



OLIVOIL GLUTAMMATE SURFACTANT

Delicate & Skin Friendly

Emollient and Soft After Feel

Creamy Foam Builder

Versatile: Face, Body & Oral Care

Sulfate & PEG Free



COSMOS
NATURAL



Kalichem
Italia s.r.l.

OLIVOIL PRODUCTS

“PEG-FREE” SURFACTANTS OF VEGETAL ORIGIN INTERNATIONALLY PATENTED

>> MARKET BACKGROUND

In the modern concepts of wellness, now consisting in the responsible respect of both body and skin equilibrium and environment, the wide success of ingredients of natural origin is due to two key aspects. **Firstly, the need for developing formulas compatible as much as possible with the physiology of skin and its annexes, without any adverse effect or allergic potential. Secondly, the growing confidence of the consumers in the beneficial properties provided by complex mixtures of natural ingredients.**

The quest for PEG-free surfactants and emulsifiers led Kalichem to the creation of new classes of base ingredients for skin-friendly and environmental-friendly cleansing cosmetic products, the OLIVOIL Series. These ingredients of vegetal origin are ethylene oxide free and highly performing in cosmetic formulations. Moreover, they provide the skin with the pleasant accompanying effects of vegetal structures.



>> THE ORIGINS

Extra-virgin Olive oil is obtained by cold pressing the pulp of the fruits of *Olea europaea* (Olive), a species of small trees of the family Oleaceae, native to the coastal areas of the eastern Mediterranean region from Lebanon, Syria, the maritime parts of Asia Minor to the south end of the Caspian Sea and successively cultivated in all the Mediterranean area. Its stone fruit, the olive, is of major agricultural importance in the Mediterranean region as the source of olive oil.

Olive oil shows the following complete composition:

Myristic acid $\text{CH}_3 [\text{CH}_2]_{12} \text{COOH}$		COOH	1%
Palmitic acid $\text{CH}_3 [\text{CH}_2]_{14} \text{COOH}$		COOH	15%
Palmitoleic acid $\text{CH}_3 [\text{CH}_2]_5 \text{CH}=\text{CH} [\text{CH}_2]_7 \text{COOH}$		COOH	1%
Heptadecanoic acid $\text{CH}_3 [\text{CH}_2]_{15} \text{COOH}$		COOH	0,5%
Stearic acid $\text{CH}_3 [\text{CH}_2]_{16} \text{COOH}$		COOH	4%

Oleic acid $\text{CH}_3 [\text{CH}_2]_7 \text{CH}=\text{CH} [\text{CH}_2]_7 \text{COOH}$		COOH	68%
Linoleic acid $\text{CH}_3 [\text{CH}_2]_4 \text{CH}=\text{CH} - \text{CH}_2 \text{CH}=\text{CH} [\text{CH}_2]_7 \text{COOH}$		COOH	9%
Linolenic acid $\text{CH}_3 \text{CH}_2 \text{CH}=\text{CH} - \text{CH}_2 \text{CH}=\text{CH} - \text{CH}_2 \text{CH}=\text{CH} [\text{CH}_2]_7 \text{COOH}$		COOH	0,5%
Others			1%

Widely preferred to other vegetal oils for its high amount of mono-unsaturated fatty acids, it exhibits well-known properties of integration with the body physiology. Olive oil has the undoubted advantage of its lipidic fraction, provided by a millenary history of contact with vital human cells, which thus allows to boast high safety standards. When the complex of its lipidic chains is chemically combined with hydrophilic molecules of known performances, functional ingredients suitable for innumerable cosmetic formulations can be created. Another interesting aspect of olive oil properties concerns its unsaponifiable fraction (0.6-1.5%). This fraction is kept unchanged in the finished material. Its antioxidant power, as well as the emollient effects of the lipidic moiety, contributes to skin normalization and protection.



