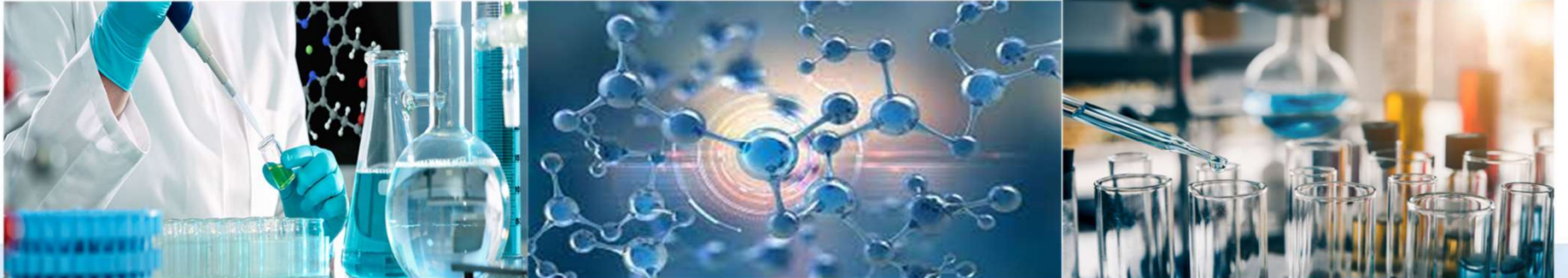




High Functional Specialty Ingredients By Bio Genetic Technology

Dr. Diana Tang, Bio Genetic Technology LLC



Specialties Capabilities

- Bio Genetic Technology also has excellent esterification manufacturing facilities with 50,000MT annual capacities
- We are fully focus on natural sustainable development for high-quality natural emollient esters, emulsifiers, surfactants, and moisturizing agents
- With our patented technologies in manufacturing processes and catalysts, we can make highly efficient products with high purity, selectivity, environmentally friendly, energy efficient and cost-benefit
- We have ***exclusively*** developed several new lipid esters and natural emulsifiers which are first in the market. Those innovative products bring excellent performance values to our customers

Innovative Raw Material – BGT™ DOLGS

Natural Ceramide-Like Liquid Crystal Emulsifiers

Product Trade Name: **BGT™ DOLGS**

Product INCI Name: Dioctyldodecyl Lauroyl Glutamate
(and) Stearyl Alcohol

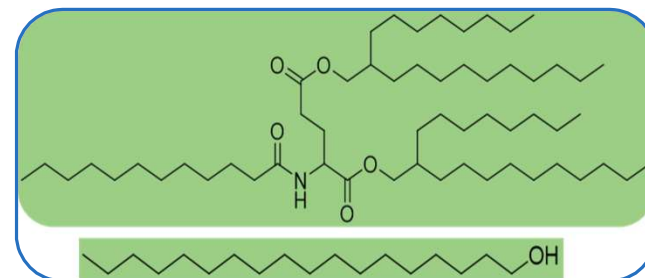
Property: White to Off-White Flakes

Applications: Skincare, Suncare, Babycare and Haircare

China Complaint: Yes

Natural Origin Index: 1

Usage Level: 1-3%



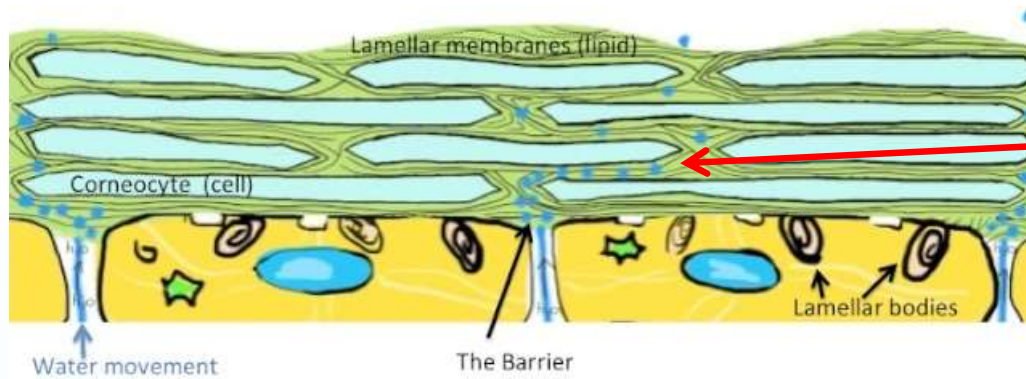
BGT™ DOLGS is a liquid crystal emulsifier with moisturizing and repairing effects. It has the ability as a carrier of functional active ingredients and improves the skin moisturizing and modifies the final skin feel. This is an exclusive product by BioGenetic Technology.



