

Material Safety Data Sheet**YARDNEY TECHNICAL PRODUCTS, INC.**

May be used to comply with
 OSHA's Hazard Communication Standard,
 29 CFR 1910.1200. Standard must be
 consulted for specific requirements.

82 Mechanic Street
 Pawcatuck, CT 06379

Chemical Identity:**Lithium Tetrachloroaluminate in Thionyl Chloride****Chemical Identity** (As used on Label and List)

Note: Blank spaces are not permitted. If any item is not applicable, or no
 information is available, the space must be marked to indicate that.

Lithium tetrachloroaluminate in thionyl chloride**I. PRODUCT IDENTIFICATION**

Manufacturer: YARDNEY TECHNICAL PRODUCTS, INC.
 82 Mechanic Street
 Pawcatuck, CT 06379

Regular Telephone: (860) 599-1100**Revision Date:** July 9, 2010

Trade Name: Lithium Tetrachloroaluminate
 in Thionyl Chloride

EMERGENCY TELEPHONE NUMBERS

CHEMTEL: 1-800-255-3924

Synonyms: Thionyl Chloride-Lithium Tetrachloroaluminate
 Lithium Aluminum Chloride in Sulfurous Oxychloride
 Electrolyte

National Fire Prevention Code 704**Chemical Formula:** LiAlCl₄ + SOCl₂**Chemical Family:** Alkali Chloroaluminate/Thionyl Chloride Solution**C.A.S. No.:** 1402-11-4 and 7719-09-7**UN / NA** UN 2922, CLASS I**Product Use:** Battery Electrolyte

NFPA RATING	
HEALTH	3
FIRE	0
REACTIVITY	2
SPECIAL NOTE	-W-

II. HAZARD LABEL STATEMENT**Special Precautions:** Corrosive, Poison by inhalation.**Health Hazards:** Corrosive to eyes (may cause blindness), skin and respiratory tract.**Physical Hazards:** Continuous inhalation of fumes may cause lung damage.

Reacts violently with water or humid air to give off corrosive fumes of hydrochloric acid
 and sulfur oxide

Special Fire Fighting Procedure: **DO NOT USE WATER. USE CARBON DIOXIDE OR DRY CHEMICALS.**

Handling and Storage: KEEP AWAY FROM WATER AND HUMID AIR. Do not get in eyes, on skin, or clothing.
 Avoid breathing vapors. Use in a dry, closed system. Keep container closed.
 Wash thoroughly after handling. Store in cool, dry area away from heat.

First Aid:

Eyes: Immediately flush eyes with water for 15 minutes, lifting the upper and lower lids.
 See a physician immediately.

Skin: Immediately wash with plenty of water. Remove contaminated clothing. If irritation occurs and
 persists, obtain medical attention.

Inhalation: Remove to fresh air. Support respiration with oxygen, if necessary. If breathing discomfort
 occurs and persists, obtain medical attention immediately.

Ingestion: Treat for strong acid ingestion.

III. INGREDIENTS

INGREDIENT EXPOSURE LIMITS

Material or Component	C.A.S. No.	Wt. %	TLV Data				
			PEL (OSHA)	TWA (ACGIH)	STEL (ACGIH)	Ceiling (OSHA)	IDLH (OSHA)
Lithium Tetrachloroaluminate	14024-11-4	10-20	REFER TO SECTION V - HAZARDOUS DECOMPOSITION PRODUCTS				
Thionyl Chloride	7719-09-7	90-80	-	-	-	1.0 ppm 5 mg/m ³	

INGREDIENT ANIMAL TEST DATA

Material or Component	LD 50	LC 50
	Species and Route	Species and Route
Lithium Tetrachloroaluminate	N/A	N/A
Thionyl Chloride	N/A	(Rat) 500 ppm, 1 hr. Inhalation

IV. PHYSICAL DATA

Physical State:	Liquid	Vapor Density: Air = 1	Not Applicable
Appearance and Odor:	Slightly yellowish to steel gray colored clear liquid with pungent odor of hydrogen chloride and sulfur dioxide.	Vapor Pressure:	100 mm Hg @ 21°C (70°F)
Odor Threshold:	Not Applicable		
Boiling Point:	78° to 85°C (172° to 185°F)	Freezing Point:	-100°C (-148°F)
Density or Specific Gravity:	1.6 to 1.7 g/ml	Solubility in Water: (% by wt. @ 25°C (77°F))	Reacts violently with water
Volatiles:	80 to 90%	pH (as is) @ 25°C:	Not applicable
Evaporation Rate:	>1	pH (1%) Soln.) @ 25°C:	<3
Coefficient of Water/Oil Distribution:	Not applicable		