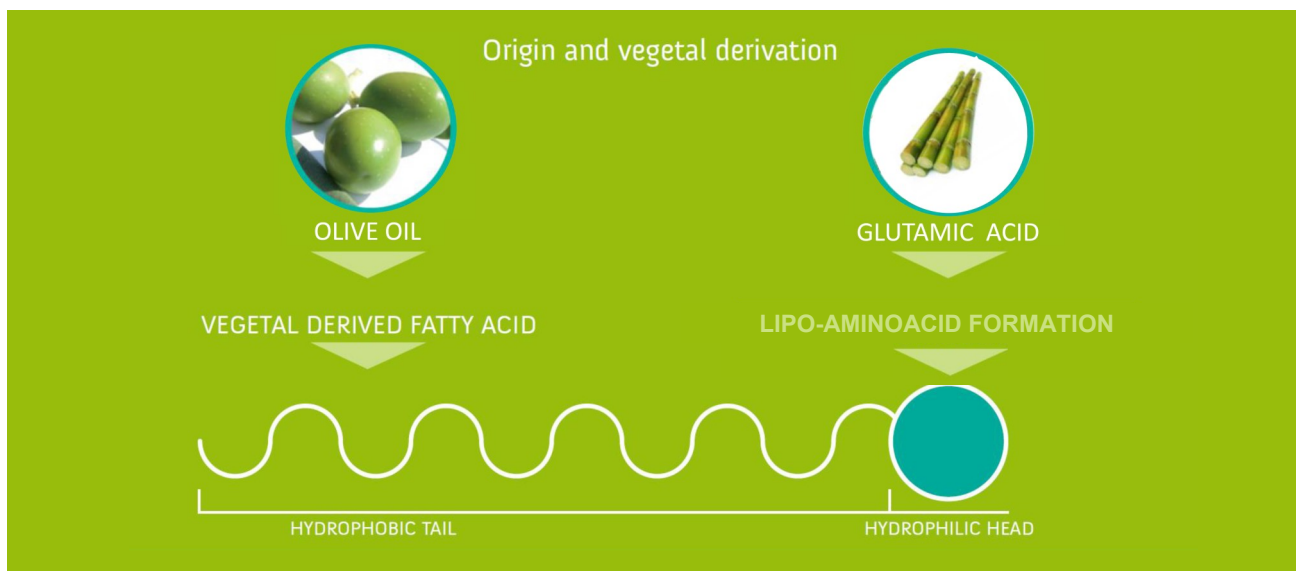
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OLIVOIL TECHNOLOGY

ITALIAN INNOVATION FROM THE OLIVE FRUIT

THE TECHNOLOGY <<

Combining the best of both vegetal oils and protein sources allowed Kalichem to achieve new molecules having relevant interfacial properties. These new surfactants can be used to formulate “totally natural” finished products that are very suitable for sensitive skin, baby-care, hair-care and personal-hygiene. Furthermore, besides being extremely performing as vehicle ingredients (as surfactants and emulsifiers), thanks to their special composition they may act as functional substances with protecting, soothing and restoring ability. As for their environmental impact, they are characterized by high biodegradability (according to the CEE regulation N.82/242 OECD Method).



OLIVE OIL AND SOFTNESS << OF OLIVE OIL PRODUCTS IN COSMETICS

One significant characteristic of the Olivoil products is given by the presence of long chain fatty acids, including oleic acid (68%), linoleic (9%) and linolenic (0,5%) and others like myristic acid, ... Their presence explains the results of the tests carried out on the surfactants concerning their highly smoothing performance. In fact a number of scientific tests show that the molecules with short chain fatty acids, like for instance the lauric acid (12 carbon atoms), have a greater irritant power than the long chain fatty acids whereby the irritant power of a surfactant is influenced by the number of carbon atoms in the fatty acids. These fatty acids of olive oil bound to proteins have more similarities to both cutaneous secretion (sebum) and cutaneous structures themselves making the Olivoil products very tolerable at the cutaneous level and thus giving the finished products containing them a very nice psychoreologic effect. The Olivoil products have an effective functional action, very soft and moisturizing, according to a correct cutaneous physiology. They leave a good feel of hydration, moisturization, smoothness, softness and cleansing on the skin: after using a wash containing an Olivoil product, one has a feel of cleanliness, satisfaction and well-being.

Olivoil products are used in association with aggressive traditional surfactants (like SLES, reducing its irritant effect) in percentages ranging from 2% to 15% depending on the desired effect. To merely reduce the irritant effect of traditional surfactants, low percentages of Olivoil products (2 - 5%) may be employed. Higher percentages of Olivoil products are suggested (5 - 15%) where an immediate feel of moisturization, smoothness and softness wants to be additionally achieved. Moreover, the higher the percentage of Olivoil used, the higher the sensory eudermic effect obtained.

PRODUCT BACKGROUND

FROM THE ENVIRONMENT THE BASE OF NEW COSMETIC RAW MATERIALS

>> OLIVOIL GLUTAMMATE SURFACTANT

The Olivoil Glutammate Surfactant is a specialty derived from entirely vegetable sources linked to the Olive Oil fatty acids and the hydrophilic and eudermic aminoacid Glutamic Acid.



