ETHYLALUMINUM DICHLORIDE

EAD

CAUTIONARY RESPONSE INFORMATION

Common Synonyms
Aluminum ethyl dichloride
EADC

Liquid heated Colorless to light yellow

IGNITES WHEN EXPOSED TO AIR. Reacts violently with water. Poisonous gas is produced on contact with water. Freezing point is 90°F.

Evacuate.
Keep people away.
Avoid inhalation.
Shut off ignition sources and call fire department.
Wear goggles and self-contained breathing apparatus.
Notify local health and pollution control agencies.
Protect water intakes.

Fire

IGNITES WHEN EXPOSED TO AIR.
Irritating gases are produced when heated.
Extinguish with dry graphite, soda ash, or other inert powder.
DO NOT USE WATER, FOAM, CARBON DIOXIDE, DRY CHEMICAL OR VAPORIZING LIQUID ON FIRE.
DO NOT USE WATER ON ADJACENT FIRES.

Exposure

CALL FOR MEDICAL AID.
GAS PRODUCED IN REACTION WITH WATER.
POISONOUS IF INHALED.
Irritating to eyes, nose and throat.
Move to fresh air.
If breathing has stopped, give artificial respiration.
If breathing is difficult, give oxygen.

LIQUID (HEATED)
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

Stop discharge
Chemical and Physical Treatment:
Neutralize
Do not add water to undissolved material

2. CHEMICAL DESIGNATIONS

2.1 CG Compatibility Group: Not listed.
2.2 Formula: $C_2H_5AlCl_2$
2.3 IMO/UN Designation: 4.2/1924
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: Inhalation of smoke from fire causes metal-fume fever (flu-like symptoms); acid fumes irritate nose and throat. Contact with liquid (which is spontaneously flammable) causes severe burns of eyes and skin.
3.3 Treatment of Exposure: INHALATION: only fumes from fire need be considered; metal-fume fever is not critical and lasts less than 36 hrs.; irritation of nose and throat by acid vapors may require treatment by a physician. EYES: flush gently with water for 15 min.; 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: Currently not available
3.8 Toxicity by Inhalation: Currently not available.
3.9 Chronic Toxicity: Metal-fume fever may develop after breathing smoke from fire.
3.10 Vapor (Gas) Irritant Characteristics: Currently not available
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: Not pertinent (ignites spontaneously)
4.2 Flammable Limits in Air: Not pertinent
4.3 Fire Extinguishing Agents: Inert dry powders such as dry graphite, soda ash, sand, limestone.
4.4 Fire Extinguishing Agents Not to Be Used: Water, foam, dry chemicals, halogenated agents, or carbon dioxide
4.5 Special Hazards of Combustion Products: Intense smoke may cause metal-fume fever. Irritating hydrogen chloride also formed.
4.6 Behavior in Fire: Contact with water applied to adjacent fires will cause formation of irritating smoke containing aluminum oxide and hydrogen chloride.
4.7 Auto Ignition Temperature: Ignites spontaneously in air 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 Stoichometric Air to Fuel Ratio: 20.2 (calc.)
4.12 Flame Temperature: Currently not available
4.13 Combustion Molar Ratio (Reactant to Product): 6.5 (calc.)
4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed

5. CHEMICAL REACTIVITY

5.1 Reactivity with Water: Reacts violently to form hydrogen chloride fumes and flammable ethane gas.
5.2 Reactivity with Common Materials: Reacts with surface moisture to generate hydrogen chloride, which is corrosive to common metals.
5.3 Stability During Transport: Stable
5.4 Neutralizing Agents for Acids and Caustics: Rinse with sodium bicarbonate or lime solution.
5.5 Polymerization: Not pertinent
5.6 Inhibitor of Polymerization: Not pertinent

6. WATER POLLUTION

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

7. SHIPPING INFORMATION

7.1 Grades of Purity: Pure (neat) 25% or less by weight in benzene, hexane, or heptane. Solutions are not pyrophoric.
7.2 Storage Temperature: 35-40°C
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

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: Solid
9.2 Molecular Weight: 130.0
9.3 Boiling Point at 1 atm: 381°F = 194°C = 467°K
9.4 Freezing Point: 90°F = 32°C = 305°K
9.5 Critical Temperature: Not pertinent
9.6 Critical Pressure: Not pertinent
9.7 Specific Gravity: 1.227 at 35°C (liquid)
9.8 Liquid Surface Tension: (est.) 30 dynes/cm = 0.030 N/m at 35°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): Not pertinent
9.12 Latent Heat of Vaporization: Not pertinent
9.13 Heat of Combustion: (est.) –5,600 Btu/lb = –3,100 cal/g = -130×10^5 J/kg
9.14 Heat of Decomposition: Not pertinent
9.15 Heat of Solution: Currently not available
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
100	76.360	96	0.460	96	1.048	100	1.918
105	76.099	97	0.460	97	1.048	105	1.828
110	75.839	98	0.460	98	1.048	110	1.743
115	75.580	99	0.460	99	1.048	115	1.663
120	75.320	100	0.460	100	1.048	120	1.589
125	75.059	101	0.460	101	1.048	125	1.518
130	74.799	102	0.460	102	1.048	130	1.453
135	74.540	103	0.460	103	1.048	135	1.391
140	74.280	104	0.460	104	1.048	140	1.332
145	74.020	105	0.460	105	1.048	145	1.277
150	73.759	106	0.460	106	1.048	150	1.225
155	73.500	107	0.460	107	1.048	155	1.176
160	73.240	108	0.460	108	1.048	160	1.130
165	72.980	109	0.460	109	1.048	165	1.086
170	72.719	110	0.460	110	1.048	170	1.045
175	72.459	111	0.460	111	1.048	175	1.005
		112	0.460	112	1.048		
		113	0.460	113	1.048		

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	130	0.072	130	0.00148		N
	E	140	0.097	140	0.00195		O
	A	150	0.129	150	0.00256		T
	C	160	0.170	160	0.00332		
	T	170	0.222	170	0.00427		P
	S	180	0.288	180	0.00545		E
		190	0.370	190	0.00690		R
		200	0.472	200	0.00867		T
		210	0.598	210	0.01082		I
		220	0.753	220	0.01342		N
		230	0.941	230	0.01652		E
		240	1.169	240	0.02023		N
		250	1.442	250	0.02462		T
		260	1.770	260	0.02979		
		270	2.160	270	0.03585		
		280	2.621	280	0.04292		
		290	3.165	290	0.05113		
		300	3.803	300	0.06062		
		310	4.547	310	0.07155		
		320	5.412	320	0.08407		
		330	6.414	330	0.09836		
		340	7.568	340	0.11460		
		350	8.894	350	0.13300		