This Innovative Product Exclusively Developed by BGT

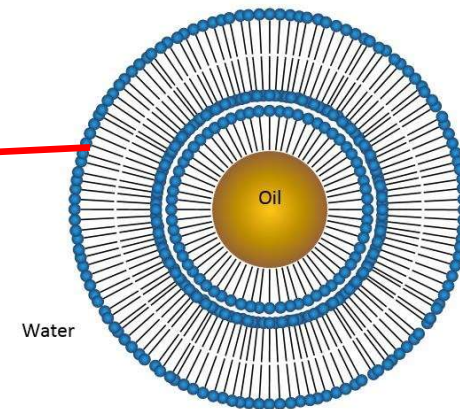
Why Lamellar Liquid Crystal Emulsion Relationship with Skin Epidermal Lipids

Skin Epidermal Intercellular Lipids (Lamellar Membranes)



- Intercellular lipids of SC form a lamellar structure that consists mainly ceramides as amphiphilic substances which demonstrates significant skin barrier function
- A healthy intercellular lipid structure in SC can prevent skin sagging and reduce the trans-epidermal water loss

Lamellar Liquid Crystal Formation by BGT™ DOLGS



- **BGT™ DOLGS** doesn't form micelles in water like traditional emulsifiers, they form **lamellar liquid crystals** which have better water retention
- The lamellar liquid crystals help to strengthen the intercellular matrix and barrier in stratum corneum to further reduce trans-epidermal water loss and improve skin moisturizing ability.

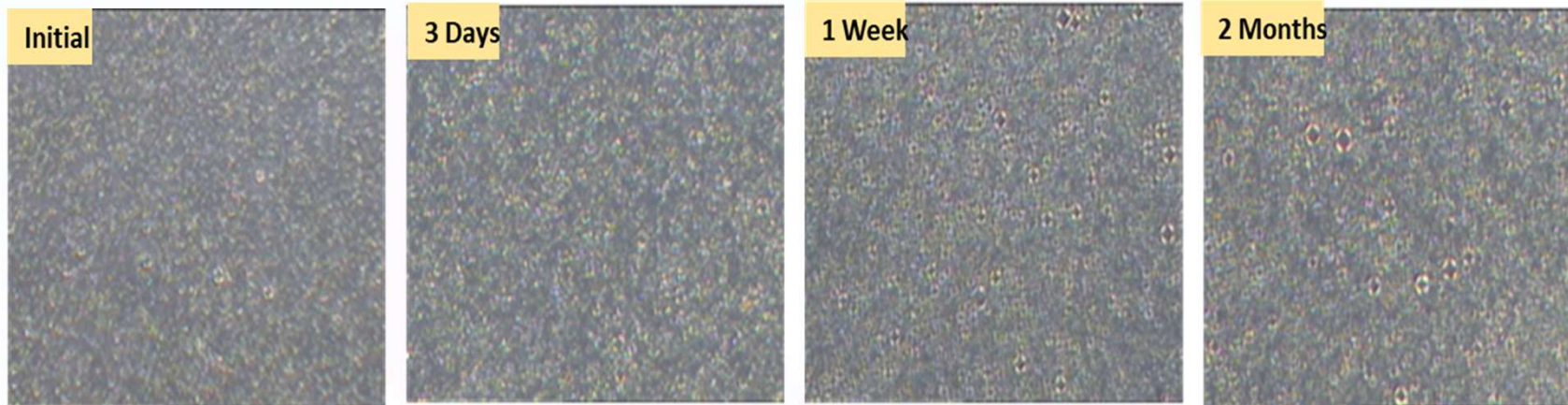
Innovative Raw Material – BGT™ DOLGS

Natural Ceramide-Like Liquid Crystal Emulsifiers

The liquid crystal formation by **BGT™ DOLGS** in an emulsion system is very stable and can exist in the product for a long time; this will guarantee the excellent skin feel as well as the epidermal lipid benefits delivered when apply on the skin

Test method: The cream containing 3.0% **BGT™ DOLGS** placed it at room temperature for 24 hours (initial measurement), three days, one week, and two months, we observe the liquid crystal emulsion morphologies under a 200X polarized light microscope

Conclusions: Many liquid crystal systems exist with poor stability during application to the human skin because the liquid crystals surrounding the oil droplets break and disappear quickly at skin temperature. However, BGT™ DOLGS creates very stable LC O/W emulsions at temperatures higher than skin temperature and confirms their efficacy and function as bio-mimetic of the intercellular skin lipids.



Innovative Raw Material – BGT™ DOLGS

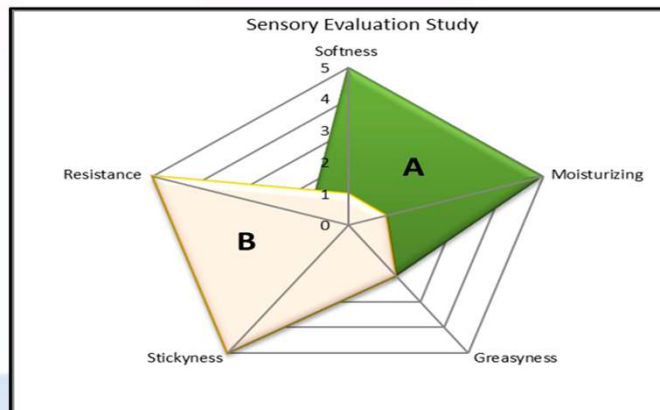
BGT™ DOLGS Performance & Evaluations

Sensory Evaluation Test:

- Experienced 10 panelists were selected to participate in the sensory evaluation
- Moisturizing cream A containing 2.0% BGT™DOLGS
Moisturizing cream B containing 2.0% alcohol ether emulsifier
- Testing creams were randomly distributed on the left and right inner forearms within 4.0 x 4.0cm area
- The product dosage is $2 \pm 0.05\text{mg}/\text{cm}^2$, applied repeatedly until the product is fully absorbed, and evaluate the product's softness, moisturizing, greasy feeling, sticky feeling and resistance feeling respectively, from 0 to 5

Conclusion:

BGT™DOLGS imparts a unique lipid-film feel to the skin, leaving it soft, moisturizing, and smooth feels

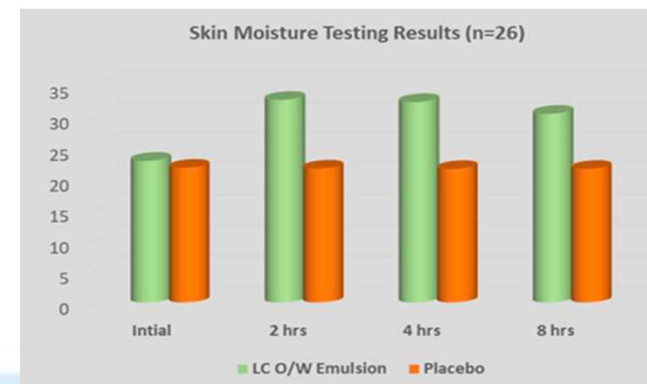


Skin Moisturizing Test:

- Skin Corneometer was used to measure the skin moisture
- 26 eligible female volunteers were selected to participate in the test
- Moisturizing cream containing 3.0% BGT™DOLGS and the blank control were distributed on volunteers' left and right forearm with a size of 4.0 x 4.0cm with the product dosage of $2 \pm 0.05\text{mg}/\text{cm}^2$
- Skin moisture levels were tested on each test area: initial, 2, 4 and 8 hours after product application.

Conclusion:

The graph shows a significant difference in moisturizing rates between creams formulated with and without BGT™DOLGS; there is no significant change in skin moisture content after 8 hours



Innovative Raw Material – BGT™ DOLGS

Natural Ceramide-Like Liquid Crystal Emulsifiers

Formulation Suggestions and Tips

- BGT™ DOLGS is a non-ionic liquid crystal emulsifier, which can be used in a wide pH range (3-10). It can be simply added into oil phase heated up to 80°C for emulsion formulation
- Add the oil phase to heated water phase and emulsify with rotor homogenizer
- Cool gradually to 50°C and allow the formulation of lamellar liquid crystal.
- BGT™ DOLGS can be also used in non-emulsion systems such as serums and essences to deliver moisturizing effects and smooth skin feels. In those non-emulsion systems, it's recommended to use 0.3-0.6%



BGT
BIO GENETIC TECHNOLOGY

Innovative Specialty Ingredient – BGT™ DLG

Natural Ceramide-Like Emollient Ester

Product Trade Name: **BGT™ DLG**

INCI Name: Dioctyldodecyl Lauroyl-Glutamate

Property: off-white flakes

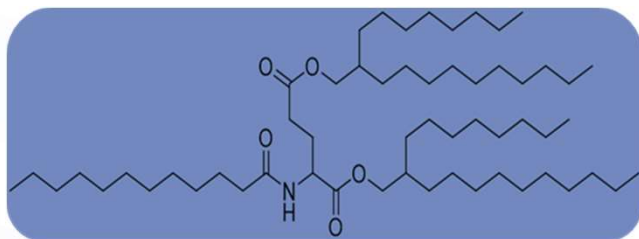
Applications: SkinCare, SunCare, Haircare and BabyCare

China Complaint: Yes

Natural Origin Index: 1

Usage Level: 0.5-3%

Structure:



BGT™ DLG is a multi-functional ingredient. The major functionalities are:

- Emollient – Skin Softening & Smooth Feel
- LC Emulsifier – Excellent Emulsification Capability
- Moisturizer – Excellent Water Retention

BGT™ DLG applied in the following market segments:

- Babycare
- Skincare
- Suncare
- Makeups

BGT™ DLG originated from all natural raw materials; it is very mild and highly safe. It is an all-purpose nonionic special ingredient with excellent emolliency, liquid crystal emulsifying, super moisturizing, conditioning and revitalizing properties.