V. FIRE, EXPLOSION, AND REACTIVITY DATA

Physical Hazard:	Non-Flammable. Reacts violently with water or humid air, and alkalis.
Flash Point:	Not applicable
Autoignition Temperature:	Not applicable
Flammable Limits in Air:	Upper: Not applicable Lower: Not Applicable
Extinguishing Media:	DO NOT USE WATER. USE CARBON DIOXIDE OR DRY CHEMICAL.
Special Fire Fighting Procedure:	Wear self-contained breathing apparatus and full fire fighting protective clothing when fighting significant-sized fires.
Unusual Fire & Explosion Hazard:	Reacts violently with water or humid air.
Hazardous Combustion Products:	Toxic chlorine and sulfur monochloride gasses.
Explosion Data:	This product is not an explosive.
Sensitivity to Mechanical Impact:	Not applicable
Sensitivity to Static Discharge:	Not applicable
Stability:	Stable when stored in approved containers. Will react slightly with metals over extended time
Conditions Contributing to Instability:	None
Incompatibility:	Water, humid air, alkalis, and temperatures above 140°C (284°F)

Conditions of Reactivity:

Contact with water, humid air, alkalis, or temperatures above 140°C (284°F).

Hazardous Decomposition Products:

Water or moist air reacts readily to decompose the product, to release the gasses of sulfur dioxide and hydrogen chloride. Also, decomposed by heat, above 140°C (284°F), releasing chlorine and sulfur monochloride gasses.

PEL (NIOSH)

Substance C.A.S. No.	PEL (OSHA)		PEL (NIOSH)		IDLH (OSHA)	TVL (ACHIG)		ACGIH Ceiling
	Standard	Ceiling	Standard	Ceiling		TWA	STEL	
Chlorine (7782-50-5)	*	1 ppm 3 mg/m ³	*	0.5 ppm 1.5 mg/m ³	25 ppm	1 ppm 3 mg/m ³	3 ppm 9 mg/m ³	LC50 inhalation/ Rat, 1 hr:293 ppm TOXIC

PEL (NIOSH)

Substance C.A.S. No.	PEL (OSHA)		PEL (NIOSH)		IDLH (OSHA)	TVL (ACHIG)		ACGIH Ceiling
	Standard	Ceiling	Standard	Ceiling		TWA	STEL	
Sulfur Monochloride	1 ppm 6 mg/m ³	*	*	*	*	1 ppm 6 mg/m ³	3 ppm 18 mg/m ³	*
Sulfur Dioxide (10025-67-9)	5 ppm 13 mg/m ³	*	0.5 ppm	*	*	2 ppm 5 mg/m ³	5 ppm 10 mg/m ³	*
Hydrogen Chloride (7647-01-0)	*	5 ppm 7 mg/m ³	*	*	100 ppm	*	*	5 ppm 7 mg/m ³

* No other applicable information was found.

Conditions Contributing**Hazardous Polymerization:**

Does not polymerize.

VI. PRODUCT HEALTH HAZARD INFORMATION**Product Health Hazard:** Corrosive to eyes (may cause blindness), skin, nose and throat.**Product Exposure Limits:** OSHA ceiling value is 1 ppm or 5mg/m³.**Product Animal Hazard Test Data:** No data available.**Route(s) of Exposure:**HazardProduct Toxicity Data and Reference:

<u>Eye Contact:</u>	Corrosive	No toxicology data available
<u>Inhalation:</u>	Corrosive Toxic	No corrosive data available LC50 (rat) 500 ppm (1 hr.), Thionyl Chloride
<u>Skin Contact:</u>	Corrosive	No toxicology data available
<u>Skin Absorption:</u>	No applicable information was found	No toxicology data available
<u>Ingestion:</u>	Corrosive	No toxicology data available

Effects of Overexposure:Acute Effects: This materials is toxic by inhalation and corrosive to eyes (may cause blindness), skin, nose or throat. Continuous inhalation of fumes may cause lung damage.Chronic Effects: See Acute Effects.**First Aid Procedures:**Eyes: Immediately flush eyes with water for 15 minutes, lifting the upper and lower lids occasionally. See a physician immediately.Skin: Immediately wash with plenty of water. Remove contaminated clothing. If irritation occurs or persists, obtain medical attention.Inhalation: Remove to fresh air. Support respiration with oxygen, if necessary. If breathing discomfort occurs and persists, obtain medical attention.

