February, 8th. 2021

Sanyo Chemical Industries, Ltd.

ALPHAPUR HSG, Cosmetic Ingredient that Forms Alpha Gels, Improves the Function of Sunscreen Formulations

- In addition to the SPF booster effect, the suppress effect of the skin penetration of ultraviolet absorbers-

Sanyo Chemical Industries, Ltd. has announced that its developed product ALPHAPUR HSG, a skin care cosmetic ingredient, improves the function of sunscreen formulations. ALPHAPUR HSG forms a stable α-gel ※1 in a wide range of formulations, and the resulting α-gel has the advantage of smoothness. ALPHAPUR HSG can be used in sunscreen products to show the SPF booster effect, which increases the UV protection factor (SPF value) ※2 and PA value ※3, as well as to suppress the skin penetration of the UV ※4.

[ALPHAPUR HSG Effects of improving the function of sunscreen formulations].

Hazards to the skin due to ultraviolet rays have become evident, making sunscreen formulations one of the essential skin care cosmetics all year long. Under such circumstances, sunscreen formulations are required not only to have a high ultraviolet protective effect, but also to have various functions such as a feeling of comfortable use without stickiness, white floating and burden to the skin even when used daily.

In 2019, Sanyo Chemical Industries, Ltd. (Headquarters: Higashiyama-ku, Kyoto, President & CEO: Takao Ando) developed ALPHAPUR HSG, a nonionic surfactant, as a raw material for forming α-gels with a new sense of enhancing the barrier function of stratum corneum. The α-gel obtained by the ALPHAPUR HSG has an unprecedented advantage of providing a highly stable and smooth feel, and when used in sunscreen formulations, it has been found to stably retain an oily component, such as an ultraviolet absorber, inside a film of α-gel having a high barrier property interconnected with a skin surface over a long time.

◆ SPF booster effect of ALPHAPUR HSG

In sunscreen preparations, an ultraviolet absorber and an ultraviolet scattering agent ※5 are used as an ingredient for protecting against ultraviolet rays, and in

order to enhance the ultraviolet protective effects, the amounts of these ultraviolet protective agents have generally been increased. However, when the amount of ultraviolet protective agents increases, the feeling of use tends to be poor, such as stickiness, white floating, and staining, and it has been difficult to satisfy the both of ultraviolet protective effects and comfortable feeling.

When ALPHAPUR HSG was used as a sunscreen formulation, we found that the UV protection effect could be improved nearly twice as much as that of an conventional surfactant-based emulsified sunscreen formulation. High UV protection can be obtained without increasing the amount of UV protection agent, which makes it possible to achieve good smoothness and a comfortable feeling of use.

◆ Suppresion effect of skin penetration of ultraviolet absorbers by ALPHAPUR HSG.

Although UV absorbers have a high UV protection effect, some people may feel a burden on the skin. It was found that sunscreen formulations using ALPHAPUR HSG can suppress the skin penetration of ultraviolet absorbers by about 30% of conventional surfactant-based emulsified sunscreen formulations. The low skin penetration of UV absorbers makes it possible to design sunscreen formulations with less burden on the skin.

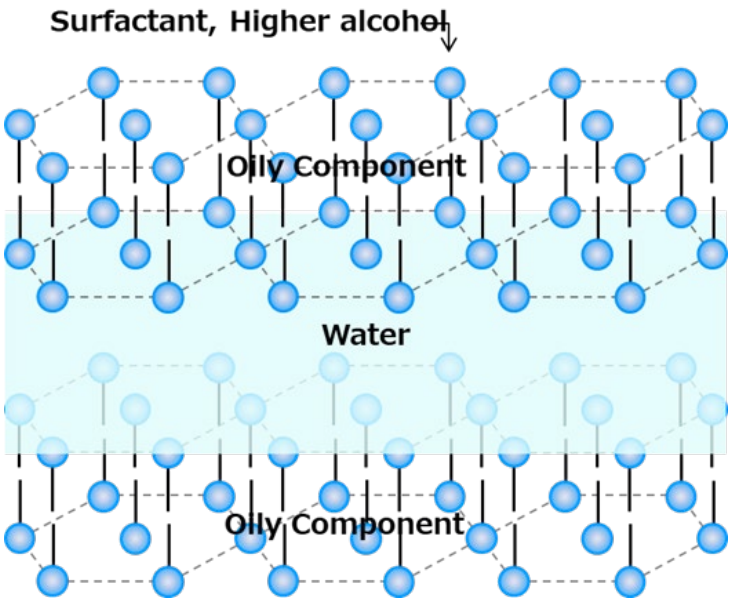

Image diagram showing oily components such as ultraviolet absorbers retained in the α-gel

◆Other Effects Expected by the ALPHAPUR HSG

ALPHAPUR HSG can be applied to various value-added formulations because the formulations using ALPHAPUR HSG can be blended with a variety of ingredients due to the stable α-gel.

