Technical Data Sheet
Date of Issue: 2026/06/03

TNOA
Tri-n-octylaluminum

CAS Number	1070-00-4
EINECS/EC	213-964-4
Molecular Formula	$(n\text{-}C_8H_{17})_3Al$

APPLICATION

Tri-n-octylaluminum (TNOA) is used primarily as a catalyst component in Ziegler-Natta type systems for olefin and diene polymerizations. Other applications include use in alkylation reactions and as a catalyst component in linear oligomerization and cyclization of unsaturated hydrocarbons.

SPECIFICATION

Aluminum, wt %, min	7
TNOA, wt %, min	94.5
Branched $(C_{16}H_{33})Al$, wt %, max	2
Hydride (calculated as AlH_3), wt %, max	0.6
Octene, wt %, max	3

STATISTICAL DATA

	Average ($\bar{x}$)	Variation (3σ)
Aluminum, wt %	7.32	0.12
TNOA, wt %	95.9	1
Branched $(C_{16}H_{33})Al$, wt %	0.4	0.1
Hydride (calculated as AlH_3), wt %	0.16	0.08
Octene, wt %	0.5	0.6

DENSITY & VISCOSITY

Temperature		Density		Viscosity
°C	°F	g/mL	lbs/gal	cp
0	32	0.8501	7.094	112
10	50	0.8435	7.038	71
20	68	0.8369	6.983	46.1
25	77	0.8336	6.956	37.6
30	86	0.8303	6.928	30.8
40	104	0.8237	6.873	21.1
50	122	0.8171	6.818	14.8
60	140	0.8105	6.763	10.6
70	158	0.8039	6.708	7.71
80	176	0.7973	6.653	5.72
90	194	0.7907	6.598	4.31
100	212	0.7841	6.543	3.29
120	248	0.7709	6.433	2
140	284	0.7577	6.322	1.28
160	320	0.7445	6.212	0.847
180	356	0.7313	6.102	0.582
200	392	0.7181	5.992	0.413

Equations:

Density: $d(g/mL) = 0.8501\text{-}0.00066t$; t= °C

Viscocity: $\log_{10}(cp) = -3.8649 + 1691.15/(t + 285.87)$; t= °C

Experimental range: 25-100 °C

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PHYSICAL PROPERTIES

Property	Value
Formula	$(n\text{-}C_8H_{17})_3Al$
Formula weight	366.55
State and color at 25C	clear, colorless liquid
Stability in contact with air	fumes vigorously, may ignite spontaneously
Stability in contact with water	reacts violently
Melting point, C	< -40
Boiling point at 760 mm Hg (extrapolated)[1], C	361.3
Specific heat at 20C, cal/gC	0.527
Specific heat 68F, btu/lb°F	0.527
Heat of vaporization at NBP, cal/g	39.0
Heat of vaporization, btu/lb	70.1
ΔH° of formation at 25C (77F), kcal/gfw	-152.6
Heat of combustion, net at 25C, cal/g	10306
Heat of combustion 77F, btu/lb	18552
Heat of reaction with water at 25C, cal/g	346
Heat of reaction with water 77F, btu/lb	623
Coefficient of volume expansion at 25C per C	0.000807

[1]Decomposes below boiling point

HANDLING & STORAGE

The pyrophoric nature of TNOA presents potential hazards not common to most liquid chemicals used by industry in tank truck quantities. TNOA, being pyrophoric, breaks into flame spontaneously and gives off dense smoke when exposed to air. It reacts violently with water. TNOA is a clear, non-corrosive mobile liquid with a low vapor pressure. Hydrocarbon solutions of TNOA, 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 TNOA 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 & PACKAGING

	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 (Tri-n-octylaluminum)

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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