

OLIVOIL PRODUCTS



OLIVOIL EMULSIFIER

***NATURAL EMULSIFIER
OF VEGETAL ORIGIN "ECOCERT"***

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OLIVOIL PRODUCTS

“PEG-FREE” SURFACE TENSION MODIFIERS OF VEGETAL ORIGIN INTERNATIONALLY PATENTED



PRODUCTS 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 as much as possible compatible with the physiology of skin and its annexes, without any adverse effect or allergic potential. Second, 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 vegetable origin are ethylene oxide free and highly performing in cosmetic formulations. Moreover, they provide to the skin the pleasant accompanying effects of vegetal structures. The OLIVOIL brand references are based on the multi-faceted combination of OLIVE OIL and vegetal PROTEINS, derived from WHEAT and OAT.

THE ORIGINS



Extra-virgin **Olive** oil is obtained by cold pressing of the pulp of fruits of *Olea europaea* (Olive), a species of small tree 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 average composition, here given in comparison with the most used edible oils:

OILS	SATURATED LIPIDIC CHAINS	MONO-UNSATURATED LIPIDIC CHAINS	POLY-UNSATURATED LIPIDIC CHAINS
OLIVE OIL	16%	75%	9%
PEANUT OIL	19%	53%	28%
SUNFLOWER OIL	11%	33%	50%
CORN OIL	5%	31%	50%
SOYA OIL	4%	23%	59%
COCONUT OIL	87%	6%	2%

Widely preferred to other vegetable 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 of a millenary history of contact with vital human cells, which thus allows to boast high safety standards. When the complex of its

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lipidic chains is chemically combined with hydrophilic molecules of known performances, functional ingredients suitable for innumerable cosmetics 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.

WHEAT AND OAT PROTEINS

Once were animal proteins... Used as active ingredients of primary choice for most cosmetic formulators, they offered economical, functional molecules of acceptable colour and odour in a variety of forms. For known reasons, today's cosmetic chemist is faced with the challenge to replace the traditional animal-derived proteins with ingredients offering the same functionality. Plants have traditionally been viewed as renewable sources of supply, as they are "harvested" on an annual basis. In addition, consumers often associate plant and vegetable derived products with improved health and cleanliness. Plant proteins are devoid of stigmas associated with the developments in BSE (Bovine Spongiform Encephalitis) and other diseases related to animals.

HYDROLYZED WHEAT PROTEINS



Naturally derived, hydrolyzed wheat proteins contain also wheat oligosaccharides (carbohydrates) and constitute a unique hydrating complex offering a combination of moisture-balancing and film-forming properties. They work synergistically to give better bounce to the hair, and smoother, softer feel to the skin. An exceptional ingredient to add moisturization to lotions, creams and serums, it is also an excellent additive for shampoos, conditioners and body washes.

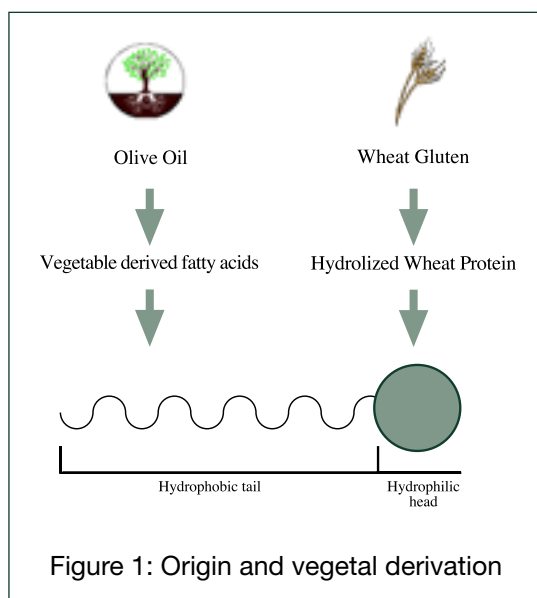
HYDROLYZED OAT PROTEINS



Oat is the only cereal containing a globulin or legume-like protein, avenalin, as the major (80%) storage protein. Globulins are characterized by their water solubility. Because of this property, oats flour may be turned into milk but not into bread. The minor protein of oat is a prolamine (typical cereal proteins such as gluten and zein) called avenin. Oat protein properties are comparable to soy proteins, which the World Health Organization considers to be equal to meat, milk, and egg protein. The protein content of the hulls of oat kernel ranges from 12 to 24%, the highest among cereals. Moreover, the hydrolyzed protein fraction generally contains an average amount of beta-glucan of 3%. It has skin healing power, stimulates collagen synthesis, promotes cellular turnover, protects and moisturizes the skin. Kalichem Italia srl has selected hydrolyzed proteins from wheat and oat which do not incorporate any genetically modified organisms (GMO).

