AHCare

Amphoteric Hydroxy Complexes: all the benefits of Alpha Hydroxy Acids with enhanced tolerance

- Patented delivery system for AHA:
  - "Time Release" mechanism prevents irritation,
  - suitable even for sensitive skin (clinical study).

- Increases cell turnover to reveal younger looking skin (clinical study).

- Exfoliation for all skin types, including problem skin and men’s skin. Also suitable for home-use peels.

Have younger looking skin the mild way
Alpha Hydroxy Acids (AHA’s) are naturally occurring carboxylic acids with a hydroxyl group on the alpha carbon (see figure 1).

![Fig. 1 - Structure of AHAs.](image)

**Fig. 1** - Structure of AHAs.

The best known AHAs are glycolic acid and lactic acid. Glycolic acid is derived from sugar cane and lactic acid can be extracted from milk. Other AHAs, such as malic-, citric and tartaric acids are found in fruits. The name fruit acids is therefore also often used for AHAs.

AHAs have a long history of use in cosmetics. Cleopatra is said to have bathed in spoiled milk, containing lactic acid. Women in the court of France used spoiled wine, containing tartaric acid, for cosmetic purposes.

The known benefits of AHA preparations include exfoliation, moisturization, reduction of fine lines and wrinkles, collagen synthesis, firming and skin lightening.

A negative side effect of AHA treatment, however, can be a stinging or burning sensation directly after product application, particularly on people with sensitive skin.

In order to get the same effect as from AHAs, but with less possible irritation, Amphoteric Hydroxy acid Complexes were developed.

**Amphoteric Hydroxy acid Complexes**

Amphoteric Hydroxy Complexes (AHCs) contain the cation form of a complexing agent (e.g. an amino acid), the anion of an AHA and undissociated AHA molecules. Figure 2 shows a 1:1 central complex of lactic acid and arginine coordinated by six molecules of lactic acid.

![Fig. 2 - Molecular Model of 1:1 lactic acid/arginine central complex coordinated by six molecules of lactic acid.](image)

These forces are responsible for the slow release of alpha hydroxy acid from the complex into the skin. This time-release process leads to a lower peak concentration of AHAs in the skin, which is usually below the user’s irritation threshold. This is depicted in a schematic model in figure 3.

![Fig. 3 - Model of time-release mechanism of AHCs resulting in a lower peak concentration of AHAs in skin (hypothetical model) (1).](image)

As a result skin irritation is virtually eliminated, which allows extending the benefits of AHAs even to more sensitive skin.


Definition / Composition
AHCare are amphoteric hydroxy complexes, composed of an amino acid, arginine, and either lactic- or glycolic acid. AHCare L65 is based on lactic acid.

AHCare is a patented technology[2], which has been exclusively licensed. Using AHCare L65 from Beauty Creations will allow you to use this patented technology free of license.

Skin benefits
• Exfoliation.
• Moisturization.
• Reduction of fine lines and wrinkles.
• Skin lightening.
• Firming/collagen synthesis.

Cosmetics use
• Exfoliating products (including home-use peels).
• Anti-age face care (reduction of fine lines and wrinkles).
• Products for skin lightening/anti-age spots.
• For hydrating skin care (face and body).

Dosage / Solubility / Mode of incorporation
1. Dose of use: 5 to 10%
3. Mode of incorporation: to be incorporated at temperature below 50 ºC during the finishing process or at room temperature for cold processed formulations.

Analytical characteristics
2. Specifications: upon request.

Tolerance
Good.

Efficacy
Test summaries hereafter.

Storage
In unopened original containers at 0 - 30°C.

INCI name
AHCare L65: Lactic Acid (and) Aqua (and) Arginine
Demonstration sting studies

Facial sting studies

Aim
Facial sting studies were carried out to prove that amphoteric hydroxy acid complexes are less irritating than AHAs.

Protocol
The stinging potential was evaluated by a panel that was identified in a pre-screening as being sensitive to lactic- or glycolic acid. In a first clinical study the stinging potential of amphoteric hydroxy complexes with a low AHA: arginine ratio was compared to that of the free AHAs. The stinging potential was evaluated on a semi-quantitative scale. In a second study it was investigated if at much higher ratios of AHA to arginine this reduced irritation potential is still maintained. In all cases the acid concentration in the AHC and the free acid solution was equivalent.

Results
Figure 4 shows the results of a comparison of a solution containing an amphoteric hydroxy complex with a lactic acid: arginine ratio of 2.5:1 against a solution with 20% lactic acid, neutralized with ammonium hydroxide to pH 3.5. The AHC solution produced a stinging sensation equivalent to that of the negative control, water.

Figure 5 shows the results of a comparison of lactic acid, adjusted to pH 2.2 with ammonium hydroxide and AHCare, which has a ratio lactic acid:arginine of 20:1. Even at this higher AHA to arginine ratio, the amphoteric hydroxy acid complex clearly has a reduced stinging potential.

Conclusion
Amphoteric Hydroxy Complexes are significantly less irritating than AHAs.
**Demonstration of efficacy**

**Dansyl chloride cell turnover study**

**Aim**
To demonstrate that amphoteric hydroxy complexes have the same efficacy as conventional AHAs, dansyl chloride staining was used.

**Protocol**
In a clinical study with 17 volunteers aged 25-29 years old, a 10 % lactic acid solution and a 14.7% AHCare L65 solution were compared. The concentration of lactic acid in these two solutions is equivalent. Both the AHA (= lactic acid) and the AHCare solution were adjusted to pH 2.4 with ammonium hydroxide. Dansyl chloride staining of the forearm was followed by visual rating of the fluorescence intensity under a Wood’s lamp over a period of 21 days. Product was applied twice a day.

**Results**
Both solutions significantly reduce the time it takes for the dansyl chloride stain to disappear (figure 7). This means that the cell turnover rate is increased, by none less than 34% for the AHCare solution, producing younger looking skin. The difference between the AHA and AHC products is not significant.

**Conclusion**
The efficacy of AHCare is similar to the efficacy of lactic acid under the same conditions of concentration and pH.
Although all statements and information in this publication are believed to be accurate and reliable, they are presented gratis and for guidance only, and risks and liability for results obtained by use of the products or application of the suggestions described are assumed by the user. THERE ARE NO WARRANTIES OF ANY KIND. ALL EXPRESS AND IMPLIED WARRANTIES ARE DISCLAIMED. Statements or suggestions concerning possible use of the products are made without representation or warranty that any such use is free of patent infringement and are not recommendations to infringe any patent. The user should not assume that toxicity data and safety measures are indicated or that other measures may not be required. The claims and supporting data provided in this publication have not been evaluated for compliance with any jurisdiction’s regulatory requirements and the results reported may not be generally true under other conditions or in other matrices. Users must evaluate what claims and information are appropriate and comply with a jurisdiction’s regulatory requirements. Recipient of this publication agrees to (i) indemnify and hold harmless each entity of the BASF organization for any and all regulatory action arising from recipient’s use of any claims or information in this publication, including, but not limited to, use in advertising and finished product label claims, and (ii) not present this publication as evidence of finished product claim substantiation to any regulatory authority.