Import and distribution for Serbia: Farmadria DOO
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TECHNICAL DATA SHEET

Product Name: Retinyl palmitate

INCI name: Retinyl palmitate, Tocopherol

CAS: 79-81-2, 10191-41-0

Chemical classification: Ester

Functional category: Conditioner for skin and hair care

IUPAC name: (2E,4E,6E,8E)-3,7-Dimethyl-9-(2,6,6-trimethyl-1-cyclohexenyl)-nona-2,4,6,8-tetraenyl] hexadecanoate.

Description: Retinyl palmitate, a form of vitamin A, is the esterified version of retinol, in which retinol is bound to palmitic acid. Upon application to the skin, retinyl palmitate undergoes several enzymatic processes, converting it into retinol, then retinaldehyde, and finally into retinoic acid—the active form of vitamin A that directly impacts skin cell metabolism. Retinyl palmitate acts as a powerful antioxidant, neutralizing free radicals that can damage the skin and cause premature aging. This process helps preserve skin structure, reduce fine lines and wrinkles, and diminish dark spots caused by UV damage. Additionally, retinyl palmitate plays a crucial role in regulating the growth of epidermal cells, increasing the cell renewal rate, resulting in smoother, refreshed skin with fewer irregularities and inconsistencies in texture. It appears as a light yellow or pale oily liquid that is relatively viscous. At lower temperatures, below 20°C, it has a thick consistency (wax), so it should be gently heated before use. The substance is hydrophobic, meaning it dissolves in lipids and organic solvents like alcohol and oils but is not water-soluble. Its melting point ranges between 27°C and 30°C, making it suitable for formulations that do not require high processing temperatures. The specific gravity of retinyl palmitate typically ranges from 0.93 to 0.96 at standard temperature, while its refractive index is between 1.475 and 1.485 at 20°C, indicating its transparency and optical properties in cosmetic formulations. A key advantage of retinyl palmitate over retinol is its significantly higher resistance to oxidation caused by UV light and oxygen, enabling its longevity and stability in products. The activity of retinyl palmitate is 1.7 Mio IU/g.

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Mechanism of action: Retinoids are chemical compounds that include retinol, the alcohol form of vitamin A, as well as its derivatives, both natural and synthetic. As lipophilic molecules, they easily penetrate the lipid layers of the skin and reach the deeper layers of the epidermis. In the skin, they bind to specific retinoid receptors (RAR and RXR) in cells, influencing gene transcription and controlling key processes such as cell differentiation and proliferation. Retinoids act on keratinocytes in the epidermis but also affect fibroblasts in the dermis, promoting skin renewal and increasing collagen production. This process leads to smoother, more even skin, reducing wrinkles, fine lines, and hyperpigmentation. Their ability to regulate sebum production makes them useful in treating acne and oily skin, as they reduce pore clogging and inflammation risk. Additionally, retinoids act as potent antioxidants, neutralizing free radicals that damage the skin and accelerate aging. Because of these properties, they are key ingredients in anti-aging treatments and products aimed at repairing UV-damaged skin. While effective, retinoids can cause irritation in sensitive skin types, so it is advisable to introduce them gradually into the skincare routine, starting with lower concentrations to allow the skin time to adjust and minimize the risk of unwanted reactions.

Benefits:

- They increase cell renewal, leading to smoother and more even skin.
- They reduce wrinkles and fine lines by stimulating collagen production.
- They even out skin tone by reducing hyperpigmentation and dark spots.
- They regulate sebum production, reducing acne and oily skin.
- They act as antioxidants, protecting the skin from damage caused by free radicals.
- They help in the recovery of skin damaged by UV radiation.

Usage: Due to its stability and mild effect, retinyl palmitate is used in various cosmetic products. It is gentler and less irritating compared to pure retinol, making it suitable for sensitive skin or for users starting with retinoids. In moisturizers and lotions, retinyl palmitate concentrations typically range between 0.1% and 0.5%. This concentration allows for long-term, daily use without causing irritation. In these products, retinyl palmitate helps with skin regeneration, while being mild enough for people with dry or sensitive skin. Regular use of such formulations results in smoother skin and improved tone, without significant side effects. For anti-aging products, retinyl palmitate concentrations range between 0.5% and 1%. These formulations usually include night creams

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or serums, as retinoids are best absorbed and act during the night when skin renewal processes are most active. At this concentration, retinyl palmitate helps stimulate collagen production, reduce wrinkles and fine lines, as well as lighten dark spots and even skin tone. Although gentler than retinol, it is important to introduce retinyl palmitate gradually, especially for sensitive skin, to avoid potential irritation. Products with higher concentrations of retinyl palmitate are used at night because retinoids make the skin more sensitive to sunlight. During the day, it is essential to use sunscreen to protect the skin from UV damage, which can neutralize the positive effects of retinoids. Due to its stability and resistance to oxidation, retinyl palmitate can be used in formulations exposed to light and air, making it suitable for longer storage without losing efficacy. It is probably the most widely used form of vitamin A in cosmetic products. It is added to numerous skincare products (creams, lotions, masks, serums). Retinyl palmitate is often added as the final ingredient in formulations to preserve its stability and prevent degradation due to heat or other factors during production. In terms of concentrations, it is typically used in the range of 500 to 20,000 IU/g, which corresponds to vitamin A units. Example: 10 drops of vitamin A in 100 g of cream gives 8,500 IU/g.

Source of raw materials: Retinyl acetate and palmitic acid

Production method: Retinyl palmitate is produced by transesterification of palmitic acid (a fatty acid) with retinyl acetate, which is derived from retinal. Retinal is synthesized from beta-carotene.

Animal testing: The substance has not been tested on animals.

GMO: Non-GMO

Vegan: Does not contain animal-derived components.