Ectoin® is a very powerful multifunctional active ingredient, which stops and prevents cell-aging! The natural amino acid derivate inhibits the formation of stress-induced singlet oxygen species (\(^{1}O_2\)) and subsequently the formation of ROS or free radicals. Ectoin® offers:

- global cell protection (in-vivo)
- STOP of UVA induced photo-aging (in-vivo)
- wrinkle improvement (in-vivo)
- long-term moisturization (7days) (in-vivo)
- improvement of skin roughness (in-vivo)
- skin barrier repair (in-vivo)
- anti-inflammatory (in-vivo)
- UVA/UVB, IR-A and "visible light" protection on cellular level
- age prevention
- DNA protection

Salt lake in Bolivia: habitat for Ectoin® producing extremophilic microorganisms.
Ectoin® is a very safe, 100% natural and multifunctional cosmetic active ingredient with global cell protection and outstanding anti-aging properties. Various in–vivo and in–vitro studies as well as clinical trials underline the extraordinary efficacy of Ectoin®.

INCI: Ectoin

Ectoin® was discovered in 1985 as the self–defense and survival substance of microorganisms living in a salt lake in Wadi El Natrun (Egyptian desert).

Ectoin®: CELL PROTECTION DESIGNED BY NATURE

Ectoin® is an amino acid derivate and belongs to the group of Extremolytes. Extremolytes are small stress–protection molecules, which protect extremophilic microorganisms and plants against the lethal and extreme conditions of their habitats like salt lakes, hot springs, permanent ice or deserts.

The Dead Sea: habitat for extremophilic microorganisms.

Several clinical studies confirmed the positive anti–aging effects and remarkable cell protection properties of Ectoin®.

By building up a strong protection layer in the skin, the so called „Ectoin® Hydro Complex“, Ectoin® protects the skin from extrinsic and intrinsic factors of skin aging and cell damage.

At the same time, Ectoin® increases and restores cell functions, which are responsible for the skin’s health and beauty. This global protection and stabilizing activity leads to a long–lasting and visible preservation and restoration of youthful and healthy skin.
EFFICACY – IN VIVO

ANTI-WRINKLE EFFICACY IN THE CROW´S FEET AREA (IN–VIVO)

An in–vivo study was carried out on 5 female volunteers over a period of 4 weeks. The aim of the study was to analyze the efficacy of 0.5% Ectoin® with regard to the reduction of wrinkles in the crow’s feet area.

Test protocol:
• placebo-controlled, intra-individual in–vivo study with 5 female volunteers (45–65 years old) treatment with cream containing 0.5% Ectoin and placebo 2x/day for 4 weeks
• application area: outer corner of the eye (crow’s feet area)
• optical measurements of the skin surface by Primos method® at day 0 and day 28
• measured parameters: mean wrinkle depth, deepest wrinkle, wrinkle volume, waveness depth, mean roughness

Results of wrinkle reduction (crow’s feet area) after 4 weeks of 2x daily application with 0.5% Ectoin® cream vs. placebo cream:

<table>
<thead>
<tr>
<th>Skin parameter</th>
<th>Cream with 0.5% Ectoin® changes in %</th>
<th>Placebo cream changes in %</th>
<th>Cream with 0.5% Ectoin®, changes compared to placebo in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean wrinkle depth (µm)</td>
<td>- 19%</td>
<td>+ 13%</td>
<td>- 32%</td>
</tr>
<tr>
<td>Deepest wrinkle (µm)</td>
<td>- 3%</td>
<td>+ 14%</td>
<td>- 17%</td>
</tr>
<tr>
<td>Volume of the wrinkles (mm³)</td>
<td>- 21%</td>
<td>+ 19%</td>
<td>- 40%</td>
</tr>
<tr>
<td>Waveness depth (Wt) (µm)</td>
<td>- 22%</td>
<td>+ 8%</td>
<td>- 30%</td>
</tr>
<tr>
<td>Mean roughness (Rz) (µm)</td>
<td>- 8%</td>
<td>+ 27%</td>
<td>- 35%</td>
</tr>
</tbody>
</table>

Table 1: percentage changes of means from day 0 to 4 weeks surface.

Results
A 4 weeks treatment with 0.5% Ectoin® showed a remarkable improvement of all wrinkle parameters in the eye area.
100% of the test subjects demonstrated a significant anti-wrinkle effect with Ectoin®.
On the contrary, the placebo cream showed no positive efficacy at all. Here all the wrinkle parameters showed even a deterioration of the respective values.
Anti-wrinkle wrinkle efficacy in crow’s feet area after 4 weeks of 2x/daily application with 0.5% Ectoin® cream vs. placebo cream:
PLEASE COME AND JOIN US AT F40 for more study results:

STOP OF UVA-INDUCED SKIN-AGING – 100% protection, 0 damage:
• 100% protection of Langerhans cells (in-vivo)
• 100% protection of the DNA of fibroblasts
• 100% inhibition of singlet oxygen induced second messenger release and AP2 activation in skin cells (prevention of the formation of ROS/free radicals)

ANTI-AGING AND SKIN REPAIR (clinical / in-vivo):
• long-term moisturization (7 days)
• improvement of wrinkle volume, scaling & roughness
• increase of skin elasticity
• skin barrier stabilization
• anti-inflammatory

FULL SPECTRUM PHOTO-PROTECTION ON CELLULAR LEVEL:
• UVA & UVB protection
• Heat/IR-A protection
• visible light protection
Product description

Applications
- skin care (face, body)
- baby care
- sun protection
- hair care
- oral care
- color cosmetics

explicitly suggested for ultra sensitive and allergic skin

Formulation guidelines
- level of use 0.3–2%
- no incompatibility with other cosmetic active substances
- can be added directly to aqueous phase prior to emulsification
- stability: pH 1–9; temperature 80°C
- excellent water solubility

Technical data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>white crystalline powder, odorless</td>
</tr>
<tr>
<td>INCI</td>
<td>Ectoin</td>
</tr>
<tr>
<td>Purity</td>
<td>≥ 96% (≤ 4% Hydroxyectoin)</td>
</tr>
<tr>
<td>Solubility</td>
<td>excellent solubility in water (390g/l), Glycerol, Propylene glycol</td>
</tr>
<tr>
<td>Chemical name</td>
<td>(4S)-2-methyl-1,4,5,6-tetrahydropyrimidine-4-carboxylic acid</td>
</tr>
<tr>
<td>Molecular formula</td>
<td>C₆H₁₀N₂O₂</td>
</tr>
<tr>
<td>CAS</td>
<td>96 702–03–3</td>
</tr>
<tr>
<td>REACH</td>
<td>01–0000017811–72–0001</td>
</tr>
<tr>
<td>Molar mass</td>
<td>142.16 g/mol</td>
</tr>
<tr>
<td>Production process</td>
<td>biotechnological fermentation / 100% natural origin</td>
</tr>
<tr>
<td>Shelf life</td>
<td>5 years</td>
</tr>
<tr>
<td>Stability</td>
<td>pH 1–9, temperature up to 80°C, light and oxygen stable</td>
</tr>
<tr>
<td>Storage conditions</td>
<td>dry place, room temperature, tightly closed</td>
</tr>
<tr>
<td>Pack sizes</td>
<td>1kg, 5kg, 25kg</td>
</tr>
</tbody>
</table>

Ectoin® is a patented active ingredient.

for general information, please visit: www.ectoin.net

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