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TECHNICAL DATA SHEET

Product Name: Sodium Lauryl Sulfate

INCI Name: Sodium Lauryl Sulfate (SLS)

CAS Number: 151-21-3

Chemical Classification: Alkyl sulfate

Functional Category: Surfactant – cleansing agent

IUPAC Name: Sodium dodecyl sulfate

Description: Sodium Lauryl Sulfate (SLS) is an anionic surfactant used primarily in cosmetic and personal care products for its ability to emulsify oils and produce a rich foam. Chemically, it belongs to the alkyl sulfate group. It is commonly synthesized from lauric acid derived from coconut or palm oil and then subjected to sulfation and neutralization with sodium hydroxide. The final product is a white, water-soluble powder or flake that facilitates the removal of sebum, impurities, and microorganisms from the skin or hair through mechanical action. In shampoos, body washes, and toothpastes, SLS acts as both a cleansing and foaming agent. Its molecular structure allows it to bind simultaneously to water and oil, which makes rinsing off oils easier. Due to its strong cleansing action, SLS can dry out the skin and irritate mucous membranes, especially in high concentrations or in products with prolonged skin contact. Therefore, its use is avoided or limited in formulations for sensitive areas, such as the area around the eyes, or for individuals with dry or reactive skin. Despite concerns over its potential aggressiveness, Sodium Lauryl Sulfate remains one of the most widely used surfactants due to its efficacy, stability, and low cost. Formulation quality and the inclusion of soothing agents like glycerin, panthenol, or plant extracts often mitigate irritation, allowing for safe use even in daily-use products.

Physico-chemical Properties: Sodium Lauryl Sulfate (SLS) typically appears as a fine white to pale yellow powder with a mild characteristic odor. It is readily soluble in water, forming a stable foamy solution. It has a low melting point, usually below 30°C in its hydrated form, while the anhydrous form melts at slightly higher temperatures. The pH of a 1% aqueous solution ranges from 7.0 to 9.5, classifying it as a mildly alkaline surfactant. The active matter content (sodium dodecyl sulfate) in commercial grades ranges

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from 90% to 95%, with moisture content typically below 5%. These properties make it suitable for formulations requiring quick solubility and strong foaming power. It is milder than Sodium Laureth Sulfate (SLES).

Benefits:

- Effectively removes excess sebum and impurities from skin and hair
- Produces rich, stable foam enhancing the sensation of cleanliness
- Allows even distribution of the product during application
- Dissolves easily in water and activates quickly upon contact with moisture
- Compatible with many rinse-off formulation ingredients
- Stable across a wide pH and temperature range
- Provides good dispersion of oils and particles in aqueous systems
- Economical choice due to low cost and wide availability

Usage: Sodium Lauryl Sulfate is most commonly used in rinse-off formulations such as shampoos, body washes, liquid soaps, and toothpastes. It is added to the aqueous phase or combined with other surfactants, with recommended processing temperatures up to 40°C to preserve system stability and prevent undesired foaming during mixing. In shampoos and soaps, its concentration typically ranges from 5% to 15%, depending on the desired cleansing strength and skin or hair type. In toothpastes, it is used at lower concentrations, usually between 1% and 3%, to ensure effective foaming with minimal mucosal irritation. In products intended for children, individuals with dry or sensitive skin, and for sensitive areas such as the area around the eyes, the use of milder surfactants or significantly reduced concentrations of SLS is recommended.

Natural or Synthetic Ingredient: Sodium Lauryl Sulfate (SLS) is considered a synthetic ingredient, even though it originates from natural raw materials like coconut or palm oil. During manufacturing, it undergoes chemical transformation (sulfation and neutralization), altering its original natural state. As such, it is classified in the cosmetic industry as a synthetic derivative of natural origin.

Animal Testing: Not tested on animals

GMO: Not GMO

Vegan: Does not contain animal-derived components