The Glutamic Acid is an hydrophilic amino-acid with moisturizing features, whose use in the cosmetics industry is increasing significantly, above all in the cleansing and skin care area.

Its combination with the Olive Oil fatty acids gives a lip-aminoacid with emulsifying and mild cleansing features, aimed to the formulation of mild washes and moisturizing leave on cosmetics.

In terms of cleansing applications, the Olivoil Glutammate Surfactant brings several technological, marketing and functional benefits over other mild surfactants found on the market:

- ◆ It is based on entirely green components: Olive Oil fatty acids and Sugar Cane (or sugar beet) derivatives.
- ◆ The Olive fatty acids moiety enables to get a superior mildness in comparison to the other alkyl glutamates found on the market (generally based on Lauryl Acid from Coconut Oil); as shown in different studies, the olive oil fatty acids have a bio-compatibility, superior to the Coconut derivatives, due to their thermodynamic behavior, physical fluidity and mono-unsaturation.
- ◆ The Olivoil Glutammate Surfactant is an excellent foam builder and booster; the foam it makes is creamy and comparable to the Sulfate based surfactants in terms of size. Because of this feature, it can be used in Sulfate free formulations as a primary or co-primary surfactant or as foaming booster in Sulfate free or Sulfate based systems as secondary surfactant.
- ◆ The bio-compatibility linked to the Olive Oil, the moisturizing action of the Glutamic Acid and the foaming features of the product, make it targeted for several applications. Among them, the surfactant has been successfully implemented in oral care formulations (due to its filming features at the gums level, to its foaming features and more neutral taste than the commonly used Sulfates derivatives), in facial mousses as sole surfactant base etc

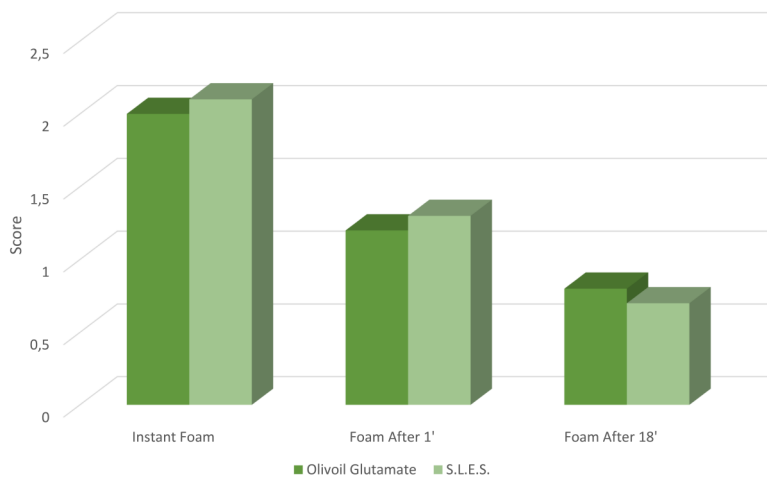


FUNCTIONAL TESTS

A CLOSE LOOK TO OLIVOIL GLUTAMMATE BENEFITS OVER THE MAIN BENCHMARKS

FOAMING POWER <<

Olivoil Glutammate vs SLES



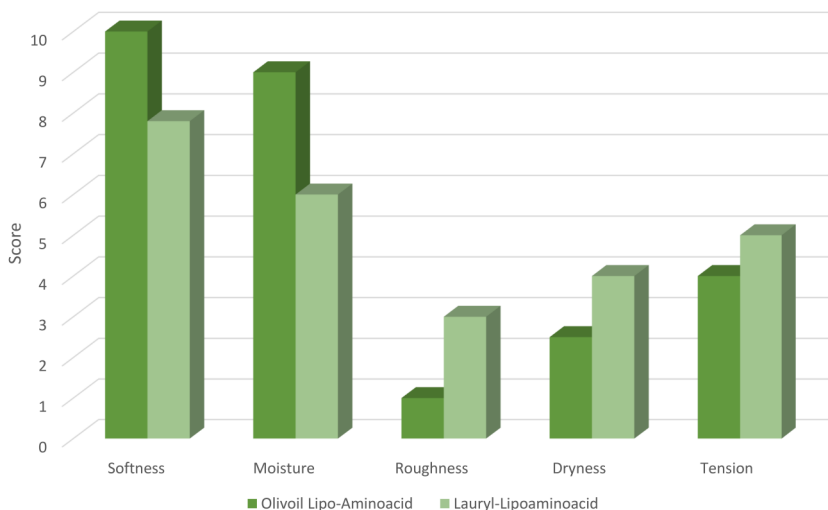
The Olivoil Glutammate Surfactant is a sulfate free specialty; despite the lack of sulfate derivatives in its composition, the raw material is able to build a creamy foam, that in terms of size is comparable to the one produced by the SLES.

