Innovation for Natural Cosmetics Part 2
- Viewing a Range of Amino Acid Technology -

Featuring
Amino Acid-Based Functional Powder
AMIHOPE® LL
and
Hair Conditioning agent AMISAFE® AL-01
Contents

Natural Cosmetics
- Market Trends
- Technical Challenges

Amino Acid-Based Functional Powder
AMIHOPE® LL

Amino Acid-Based Hair Conditioning Agent
AMISAFE® AL-01
European Market for Natural Personal Care Products

The market has been growing at a fast rate.

- Growing consumer demand for natural/organic personal care products
- Broading sales channels for natural cosmetics
- New entrants and new product launches.

Source: Organic Monitor
New Natural /Organic Cosmetics

Europe & North America: levelled off ???
Significant growth in Asia Pacific

Source: Mintel GNPD
Technical Challenges in development of Natural Formulations

Lathering
- without alkyl (ether) sulfate

Viscosity building
- without alkyl (ether) sulfate or synthetic polymers

Emulsification
- Limited range of emulsifiers

Preservation

Sensory aspects
- Silicones, cationic polymers, quat-compounds are not in the lists
Benefits of AMIHOPE® LL on Natural Hair Conditioner
Amino Acid-Based Functional Powder
AMIHOPE® LL

ECOCERT certified natural ingredient

Chemical Name: Nε-Lauroyl-L-Lysine
PCPC INCI Name: Lauroyl Lysine

L-Lysine

Flat hexagonal crystal

Amino acid-based organic powder derived from L-Lysine and coconut fatty acid
The dynamic friction coefficient of AMIHOPE® LL is extremely small compared with other powders. = Excellent lubricity

Comparison of Friction Coefficient with AMIHOPE® LL and Other Powders

AMIHOPE® LL

Polytetrafluoroethylene

Boron nitride

Talc

Mica

Nylon powder

Kinematic frictional coefficient

0    0.1    0.2    0.3
Features of AMIHOPE® LL

Characteristics
- Insoluble either in water or oils
- High lubricity / smoothness and spreadability
- Water repellant / long-lasting
- High adhesiveness / prevents breaking of makeup products

Applications
- Foundations
- Other color cosmetics

Main Application
- Today’s proposal - Application to hair conditioners
### Sensory Evaluation of Conditioner with AMIHOPE® LL

AMIHOPE® LL gives hair smoothness and softness during rinse, and well control after dry.

<table>
<thead>
<tr>
<th>Conditioner with / without 0.5% AMIHOPE® LL</th>
<th>Control is better</th>
<th>With AMIHOPE® LL is better</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet hair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoothness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finger through</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hair softness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry hair</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoothness</td>
<td></td>
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<tr>
<td>Finger through</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preference</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Preparation of Hair Conditioner with AMIHOPE® LL

**Oil Phase**
- Part A
  - Cationic Surfactant
  - Higher Alcohol
- Heat to dissolve

**Aqueous Phase**
- Part B
  - Polyol
  - pH adjuster
  - Preservatives
  - Water
- Heat to dissolve

**Emulsification**

Hair conditioner
Quat-free lightweight hair conditioner

**AMIHOPE**® LL gets the hair soft and manageable without weighing it down.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>(wt%)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>STEARAMIDOPROPYL DIMETHYLAMINE</td>
<td>2.8</td>
<td>Hair conditioning agent</td>
</tr>
<tr>
<td></td>
<td>CETYL ALCOHOL</td>
<td>9.0</td>
<td>Emulsion stabilizer</td>
</tr>
<tr>
<td>B</td>
<td>STEARAMIDOPROPYL DIMETHYLAMINE</td>
<td>0.2</td>
<td>Dispersing agent</td>
</tr>
<tr>
<td></td>
<td>GLYCERIN</td>
<td>8.0</td>
<td>Moisturizer</td>
</tr>
<tr>
<td></td>
<td>GLUTAMIC ACID</td>
<td>1.8</td>
<td>pH adjuster</td>
</tr>
<tr>
<td></td>
<td>WATER</td>
<td>Balance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PRESERVATIVE</td>
<td>q.s.</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>AMIHOPE LL</td>
<td>0.5</td>
<td>Sensory improver</td>
</tr>
<tr>
<td></td>
<td>SODIUM HYDROXIDE</td>
<td>0.1</td>
<td>Solubilizer</td>
</tr>
<tr>
<td></td>
<td>WATER</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>FRAGRANCE</td>
<td>q.s.</td>
<td></td>
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</tbody>
</table>

100.0
AMIHOPE® LL

- Amino acid-based organic powder derived from L-Lysine and coconut fatty acid

- ECOCERT certified natural ingredient.