OLIVOIL TECHNOLOGY

Combining the best of both vegetal oils and protein sources allowed Kalichem to achieve new molecules having relevant interfacial properties (see fig. 1):



These new surface-active agents can be used to formulate 'totally natural' finished cosmetic products that are very suitable for sensitive skin, baby-care, hair-care and personal-hygiene. Furthermore, beside 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 of high biodegradability (according to the CEE regulation N.82/242 OECD Method).

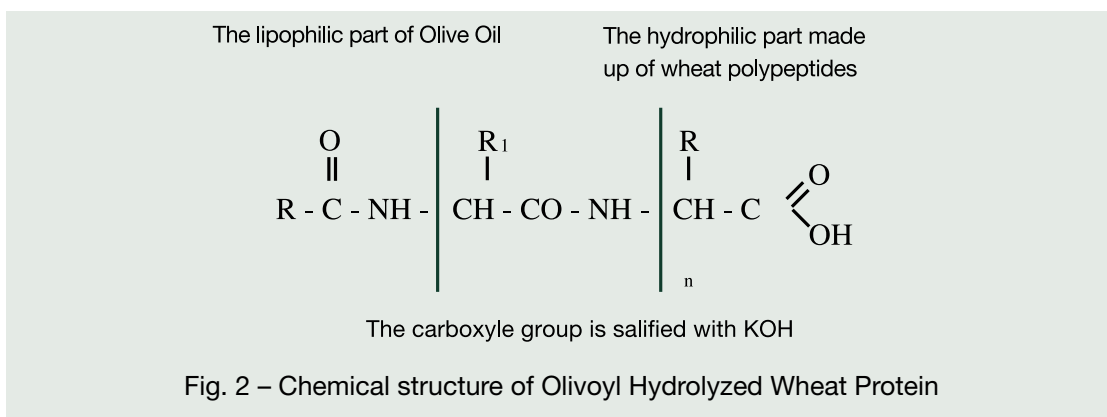
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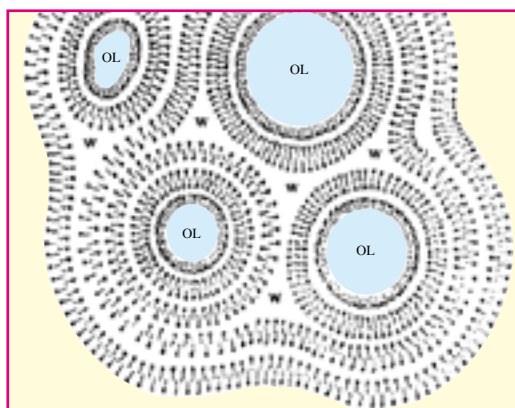
OLIVOIL EMULSIFIER

"PEG-FREE" SOFT AND EMOLLIENT EMULSIFIER

OLIVOIL EMULSIFIER is a non-ethoxylated, vegetal derived surfactant that combines the unique fatty acid profile of olive oil with the characteristic affinity of hydrolyzed wheat proteins toward the skin surface. The result is a new emulsifier structure with high skin compatibility and maximum biodegradability. OLIVOIL EMULSIFIER is based on Olivoyl Hydrolyzed Wheat Protein, a lipo-protein with a fatty amide structure, showing high inter-facial activity. It is obtained by condensation of one amino group of proteins and the carboxyl group of fatty acids of olive oil:



In order to achieve an amphiphilic system suitable for the stabilization of O/W emulsions, this structure (called Olivoil Glutinate) is combined in a balanced way with olive oil wax (mainly composed of Glyceryl Oleate and Glyceryl Stearate). The result is an 'emulsifier base' with an outstanding emulsifying power. This is due to its ability to mimic the ordered aggregation of water and oil in natural systems: the liquid crystal structure.



