



Polylac[®] 136A

Lactic Acid Ester

Cosmetic properties of the Polylac[®] 136A

- Powerful moisturizing, humectant and emollient agent
- It improves the quality of the foam and the thickening property of the surfactants.
- It forms an emollient, protective film layer against dehydration and dryness

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■ Definition

The Lactic Acid (C₃H₆O₃) has a molecular weight of 90.08 and may also be referred to as Acid 2 - Hydroxypropanoic or Acid - Hydroxypropionic. In many plants, lactic acid results from the metabolism of carbohydrates.

The Lactic Acid Ester was the first to be used by the cosmetic industry. It has been widely used in anhydrous formulations. However, especially in the makeup industry, the Lactic Acid Ester has been employed to ensure the physical stability of pigments.

The Lactic Acid Ester is a powerful moisturizing, humectant and emollient agent. It is known that once initiated, the hydrolysis of the Lactic Acid Ester (in the presence of water) is catalyzed by the Lactic Acid itself, which breaks the whole molecule transforming it into Lactic Acid and Free Alcohol.

When used in shampoos, the lactic acid ester improves the quality of the foam and the thickening property of the surfactants, making the final product smoother and giving a soft feel to the hair.

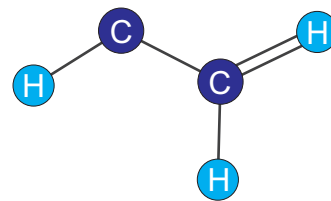
The lactic acid ester forms an emollient, protective film layer against the dehydration and dryness of the hair strands as well as a dermo protective action for the scalp.

■ Alpha Hydroxy Esters

The Alpha Hydroxy Acids (AHA) are organic acids with a free hydroxyl in the alpha position relative to the carboxyl. These molecules, normally present in nature, can also be obtained synthetically. Some of them are very well known in the pharmaceutical, food and cosmetic industries.

Alpha hydroxy acids have been used throughout this century for topical application, both in the form of free acids and salts. Since the 1930s there are references published on the skin softening properties by the lactic acid from preparations of urea.

In recent decades, there have been several clinical investigations on the AHAs. The AHA with the smaller molecule is the Glycolic Acid. It can be obtained from both plant extract and synthetically. The Glycolic Acid is a highly irritating substance, however it has been used by the cosmetic industry for its keratolytic and exfoliating action.



Glycolic Acid Molecule

The risks associated with dermatologic use of the Glycolic Acid have led researchers to test the higher homologues with less aggressive properties. The effectiveness of these, as well as other AHAs, has directed the Cosmetic Industry towards products that are more reliable and less irritating.

Therefore, the industry introduced the lactic, malic, citric, tartaric and ascorbic acids. They are also known as fruit acids, as they are produced from fruity extracts. These acids have been used as buffers and anti-oxidizing agents by the cosmetics industry.

The Beta Hydroxy Acids (BHA) have recently been introduced, with less irritability when compared to the Alpha Hydroxy Acids. The BHA, such as the Kojic Acid and the Salicylic Acid, has more or less the same dermatological behavior as the AHAs, except for being softer and less irritating.

■ Hydration test

Evaluation of the hydration of the superficial skin layer by corneometry. The moisturizing cosmetic products can prevent water loss in two ways:

1. Forming a barrier against superficial evaporation;
2. Moisturizing the stratum corneum with the water contained in the applied product or by absorbing water from the atmosphere (humectant).

The products designed to keep the skin moisturized and healthy should be evaluated in order to determine its effectiveness.

Among the commercially available equipment, Corneometer® is one of the most used for assessing the level of skin hydration. The method is based on capacitance measurements, and the capacitor formed between the base of the Corneometer® probe and the skin presents changes in the capacitance value according to the amount of water in the skin.

Formulations used:

Basic Moisturizing Lotion - With 10% Propyleneglycol - Proof01

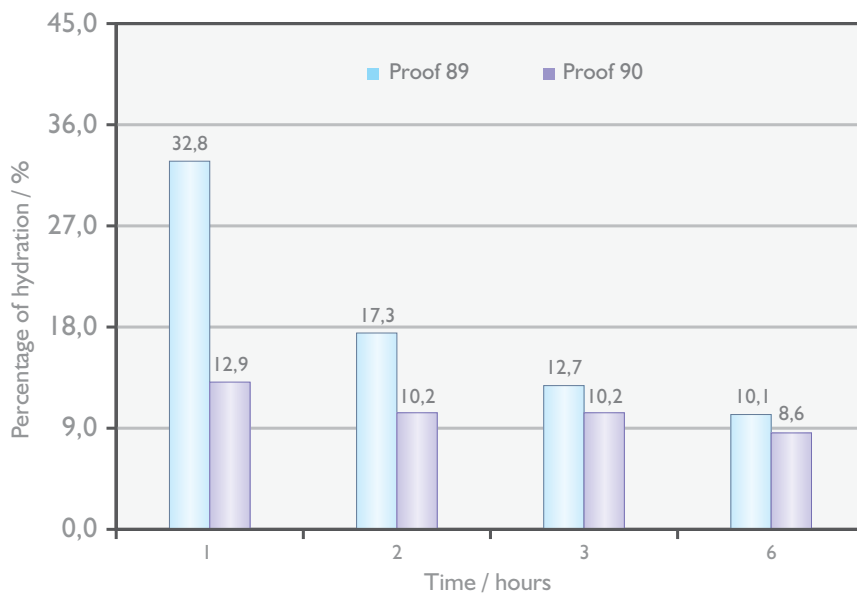
Basic Moisturizing Lotion - With 2% of Propyleneglycol + 0.15% of Poly lac 136-A® - Proof02

Test on 20 female volunteers, aged from 18 to 50 years, who presented dry skin in the region of the forearms and suspended the use of any product in that region 48 hours before the start of the study.

After application, the volunteers remained in the laboratory for measurement after 1 h, 2 h, 3 h and 6 h, in an acclimatized room.

■ Hydration test

Results in Percentage of Hydration x Time / Hour



The skin hydration granted by both products was statistically significant after 1, 2, 3 and 6 hours of application when compared with the control scenario (area without application of any product). This indicates that the products moisturize the skin for up to 6 hours.

It is also evident that due to the physical and chemical characteristics of the propylene glycol, proof01 showed significantly higher hydration compared to the product in proof02 after 1 hour of application. However, after 2, 3 and 6 hours, no significant difference was seen between these products, which means that the Polylac 136-A® promotes prolonged hydration, even in low concentrations.

It is noteworthy that, in addition to moisturizing, the Polylac 136-A® is also an excellent emollient, rapidly absorbed to provide a uniform dry film, thus significantly improving the final sensory of the formulations.

■ Physical-Chemical Characteristics

Aspect (25° C):	Pasty	Visual
Color	White / Slightly yellow	Visual
Acidity Index:	Max 2.0	PL 003
Saponification Index	176 - 193	PL 007

■ Recommended Dosage

Hair care products: 0.5 - 5%

Dermatological products: 1 - 3%

■ Expiration

Product valid for 36 months from the date of manufacture.

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