

# CAFEISILANE C

EXSYMOL

Silanol caffeinate and alginate  
INCI name: Siloxanetriol alginate (and) caffeine (and) butylene glycol  
MHW database n° : 20800CZY10034000

## Chemical family

CAFEISILANE C is a SILANOL. Silanols are derivatives of organic silicon, hydrosoluble, with numerous hydroxyls functions and obtained by reaction on various radicals, selected to confer its specificity to the compound. All silanols are endowed with some particular biological activities, and some properties are amplified by the nature of the radicals. In the case of CAFEISILANE C, the main radicals are caffeine and mannuronic acid.

## Analytical composition

caffeine	4,00 %
polymannuronic acid	0,35 %
methylsilanetriol	0,45 %
including silicon	0,135 %
1,3 butanediol	25,00 %
water sq	100,00 %

## Technical characteristics

limpid (\*) to slightly opalescent liquid,  
colorless to slightly yellow  
pH : around 5,5  
density, 20° C : around 1,0  
miscible with water at room temperature,  
not miscible with concentrated alcohols

## Availability

5, 30 or 60 kg drums

CAFEISILANE C is also available as NANOSPHERES 100 CAFEISILANE C (SA).

## Uses

Body contour ( LIPOLYTIC, ANTI-CELLULITE )

Body and face firming

Bags under the eyes / puffy eyes

Body and face moisturization

# BIOLOGICAL ACTIVITIES

## Lipolysis - anti cellulite activity

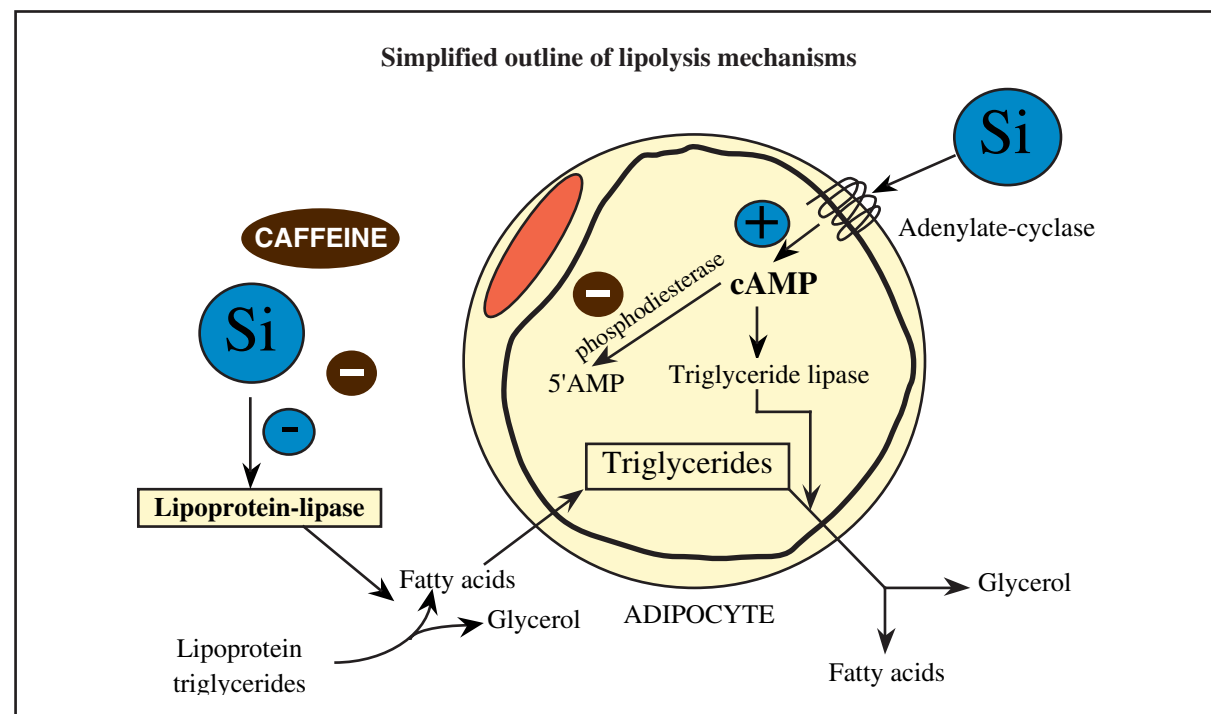
The metabolism of adipose tissue and lipolysis mechanisms are complex phenomena. 3 phases are generally distinguished :

- \* lipogenesis : phase of lipids formation,
- \* storage of lipids into the adipocytes,
- \* lipolysis : destruction (and elimination) of the lipids.

The formation of lipids, or **lipogenesis**, mainly originates from  $\alpha$ -glycerophosphate, resulting from glucose metabolism, and fatty acids, contained in the blood as lipoproteins.

The **lipoprotein lipase** is an enzymatic complex, located in the adipocyte membrane, that hydrolyzes the triglyceride lipoproteins in order to liberate free fatty acids, further **stored** in the adipocytes as triglycerides.

The **lipolysis** that takes place into the adipocytes results in the hydrolysis of the triglycerides. This lipolysis liberates simultaneously fatty acids and glycerol, characteristic for the lipolytic activity of the cells. The mechanisms of lipolysis are various and involve numerous enzymes, hormones, and membrane receptors (cf. *Cosmétique et adipocytes*, EXSYMOL).



It has been evidenced that CAFEISILANE C may be involved at 2 different stages in the anti cellulite action :

- \* CAFEISILANE C stimulates lipolysis through its action on cAMP,
- \* CAFEISILANE C decreases formation and storage of triglycerides into the adipocytes by inhibition of lipoprotein lipase.