[Features of α-gel formed by ALPHAPUR HSG].

An α-gel has the self-organized structure composed of surfactant, higher alcohol and water, and its structure is similar to the intercellular lipids. The hydrophilic and hydrophobic parts of its surfactants can contain water and oil, respectively. An α-gel is attracting attention as a raw material for skin care cosmetics because of its unique features such as water retention, barrier function and a rich and creamy feeling of use. On the other hand, α-gel has the problem that its structure, viscosity and dispersion stability change with time, and that it has poor spreadability due to the ordered network structure.

Using ALPHAPUR HSG, a nonionic surfactant developed by us, we can solve the problem of stability and smooth feeling without compromising the features of conventional α-gels.

The features of the ALPHAPUR HSG are summarized below.

1. Can be used for any formulation
2. Can form α-gels that has excellent stability with respect to time and temperature
3. Can form α-gels that are smooth and have good spreadability
4. Creams and emulsions containing α-gel have high moisture retention and barrier properties

We believe that ALPHAPUR HSG, which possesses these advantages, can be used not only as a sunscreen formulation but also as a raw material for skin care cosmetics in a variety of formulations tailored to the needs of customers.

[Future plans]

Sunscreen formulations are required not only to have a high UV protection effect but also to have a pleasant feeling of use and reduce the burden on the skin. We believe that the use of ALPHAPUR HSG will enable us to propose an optimal formulation for these needs. We continue to focus on product development in the cosmetics field and propose comprehensive and attractive solutions.

<Cosmetic Ingredient Information>

"ALPHAPUR HSG"

INCI Name :PPG-2-CETETH-12

Cosmetic Labeling Name: PPG-2 Cetes-12

Compositional Schematic: Polyoxyethylene Polyoxypropylene Cetyl Ether (12E.O.) (2P.O.)

※ 1 α-gel has been known as one of attractive self-organized structures and its structure is similar to the intercellular lipid of the skin. The hydrophilic and hydrophobic parts of ordered surfactants and higher alcohols contain water and oil, respectively. It has high thickening effect, water retention effect, barrier effect and stabilizing effect of emulsion due to the unique network structure with strong interaction, and the formulation in which α gel is blended has a unique rich and creamy feeling of use.

※ 2 SPF is an abbreviation for "Sun Protection Factor. Values ranging from 1 to 50+ as an effect index to prevent UVB (ultraviolet B-wave), which causes erythema and inflammation in the skin. It represents how long inflammation by UVB can be prevented compared with the case without any coating, and the higher the value represents the higher the protective effect against UVB.

※ 3 PA is abbreviation for Protection Grade of UV-A.

PA means the effect of preventing UVA (ultraviolet A wave). UVA reaches the dermis deep in the skin and is thought to cause stains, wrinkles, and sagging. The effect of sunscreen formulations to prevent UVA waves is represented by +~+++, indicating that the higher the number of +, the higher the protective effect against UVA.

※4 Ultraviolet absorbers are organic compounds that absorb ultraviolet rays through chemical mechanisms and prevent them from penetrating the skin. It is clear, hard to float white, and has a high UV protection effect.

※5 UV scattering agent is an inorganic component that physically reflects and scatters ultraviolet rays. It has the advantage of being less irritating to the skin than ultraviolet absorbers.

About Sanyo Chemical

Sanyo Chemical, established in 1949 in Kyoto, Japan, is a global manufacturer and seller of performance chemicals. Beginning as a manufacture of soap and textile agents, we have since diversified our product portfolio to meet the needs of the market. Today, we feature over 3,000 different types of products and have established an international presence. Our portfolio of chemicals spans a variety of industries and types, from automotive components to daily-use electronics, as well as cosmetics and medical equipment, all with the aim of creating more safe and environmentally friendlier offerings, improving lives and societies across the world.

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