In this manner, extremely fine and very stable emulsions are obtained, with the oil droplets surrounded by bi-layers of amphiphilic molecules which strengthen the interface stability, thus avoiding the coalescence. With OLIVOIL EMULSIFIER, the concepts of skin-compatible liquid crystals and skin water-management become a reality. The hydro-lipidic balance of the skin, which is significantly lowered by traditional emulsifiers, is only barely altered. The increased capacity of the skin to retain moisture,

after the application of an emulsion realized with OLIVOIL EMULSIFIER can be determined. Furthermore, the lipidic moiety of the OLIVOIL EMULSIFIER, thanks to the relevance of saturated and unsaturated fatty acids from olive oil, can provide a significant contribution to the anti-aging effect of the whole cosmetic product.

KEY CHARACTERISTICS

The product comes in solid waxy blocks with a characteristic odour and ivory white color. It is suggested the addition to the oil phase of cosmetic emulsions. Having a melting point within the range 62-67 °C, it may require heating up to 70 °C for addition. The operating

parameters in the emulsification phase (time, speed, cycles of stirring and homogenization) have to be defined by taking into account the specific equipment characteristics.

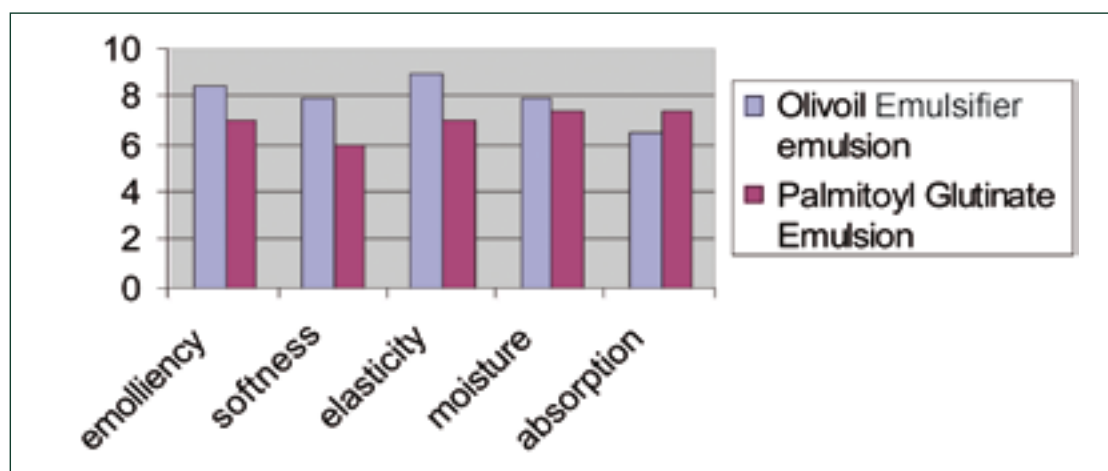
COSMETIC APPLICATIONS

Even if OLIVOIL EMULSIFIER can be used in a wide range of skin-care products, it should be underlined that it represents the best choice to formulate performing cosmetic emulsions, suitable for sensitive and delicate skin (dry skin, baby skin, ethnic products). Furthermore, it is useful to build-up anisotropic lamellar phases O/W from vegetal oils, by means of totally natural ingredients. Emulsions with very pleasant white appearance and characteristic soft-touch, stable at high temperature, without addition of co-emulsifiers, can be obtained. Their outstanding skin-feel is a very important 'marketing plus': immediate perceptions of skin smoothness, softness and silkiness are easily noticeable during and after application.

TECHNICAL AND SENSORY EVALUATIONS

1) OLIVOIL EMULSIFIER - Evaluation of skin parameters

The evaluation of sensory skin parameters was carried out following a randomized half-face test protocol by a panel of 20 subjects. They were using an emulsion containing OLIVOIL EMULSIFIER at 10%. This molecule is the key-player in the emulsifying system OLIVOIL EMULSIFIER. The test sample was applied twice daily on one side of the face, in comparison with an emulsion where the OLIVOIL EMULSIFIER structure was replaced by Palmitoyl Glutinate, on the other side of the face, for 5 consecutive days. Test results are given through the answers of the panellist to a set of questions regarding the sensorial skin parameters on a 0 to 10 scale.