- Gives smoothness, softness, natural fiber alignment, good volume and well control

- Suitable as sensory improver for hair conditioner, particularly for silicone-free, “natural” hair care products.

- Disperse AMIHOPE® LL in an oil phase, recommended dosage: 0.1 – 0.5%
Benefits of AMISAFE® AL-01 on Natural Hair Shampoo
Amino Acid-Based Hair Conditioning agent
AMISAFE® AL-01

ECOCERT certified natural ingredient

Chemical Name: Nα-Lauroyl-L-Arginine
PCPC INCI Name: Lauroyl Arginine

Lauric acid

Emollient effect

High affinity to hair
Moisturizing effect

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Benefits of AMISAFE® AL-01 for Damaged Hair

AMISAFE® AL-01 alleviates unruly hair to leave hair controlled. This effect is more prominent on damaged hair.

**Control**
- Hair frizz is emphasized.
- The hair tip end is unruly and looks uncontrolled.

**With 0.2% AMISAFE® AL-01**
- Hair is in straight line.
- The hair tip end is more aligned.

TS Data No. 0125-0530E
How to Incorporate AMISAFE® AL-01 to Hair shampoo

AMISAFE® AL-01 is hardly soluble in water, alcohol or polyols.

*The water solubility is less than 0.01wt%*

- Key point -

Add AMISAFE® AL-01 into the surfactant solution and solubilize it by heating up.
Guide Formulation
Hair shampoo <Transparent> NSAI-0030

Sulfate-free mild hair shampoo formulation with skin neutral pH

**AMISAFE® AL-01** improves the hair combability and smoothness by reducing the wet friction.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>(wt%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>SODIUM LAURYL SULFOACETATE</td>
<td>4.00</td>
</tr>
<tr>
<td></td>
<td>LAURYL GLUCOSIDE (50%)</td>
<td>9.00</td>
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<tr>
<td></td>
<td><strong>AMISOFT CS-22 (25%)</strong></td>
<td>20.00</td>
</tr>
<tr>
<td></td>
<td>PRESERVATIVES</td>
<td>q.s.</td>
</tr>
<tr>
<td></td>
<td>WATER</td>
<td>45.00</td>
</tr>
<tr>
<td>B</td>
<td>GLYCERYL CAPRATE</td>
<td>3.00</td>
</tr>
<tr>
<td>C</td>
<td><strong>AMISAFE AL-01</strong></td>
<td>0.40</td>
</tr>
<tr>
<td>D</td>
<td>FRAGRANCE</td>
<td>q.s.</td>
</tr>
<tr>
<td>E</td>
<td>MAGNESIUM CHLORIDE</td>
<td>1.50</td>
</tr>
<tr>
<td>F</td>
<td>CITRIC ACID</td>
<td>0.54</td>
</tr>
<tr>
<td></td>
<td>WATER</td>
<td>Balance</td>
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<tr>
<td></td>
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<td>100.00</td>
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</tbody>
</table>

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Technical Data Sheet No. NSAI-0030E
Summary of AMISAFE® AL-01 in Natural Hair Shampoo

**AMISAFE® AL-01**

- Amino Acid-Based Hair Conditioning agent derived from L-Arg and fatty acid. It’s certified by ECOCERT as natural ingredient.

- Improves hair smoothness and combability during shampooing.

- Leaves the hair well-controlled, especially this effect is prominent on damaged hair.

- Improves foambility, hair smoothness and control at low concentration.

- Soluble in a surfactant solution.
Thank you for your kind attention!

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