

AEROSOL AY surfactants

Type: Anionic
Chemical: Sodium diamyl sulfosuccinate
CAS No: 922-80-5
Molecular Formula: C₁₄H₂₅O₇NaS
Molecular Weight: 360
EPA Status: Exempt 40 CFR 180.1001 (d)
FDA Status: Approved 21 CFR 178.3400

AEROSOL AY is a good wetting agent with high electrolyte and calcium tolerance. AEROSOL AY is available in two grades AY-100, a solid and AY-65, a 65% solution.

PHYSICAL AND CHEMICAL PROPERTIES

	<u>AY-100</u>	<u>AY-65</u>
Appearance at 25°C (77F)	Hard waxy solid	Clear liquid
Solids, % by weight	98 minimum	63-67
Solvent	—	Water/ethanol
Color, APHA, maximum 50% solids in 1:1 alcohol: water	100	100
Density, lb/gal	10.0	9.0
Specific gravity, 25°C	1.2	1.081
Melting point, °C	105-108 (222-227°F)	—
Freezing point, °C	—	<0 (<32°F)
Flash point, °F	>200 (93°C)	77 (25°C)
Setaflash, (closed cup)		
Autoignition temperature	Does not promote spontaneous combustion	
pH of 10% solution	—	5-7
Acid number, solids basis, maximum	2.5	1.6
Iodine (value, solids basis, maximum)	0.25	0.16

SOLUBILITY

In polar organic solvents Good
 In nonpolar organic solvents Sparingly soluble
 In water See Table 1

Table 1—Solubility Limits of AEROSOL AY In Water, solids basis

<u>Temperature, °C</u>	<u>AEROSOL AY surfactant g/100 mL water</u>
25	39.2
30	40.7
40	43.2
50	45.5
60	47.9
70	50.2

ELECTROLYTE TOLERANCE

Calcium tolerance

<u>AEROSOL AY surfactant Concentration, % solids</u>	<u>Calcium Tolerance ppm</u>
0.25	2250
0.50	1125

SURFACE ACTIVE PROPERTIES

Critical Micelle Concentration (CMC), % by weight	1.8-2.2
Interfacial tension, dynes/cm 1% active solution of Nujol	7.0
Surface tension	See Table 2
Ross Miles Foam Test, ASTM D-1173, 0.5% solution, 25°C	
Initial foam volume, mL	235
Foam volume after 15 minutes, mL	30
Wetting (Draves Test)	See Table 3

SURFACE TENSION

Table 2—Surface Tension of Solutions of AEROSOL AY Surfactant in Water and Na₂SO₄

Concentration of AEROSOL AY, % solids	Surface tension, dynes/cm			
	Water	1% Na ₂ SO ₄	10% Na ₂ SO ₄	15% Na ₂ SO ₄
0	72.0	72.8	74.8	76.2
0.001	74.5	69.2	66.6	68.4
0.005	70.3	—	—	47.5
0.025	55.1	50.3	40.6	35.8
0.1	44.5	35.5	29.4	24.8
0.25	40.2	27.5	24.6	23.6
0.5	37.4	25.4	24.2	23.6
1.0	34.0	25.0	23.6	23.6
2.0	31.0	—	—	—

WETTING (DRAVES TEST)

Table 3—Wetting Time vs AEROSOL AY Surfactant Concentration

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

AEROSOL AY	Temp °C	Surfactant Concentration, %																	
		.55	.50	.45	.40	.30	.20	.15	.10	.075	.06	.05	.04	.035	.03	.025	.02	.015	
In Water	30	14	19	26	34	92													
	50	14	19	27	38	95													
	75	20	26	36	51	120													
In 5% NaCl	30						15	34	110	—									
	50						8	18	54	120									
	75						—	10	31	70									
In 15% NaCl	30										7	12	24	—	56				
	50										11	18	32	—	70				
	75										14	24	43	—	95				
In 20% NaCl	30														8	13	22	43	90
	50														10	16	27	52	120
	75														13	20	34	64	140

BIODEGRADABILITY

AEROSOL AY is completely biodegraded within two days in the CSMA Shake Culture Test.

EPA STATUS¹

Under the provisions of 40 CFR 180.1001 (d) of the Pesticides Chemicals Regulations, AEROSOL AY 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.

FDA STATUS

AEROSOL AY surfactant is permitted for use under 21 CFR 178.3400. This regulation constitutes a blanket approval for the use of AEROSOL AY in the manufacture of any non-food article intended for food-contact use. Therefore, in effect, AEROSOL AY is listed in every regulation in Subpart F of the Food Additives Regulations. Unless otherwise specified, there are no limitations on the nature or amount of use of AEROSOL AY other than the general limitations given in Section 174.5, which are applicable to every substance listed in Subpart D.

HEALTH AND SAFETY INFORMATION

The acute oral LD₅₀ for rats has been found to be 4.65 g/kg. By absorption through the intact skin of rabbits, the single dose LD₅₀ was found to be greater than 10 g/kg. The product is moderately irritating to rabbits' eyes and to the skin of rabbits when held in continuous contact for 24 hours. 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 AY was added to the diets of rats and fed for 32 days, levels as high as 1.0 g/kg/day were without effect.

On the basis of these studies it may be concluded that prolonged or repeated skin contact with concentrated solutions of AEROSOL AY should be avoided and care should be exercised to prevent entry of the product into the eye.

PHYTOTOXICITY

AEROSOL AY surfactant is not phytotoxic if used in spray solution at a concentration of less than 0.5%.

STORAGE AND HANDLING

AEROSOL AY-65 surfactant is a Class I flammable liquid. Precautions should be followed for this classification. AEROSOL AY-100 surfactant is stable under a wide variety of storage conditions.

Solutions of AEROSOL AY may be stored and used in a wide variety of containers or reaction vessels. Stainless steel, aluminum and Monel are recommended for reaction and storage vessels; glass and rubber are suitable lining materials. Some of the sprayed resinous coatings are satisfactory in stationary tanks in which the coating can be built up more heavily than is customary in drums. In permanent installations, however, the added expense of aluminum, stainless steel or clad-steel frequently is justified.

Containers filled with AEROSOL AY-65 surfactant should be kept closed when not in use, as evaporation of water and solvent may cause gelation. The system composed of AEROSOL AY-65 surfactant plus water and solvent is sensitive to loss of liquid through evaporation causing reversion to a gel state. The quality of the AEROSOL AY-65 surfactant is not affected by this physical change.

If a batch of AEROSOL AY-65 surfactant should gel, a small amount of ethanol should be added and the drum rolled until the gel has disappeared (1-2% of ethanol on the weight of the batch is sufficient). To effect more rapid liquefaction, the drum should be put in a steam-heated chest.

The efficacy of AEROSOL AY-65 surfactant is not impaired by freezing and thawing. However, if a freeze-thaw occurs, it is recommended that the entire contents of the container be agitated prior to use.

IMPORTANT NOTICE

The information and statements herein are believed to be reliable but are not to be construed as a warranty or representation for which we assume legal responsibility. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information or products referred to herein. NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS MADE. Nothing herein is to be taken as permission, inducement or recommendation to practice any patented invention without a license.

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TSCA INFORMATION

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

CYTEC

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