⁴ as well as treat acne through topical application.⁵ In addition, salicylic acid has been suggested as a therapeutic agent for ameliorating the effects of photoaging, the undesirable deterioration of the skin brought on by excessive exposure to ultraviolet radiation from the sun.⁶ The effects of photoaging on the skin are manifested as wrinkles, sagging, discolorations and other undesirable physical changes.

Likewise, the benefits of trimethylglycine in skin care are also well established including an ability to increase skin moisturization, skin elasticity and skin hydration among other dermatological improvements.⁷⁻⁸ Trimethylglycine is an especially interesting molecule because it possesses both an anionic charge and a cationic charge on the same molecule. The natural presence of the cationic charge is particularly relevant to skin care applications as it is well established that human skin, under normal physiological conditions, has an overall anionic charge. Therefore, molecules that possess a cationic charge have a natural affinity (substantivity) towards the skin.

Product Information

Genti-Fol® SA is a product advancement from the laboratories of Lonza Personal Care that combines the benefits of salicylic acid with the unique and gentle skin improvement properties of trimethylglycine. The product is an internal salt represented by the schematic illustration shown in figure 1. In this chemical structure, the anionic portion of the salicylic acid molecule shares a common charge with the anionic portion of the trimethylglycine molecule. This complexes the salicylic acid tightly to the trimethylglycine molecule and isolates the cationic charge of the trimethylglycine to create a “Substantive Keratolytic Complex”. Thus, the new molecular entity offers the combined benefits of both the salicylic acid moiety and the trimethylglycine moiety. This new product becomes ideal for leave-on and rinse off compositions that require mild exfoliation and antimicrobial properties blended with substantial moisturizing and anti-irritation claims.

Applications

- Anti-acne and Anti-microbial Formulations
- Exfoliation Applications with Anti-Irritation Claims
- Leave-on and Rinse-off Applications

Substantive Keratolytic Complex

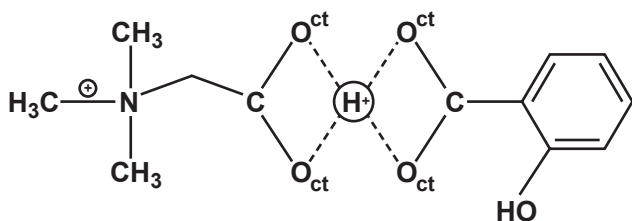


Fig. 1

Compositional Breakdown

Genti-Fol® SA Solubility Characteristics

Material	Salicylic Trimoniumglycine (10 %)
SDA 40 Alcohol	S
PEG – 8	S
Pentylene Glycol	S
Tween 20	PS
Sodium Laureth Sulfate (90%)	S
Sodium Lauryl Sulfate (90%)	S
Cocamidopropyl Betaine (90%)	S
Ammonium Lauryl Sulfate (90%)	S

PS = Partly Soluble 1–10 % by weight

S = Soluble 10 % by weight or higher

Solubility vs pH

5 %, 10 %, and 50 % Salicylic Trimoniumglycine in Water

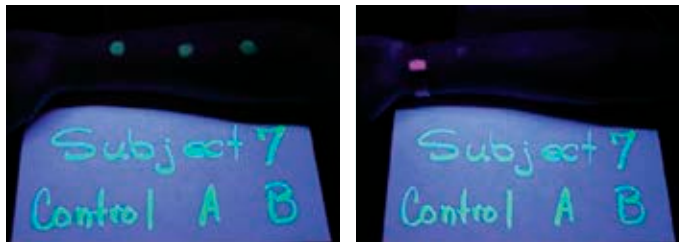
pH	
As is 2.80	Insoluble
3.80 – 4.20	Soluble*

* Neutralized with AMP 95

In vivo Cell Renewal Study

An in-house, in vivo study was conducted on seven individual test volunteers to look at the effectiveness of Genti-Fol® SA to exfoliate skin in comparison to controlled untreated exfoliation and to a product that contained salicylic acid. The products tested included a 2 % solution of salicylic acid in butylene glycol, and a 4 % solution of Genti-Fol® SA in butylene glycol (equivalent to 2 % salicylic acid content). The test individuals included men and women of various ages and each participant was instructed to apply the test products once in the morning and again in the evening. The study was terminated after ten test days as individual dansyl chloride spots began to disappear.

A 1 to 5 grading scale was used to assess the level of remaining Dansyl Chloride stain after 10 days. As expected, the control sites retained the highest level of stain. Genti-Fol® SA and Sal Acid performed equally as well.



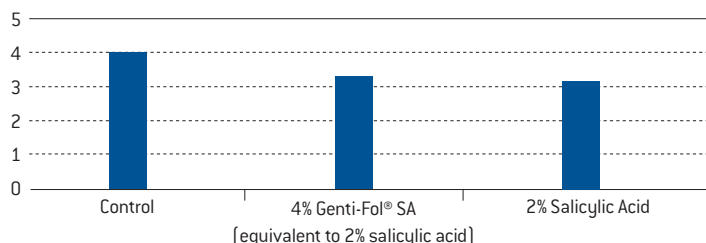
Day 0

Day 10

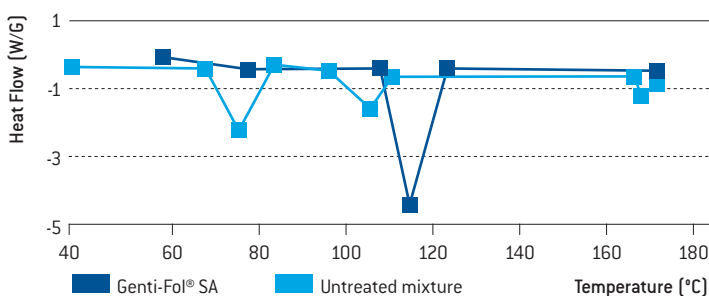
A-Salicylic Acid

B-Genti-Fol® SA

Average Subjective Evaluation



Using state-of-the-art differential scanning calorimetry (DSC) analysis, Lonza Personal Care is able to confirm that the reaction of betaine with salicylic acid to make Genti-Fol® SA offers a very clean product. In the figure below, we show examples of overlaid thermograms for an unreacted mixture of betaine and salicylic acid (green spectrum) and for Genti-Fol® SA (blue spectrum) which appears as a single peak with a thermal maximum at ~118 °C. Differential Scanning Calorimetry operates by applying a heating cycle to solid products and accurately measuring energy absorption over a range of temperatures. The peak signals in the thermograms indicate temperatures where an individual molecular species absorbs (endothermic) or releases (exothermic) excess energy. In low molecular weight solid products this temperature is typical of a melting point transition. In the particular example below, the thermogram shows the difference between a fully reacted, pure product and a simple blend of the two components.



Use Levels	0.5 %–4.0 %
Preservatives	None

References

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USA

Lonza Consumer Care
70 Tyler Place
South Plainfield, NJ 07080
Tel +1 908 561 5200

Switzerland

Lonza Ltd
Muenchensteinerstrasse 38
4002 Basel
Tel +41 61 316 81 11

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