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

DEAC
Diethylaluminum chloride

CAS Number	96-10-6
EINECS/EC	202-477-2
Molecular Formula	$(C_2H_5)_2AlCl$

APPLICATION

Diethylaluminum chloride (DEAC) 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. %	22.0 - 22.6
Chlorine/Aluminum, atom ratio	1.00 - 1.03
Hydrolysis gas composition	
Ethane, mol. %, min	99.0
n-Butane, mol. %, max	0.5
Isobutane, mol. %, max	0.5
Hydrogen, mol. %, max	0.05

	Average ($\bar{x}$)	Variation (3σ)
Aluminum, wt. %	22.25	0.25
Chlorine/Aluminum, atom ratio	1.016	0.013
Hydrolysis gas composition		
Ethane, mol. %	99.8	(*)
n-Butane, mol. %	0.1	(*)
Isobutane, mol. %	< 0.1	(*)

(*) Insufficient data to determine sigma.

DENSITY & VISCOSITY

Temperature		Density		Viscosity
°C	°F	g/mL	lbs/gal	cp
0	32	0.9949	8.302	2.292
10	50	0.9853	8.222	1.908
20	68	0.9757	8.142	1.612
25	77	0.9709	8.102	1.49
30	86	0.9661	8.061	1.381
40	104	0.9565	7.981	1.198
50	122	0.9469	7.901	1.05
60	140	0.9372	7.82	0.929
70	158	0.9276	7.74	0.829
80	176	0.918	7.66	0.746
90	194	0.9084	7.58	0.675
100	212	0.8988	7.5	0.615
120	248	0.8796	7.34	0.519
140	284	0.8604	7.179	0.447
160	320	0.8411	7.018	0.391
180	356	0.8219	6.858	0.346
200	392	0.8027	6.698	0.31

Equations:

Density: d(g/mL)=0.9949-0.000961t; t= °C

Viscosity: $\log_{10}(cp) = -1.4498 + 392.6/(t + 216.9)$; t = °C

Experimental Range: 20-100 °C

Albemarle®

PHYSICAL PROPERTIES

Property	Value
Formula	$(n\text{-}C_6H_9)_3Al$
Formula weight	120.56
State and color at 25°C	clear, colorless liquid
Stability in contact with air	flames spontaneously
Stability in contact with water	reacts violently
Melting point, °C (°F)	-74 (-101)
Boiling point at 760 mm Hg, °C (°F)	214 (417)
Vapor pressure[1], mm Hg at:	
0°C (32°F)	0.0177
10°C (50°F)	0.0461
20°C (68°F)	0.1467
30°C (86°F)	0.282
40°C (104°F)	0.523
50°C (122°F)	1.04
60°C (140°F)	1.98
80°C (176°F)	6.26
100°C (212°F)	17.1
120°C (248°F)	40.9
140°C (284°F)	88
160°C (320°F)	173
180°C (356°F)	314
200°C (392°F)	538
220°C (428°F)	871
240°C (464°F)	1276
Specific heat at 25°C, cal/g°C	0.395
Specific heat at 77°F, btu/lb°F	0.395
Heat of vaporization at NBP, cal/g	42.6
Heat of vaporization at NBP, btu/lb	77.0
ΔH° of formation at 25°C, kcal/gfw	-92.1
Heat of combustion, net at 25°C, cal/g	6326
Heat of combustion, net at 77°F, btu/lb	**11837**
Heat of reaction with water at 25°C, cal/g	808
Heat of reaction with water at 77°F, btu/lb	1454
Coefficient of volume expansion at 25°C, per °C	0.001014
Dielectric constant at 5 megacycles at 25°C	2.73
Critical pressure, atm	17.7
Critical temperature, °C	383
Decomposition rate[2] (%/hour) at saturation pressure at:	
100°C (%/min)	0.0072
120°C (%/min)	0.0140
140°C (%/min)	0.0260
160°C (%/min)	0.0450
180°C (%/min)	0.0750
200°C (%/min)	0.1200
220°C (%/min)	0.1800
240°C (%/min)	0.2600

[1]Experimental range: 80-200°C
Equation: log P = 6.9223 - 1592.9/(t + 180); P = mm Hg, t = °C
[2]Calculated assuming one mole of gas liberated per gram formula weight of DEAC decomposed.
Experimental range: 150-204°C
Equation: $\log_{10}(\%hr)=3.6023-2143.7/t$; t= °C + 273

SAFETY & HANDLING

The pyrophoric nature of DEAC presents potential hazards not common to most liquid chemicals used by industry in tank truck quantities. DEAC, being pyrophoric, breaks into flame spontaneously and gives off dense smoke when exposed to air. It reacts violently with water. DEAC is a clear, non-corrosive mobile liquid with a low vapor pressure. Hydrocarbon solutions of DEAC, 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 DEAC will react with air and moisture at the surface ofthe solution, giving off dense smoke, heat and flammable gas. For specific information on the safe handling and toxicity of this product, please refer tothe 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 (Diethylaluminum chloride)

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

Albemarle®