SILYSIN C4

Monomethylsilanetriol L-lysinate
INCI name : SILANETRIOL LYSINATE

Chemical family

SILYSIN C4 belongs to the chemical family of Silanols. Silanols are derivatives of organic silicon, obtained by condensation of a methylsilanol, organosilan rich in silanols functions, with a specific radical that endowes the resulting Silanol with a specificity. SILYSIN C4 is the reaction product of methylsilanetriol with L-lysine.

Analytical composition

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-Lysine</td>
<td>0.47%</td>
</tr>
<tr>
<td>Methylsilanetriol</td>
<td>0.30%</td>
</tr>
<tr>
<td>in which silicon</td>
<td>0.09%</td>
</tr>
<tr>
<td>Water sq</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Analytical characteristics

- Colorless, limpid to slightly opalescent liquid
- pH : around 5.5
- Density at 20°C : around 1.0
- Soluble in water, alcohols and glycols

Availability

Drums of 5, 30 or 60 kg

Uses

Glycoprotecting • Anti-glycation • Anti-aging, anti-wrinkles

Literature available upon request

Technical literature
Glycation and silanol :
Study of the reactivity of SILYSIN C4 with Glucose 6-phosphate.
Prevention of proteins glycation.
Tolerance

Formulation

SILYSIN C4 is stable for pH between 4 and 7. The recommended concentration is around 4 to 6%.

Important notice : SILYSIN C4 must not be stored at temperature inferior to 0°C otherwise an irreversible polymerization might occur.

Tolerance

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.
BIOLOGICAL ACTIVITY

Glycation is a chemical reaction occurring between the aldehydes functions of the reactive sugars and the amines functions of the proteins (enzymes, collagen, elastin...). On the skin, this reaction results to a cross-linking of the proteins responsible for a loss of elasticity of it, formation of lines and wrinkles and premature aging. Silanols are known for their anti-glycation properties. They protect some specific sites of the proteins and are involved with the sugars oxidation products.

Lysin, that contains a primary amine function, can act as a decoy towards toxic aldehydes. A significant synergic effect was evidenced, with SILYSIN C4.

Anti-glycation effect : electrophoresis evidence

A protein (collagen or SOD) is incubated at 37°C with glucose-6-phosphate (G6P, metabolic form of glucose in the organism) or glucosone (reactive by-product of the oxidative degradation of sugars). The collagen glycation is monitored after 2 days or 3 weeks of incubation.

The electrophoresis besides show that the proteins, such as SOD or collagen are altered by some reactive derivatives of glucose like glucosone or glucose-6-phosphate. The spot of the SOD disappears (lane A2), hint for a complet degradation of this protein, and the spot of the collagen is much more diffused upward (lane B2), revealing an increase in the size of the proteins submitted to cross-linking.

Besides, proteins incubated with SILYSIN C4 are protected from glycation much more than with pure lysin.

Reactivity of SILYSIN C with glucose-6-phosphate

In this study, G6P was incubated with an equimolar quantity of lysin or SILYSIN C4. The reaction is monitored by UV spectrometry.

The reaction between a primary amine and an acyclic aldehyde function of glucose-6-phosphate generates a Schiff base. This reaction is characterized in UV by the appearance of a band around 290 nm. The increase of this band evidences the advance of the reaction.

SILYSIN C4 reacts with glucose-6-phosphate and acts as a decoy, one of the components of its anti-glycation activity.