

# LASILIUM®

## O.S. LASILIUM 0.35

EXSYMOL

### LASILIUM

INCI name : SODIUM LACTATE METHYLSILANOL

Ingredient code CLS : 532245

### O.S. LASILIUM 0.35

INCI : SODIUM LACTATE METHYLSILANOL (and) WATER

### Origin

**LASILIUM®** is a SILANOL obtained by condensation of a synthetic derivative of silicon on lactic acid. The silicon derivative is obtained by synthesis, no derivative of animal origin is used.

Lactic acid is obtained by fermentation from sugar, no derivative of animal origin is used. On the other hand, the strain and the raw material used are not genetically modified.

**O.S. LASILIUM 0.35** is a stable dilution of 35% **LASILIUM®** in water.

#### Analytical composition (\*)

methysilanetriol	0.51%
of which silicon is	0.15%
lactic acid	0.49%
water sq	100.0%

#### Technical characteristics (\*)

colorless to slightly pink, limpid liquid  
pH : around 5.5  
density at 20° C : around 1  
miscible with water, alcohol and glycols

### Preservation

**LASILIUM®** is preserved with sodium methyl paraben, propyl paraben and salicylic acid.

### Availability

5, 30 or 60 kg drums

### Uses

Face and body moisturizers

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Dry skin

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Serine-protease regulation

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Anti-glycation

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Anti-aging : prevention and reparation

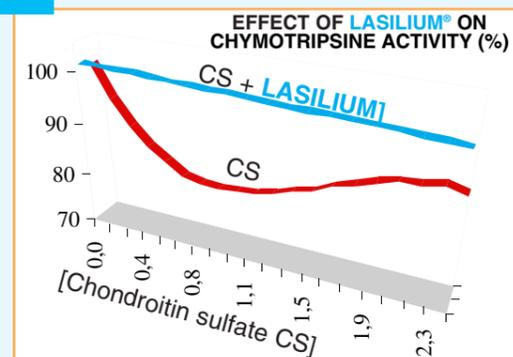
(\*) for LASILIUM

# BIOLOGICAL ACTIVITIES

**LASILIUM®** : the harmonious union of a silanol and AHA (lactic acid).

## SERINE-PROTEASES REGULATION

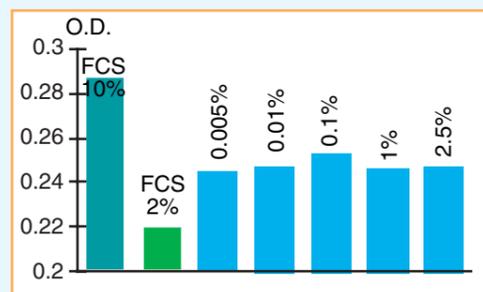
The very close relation between extra-cellular matrix (ECM) and tissue metabolism led us to study the effect of silanols, e.g. **LASILIUM®**, on some enzymes like serine-proteases (e.g. chymotrypsine), known to be involved in the processes of desquamation and moisturization. We have designed an *in vitro* experiment in which the enzymatic activity of chymotrypsine is studied under permanent control of glycan structures (e.g. chondroitin sulfate). However no inhibition of this protein is observed when a silanol (e.g. **LASILIUM®**) is incubated in the presence of the pure enzyme, we have been able to confirm that the overall enzymatic activity is partially inhibited by chondroitin sulfate (CS) (red curve). In presence of silanol, together with glycoaminoglycane (CS), the enzymatic activity



is fully and constantly preserved, keeping then a higher moisturization of the tissue (blue curve). The complete epiderm fraction is compulsory for the silanol to efficiently regulate and counteract the negative effect of chondroitin sulfate on the enzymatic activity, which confirms that the ECM and the metabolic activity of the tissue are very much interconnected.

## CYTOSTIMULATION

Cutaneous cell cyto stimulation, in particular for fibroblasts, is a key factor of the young connective tissue. **LASILIUM®** responds to this need by stimulating fibroblasts division, and therefore contributes to maintain a normal cellular metabolism in aging tissue. The cyto stimulating and regenerative effect of **LASILIUM®** was evidenced *in vitro* on a human fibroblast deprived culture medium (Fetal Calf 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 O.D. value is characteristic for an important cyto stimulation.

