Product Data Sheet

Product Name: Sodium laureth sulfate (Sodium lauryl polyoxyethylene ether sulfate)
Cat. No.: GC30005

Chemical Properties

Cas. No.	9004-82-4		
SMILES	CCCCCCCCCCCCOCCOS(=O)(O)=O.[n].[Na+]		
Formula	$(C_2H_4O)n\ C_{12}H_{26}O_4S\ .\ Na$	M.Wt	
Solubility	Water : ≥ 31 mg/mL	Storage	Store at -20°C
General tips	For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		
Structure			

Protocol

Cell experiment [1]:

Cell lines	*Saccharomyces cerevisiae* (yeast strain ATCC9763)
Preparation Method	*S. cerevisiae* cells were cultured in yeast extract-peptone-dextrose (YPD) medium at 30°C with shaking (120rpm) until mid-log phase. Cells were harvested, washed, and resuspended in sterile saline (0.85% NaCl). Cells were treated with plasma-activated water (PAW) combined with Sodium laureth sulfate at concentrations of 0.01–0.50mg/mL for 5–20min.
Reaction Conditions	0.01–0.50mg/mL; 5–20min

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Applications	The combined treatment of PAW and Sodium laureth sulfate synergistically inactivated *S. cerevisiae*, reducing the population from 6.95 $\log_{10}$CFU/mL to undetectable levels. Sodium laureth sulfate enhanced PAW-induced membrane damage, leading to leakage of intracellular nucleic acids and proteins.

Animal experiment [2]:

Animal models	Albino guinea pigs
Preparation Method	Guinea pigs were treated topically with Sodium lauryl sulphate at 50mg/kg alone or in combination with Sodium laureth sulfate (50mg/kg) for 7 and 14 days. The treated skin was homogenized in sucrose solution, and enzyme activities and biochemical parameters were analyzed.
Dosage form	50mg/kg; topical application; daily for 7–14 days.

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Applications	Sodium laureth sulfate treatment significantly increased the activities of lysosomal enzymes (acid phosphatase, β-glucuronidase), cytoplasmic enzymes (lactic dehydrogenase, malic dehydrogenase), and amino acid metabolism enzymes (aspartate aminotransferase, alanine aminotransferase). Sodium laureth sulfate also elevated skin amino nitrogen and sulphydryl group contents. These alterations were more pronounced when Sodium laureth sulfate was combined with nickel, indicating synergistic dermal toxicity. The study suggests that Sodium laureth sulfate induces skin irritation through membrane damage, protein denaturation, and inflammatory responses, highlighting risks for industrial workers exposed to Sodium laureth sulfate and nickel.

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References:
[1] Liu X, Li Y, Zhang R, et al. Inactivation effects and mechanisms of plasma-activated water combined with sodium laureth sulfate (SLES) against Saccharomyces cerevisiae. Appl Microbiol Biotechnol. 2021 Apr;105(7):2855-2865.
[2] Mathur AK, Agarwal C, Singh A, et al. Effect of sodium lauryl sulphate and nickel alone and in combination on the skin of guinea pigs. Toxicol Lett. 1988 Sep;42(3):249-56.

Background

Sodium laureth sulfate (Sodium lauryl polyoxyethylene ether sulfate) is an anionic surfactant with excellent properties in detergency, emulsification, dispersion, wetting, and foaming[1]. Sodium laureth sulfate effectively reduces the surface tension of liquids, separates dirt molecules, and produces abundant foam to enhance cleaning efficacy[2].

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In vitro, Sodium laureth sulfate (0.01–0.50mg/mL) combined with plasma-activated water and applied to *Saccharomyces cerevisiae* cells for 20–30min can cause severe disruption of cell membrane integrity, Sodium laureth sulfate increased lipid peroxidation, accumulation of intracellular reactive oxygen species, and abnormal mitochondrial membrane potential[3].

In vivo, topical application of Sodium laureth sulfate (50mg/kg) to guinea pig skin for 7–14 days, Sodium laureth sulfate can significantly elevate the activities of multiple enzymes, including acid phosphatase, alkaline phosphatase, aspartate aminotransferase, alanine aminotransferase, β-glucuronidase, lactate dehydrogenase, and malate dehydrogenase, while also markedly increasing the levels of amino nitrogen and sulfhydryl groups in the skin[4].

References:
[1] Bhattacharya R, Chatterjee A, Chatterjee S, et al. Acute toxicity and sublethal effects of sodium laureth sulfate on oxidative stress enzymes in benthic oligochaete worm, Tubifex tubifex. Comp Biochem Physiol C Toxicol Pharmacol. 2021 May;243:108998.
[2] Symanzik C, Weinert P, Babić Ž, et al. Skin Toxicity of Selected Hair Cosmetic Ingredients: A Review Focusing on Hairdressers. Int J Environ Res Public Health. 2022 Jun 21;19(13):7588.
[3] Liu X, Li Y, Zhang R, et al. Inactivation effects and mechanisms of plasma-activated water combined with sodium laureth sulfate (SLES) against Saccharomyces cerevisiae. Appl Microbiol Biotechnol. 2021 Apr;105(7):2855-2865.
[4] Mathur AK, Agarwal C, Singh A, et al. Effect of sodium lauryl sulphate and nickel alone and in combination on the skin of guinea pigs. Toxicol Lett. 1988 Sep;42(3):249-56.

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