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Lactic Acid Research Paper

APPEARS IN

Lactic acid is an alpha hydroxy acid. An alpha hydroxy acid (AHA) is a naturally occurring substance. Lactic acid is present in the body, can be made from glucose, and is also found in sour milk. In fact, Cleopatra was rumored to have bathed in sour milk to help rejuvenate her skin and keep it looking soft and radiant. Benefits of AHAs include increased cell turnover, and improvement of hyperpigmentation and age spots. Three Ships' Superfruit Exfoliating Mask utilizes this natural ingredient that is packed with exfoliating and moisturizing properties.

LACTIC ACID, AN AHA, HELPS TO EXFOLIATE THE SURFACE OF THE SKIN

Lactic acid, an AHA, helps to exfoliate the surface of the skin. AHAs help smooth out the top dead layer of the skin (stratum corneum) and allow for better penetration of other ingredients. AHAs dissolve the glue between cells to exfoliate the top layer of the skin. Lactic acid has been used in cosmetics for decades and were first discovered to have effects on keratinization (a disease involving autoinflammation and autoimmunity) by Van Scott and Yu in 1974. Lactic acid increases the turnover rate of skin and eliminates accumulated dead skin cells on the epidermis, which, overall, results in a smoother appearance of the skin and a reduction in uneven complexion.

Lactic acid is manufactured by the natural process of fermentation of glucose syrup. The glucose is broken down to produce lactic acid. The broth is filtered to separate the buffered lactic acid from biomass and concentrated by evaporation of water. The lactic acid is purified by adsorption and decolourized with activated carbon.

Following the evaporation of water, the lactic acid is further purified through distillation. The final pure concentrated lactic acid solution is then diluted with water to the targeted concentrations.

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BENEFITS OF AHAS INCLUDE INCREASED CELL TURNOVER, AND IMPROVEMENT OF HYPERPIGMENTATION

Hydroxy acids are organic acids that have one or more hydroxyl groups attached to a carbon chain. Hydroxy acids can be classified by the position of the hydroxyl group (e.g. α, β, γ) and the number of hydroxyl groups (mono- and poly-). In general, the smaller the molecular size of the AHA, the greater the risk of irritation. This is because a smaller molecular size means that the AHA will be absorbed by the skin at a faster rate and, hence, may cause sensitivity. The AHAs from smallest to largest molecular size are glycolic acid, lactic acid, malic acid, and citric acid. Hydroxy acids can be derived from plants (e.g. sugar cane, lemons, and oranges) and have been used since Ancient Egyptian time for their anti-bacterial and exfoliating properties. Hydroxy acids are a type of chemical/herbal exfoliant that loosen the glue-like substance that holds cells together, which allows them to slough off and thereby promotes cell turnover.

The precise mechanism of action of hydroxy acids is not fully elucidated; however, there is a general consensus that the exfoliation of the stratum corneum (outermost layer of the skin) improves skin texture and reduces hyperpigmentation and fine lines. AHAs found in the fruit AHA blend help to normalize cell turnover in the epidermis (top layer of the skin). The process of desquamation, or cell turnover, involves the rapid formation of normal healthy skin and the sloughing off of dead skin cells from the stratum corneum. Overall, this reduces the formation of wrinkles and dry skin.

SCIENTIFIC STUDY

The Roles of pH and concentration in lactic acid-induced stimulation of epidermal turnover

In this study, the effect of the concentration of lactic acid, an AHA, on skin renewal rate was examined. Twenty-six female subjects participated in the double-blind, randomized, placebo-controlled study. The dansyl chloride technique for stratum corneum renewal was used as an indicator to determine cell renewal turnover time. Overall, the study found that lactic acid accelerates epidermal turnover and exfoliates the stratum corneum. The study also found that effects of lactic acid are pH and concentration dependent.

All in all, the findings suggest that lactic acid is an effective and natural exfoliating ingredient, which is safe to use during pregnancy. Unlike glycolic acid, lactic acid is less irritating and is effective in individuals with sensitive skin conditions. AHAs help to rejuvenate the skin by increasing cell turnover and hence may even help reduce wrinkles and fine lines. Hence, lactic acid has exfoliating and moisturizing properties.