The foam produced is creamy, with small bubbles and lasts for all the time necessary for the different washing applications (shower gel, bubble bath, toothpaste etc).

OLIVOIL GLUTAMMATE OVER THE OTHER ALKYL GLUTAMATES <<

The Olivoil Glutammate is a new generation surfactant based on the use of Olive Oil fatty acids; in comparison to the other alkyl glutamates, (generally based on Coconut Oil or Palm Oil fatty acids) it shows a different lipidic profile, that determines a different functional behavior.

Olivoil vs Lauryl derivativs



In order to check such differences, the Olivoil based surfactant has been compared to a surfactant characterized by the same hydrophilic moiety, but with a different fatty profile (in the test, the Lauryl Acid was chosen, as it represents the base of many mild surfactants found on the market, such as the Sodium Lauryl Glutamate).

The test shows that the presence of the Olive Oil fatty acids decreases significantly the *roughness*, *tension* and *dryness* and increases the moisturization and softness compared to the Lauryl based surfactant.

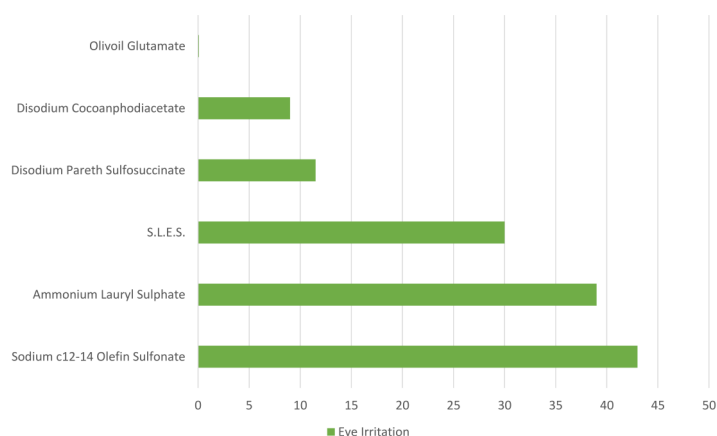
For such a reason the Olivoil Glutammate is the perfect candidate for the inclusion in wash formulations where an upgraded mildness is required. The above test proves that the Olive Oil based surfactants represent the ideal complement for Sulfate based formulations (where the aggressiveness reduction of the Sulfates is required) and for Sulfate Free products where one wants to obtain top results in terms of formulation softness, moisturization and biocompatibility.

>> SULPHATES AGGRESSIVENESS REDUCTION *(use as secondary surfactant)*

The Olivoil Glutamate Surfactant most interesting application is linked to its use as secondary surfactant in SLES based systems. In such condition, it has been observed that shower gel formulations containing SLES, can be significantly improved in terms of mildness through the addition of very low amounts of Olivoil Glutamate Surfactant.

Its use as secondary surfactant, in fact, decreases the skin irritation and dryness through the formation of mixed micelles that reduce the Sulfates based surfactant aggressiveness: this feature is related to the raw materials lack of irritation power on the skin and the mucous.

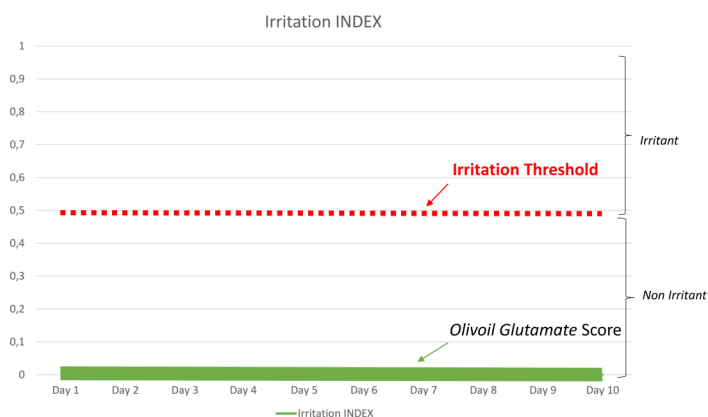
>> EYE IRRITATION



The alkyl glutamates are a family of ingredients with a very well known compatibility with human tissues; this feature is linked to the mildness of the Glutamic Acid, a compound naturally occurring in the skin composition aimed to keep the cutis moisture.

