

TRIETHYLALUMINUM

TAL

CAUTIONARY RESPONSE INFORMATION

Common Synonyms Aluminum triethyl ATE TEA	Liquid Colorless IGNITES WHEN EXPOSED TO AIR. Flammable gas is produced on contact with water.
Evacuate. Keep people away. Shut off ignition sources and call fire department. Wear rubber overclothing (including gloves). Notify local health and pollution control agencies. Protect water intakes.	
Fire	IGNITES WHEN EXPOSED TO AIR. POISONOUS GASES MAY BE PRODUCED IN FIRE. Wear goggles and self-contained breathing apparatus. Extinguish with dry graphite, soda ash, or other inert powder. DO NOT USE WATER, FOAM, CARBON DIOXIDE, DRY CHEMICALS OR VAPORIZING LIQUIDS ON FIRE. DO NOT USE WATER ON ADJACENT FIRES.
Exposure	Call for medical aid. LIQUID Will burn skin and eyes. Harmful if swallowed. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. DO NOT INDUCE VOMITING.
Water Pollution	Effect of low concentrations on aquatic life is unknown. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.

1. CORRECTIVE RESPONSE ACTIONS

Dilute and disperse
Stop discharge

2. CHEMICAL DESIGNATIONS

- 2.1 CG Compatibility Group: Not listed.
- 2.2 Formula: (C₂H₅)₃Al
- 2.3 IMO/IUN Designation: 4.2/1102
- 2.4 DOT ID No.: Not listed.
- 2.5 CAS Registry No.: Currently not available
- 2.6 NAERG Guide No.: Not listed
- 2.7 Standard Industrial Trade Classification: 51550

3. HEALTH HAZARDS

- 3.1 **Personal Protective Equipment:** Full protective clothing, preferably of aluminized glass cloth; goggles; face shield; gloves. In case of fire, all-purpose canister or self-contained breathing apparatus.
- 3.2 **Symptoms Following Exposure:** Exposure to smoke from fire causes metal-fume fever (flu-like symptoms). Since liquid ignites spontaneously, contact with eyes or skin causes severe burns.
- 3.3 **Treatment of Exposure:** INHALATION: only fumes from fire need be considered; metal-fume fever is not critical, lasting less than 36 hrs. EYES: flush gently with copious quantities of water for 15 min. with lids held open; treat burns if fire occurred; get medical attention. SKIN: wash with water; treat burns caused by fire; get medical attention.
- 3.4 TLV-TWA: Not listed.
- 3.5 TLV-STEL: Not listed.
- 3.6 TLV-Ceiling: Not listed.
- 3.7 **Toxicity by Ingestion:** Not pertinent (ignites instantly in air, reacts vigorously with water)
- 3.8 **Toxicity by Inhalation:** Currently not available.
- 3.9 **Chronic Toxicity:** Currently not available
- 3.10 **Vapor (Gas) Irritant Characteristics:** Not pertinent
- 3.11 **Liquid or Solid Characteristics:** Severe skin irritant. Causes second-and third-degree burns on short contact and is very injurious to the eyes.
- 3.12 **Odor Threshold:** Currently not available
- 3.13 IDLH Value: Not listed.
- 3.14 OSHA PEL-TWA: Not listed.
- 3.15 OSHA PEL-STEL: Not listed.
- 3.16 OSHA PEL-Ceiling: Not listed.
- 3.17 EPA AEGL: Not listed

4. FIRE HAZARDS

- 4.1 **Flash Point:** Ignites spontaneously in air at all temperatures
- 4.2 **Flammable Limits in Air:** Not pertinent
- 4.3 **Fire Extinguishing Agents:** Inert powders (sand, limestone), dry chemical
- 4.4 **Fire Extinguishing Agents Not to Be Used:** Water, foam, halogenated extinguishing agents.
- 4.5 **Special Hazards of Combustion Products:** Intense smoke may cause metal-fume fever.
- 4.6 **Behavior in Fire:** Dense smoke of aluminum oxide forms. Contact with water applied to adjacent fires causes violent reaction producing toxic and flammable gases.
- 4.7 **Auto Ignition Temperature:** Not pertinent (self-ignites at ambient temperature)
- 4.8 **Electrical Hazards:** Not pertinent
- 4.9 **Burning Rate:** Not pertinent
- 4.10 **Adiabatic Flame Temperature:** Currently not available
- 4.11 **Stoichiometric Air to Fuel Ratio:** 38.1 (calc.)
- 4.12 **Flame Temperature:** Currently not available
- 4.13 **Combustion Molar Ratio (Reactant to Product):** 11.0 (calc.)
- 4.14 **Minimum Oxygen Concentration for Combustion (MOCC):** Not listed

5. CHEMICAL REACTIVITY

- 5.1 **Reactivity with Water:** Reacts violently to form flammable ethane gas
- 5.2 **Reactivity with Common Materials:** No significant reaction
- 5.3 **Stability During Transport:** Stable
- 5.4 **Neutralizing Agents for Acids and Caustics:** Not pertinent
- 5.5 **Polymerization:** Not pertinent
- 5.6 **Inhibitor of Polymerization:** Not pertinent

6. WATER POLLUTION

- 6.1 **Aquatic Toxicity:** Not pertinent
- 6.2 **Waterfowl Toxicity:** Not pertinent
- 6.3 **Biological Oxygen Demand (BOD):** Not pertinent
- 6.4 **Food Chain Concentration Potential:** None
- 6.5 **GESAMP Hazard Profile:** Not listed