Innovative Specialty Ingredient – BGT™ DLG

Natural Ceramide-Like Emollient Ester and Liquid Crystal Emulsifiers

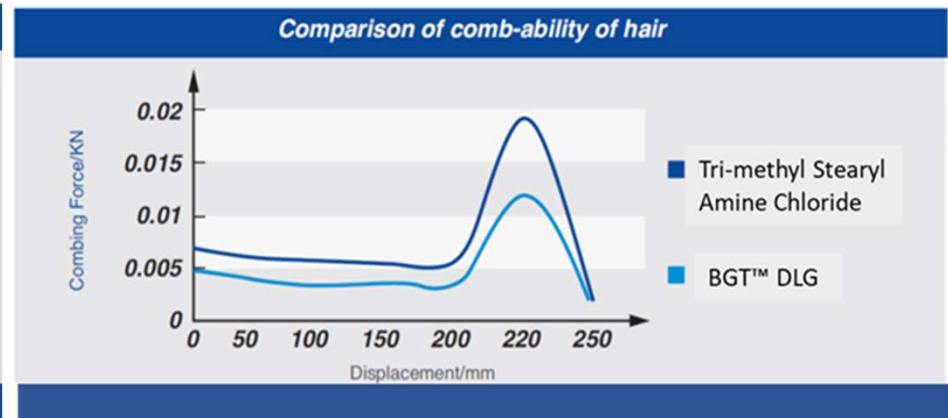
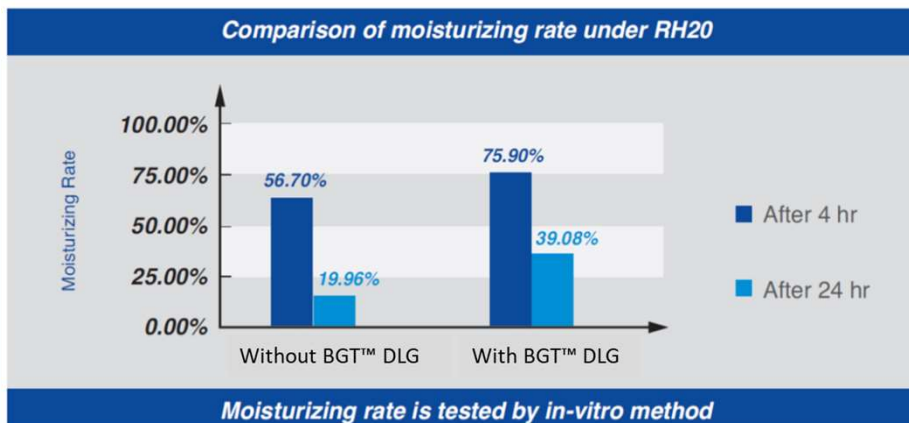
Product Major Performance and Functionalities:

- BGT™ DLG is a multi-functional ingredient for all skincare formulations. The product is not only playing an important role for **emolliency** such as softening skin feel and final product appearances, but also having great **emulsification** capability
- This product is a liquid crystal emulsifier which delivers high moisturizing and water loss prevention effects; because the formation of lamellar liquid crystal emulsion by BGT™ DLG can enhance barrier function of the SC to strength the intercellular lipid matrix and further to prevent skin sagging
- BGT™ DLG is also a good hair conditioning agent which improves the softness and luster of hair, provides better dry and wet combability, and repairs damaged hair

Innovative Specialty Ingredient – BGT™ DLG

Emulsifying Emollient Ester Performance

- BGT™ DLG can form an emulsion with liquid crystal structure and exhibits super moisturizing and skin softening effect; therefore, it can be used as “Emulsifying Emollient Ester”
- BGT™ DLG can improve the softness and luster of hair and increase the wet and dry combabilities



Innovative Specialty Ingredient – BGT™ DLG

Emulsifying Emollient Ester Performance

Formulation Suggestions and Tips

- BGT™ DLG is an anionic multi-functional ingredient. It can be used as a primary emulsifier (~3%) or as a co-emulsifier (~1%) to improve the emulsion quality and skin feel
- BGT™ DLG was used in many eye care commercial products, such as eye contour, eye serum, etc. Usage level can be 0.5-2.5%
- It can also be used as a hair conditioning agent for hair fiber repairing and revitalizing, the usage level can be 3-5%
- BGT™ DLG is oil soluble, and it can be mixed and heated to 80°C in the oil phase to make emulsion, serum, or gel systems

