HYDROXYPROLISILANE C N®

INCI name: METHYLSILANOL HYDROXYPROLINE ASPARTATE
Ingredient code CLS (Japan): 532273

**CHEMICAL FAMILY**

HYDROXYPROLISILANE C N® belongs to the chemical family: Silanols. Silanols are hydrosoluble derivatives of organic silicon, obtained by condensation of methylsilanol, an organosilane, with numerous silanols functions, on a specific radical which confers to the Silanol obtained, its specific action mode.

**ORIGIN**

HYDROXYPROLISILANE C N® is a non-animal derivative resulting from the reaction of methylsilanetriol with hydroxyproline, obtained by biotechnology.

**ANALYTICAL COMPOSITION**

<table>
<thead>
<tr>
<th>Component</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylsilanetriol</td>
<td>0.41%</td>
</tr>
<tr>
<td>in which silicon</td>
<td>0.125%</td>
</tr>
<tr>
<td>Hydroxyproline</td>
<td>0.58%</td>
</tr>
<tr>
<td>Aspartic acid</td>
<td>0.10%</td>
</tr>
<tr>
<td>Water sq</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

**TECHNICAL CHARACTERISTICS**

- Colorless to slightly pinkish limpid to slightly opalescent liquid
- pH: about 5.5
- Density at 20°C: about 1.0
- Miscible with water, alcohols and glycols.

**AVAILABILITY**

5, 30 or 60 kg drums

**USES**

- Anti-aging: prevention and repair
- Body, Neck, Bust-firming products
- Anti-stretch mark products
- Treatment post radiotherapy or laser
- Healing process on small scars
- Eye-contour
- Anti-free radical activity (products for skins prone to acne, sensitive skins, babies and children, sun and after-sun products, after-shaves, depilatory products...)

**EXSYMOL**
**BIOLOGICAL ACTIVITIES**

**HYDROXYPROLISILANE C N® : THE ULTIMATE SILANOL FOR TISSUE REGENERATION AND SKIN–FIRMING**

**SKIN REGENERATION**

The skin regeneration is studied on an artificially aged skin (after scarification) on which HYDROXYPROLISILANE C® has been applied, versus non-treated skin. HYDROXYPROLISILANE C® shows a ~back to normal~ epidermis (scales and magnification are the same on the 2 pictures).

Biopsies allow the observation of epiderm and derm. A characteristic hyperplasia (important thickness of the epiderm) is visible on the non-treated epidermis while the skin treated with 4% HYDROXYPROLISILANE C® shows a ~back to normal~ epiderm (scales and magnification are the same on the 2 pictures).

In the case of the non treated derm, the regeneration has occurred in an ~anarchic~ way where the collagen fibbers (light blue on the picture) are disorganized. In the case of the treated derm, the collagen fibbers appear much better organized (parallel to each other and to the surface of the skin), which results in a better skin appearance and elasticity.

Other pictures (not shown here) using appropriate coloration display higher number of fibroblasts in the treated skin.

The excellent activity of HYDROXYPROLISILANE C N® as a skin regenerator is the logical consequence of the cytostimulation (evidenced in vitro) : the more numerous fibroblasts will be able to produce more proteins, in particular collagen, whose main constituent is hydroxyproline. HYDROXYPROLISILANE C N® would complementarily behave as a pool of hydroxyproline.

**CELL RENEWAL (CYTOSTIMULATION) **

Cutaneous cell cytostimulation, in particular for fibroblasts, is a key factor of the young connective tissue. HYDROXYPROLISILANE C® responds to this need by stimulating fibroblasts cell division, thus they contribute to the maintain of a normal cellular metabolism in aging tissue. The cytostimulating and regenerative effect of HYDROXYPROLISILANE C® was evidenced in vitro on a human fibroblast deprived culture medium (Fetal Call Serum (FCS) 2 %). Neutral Red is added to the incubation medium and the incorporation of it, which occurs only into living cells, is measured by U.V. (Optical density). A high OD value is characteristic for an important cytostimulation.

HYDROXYPROLISILANE C® stimulates the multiplication of ~aged~ cells and is capable to enhance the cell renewal in a very significant manner.

**CELLULAR SENESCEENCE**

Cellular senescence is a genetically programmed mechanism responsible for an irreversible stop in the cell growth and multiplication. This phenomenon occurs along with the appearance of a population of "senescent cells", with characteristic morphology and metabolism.

The replicative lifetime is defined as the time during which the cells do multiply (mitotic cells) ; when they still survive but do not multiply any more, they are said senescent.

Those tests were performed with the former animal version : HYDROXYPROLISILANE C®. Providing that the only difference with the sole currently available non-animal version (HYDROXYPROLISILANE C N®) is the biotech origin of hydroxyproline, used as a reagent for the synthesis of HYDROXYPROLISILANE C® , we consider that the efficacy of both materials is identical.

**HEALING IMPROVEMENT**

A direct application of the skin regeneration property of HYDROXYPROLISILANE C N® is against stretch-marks that generally appears after pregnancy or after a slimming diet and a loss of weigh...

A cream containing 6% HYDROXYPROLISILANE C® is applied on the abdomen of 23 pregnant women from the beginning of the 3rd month until one month after delivery.

Among the primipare patients (never pregnant before), 79% considered the effect of the product as very good, 7% of them considered it as good or fair and 14% of them considered that it had no effect.

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The energy requirement (G6PDH activity) is measured during which the cells do multiply (mitotic cells) ; when

**ANTI-STRETCH MARKS : CLINICAL EVIDENCE**

The application of HYDROXYPROLISILANE C N® on a skin, artificially aged, results in a significant improvement of its regeneration and healing capacities, while limiting the energy requirement.

Biopsies show that, after the same healing period, an aged skin (picture 1) produced a lot of compact neocollagen, few mature collagen and few interfibrillar volumes and still has not regained its young tissue aspect. At the same time, an aged skin treated by HYDROXYPROLISILANE C N® (picture 2) was able to heal much more efficiently while getting back its aspect of young skin much quicker.

The energy requirement (G6PDH activity) is measured during the healing of an aged skin submitted to Hydroxyproline or HYDROXYPROLISILANE C® treatment.

The energy necessary to heal with HYDROXYPROLISILANE C N® is less than that necessary with hydroxyproline.

**EXSYMOL**

**EXSYMOL**
TOLERANCE STUDY

The tests performed showed that the product is neither toxic nor irritant. The tolerance has been studied in vitro by alternative methods on both cell culture and reconstituted epidermis. The ocular tolerance is evaluated by studying the cytotoxicity on cornea-isolated fibroblasts culture. The cutaneous tolerance is evaluated on reconstituted epidermis by measure of the cell viability after a contact period of 24 hours with the product.

FORMULATION

The suggested concentration for an optimum activity of HYDROXYPROLISILANE C N® is from 2 to 5%.

Important remark:
HYDROXYPROLISILANE C N® must not be stored at temperature inferior to 0°C otherwise an irreversible polymerization might occur.

Heat ingredients of PHASE A to 80°C. Add ingredients of PHASE B while mixing gently. Add ingredients of PHASE C and mix gently for 15 min. Start to cool down and add ingredients of PHASE D, adjust viscosity, before incorporating fragrance.

EXISTING STUDIES

(available upon request)

- Technical document
- Cosmetic activities
- Histological anti-ageing study
- Stretch mark clinical trial

Effect of a cosmetic cream containing HYDROXYPROLISILANE C N® on the improvement of the healing properties of an aged skin. Comparison with hydroxyproline

Effect of HYDROXYPROLISILANE C N® on cellular senescence

Tolerances