

AEROSOL® IB-45 surfactant

Type: Anionic

Chemical: Sodium diisobutyl sulfosuccinate

CAS No.: 127-39-9

Molecular Formula: C₁₂H₂₁O₇NaS

Molecular Weight: 332

EPA Status: Exempt 40 CFR 180.1001 (d)

Physical and Chemical Properties

Appearance at 25°C (77°F)	Clear liquid
Solids, % by weight	45.0-48.0
Active Content % by weight	44.0-46.0
Solvent	Water
Color, APHA, as-is, maximum	90
Specific Gravity, 25°C	~1.12
Density, lb/gal, 25°C	~9.3
Freezing point, °C	20-21 (68-70°F)
Flash point, °C Pensky Marten	>100 (212°F)
pH, 10% solids solution	5-7
Acid number, solids basis, maximum	2.0
Iodine value, solids basis, maximum	0.2
Solubility	
In organic solvents	Insoluble
In water	See Table 1

AEROSOL IB-45 is a very hydrophilic surface active agent which exhibits excellent compatibility with electrolytes. It is an extremely efficient wetting agent in high concentrations of electrolytes.

Solubility

Table 1 – Solubility Limits of AEROSOL IB-45 Surfactant in Water

Temperature, °C	g/100 mL water
25	76.0
30	76.5
40	77.4
50	78.6
60	80.4

Surface Active Properties

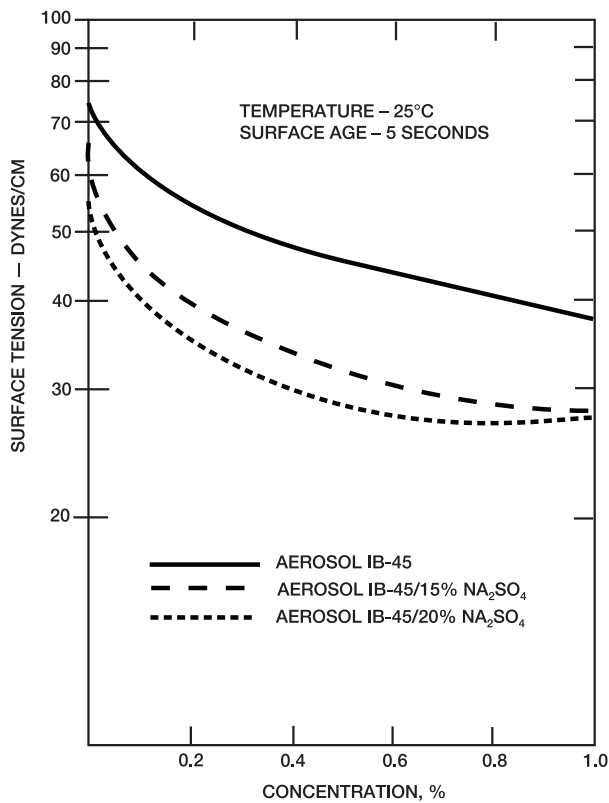
Critical Micelle Concentration (CMC), % by weight	3.5
Surface Tension	See Table 2 & Figure 1
Interfacial tension	See Table 3 & 4
Wetting	See Table 5
Ross Miles Foam Test, ASTM D-1173, 0.5% solution, 25°C	
Initial foam volume, mL	40
Foam Volume after 15 minutes, mL	5
Electrolyte Tolerance, ppm CaCO ₃ , 0.01-0.5% surfactant solution	2250 See also Table 6

Surface Tension

Table 2–Surface Tension of AEROSOL IB-45 Surfactant (25°C, Surface Age 5 Seconds)

	Concentration of AEROSOL IB-45, % solids						
	0	0.001	0.02	0.1	0.25	0.5	1.0
	dynes/cm						
In water	72.0	73.0	70.7	61.3	53.3	46.7	38.2
In 15% Na ₂ SO ₄	76.2	68.3	55.8	45.3	38.7	32.4	28.7
In 20% Na ₂ SO ₄	77.5	67.8	50.8	41.8	35.7	29.5	28.7

Figure 1 – Surface Tension AEROSOL IB-45 Surfactant, (Solids Basis) with Varying Concentrations of Na₂SO₄



Interfacial Tension

Table 3 – Interfacial Tension – AEROSOL IB-45 Surfactant in Water vs Mineral Oil

	Age of interface	dynes/cm
AEROSOL IB-45, 1% solids, in water vs mineral oil	10 seconds	33.0
	30 seconds	32.8
	15 minutes	32.0

