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

L-Lysine	0.47%
Methylsilanetriol	0.30%
in which silicon	0.09%
Water sq	100.00%

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
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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%.

Importante 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.

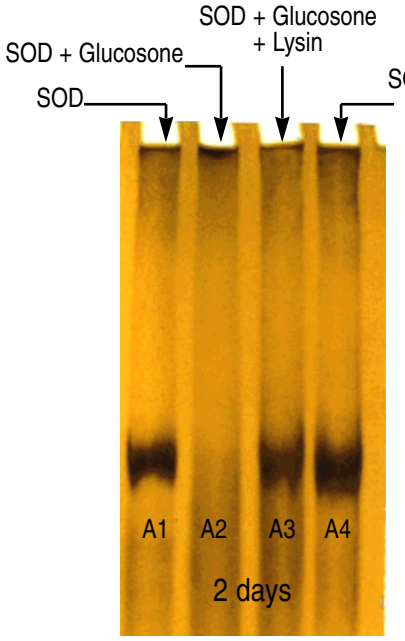
The tolerance has been studied *in vitro* by alternative methods on both cell culture and reconstituted epidermis. The ocular tolerance is evaluated by studying the cytotoxicity on cornea-isolated fibroblasts culture. The cutaneous tolerance is evaluated on reconstituted epidermis by measure of the cell viability after a contact period of 24 hours with the product.

BIOLOGICAL ACTIVITY

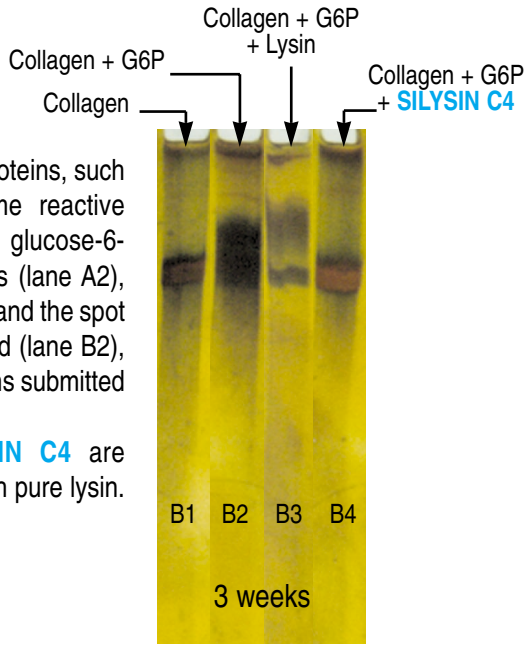
Glycation is a chemical reaction occurring between the aldehydes functions of the reactive sugars and the amines functions of the proteins (enzymes, collagen, elastin…). On the skin, this reaction results to a cross-linking of the proteins responsible for a loss of elasticity of it, formation of lines 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

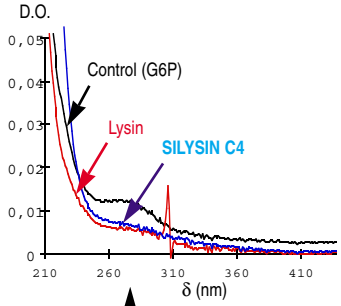
A protein (collagen or SOD) is incubated at 37°C with glucose-6-phosphate (G6P, metabolic form of glucose in the organism) or glucosone (reactive by-product of the oxidative degradation of sugars). The collagen glycation is monitored after 2 days or 3 weeks of incubation.



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.



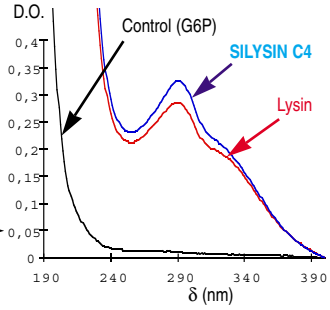
Reactivity of SILYSIN C with glucose-6-phosphate



UV spectrum at the biginning of the reaction

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

UV spectrum at the end of the reaction (3 weeks)



The reaction between a primary amine and an acyclic aldehyde function of glucose-6-phosphate generats a Schiff base. This reaction is characterized in UV by the appearence 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.

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