Diocetyldodecyl Lauroyl-Glutamate Market Products

Japan whitening skin care natural lotion
face cream for female



MATSUTAKE EXTRACT REVITALIZING CREAM



Male Enhancement Cream



Ever-Eden Protecting Baby Face Cream



Natural Ceramide-like & Cholesterol-like Emollient Ester BGT™POLG

Product Trade Name: **BGT™ POLG**

Product INCI Name: Phytosteryl / Octyldodecyl Lauroyl Glutamate

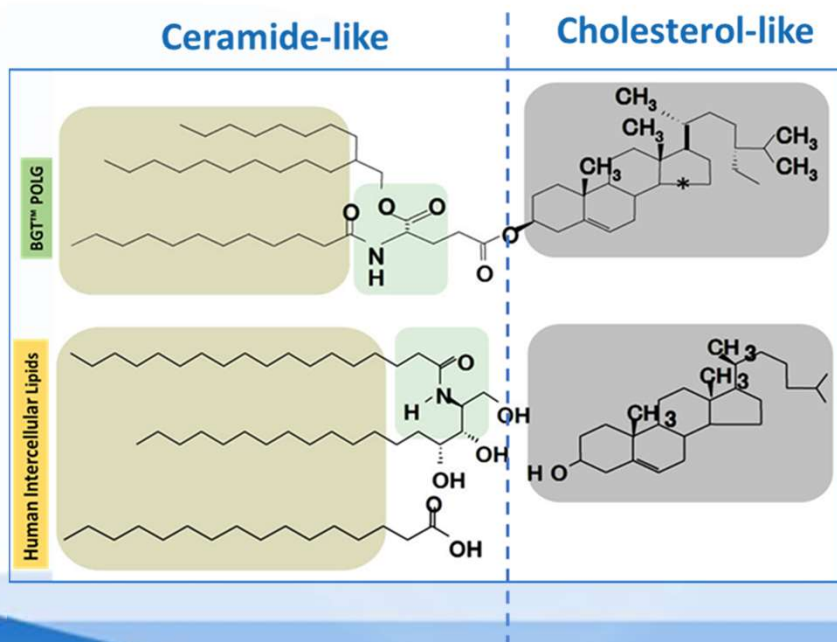
Appearance: Colorless to Pale Yellow Liquid

Applications: Skincare, Suncare, Foundations, and Color Cosmetics

China Complaint: Yes

Natural Origin Index: 1

Usage Level: 0.5-3%



BGT™ POLG has ceramide-like structure, and it is a skin-lipid like emollient that acts as skin lipid enhancer.

BGT™ POLG is more effective than lots of other emollients in promoting the recovery of damaged skin and improving rough skin conditions.

BGT™ POLG is used to promote high performance of final formulations, such as creams, lotions, serums, essences and color cosmetic. Only small amount, from 0.5% to 3%, can greatly deliver outstanding skin feel.

Natural Amino Acid High Moisturizing Emollient Ester – BGT™POLG

BGT™ POLG Performance and Functionalities:

- BGT™ POLG is a moisturizing emollient ester derived from 100% natural plants. It can form a lipid film on the skin surface, which is very similar to the lipid structure between cells in the skin
- BGT™ POLG is derived from an amino-acid (glutamic acid) and phytosterol; it is very compatible with skin lipids and is super important for a healthy skin barrier and keeping water in the upper layers of the skin; great water-locking capability
- BGT™ POLG is more effective than lots of other emollients in promoting the recovery of damaged skin and improving rough skin conditions. It delivers exceptional skin feel in all skin care products. Similar to the structure of ceramide/cholesterol, it has excellent emollient properties
- Anti-inflammatory and soothing effects from phytosterols
- Excellent pigment dispersion and emulsion stability, which can effectively improve the feel of foundation and lipstick.

Natural Amino Acid High Moisturizing Emollient Ester – BGT™POLG

Formulation Suggestions and Tips

- **BGT™ POLG** is a great skin lipid enhancer, and it can be used in any skincare applications to improve the final skin feel with the functionalities of moisturizing and skin lipid revitalizing and repairing. The suggested usage levels for different applications are:
 - ❖ Moisturizing Creams: 0.5-3%
 - ❖ Moisturizing Emulsion Lotions: 0.5-2%
 - ❖ Repairing Eye Cream: 0.5-2%
 - ❖ Essences & Serums: 0.2-1%
 - ❖ Lipsticks & Lip balms: 1-3%

- **BGT™ POLG** it's comparable with natural oils, silicon oils, and waxes and can be simply mixed into oil phase heated up to 85°C for emulsion formulation process

Natural Amino Acid High Moisturizing Emollient Ester – BGT™POLG

Market Products and Applications (Usage Level 0.1-3%)

SK-II Refined Anti-Freckle Essence



OLAY®WHITE RADIANCE Advanced Light-Perfecting Essence



Shiseido Benefiance Anti-Wrinkle Repairing Eye Cream



Shiseido PRIOR MASK IN Highly Moisturizing Anti-aging Emulsion



Innovative Multi-Functional Ingredient – BGT™ SHCG

A Green Material Induced by Liquid Crystal Amido Acid Surfactant System

Product Trade Name: **BGT™ SHCG**

Product INCI Name: Isostearyl Hydroxystearate (and) Cocoyl Glutamic Acid

Property: Pale Yellow Liquid

China Complaint: Yes

Natural Origin Index: 0.7

Applications: Facial Cleansers, Body Wash, , Skincare, Baby Products & Hair Care

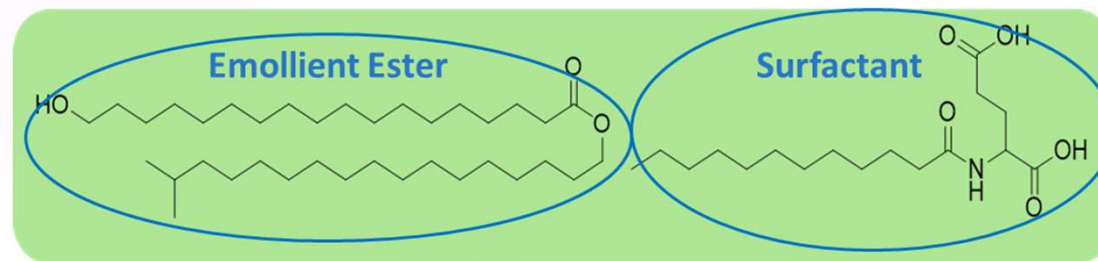
Usage Level: 1-3%

BGT™ SHCG is a multi-functional ingredient. The major functionalities are:

- Functional Surfactant – Unique cleansing/foaming/stabilizing
- Emollient – Skin softening and smoothing
- Emulsification – Lyotropic liquid crystal formation
- Moisturizing - Skin hydration

BGT™ SHCG applied in the following market segments:

- Facial Cleansers
- Skincare
- Babycare
- Haircare

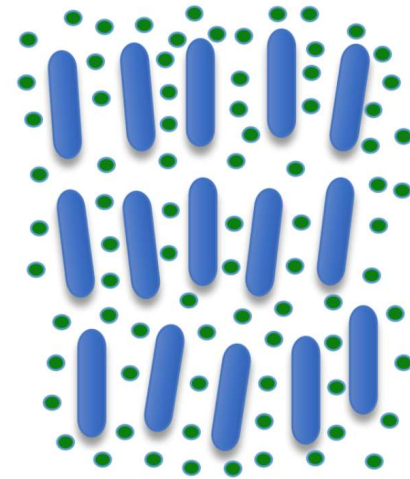


This Innovative Product Developed Exclusively by BGT

Innovative Multi-Functional Ingredient – BGT™SHCG

Product Major Performance and Functionalities:

- BGT™ SHCG has unique chemical composition with amino acid surfactant and emollient
- Excellent for the preparation of high-viscosity fatty amino acid salt facial cleansing creams
- BGT™ SHCG can greatly reduce the surfactants' irritation and further provide moisturizing and repairing properties, which can make the skin soft and moisturized after washing
- The lyotropic liquid crystal formed by BGT™ SHCG can be as a carrier to carry large number of active components to make very stable formulations
- BGT™ SHCG is also an emulsifier with great skin feel, and can form stable liquid crystal emulsion skin care products



Lyotropics

Innovative Multi-Functional Ingredient – BGT™ SHCG

Liquid Crystal Induced in a Surfactant Systems

Testing Formula A

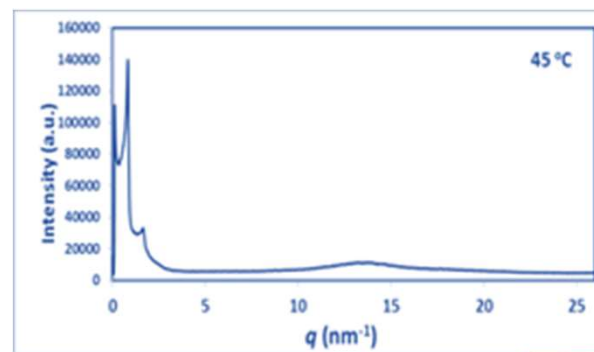
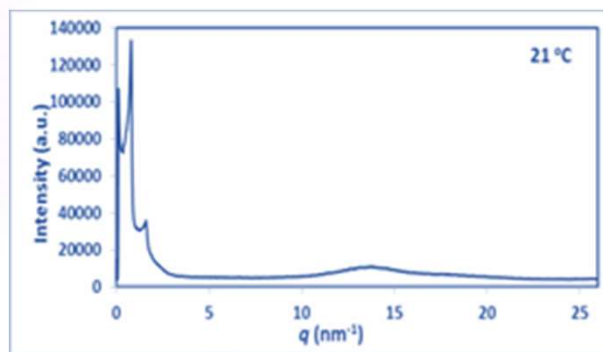
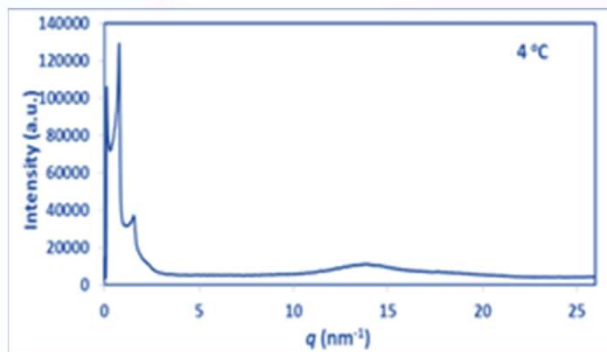
Sorbitol (70%)	15.0%
Sodium Lauroyl Sarcosinate (30%)	50.0%
Ethylhexyl Glycerol	4.0%
Lauric Acid	5.2%
Isostearic Acid	3.0%
BGT™ SHCG	2.5%
Cocamide MIPA	1.5%
Water	18.8%

Testing Method:

Use a small-angle X-ray scatterometer with a constant temperature system to determine the liquid crystal phase structure of the test formula A samples at different temperatures.

