Technical Data Sheet
Date of Issue: 2026/09/03

TMA
Trimethylaluminum

CAS Number	75-24-1
EINECS/EC	200-853-0
Molecular Formula	$(CH_3)_3Al$

APPLICATION

Trimethylaluminum (TMA) can be used as a catalyst component in Ziegler-Natta type systems for olefin and diene polymerizations, and has found applications in alkylation reactions.

SPECIFICATION

Aluminum, wt. %	36.3 - 37.4
TMA, wt. %, min	98.0
TEA, wt. %, max	2.0
Chloride, wt. %, max	0.1
Hydride (calculated as AlH_3), wt. %, max	0.1

	Average ($\bar{x}$)	Variation (3σ)
Aluminum, wt. %	36.5	(*)
Chloride, wt. %	99.4	
Hydrolysis gas composition		
Isobutane, mol. %	0.5	

(*) Insufficient data to determine sigma.

DENSITY & VISCOSITY

Temperature		Density		Viscosity
°C	°F	g/mL	lbs/gal	cp
0	32	0.769*	6.417*	1.6
10	50	0.7605*	6.346*	1.33*
20	68	0.752	6.275	1.12
25	77	0.7478	6.24	1.03
30	86	0.7436	6.204	0.951
40	104	0.7351	6.134	0.816
50	122	0.7266	6.063	0.707
60	140	0.7181	5.992	0.618
70	158	0.7096	5.921	0.544
80	176	0.7012	5.851	0.482
90	194	0.6927	5.78	0.43
100	212	0.6842	5.709	0.386
120	248	0.6672	5.568	0.317
140	284	0.6503	5.426	0.264
160	320	0.6333	5.285	0.224
180	356	0.6164	5.143	0.193
200	392	0.5994	5.002	0.168

Equations:
Density: d(g/mL) = 0.7690 - 0.000848t; t = °C
Experimental range 25 - 100°C
Viscosity: $\log_{10}(cp) = -2.1440 + 657.86/(t + 280)$; t = °C
Experimental range: 25 - 100°C
*For supercooled liquid

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PHYSICAL PROPERTIES

Property	Value
Formula	$(CH_3)_3Al$
Formula weight	72.09
State and color at 25°C	clear, colorless liquid
Stability in contact with air	flames instantly
Stability in contact with water	reacts violently
Melting point °C(°F)	15 (59)
Boiling point at 760 mm Hg, °C(°F)	127 (261)
Vapor pressure 20°C (68°F)	9.05
Vapor pressure 30°C (86°F)	15.97
Vapor pressure 40°C (104°F)	27.01
Vapor pressure 50°C (122°F)	43.98
Vapor pressure 60°C (140°F)	69.22
Vapor pressure 80°C (176°F)	157.09
Vapor pressure 100°C (212°F)	323.22
Vapor pressure 120°C (248°F)	614.45
Vapor pressure 140°C (284°F)	1102.6
Vapor pressure 160°C (320°F)	1877.8
Vapor pressure 180°C (356°F)	3052.9
Vapor pressure 200°C (392°F)	4749.5
Vapor pressure 220°C (428°F)	7111.4
Vapor pressure 240°C (464°F)	10297.0
Specific heat at 20°C, cal/g°C	0.512
68°F, btu/lb°F	0.512
Heat of vaporization at NBP, cal/g	66.33
btu/lb	119.4
ΔH° of formation at 25°C (77°F), kcal/gfw	-36.0
Heat of combustion, net at 25°C, cal/g 77°F	9799
btu/lb	17640
Heat of reaction with water at 25°C, cal/g 77°F	1633
btu/lb	2939
Coefficient of volume expansion at 25°C,/°C	0.001166
Critical pressure, atm	37.4
Critical temperature, °C	305

SAFETY & HANDLING

The pyrophoric nature of TMA presents potential hazards not common to most liquid chemicals used by industry in tank truck quantities. TMA, being pyrophoric, breaks into flame spontaneously and gives off dense smoke when exposed to air. It reacts violently with water. TMA is a clear, non-corrosive mobile liquid with a low vapor pressure. Hydrocarbon solutions of TMA, depending on the concentration and temperature, may not be pyrophoric. However, these solutions must still be blanketed with an inert gas such as dry nitrogen because TMA will react with air and moisture at the surface of the solution, giving off dense smoke, heat and flammable gas. For specific information on the safe handling and toxicity of this product, please refer to the Material Safety Data Sheet, which is available upon request.

TRANSPORT & PACKAING

	Nominal Value		Approximate Loadings	
Container Description	Gallons	Liters	Pounds	Kilograms
Tank Car (DOT-105A300W)	23,000-25,100	87,100-95,000	135,000-230,000	61,400- 104,000
Tank Trailer (DOT-MC330 or 331)	6,200-7,200	23,500-27,200	30,00-48,000	13,600- 21,800
Portable Tanks (DOT-51)/UN T21	430	1,635	2,250-3,800	1,021-1,725
	1,980	7,500	10,257-17,000	4,880-7,711
Isotank	5,635-5,970	21,330-22,600	30,000-34,000	13,600- 15,500
Cylinders: dual valve (DOT-4BA240)				
5 gallon size	5.7	22	25-53	11-24
26 gallon size	28.0	106	150-268	68-120
Laboratory cylinders (DOT-3AA2015)				
0.4 gallon size	0.40	1.47	1.2-2.2	0.58-0.97
1.0 gallon size	0.94	3.60	2.9-6.3	1.4-2.8

*Actual weight depends on highway load limits, product density and lifting considerations.

Shipments are made in accordance with DOT regulations — Section 173.134. All containers are shipped blanketed with dry nitrogen under slight positive pressure. Hydrocarbon solutions are also available blended to customer specifications.Tank rail cars and tank trucks are available in North America only.

Transportation Classification

Proper shipping name ..... Organometallic Substance, Liquid, Pyrophoric, Water Reactive (Triethylaluminum)

Hazard class ..... 4.2 (spontaneously combustible) + 4.3(dangerous when wet)

ID number UN3394

Placard(s ..... spontaneously combustible w/ number 4+dangerous when wet 4

Label(s ..... spontaneously combustible+dangerous when wet

MARPOL Classification ..... n/a

Harmonized tariff number 2931.00.4000-2

Schedule B number ..... 2931.00.6000-7)

OTHER INFORMATION

Further Related Documents — Safety Data Sheet

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