RESEARCH PRODUCTS INTERNATIONAL

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TECHNICAL DATA SHEET



SDS
[Sodium dodecylsulfate] [Lauryl sulfate]
L22010

CAS No: 151-21-3

MW: 288.4

Formula: $C_{12}H_{25}NaO_4S$

Storage: Room Temperature

Solubility: Water

Sodium dodecyl sulfate (SDS), also known as sodium lauryl sulfate, is a commonly used anionic surfactant with a wide range of applications, especially in biological, biochemical, and industrial contexts. Ideal ionic detergent for denaturing proteins prior to gel electrophoresis.

Biological and Biochemical Applications

1. SDS-PAGE (Sodium Dodecyl Sulfate–Polyacrylamide Gel Electrophoresis)

Purpose: Denatures proteins and gives them a uniform negative charge.

Note: SDS binds to proteins (~1.4 g SDS per g of protein), disrupting non-covalent bonds and allowing size-based separation during electrophoresis.

Buffer system: Usually used in Laemmli buffer system.

2. Protein Solubilization and Extraction

Use: Solubilizes membrane proteins or total protein from cells or tissues.

Note: Effective at breaking lipid bilayers and denaturing proteins.

3. Cell Lysis

Use: Breaks open cells in DNA/RNA or protein extraction protocols.

Note: Often used in conjunction with mechanical disruption (e.g., bead beating or sonication) and other reagents (e.g., EDTA, Tris-HCl).

4. DNA/RNA Purification

Use: Removes proteins and lipids during nucleic acid extraction.

Note: SDS is typically included in lysis buffers; downstream cleanup may require phenol/chloroform or alcohol precipitation.

Molecular Biology Techniques

5. Western Blotting

Use: SDS-treated proteins from SDS-PAGE are transferred to membranes.

Note: Ensures proteins are denatured and linearized for detection by antibodies.

6. Chromatin Immunoprecipitation (ChIP)

Use: In nuclear lysis buffers to solubilize chromatin.

Note: Concentration is typically low to preserve epitope integrity while lysing nuclei.

Industrial and Consumer Products

7. Detergents and Cleaning Agents

Use: Found in shampoos, soaps, and toothpaste.

Note: Acts as a foaming agent and removes oils and particulates.

8. Emulsifier and Wetting Agent

Use: In industrial processes requiring solubilization of hydrophobic compounds.

Note: Helps mix oil and water phases.

Chemical and Analytical Applications

9. Micellar Systems

Use: Forms micelles in aqueous solution above critical micelle concentration (CMC).

Note: Useful for solubilizing hydrophobic substances or in controlled drug delivery research.

10. Capillary Electrophoresis

Use: SDS is used to modify electroosmotic flow and separate analytes.

Note: Important in techniques like micellar electrokinetic chromatography (MEKC).

Concentration Notes:

SDS-PAGE: ~0.1% – 0.5% w/v in buffers

Lysis Buffers: 0.1% – 1% (can be higher for tough samples)

CMC: ~8 mM (0.23% w/v in water) at 25°C