Table 4 – Effect of Electrolytes on Interfacial Tension of AEROSOL IB-45 Surfactant vs Mineral Oil

Temperature: 25°C % solution: g/100 mL solution	Age of interface	Interfacial tension dynes/cm
Water 20% Na ₂ SO ₄ solution	10 seconds	54.9
	10 seconds	58.3
	5 minutes	57.7
	15 minutes	57.1
AEROSOL IB-45 surfactant, 1% solids, in Water	10 seconds	33.0
	30 seconds	32.8
	1 minute	32.6
	5 minutes	31.3
	15 minutes	30.6
AEROSOL IB-45 surfactant, 1% solids, in 20% Na ₂ SO ₄	0 seconds	4.6
	10 minutes	4.7
	15 minutes	4.7

Wetting (Draves Test)

Table 5 – Wetting Time vs AEROSOL IB-45 Surfactant Concentration

Draves Sinking Time in seconds
AATCC 17-1952, 1.5 g hook, 25°C

	Temp °C	Concentration of AEROSOL IB-45 surfactant, % by volume									
		0.45	0.40	0.30	0.25	0.20	0.15	0.10	0.075	0.05	0.035
In 13% NaCl	30	—	—	12	19	35	76				
	50	—	10	19	31	56	120				
	75	11	15	34	53	98	—				
In 22% NaCl	30						8	23	52		
	50						10	30	66		
	75						13	38	84		
Saturated											
In 27.8% NaCl	30								10	32	92
In 27.5% NaCl	50								10	32	92
In 28.0% NaCl	75								10	32	93

Electrolyte Tolerance

Table 6 – Solubility of AEROSOL IB-45 Surfactant in Electrolyte Solutions

Maximum concentration of electrolyte solution in which 1.0% AEROSOL IB-45 surfactant solids is soluble, 25°C

NaCl %	NH ₄ Cl %	NaNO ₃ %	Na ₂ SO ₄ %	Appearance of solution
20	20	30	20	Clear
25	25	35	25	Turbid

For lower concentrations of AEROSOL IB-45 surfactant, higher concentrations of electrolyte can be tolerated.

EPA Status¹

Under the provisions of 40 CFR 180.1001 (d) of the Pesticide Chemicals Regulations, AEROSOL IB-45 surfactant is exempted from the requirement of a tolerance when used in accordance with good agricultural practice as an inert ingredient of pesticide formulations applied to growing crops.

¹ 21 CFR 182.99 Adjuvants for Pesticide Chemicals—Adjuvants, identified and used in accordance with 40 CFR 180.1001 (c) and (d), which are added to pesticide use dilutions by a grower or applicator prior to application to the raw agricultural commodity, are exempt from the requirement of tolerance.

Storage And Handling

To prevent crystallization, AEROSOL IB-45 surfactant should be stored at a temperature above 75°F. Below 70°F the batch will remain mobile but becomes turbid and increasingly viscous with a drop in temperature from 70 to 65°F. AEROSOL IB-45 is non-flammable and consequently, no explosion-proof equipment or special precautions are required.

Suitable materials of construction are glass, rubber, plastics, 304 stainless steel, aluminum, Monel metal or clad steel. Copper and brass must be avoided.

Health And Safety Information

Before handling this material, read the corresponding Cytec Industries Inc. Material Safety Data Sheet for safety, health and environmental data.

The acute single oral LD₅₀ for albino rats has been found to be 6.16g/kg (solids basis). By absorption

through the skin of albino rabbits, the single dose LD₅₀ was found to be greater than 5g/kg. The surfactant is slightly irritating to the skin of rabbits when held in continuous contact for 24 hours and moderately irritating to rabbit's eyes. This property is common to many anionic surface active agents. No skin sensitization was produced during a repeated insult patch test with human subjects. When AEROSOL IB-45 was added to the diets of rats and fed for 90 days, levels as high as 1% were without effect. Consequently, AEROSOL IB-45 is considered to be practically non-toxic both by ingestion in single doses and by single skin applications. Although it is slightly irritating to rabbit skin, it is not expected to produce significant skin irritation under conditions of ordinary industrial handling. However, this product is sufficiently irritating to the rabbit's eye so that precautions should be observed to avoid its introduction into, or near the eyes.

TSCA Information

This product is manufactured in compliance with all provisions of the Toxic Substances Control Act, 15 U.S.C.

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