Its combination to the Olive Oil fatty acids leads to the formation of a specialty with a very low irritation power on the eye mucous, as proven through *RBC test* (based on the haemolysis and the denaturation of the haemoglobin).

>> SKIN IRRITATION



The skin irritation has been evaluated through *Flex Wash Test* (consisting of the application of the surfactant on the arm 3/die for 10 consecutive days; the irritation index is measured in compliance to the Draize Classification).

According to Draize parameters, the irritation threshold is set to a value of 0,5; the Olivoil Glutamate Surfactant reported a score of 0 with all the panelists and during each day of measurement.

Based on such test, Olivoil Glutamate Surfactant represents a perfect candidate for washes aimed for sensitive skin use.

>> ORAL CARE FEATURES

The Olivoil Glutamate Surfactant is one of the most interesting alternatives to the Alkyl Sulfates and Alkyl Ether Sulfates commonly used in the oral care industry. Compared to them, the Olivoil Glutamate Surfactant enables to get a more creamy foam and a softer after feel on the gums.

The presence of the Olive Oil fatty acids reduces the irritation power commonly observed with the Sulfates, so it is suitable in toothpaste formulations aimed for sensitive gums applications. Furthermore, its taste is more neutral than the Sulfates derivatives, so it improves the technological features of the toothpaste as well.

FORMULATION EXAMPLES <<

ECOCERT SHOWER GEL (pH 6-7)

Phase	INCI NAME	% p/p
1	POTASSIUM OLIVOYL HYDROLYZED OAT PROTEIN, AQUA (OLIVOIL AVENATE - Kalichem Italia)	20
2	SODIUM COCOYL/OLIVOYL HYDROLYZED OAT PROTEIN and FRUCTOSYL COCOATE/OLIVATE (OLIVOIL FRUTTOSIDE - Kalichem)	10
3	SODIUM COCOYL GLYCINATE, AQUA (SODIUM COCOYL GLYCINATE - Kalichem)	10
4	SODIUM OLIVOYL GLUTAMATE, AQUA (OLIVOIL GLUTAMMATE – Kalichem)	5
5	AQUA	50
6	XANTHAN GUM	1
7	GLYCERIN	4

LOW COST MILD SHOWER-GEL (pH 4,5- 7)

Phase	INCI NAME	% p/p
1	SODIUM LAURETH SULFATE, AQUA	25
2	COCAMIDOPROPYL BETAINE, AQUA	5
3	SODIUM OLIVOYL GLUTAMATE, AQUA (OLIVOIL GLUTAMMATE – Kalichem)	2-6%
4	AQUA	To 100%
5	PEG-120 METHYL GLUCOSE DIOLEATE, POTASSIUM OLIVOYL PCA, SODIUM COCOYL GLYCINATE, AQUA (COCOGLYDOC- Kalichem)	1
6	SODIUM CHLORIDE	Q.B.

ECOCERT FACE MOUSSE/BABY CARE (pH 6-7)

Phase	INCI NAME	% p/p
1	SODIUM OLIVOYL GLUTAMATE, AQUA (OLIVOIL GLUTAMMATE – Kalichem)	15 %
2	POTASSIUM OLIVOYL PCA, AQUA	5 %
3	AQUA	To 100

n.b.: The preservatives (to be chosen depending on the product brief) have to be added to each of the formulations.

WAY OF USE <<

The Olivoil Glutammate Surfactant is a lipo-aminoacid; in order to keep its structure stable, it is fundamental working at a pH of use between 5,5 and 7 (in case the surfactant is used as co-primary or primary surfactant in formula). For a use at lower amounts as secondary surfactant, the pH range of use can be extended to more acidic values (in line with the target pH of the Ecocert approved preservatives).

Summarizing, following the recommended concentration of use:

- ◆ 2-6 % as secondary surfactant in shower gels, shampoos and all sorts of cleansers
- ◆ 10-30 % as primary/co-primary surfactant in shower gels, shampoos and all sorts of cleansers
- ◆ 4-8 % in toothpaste



OLIVOIL AVENATE EMULSIFIER
OLIVOIL AVENATE SURFACTANT
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OLIVOIL FRUTTOSIDE SURFACTANT
OLIVOIL GLUTAMMATE EMULSIFIER
OLIVOIL GLUTAMMATE SURFACTANT
OLIVOIL PCA
OLIVOIL SURFACTANT
POTASSIUM OLIVATE



OLIVOIL
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