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Product name: Tranexamic acid

INCI name: Tranexamic Acid

CAS: 1197-18-8

Chemical classification: Amino acid

Functional category: Skin conditioner; Astringents ~ Cosmetic

Description: Tranexamic acid (TXA) is a synthetic derivative of the amino acid lysine. Its chemical structure consists of a central carbon atom bonded to an amino group (NH₂) and a carboxyl group (COOH). It usually occurs as a white crystalline powder, odorless, with a slightly bitter taste. The powder is soluble in water, insoluble in oils. The melting point ranges from 210°C to 216°C. Tranexamic acid is stable under normal conditions when properly stored. It is sensitive to light and should be protected from exposure to direct sunlight. Tranexamic acid is a weak organic acid with a pKa value of about 4.5. In solution, it can form salts with bases. It is compatible with various cosmetic ingredients. IUPAC name: trans-4-(Aminomethyl)cyclohexanecarboxylic acid.

Action on the skin: Tranexamic acid was originally developed in pharmacy as an antifibrinolytic. Over time, it has proven to be a valuable cosmetic raw material with whitening functional activity and in the treatment of melasma, as it is capable of inhibiting melanin synthesis by inhibiting the plasminogen/plasmin system, blocking the interaction between melanocytes and keratinocytes. Additionally, acids such as TXA have exfoliating properties, leading to the regeneration of epidermal and dermal tissues and reducing pigmentary dyschromia. TXA is widely used in the treatment of hyperpigmentations caused by exposure to ultraviolet radiation (UV). Among them, melasma, a hyperpigmentation disorder resulting in the formation of brown or grayish spots on the face, is one of the most common. The etiology of this condition is multifactorial, however, among the main causes are hormonal imbalance, genetic and ethnic factors, and environmental exposure, with ultraviolet radiation (UV) being the most common cause. These factors lead to increased melanocyte activity and, consequently, to melanin accumulation, as identified by histopathological analysis. Clinical studies show positive results regarding melanin levels after the application of TXA in the treatment of melasma. Kanechorn et al. (2012) evaluated the efficacy of

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applying 5% TXA, twice daily, for 12 weeks, observing a reduction in melanin index at the application site in 78.2% of patients. In a similar study conducted by Kim et al. (2016), the application of acid in a concentration of 2% yielded satisfactory results, with a significant decrease in melanin content in the epidermis in 22 out of 23 patients. Net et al. (2012) also evaluated the application of a topical agent with 2% TXA, twice daily, for 8 weeks, to explore effects on epidermal lesions, describing a reduction in pigmentation, number of blood vessels, and number of mast cells.

Benefits:

- **Reduces hyperpigmentation and melasma:** Tranexamic acid has demonstrated effectiveness in reducing hyperpigmentation and melasma, common skin discoloration issues. By inhibiting the enzyme tyrosinase, which is crucial in the process of melanin production in the skin, it blocks the production of melanin, the pigment that gives color to our skin, and prevents its accumulation in the skin. Additionally, TXA can block the effects of pigmentation growth factors (which stimulate melanin production), further aiding in reducing hyperpigmentation. Regular use of tranexamic acid has been shown to reduce the appearance of dark spots and uneven skin tone.

- **Brightens and evens out skin tone:** Tranexamic acid has also shown the ability to brighten and even out skin tone, making it brighter and younger-looking.

- **Improves skin texture:** Tranexamic acid has shown the ability to improve overall skin texture by reducing inflammation and promoting collagen production. It helps reduce the appearance of fine lines and wrinkles, making the skin smoother and more elastic.

- **Helps treat acne:** Tranexamic acid has also shown effectiveness in treating acne. Its ability to reduce inflammation and prevent melanin accumulation in the skin helps reduce the appearance of acne scars and dark spots.

- **Repairs sun damage:** UV radiation can cause dark spots to appear on the skin, especially in individuals with light skin. Tranexamic acid can help reduce sun damage by inhibiting melanin production after UV exposure, resulting in reduced dark spots and preventing their reappearance.

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• **Moisturizes the skin:** Tranexamic acid has moisturizing properties that help maintain the softness and elasticity of the skin. It works by enhancing the skin's natural hydration barrier and preventing water loss, which is important for maintaining healthy and youthful-looking skin.

• **Suitable for different skin types:** One of the advantages of tranexamic acid is its good tolerance for different skin types, including sensitive skin. This makes it suitable for a wide range of users, regardless of skin type or any skin issues.

Method of use: It is commonly used in concentrations ranging from 0.5 to 3%. It is a water phase in the emulsion system. For external use only.

Application: It is often used to make face serums applied to clean skin before other skincare products. Serums are usually concentrated and quickly absorbed, allowing tranexamic acid to penetrate deeper into the skin and provide its benefits. Tranexamic acid can also be found in face creams and lotions. These products are applied to the skin after cleansing and toning, usually in the morning and/or evening. Creams and lotions provide hydration and protection to the skin, while tranexamic acid works to improve skin tone and reduce hyperpigmentation. There are also face masks containing tranexamic acid as one of the active ingredients. These masks are usually used once or twice a week to provide additional skincare and improve results in the fight against hyperpigmentation. Sometimes tranexamic acid can also be found in targeted treatment products, such as spot applications or treatments for dark spots and melasma. These products can be used locally on problematic areas to directly address hyperpigmentation. Tranexamic acid is often combined with other active ingredients such as retinol, vitamin C, or alpha hydroxy acids (AHA) to enhance its effects. These combined formulations can provide multiple benefits for the skin, including brightening, hydration, and improving skin texture.

Animal testing: Substance has not been tested on animals.

GMO: Not GMO

Vegan: Does not contain animal-derived components.

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