7. SHIPPING INFORMATION

- 7.1 **Grades of Purity:** 92+%. 20% or less by weight in benzene, hexane, or heptane. Solutions are not pyrophoric.
- 7.2 **Storage Temperature:** Ambient
- 7.3 **Inert Atmosphere:** Inerted; dry nitrogen at 5 psig
- 7.4 **Venting:** Safety relief, with rupture disc
- 7.5 **IMO Pollution Category:** Currently not available
- 7.6 **Ship Type:** Currently not available
- 7.7 **Barge Hull Type:** Currently not available

8. HAZARD CLASSIFICATIONS

- 8.1 **49 CFR Category:** Not listed.
- 8.2 **49 CFR Class:** Not pertinent.
- 8.3 **49 CFR Package Group:** Not listed.
- 8.4 **Marine Pollutant:** No
- 8.5 **NFPA Hazard Classification:**

Category	Classification
Health Hazard (Blue).....	3
Flammability (Red).....	3
Instability (Yellow).....	3
Special (White).....	W

* Up to 20% by weight in hydrocarbon solution.

- 8.6 **EPA Reportable Quantity:** Not listed.
- 8.7 **EPA Pollution Category:** Not listed.
- 8.8 **RCRA Waste Number:** Not listed
- 8.9 **EPA FWPCA List:** Not listed

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 **Physical State at 15° C and 1 atm:** Liquid
- 9.2 **Molecular Weight:** 114.2
- 9.3 **Boiling Point at 1 atm:** 367.9°F = 186.6°C = 459.8°K
- 9.4 **Freezing Point:** -51°F = -46°C = 227°K
- 9.5 **Critical Temperature:** 761.0°F = 405°C = 678.2°K
- 9.6 **Critical Pressure:** 1,970 psia = 134 atm = 13.6 MN/m²
- 9.7 **Specific Gravity:** 0.836 at 20°C (liquid)
- 9.8 **Liquid Surface Tension:** 26.1 dynes/cm = 0.0261 N/m at 28°C
- 9.9 **Liquid Water Interfacial Tension:** Not pertinent
- 9.10 **Vapor (Gas) Specific Gravity:** Not pertinent
- 9.11 **Ratio of Specific Heats of Vapor (Gas):** Currently not available
- 9.12 **Latent Heat of Vaporization:** 216 Btu/lb = 120 cal/g = 5.02 X 10⁵ J/kg
- 9.13 **Heat of Combustion:** -18,364 Btu/lb = -10,202 cal/g = -426.85 X 10⁵ J/kg
- 9.14 **Heat of Decomposition:** Not pertinent
- 9.15 **Heat of Solution:** -1,995 Btu/lb = -1,109 cal/g = -46.40 X 10⁵ J/kg
- 9.16 **Heat of Polymerization:** Not pertinent
- 9.17 **Heat of Fusion:** Currently not available
- 9.18 **Limiting Value:** Currently not available
- 9.19 **Reid Vapor Pressure:** Currently not available

NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
55	52.460	34	0.476	52	1.129	55	3.241
60	52.350	36	0.477	54	1.129	60	3.069
65	52.230	38	0.478	56	1.129	65	2.910
70	52.110	40	0.479	58	1.129	70	2.761
75	52.000	42	0.481	60	1.129	75	2.623
80	51.880	44	0.482	62	1.129	80	2.494
85	51.760	46	0.483	64	1.129	85	2.374
90	51.650	48	0.484	66	1.129	90	2.261
95	51.530	50	0.485	68	1.129	95	2.156
100	51.420	52	0.486	70	1.129	100	2.057
105	51.300	54	0.487	72	1.129	105	1.965
110	51.180	56	0.488	74	1.129	110	1.878
115	51.070	58	0.489	76	1.129	115	1.796
120	50.950	60	0.491	78	1.129	120	1.719
125	50.840	62	0.492	80	1.129	125	1.647
130	50.720	64	0.493	82	1.129	130	1.579
135	50.600	66	0.494	84	1.129	135	1.515
140	50.490	68	0.495	86	1.129	140	1.454
145	50.370	70	0.496			145	1.397
150	50.250	72	0.497			150	1.343
155	50.140	74	0.498			155	1.292
160	50.020	76	0.499			160	1.244
165	49.910	78	0.501			165	1.198
170	49.790	80	0.502			170	1.154
175	49.670	82	0.503			175	1.113
180	49.560	84	0.504			180	1.074

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
	R	180	0.079	180	0.00132		N
	E	190	0.115	190	0.00189		O
	A	200	0.165	200	0.00267		T
	C	210	0.234	210	0.00371		
	T	220	0.326	220	0.00510		P
	S	230	0.449	230	0.00693		E
		240	0.612	240	0.00931		R
		250	0.826	250	0.01238		T
		260	1.103	260	0.01630		I
		270	1.458	270	0.02126		N
		280	1.910	280	0.02747		E
		290	2.480	290	0.03520		N
		300	3.195	300	0.04474		T
		310	4.082	310	0.05642		
		320	5.176	320	0.07063		
		330	6.516	330	0.08779		
		340	8.148	340	0.10840		
		350	10.120	350	0.13300		