
AEROSOL[®] 501

surfactant

Type: Anionic
Chemical: Proprietary sulfosuccinate surfactant mixture
FDA Status: Approved 21 CFR 178.3400

AEROSOL 501 surfactant is a surface tension depressant and a dispersing and wetting agent. It can be used in many applications where nonionic surfactants are presently utilized.

PHYSICAL AND CHEMICAL PROPERTIES

Appearance at 25°C (77°F)	Clear liquid
Solids, % by weight	49-51
Solvent	Water
Color, APHA, as is, maximum	60
Specific gravity, 25°C	~1.16
Density, lb/gal, 25°C	~9.66
Viscosity, cps, 25°C	
Brookfield RFV, No 2	
spindle, 20 rpm	~260
Freezing point, °C	-3 (27°F)
Flash point, °F	
Setaflash (closed cup)	>200 (93°C)
pH, as is	6.0-7.0
Acid number, as is, maximum	7.0
Iodine value, as is, maximum	0.6
Solubility in water	Infinite

SURFACE ACTIVE PROPERTIES

Critical Micelle Concentration (CMC), % by weight	0.024-0.030
Surface tension, dynes/cm, 25°C (at CMC), DuNoüy Method	37.3+0.5
Ross Miles Foam Test, ASTM D-1173, 0.5% solution, 25°C	
Initial foam volume, mL	370
Foam volume after 15 minutes, mL	90
Electrolyte tolerance, CaCl ₂	No turbidity developed on infinite dilution with CaCl ₂ solution

SURFACE TENSION, AT 25°C

Concentration, % by weight	Surface tension, dynes/cm
0.001	61.9
0.004	52.7
0.010	44.7
0.018	40.0
0.030	36.2
0.033	36.6
0.045	35.3
0.060	34.7
0.10	32.8
0.20	30.4
0.40	28.7
1.00	28.4

ACRYLIC LATEX APPLICATIONS

AEROSOL 501 was specifically designed for use as the sole emulsifier in preparing polyacrylate latexes.

AEROSOL 501 permits the incorporation of greater amounts of self-crosslinking monomers, such as CYLINK* NMA monomer (*N*-methylolacrylamide), into acrylic polymer latexes without sacrificing latex performance requirements. AEROSOL 501 offers, in addition, the following performance features:

- Low surfactant usage level (as low as 1.5%)
- High latex solids (50% and more)
- Low coagulum (between 0.001% and 0.1%)
- Low viscosity
- Excellent mechanical stability
- Greater pH tolerance
- Excellent freeze-thaw stability
- Superior properties in latex films
 - High optical clarity
 - No discoloration on heat curing

AEROSOL 501 may also be utilized as the sole emulsifier for other latex systems. For example AEROSOL 501 has utility in acrylic-modified vinyl acetate polymer latex and permits the incorporation of many of the above performance features.

TYPICAL ACRYLIC LATEXES PREPARED WITH AEROSOL 501 SURFACTANT

Table 1 presents a summary of results obtained from some typical acrylic latexes that were prepared with 1.5 weight percent (based on total monomer mixture) of AEROSOL 501 surfactant.

Table 1—*Typical Acrylic Latexes Prepared with 1.5% AEROSOL 501 Surfactant*

Monomers ¹	EA/MMA/ NMA/IA	EA/ NMA/ IA	EA/ MMA/ NMA	EA/NMA	EA/ MMA/ MAA	EA/ MMA/ AA
Composition	78/18/3/1	95/3/2	59/38/3	95/5	48/50/2	59/40/1
Polymerization Procedure	Monomer Pre-Emulsion			Standard		
Latex Properties:						
Solids, %	50	50	50	50	50	50
Coagulum, % ²						
Total	0.008	0.05	0.01	0.3	0.27	0.13
Latex	0.0013	0.002	0.002	0.11	0.04	—
pH	5.6	5.1	6.7	6.8	6.8	8.0 ⁵
Viscosity, cps ³	120	66	65	118	39	45
Mechanical stability, minutes ⁴	40+	40+	40+	40+	40+	40+
Surface tension, dynes/cm	39	37	37	39	43	46
Particle size, nm	170- 300	250- 420	220- 300	220- 400	100- 200	80- 120

¹ Monomers: EA—Ethyl acrylate IA—Itaconic acid VAc—Vinyl acetate
 MMA—Methyl methacrylate MAA—Methacrylic acid AN—Acrylonitrile
 NMA—*N*-Methylolacrylamide M—Acrylic acid

² Coagulum: Percent was measured by weighing the total amount of wall and latex coagulum filtered out on a tandem combination of 20- and 200-mesh nylon screens. The coagulum was washed and dried at 100°C. Latex coagulum was the part retained on the 200-mesh screen.

³ Measured with Brookfield LVT Viscometer, No 2 spindle at 60 rpm, 25°C.

⁴ Hamilton-Beach Mixer, shaft off-center, 6300 rpm, 2-blade action.

⁵ Post-adjusted with ammonium hydroxide.

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MODIFIED ACRYLIC LATEXES PREPARED WITH AEROSOL 501 SURFACTANT

AEROSOL 501 surfactant is also useful at the 1.5% level for acrylic latexes that are modified with other monomers, e.g., vinyl acetate or acrylonitrile. Table 2 presents data for several modified acrylic latexes.

Table 2—*Modified Acrylic Latexes Prepared with 1.5% AEROSOL 501 Surfactant*

Monomers ¹	VAc/EA/ NMA/AA	EA/ NMA/AN	EA/MMA/ NMA/AN	EA/MMA/ MAA/AN
Composition	63/32/3/2	87/3/10	70/25/2/3	70/25/2/3
Polymerization Procedure	Monomer Pre-Emulsion			Standard
Latex Properties				
Solids, %	50	50	50	50
Coagulum, % ² Total Latex	0.2 0.0011	0.29 0.01	0.30 0.04	0.12 —
pH	4.8	7.2	7.7	9.0 ⁵
Viscosity, cps ³	670	41	31	57
Mechanical stability, minutes ⁴	40+	40+	20+	40+
Surface tension, dynes/cm	40	38	37	45
Particle size, nm	150- 200	250- 450	250- 450	90- 150

Footnotes: See Table 1

FDA STATUS

AEROSOL 501 is permitted by 21 CFR 178.3400 as a component in adhesive formulations.

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 Modified Draize-Shelanski Patch Test was carried out on 100 human volunteer subjects. AEROSOL 501 surfactant was used at a 2.5% level for induction and 1.0% in petrolatum for the challenge. A 15 mm patch of the test material was applied to patch sites on the backs or volar forearms of 100 subjects for ten alternate-day 24-hour periods under occlusion. Following a seven-day rest period, 15 mm challenge patches of the material were applied in the same manner to fresh sites on the backs or volar forearms of all 100 subjects for 24 hours thereafter.

There were no instances of irritation or sensitization from this material in any of the 100 subjects. It is unlikely that AEROSOL 501 would present a danger of irritation or sensitization in its normal intended use.

As with most anionic surfactants, care should be exercised to prevent entry of AEROSOL 501 into the eyes.

STORAGE AND HANDLING

AEROSOL 501 surfactant is shipped at 50% solids. It is non-flammable and will remain stable when stored under normal conditions. If frozen, AEROSOL 501 surfactant can be liquefied by warming to 50-75°F (10°-24°C).

The efficacy of AEROSOL 501 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.

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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.



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