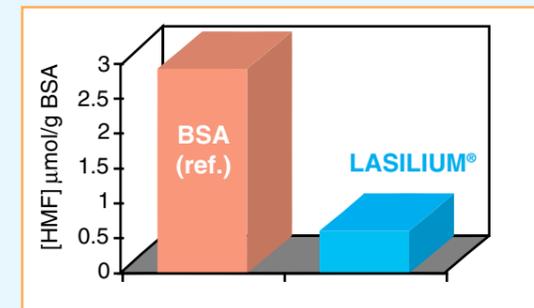


**LASILIUM® stimulates the multiplication of «aged» cells and is capable to enhance the cellular regeneration in a very significant manner.**

## ANTI-GLYCATION

The glycation is a reaction between sugars (or all other aldehydes) and a protein, leading to protein alteration. This reaction, activated by free radicals and oxidative stress, is also called the Maillard reaction. All the proteins and in particular, the cutaneous proteins (collagen, elastin, enzymes...) are affected by glycation, which results in a loss of elasticity, and in the tissue rigidification but also in a loss of enzymatic activity leading finally to skin aging.

The amine functions of the protein react with the aldehydes and lead to the formation of a Schiff Base as an intermediate in the irreversible production of Amadori products and Advanced Glycosylated End products (A.G.E.). Finally, the cross-linking of the protein appears.



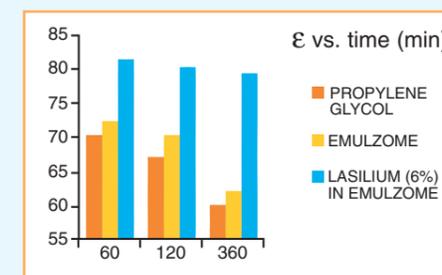
The glycation rate is measured by the quantity of 5-hydroxymethyl furfuraldehyde (HMF), liberated during the hydrolysis.

The anti-glycation activity of **LASILIUM®** was demonstrated on a reference protein (BSA) submitted to glycation by glucose. With a concentration of **LASILIUM®** corresponding to 150 mg/l in silicon, an inhibition of glycation of the protein of about 85% can be reached. Based on our knowledge on silanols' reactivity

and affinity for proteins and glucose derivative, it is very likely due to a competitive reaction between the silanol and the protein, on the one hand, and the silanol and the glucose on the other hand.

## MOISTURIZATION : CORNEOMETRY

The moisturizing capacity is evaluated with a corneometer by measurement of the dielectric constant of the skin on a group of 10 people (6 females and 4 males) aged between 28 and 52. The probe of the corneometer is applied on a predefined area of the forearm and the dielectric constant ( $\epsilon$ ) is measured regularly for 3 hours.



• Each volunteer is applied 3 different products :

- 1 : propylene glycol
- 2 : EMULZOME®
- 3 : 6% **LASILIUM®** in EMULZOME®

All products applied generate an immediate moisturization on the skin after up to 2 hours. Both propylene glycol and EMULZOME® increase the dielectric constant of about 15% while **LASILIUM®** increases it of about 35%. (The red line indicates the basic dielectric constant of the non-treated reference skins). Moreover, **LASILIUM®** is able to maintain the same moisturization degree for 3 hours or more.

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## 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.

The results show that :

- **LASILIUM®** is **not irritant** according to the procedure of ocular irritation,
- **LASILIUM®** is **not irritant** according to the procedure of primary cutaneous irritation,
- **LASILIUM®** is **not mutagenic**.

## Formulation

The suggested concentration for an optimum activity is from 3 to 4 %.

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

## Shelf-life

**LASILIUM®** should be recontroled after a 6 month storage whereas **O.S. LASILIUM 0.35** should be recontroled only after 12 months.

### Information available

Technical document

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Evaluation of moisturization by corneometry

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Study of cyto stimulation *in vitro* : fibroblast culture

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Reorganization of cell membranes

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Anti-glycation properties

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Serine-protease regulation

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Tolerances