Testing Results:

BGT™ SHCG can induce a low concentration of surfactant composition to form a liquid crystal phase, and it can exist stably in a wide temperature range

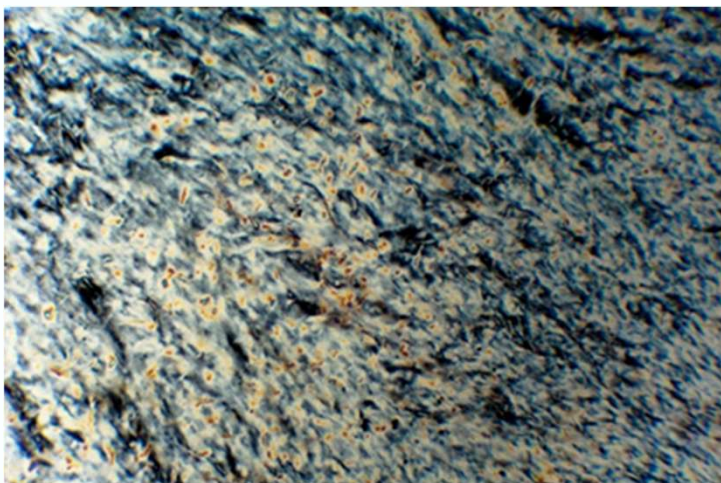


Innovative Multi-Functional Ingredient – BGT™SHCG Liquid Crystal Induced in a Surfactant Systems

BGT™ SHCG can be formulated into a facial cleansing cream with high viscosity; the product liquid crystal morphology is still the same and the viscosities didn't change from -18°C to 45°C for 30 days

The picture below indicates the formulation A sample formed a large amount of lamellar liquid crystal is clearly visible under the polarized microscope

Formula A is observed liquid crystal by 200X polarized microscope



Temperature	Appearance	Viscosity (cps, 25°C)	
		Before	After
-18°C	After returning to normal temperature, the appearance and performance of the samples has no change	46,100 cps	44,300 cps
4.0°C			46,900 cps
45°C			45,320 cps

Innovative Multi-Functional Ingredient – BGT™ SHCG

Liquid Crystal Induced in a Surfactant Systems

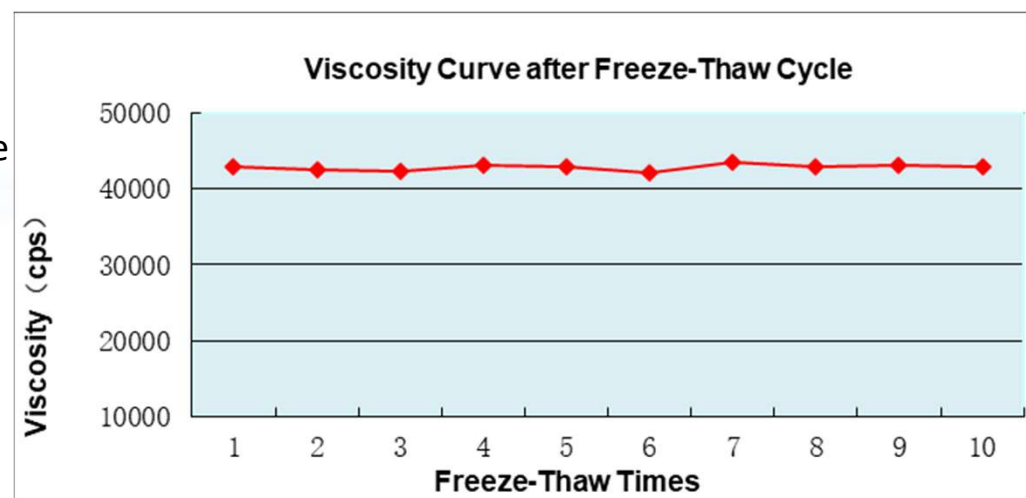
Rapid freeze-thaw cycles are the most effective stability testing methods for liquid crystal products; The surfactant system containing 2.5% BGT™ SHCG exhibits excellent stability and indicated the lyotropic liquid crystal morphology system' exist and stable.

Test method:

The sample of formula A is placed in a temperature alternating chamber with a cycle of -10 ° C ~ 45 ° C, each cycle is 12 hours, and a total of 10 cycles. Sample stability was observed by measuring the change in viscosity of the sample after each cycle

Conclusion:

The chart shows the viscosity of the amino acid system thickened with 2.5% BGT™ SHCG complex fatty acid is very stable and is not affected by temperature changes