The different constituents of CAFEISILANE C provide an optimum action as lipolytic (caffeine and derivative of silanol), restructuring and firming (alginic acid and silanol derivative) but also anti inflammatory. Therefore, CAFEISILANE C is particularly recommended for anti cellulite treatments and their undesirable side effects such as loss of tissue elasticity and flexibility as well as localized inflammations.

## Lipolysis stimulation by CAFEISILANE C

It has been shown that the lipolytic activity could appear according to 2 mechanisms : either by a stimulating action of cAMP or by an inhibitory action on lipoprotein lipase.

### cAMP activation

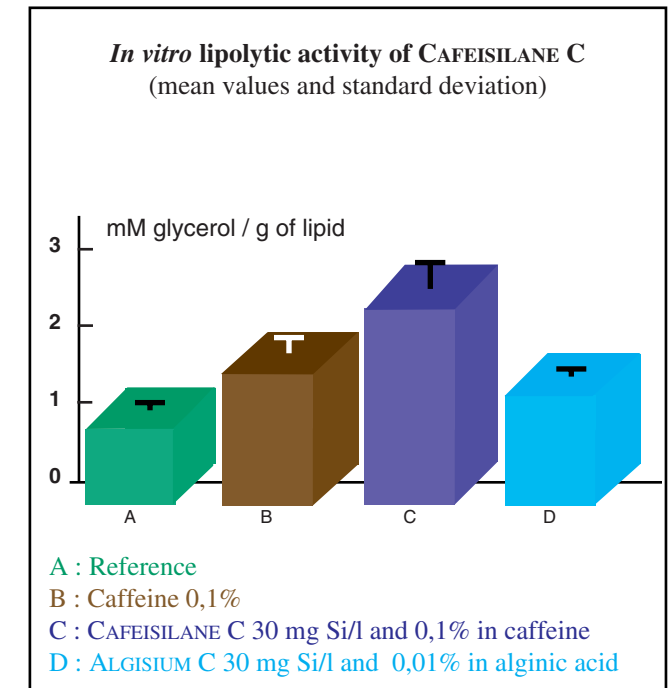
The lipolytic activity was evidenced by an *in vitro* study on adipocytes, coming from a recent sampling and maintained alive for several hours in an appropriate culture medium.

The lipolytic activity is obtained by measurement of the quantity of glycerol liberated by the adipocytes.

CAFEISILANE C shows a very high lipolytic activity, compared to caffeine and Algisium C at similar concentrations.

The mechanism of action of CAFEISILANE C on cAMP is probably double :

- \* caffeine induces an accumulation of cAMP by inhibition of phosphodiesterase, the enzyme that converts cAMP into 5'AMP,
- \* the derivative of organic silicon induces a stimulation of cAMP, without accumulation, probably by activation of membrane enzymes such as adenylate-cyclase.



### Inhibition of lipoprotein lipase

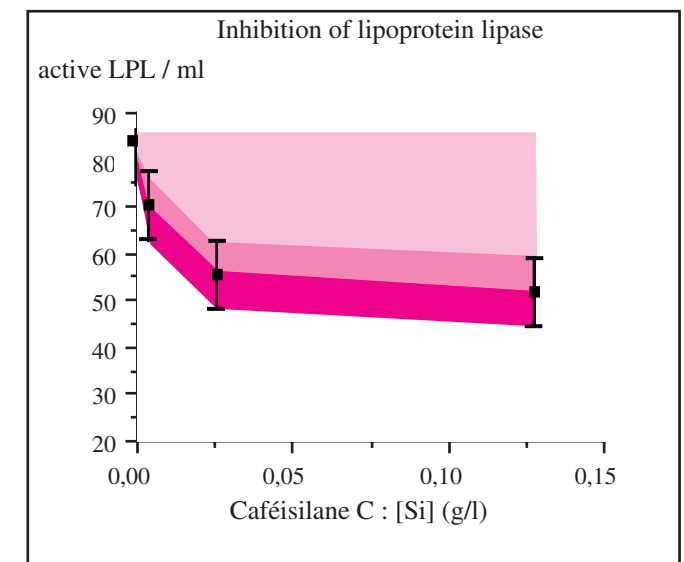
Lipoprotein lipase (LPL), produced by adipocytes, hydrolyzes the circulating lipoprotein triglycerides and liberates the corresponding fatty acids.

Then these free fatty acids come into the adipocytes where they are stored as triglycerides.

A research was performed in order to determine whether CAFEISILANE C could limit the activity of that enzyme and therefore limit the uptake of triglycerides into the adipocytes.

Our *in vitro* results evidenced that CAFEISILANE C partly inhibits the activity of lipoprotein lipase.

This effect could be involved in the lipolytic activity evidenced for this active ingredient.



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## Tolerance study

The product is neither toxic nor irritant.

Tolerance has been studied in vitro by alternative methods on both cell culture and reconstituted epidermis. Ocular tolerance is evaluated by studying cytotoxicity on cornea isolated fibroblasts culture. Cutaneous tolerance is evaluated on reconstituted epidermis by valuation of cells viability after a contact period of 24 hours with the product.

## Formulation

CAFEISILANE C is stable for pH included between 3,5 and 6,5. On average, the recommended concentration is 3 to 6%. The product is incompatible with calcium salts and concentrated alcohols.

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

(\*) The saturation in caffeine may result in a cristallization, easily reversed by heating in a 40° C water bath.

### Existing studies

Technical document

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In vitro lipolytic activity

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Effect of CAFEISILANE C on lipoprotein lipase

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Lipolytic activity of CAFEISILANE C : bioavailability and cell communication

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Tolerances