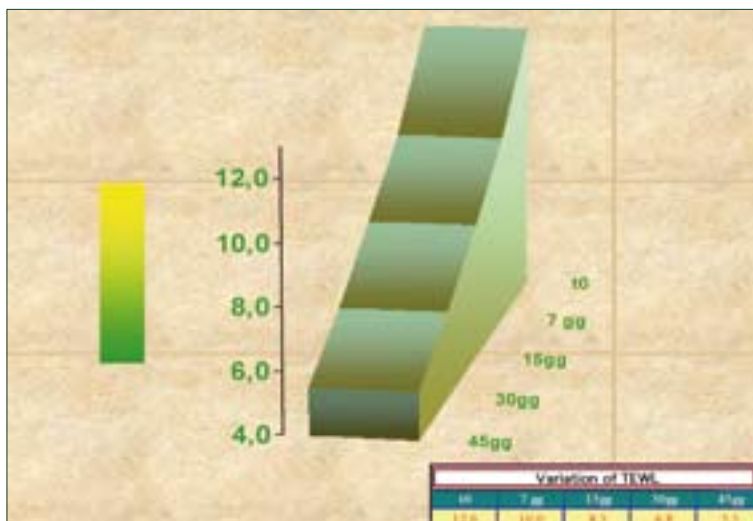
2) Objective evaluation of skin redness recovery

The evaluation of skin parameters concerning elasticity perception (skin firmness) and anti-reddening power was carried out by a panel of 10 subjects after using an emulsion containing OLIVOIL EMULSIFIER at 8%. The test sample was applied on the forearm, which has been previously rubbed with an harsh cloth for 3' in order to induce an evident skin reddening. The test emulsion was applied onto half of the reddened area, and an objective evaluation of the reddening intensity has been carried out respectively 5', 15' and 30' after application. The scores were given according by the dermatologist to a 10 point intensity scale.

3) Instrumental evaluation of skin barrier

The evaluation of skin barrier recovery was carried out by a panel of 10 subjects who were

using the emulsion containing OLIVOIL EMULSIFIER at 8% during 45 days. Volunteers have been selected among individuals having sensitive skin. The test sample was applied on the whole face surface. TEWL measures were taken before the emulsion application and during the test period, at 7, 15 and 30 days of



application. The graphic shows that the product containing OLIVOIL EMULSIFIER helps restoring the skin to its natural defences. Indeed it has a protective power on skin barrier: TEWL changed significantly during the period of treatment.

4) *In Vitro* evaluation of the ocular irritancy of OLIVOIL EMULSIFIER

According to this *in vitro* evaluation of ocular irritancy (Red Blood Cell test), the product called OLIVOIL EMULSIFIER proved to be not irritating.

OLIVOIL EMULSIFIER - PRODUCT SPECIFICATION

INCI NAME and COMPOSITION:	CAS No	EINECS/ELINCS	Range %
Potassium Olivoyl Hydrolyzed			
Wheat Protein	-	Biopolymer	25-50%
Cetearyl Alcohol	67762-27-0	267-008-6	10-25%
Glyceryl Oleate	25496-72-4	247-038-6	10-25%
Glyceryl Stearate	31566-31-1	250-705-4	10-25%

PHYSICO - CHEMICAL ANALYSIS	METHOD	LIMITS
APPEARANCE:	Visual	SOLID
COLOUR:	Visual	IVORY WHITE
ODOUR:	Sensorial	FAINT, CHARACTERISTIC
MELTING POINT (°C)	Internal	62° - 67° C.
pH (5% solution METHANOL/WATER; 70/30)	Internal	6.0 - 7.0
NITROGEN:	Kieldhal	1.2 - 1.6%
PEROXYDES:	Internal	0 - 10 mEq O2/kg
MICROBIOLOGICAL SPECIFICATION:	Internal	< 100 UFC/g

SHELF LIFE: 12 months in the original containers

IN-VITRO SAFETY EVALUATIONS

LPO586: it does not induce any lipo-peroxidation.

IN-VIVO SAFETY EVALUATION

Skin irritation (20 volunteers, epicutaneous patch-test, according to Draize classification): no reactions

APPLICATIONS %

General cases: between 3 and 10% in skin care products (O/W emulsions).

Amounts from 5 to 10% are suggested to reach thick emulsions; while 2 to 5% is usually necessary to obtain fluid emulsions (with water phase gelification). pH range: the optimum stability is between 5 and 7 values.

OLIVOIL EMULSIFIER has obtained the ECOCERT certification (since Nov. 2006)

RANGE PRODUCTS:

OLIVOIL EMULSIFIER

OLIVOIL SURFACTANT

OLIVOIL GLUTAMATE SURFACTANT

OLIVOIL AVENATE SURFACTANT

OLIVOIL PCA