Natural Amino Acid Surfactant for Baby/Kid Rinse-off Products – BGT™ YS-30

Product Trade Name: **BGT™ YS-30**

Product INCI Name: Sodium Cocoyl Alaninate

CAS Number: 90170-45-9

Property: Colorless to Pale Yellow Liquid

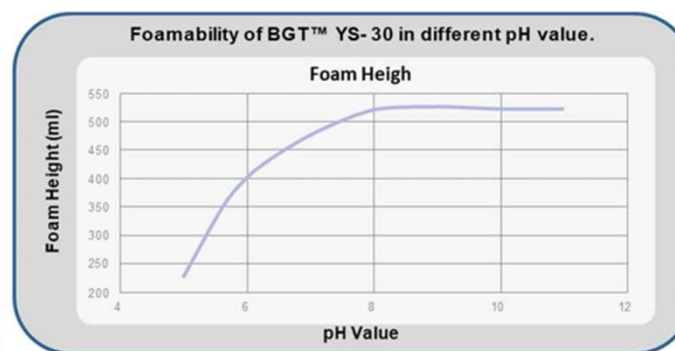
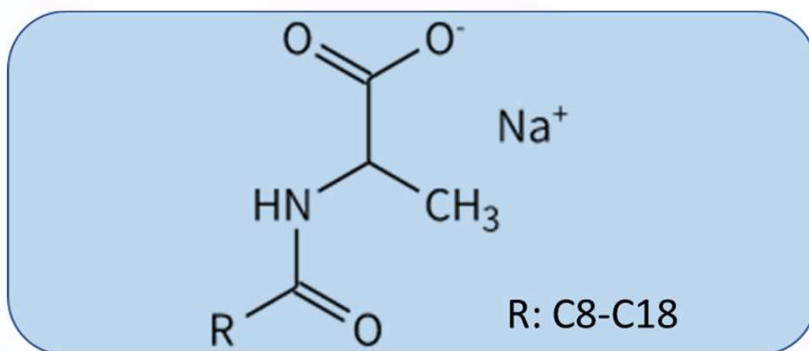
Applications: Hair Care, Facial Cleansers, Baby Wash Products

Recommend Dosage: 5-30%

China Complaint: Yes

Natural Origin Index: 1

Chemical Structure:



Product Description and Attributes

Product Performance and Functionalities:

BGT™ YS-30 is an anionic mild surfactant made from L-alanine and plant-derived fatty acids. Under weak acid to alkaline conditions, BGT™ YS-30 has high foaming power, strong resistance to hard water. Smooth and moist after washing, suitable for baby shampoo and cleanser.

- Sodium cocoyl glycinate is an amino acid-derived cleansing and skin-softening ingredient that is considered highly safe, super mild, and non-irritating to skin as used in cosmetic and personal care products, especially for baby care
- **BGT™ YS-30** has a wide range of applications in rinse-off products because of its good foamability in a wide pH range
- This sulfate-free natural surfactant exhibits extremely mild and non-irritation, it can be used baby shampoos as well as facial cleansing products
- **BGT™ YS-30** can reduce irritation when combining with traditional surfactants, such as sodium lauryl sulfate and sodium lauryl ether sulfate
- **BGT™ YS-30** when used in shampoos, it can enhance the appearance and sensory feel of hair by improving hair body, combability, and sheen, especially for damaged hair
- It demonstrates strong cleansing power and easy wash-off

BGT™YS-30 Foamability

BGT™ YS-30 has excellent foaming ability under weak acid to alkaline conditions

Test method:

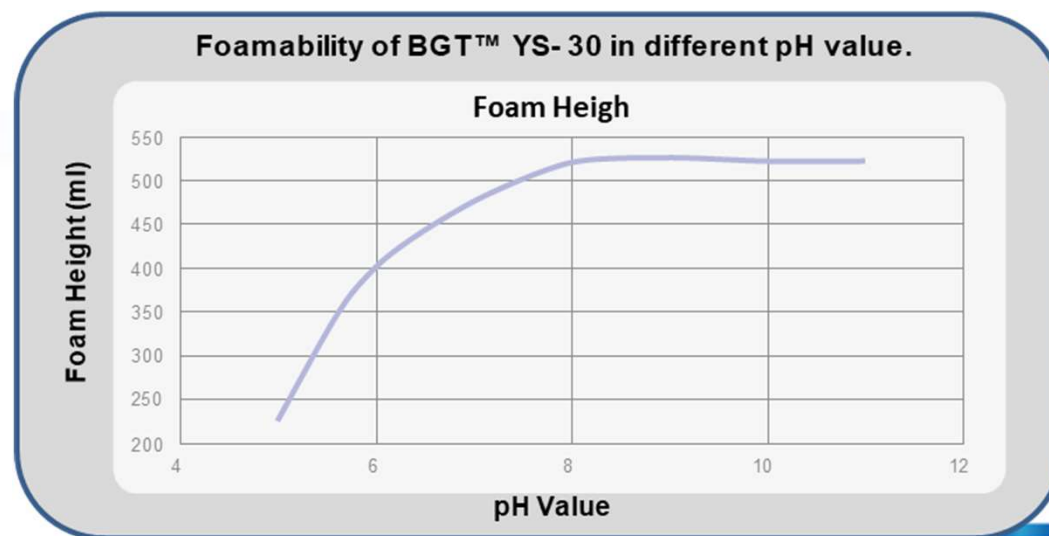
0.25% active was prepared into 100g solution in deionized water and stirred at 30s/ns high spread

Recommend Dosage:

5.0~70.0%

Applications:

Baby/Kid Facial cleanser, shampoo, body wash, baby wash, etc.



BGT™YS-30 – Sodium Cocoyl Alaninate Market Products





**BGT Committed to
Innovations, Natural Science and Beauty!**

Thanks!