Ingestion:

Rinse mouth with water. Drink two glasses of water. DO NOT induce vomiting. Do not give anything by mouth to an unconscious person.

Decontamination Procedure:

Wash with soap and water.

NOTES TO PHYSICIAN:

Lithium Tetrachloroaluminate in Thionyl Chloride is corrosive. Removal from exposure should be immediate, using copious water flushes. Assessment for esophageal burns with careful endoscopy and lavage, and management for esophageal stricture, should be considered for ingestion exposure. Treatment is otherwise symptomatic and supportive.

Other Toxicological Properties:

Carcinogenicity:

Product is not indicated to be carcinogenic.

NTP Annual:

Neither product nor its ingredients are listed.

IARC Monograph:

Neither product nor its ingredients are listed.

OSHA 29 CFR Part 1910 Subpart Z:

Neither product nor its ingredients are listed.

ACGIH (Appendix A):

Neither product nor its ingredients are listed.

Irritancy:

No applicable, corrosive

Sensitization:

No applicable information was found.

Teratogenicity:

No applicable information was found.

Mutagenicity:

No applicable information was found.

Toxicologically

Synergistic Products:

No applicable information was found.

Any Medical Conditions Generally

Recognized as being Aggravated by

Exposure:

No applicable information was found.

VII. OTHER GOVERNMENTAL LISTINGS

SARA III SECTION 313:

This product does not contain any toxic chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR Part 372.

This information must be included in all MSDSs that are copied and distributed for this material.

ISCA:

Listed

CERCLA:

Neither product nor its ingredients are listed.

SECTION 302:

Neither product nor its ingredients are listed.

RCRA:

Neither product nor its ingredients are specifically listed. It is a hazardous waste by characteristic.

California Proposition 65:

Neither product nor its ingredients are listed.

OSHA:

This product is listed in 29CFR 1910.119 Process Safety Management. The threshold quantity is 250 lbs.

VIII. DISPOSAL, SPILL OR LEAK PROCEDURES

Procedure for Release or Spill:

Cover with sodium bicarbonate or 1:1 mixture of soda ash and slaked lime. Cautiously apply water fog. Transfer into suitable containers.

Waste Disposal Method:

Dispose of waste according to federal EPA, state and local regulations.

IX. PERSONAL PROTECTION INFORMATION

Ventilation Requirements:

Use in a closed, dry system (i.e. glove box).

Specific Personal Protection Equipment:

<u>Respiratory:</u>	Wear a NIOSH/MSHA-approved respirator with full face piece when adequate ventilation is not available.
<u>Eyes:</u>	Safety glasses or goggles.
<u>Gloves:</u>	Rubber
<u>Footwear:</u>	No special requirement.
<u>Clothing:</u>	No special requirement.
<u>Others:</u>	Quick-drench eyewash and safety shower.

X. HANDLING AND STORAGE

KEEP AWAY FROM WATER AND HUMID AIR

Do not get in eyes, on skin, or clothing. Avoid breathing vapors. Use in a dry, closed system.

Keep container tightly sealed. Store in cool, dry area away from heat. Wash thoroughly after handling.

XI. TRANSPORTATION DATA

Domestic:

DOT Proper Shipping Name:	Corrosive Liquids, Toxic, N.O.S. (Thionyl Chloride, Lithium Tetrachloroaluminate Solution)
DOT Hazard Class:	8 Pg I
DOT Labels:	Corrosive, Poison
DOT Marking:	Corrosive Liquids, Toxic, N.O.S. (Thionyl Chloride, Lithium Tetrachloroaluminate Solution)
DOT Placard:	Corrosive & Poison over 1,000 pounds; under 1,000 pounds corrosive only
UN Number:	UN 2922
ERG Guide No:	154

Emergency Accident:

Precautions and Procedures: Keep away from water, humid air, alkalis, and direct sunlight.
Keep containers tightly closed.

Precautions to be Taken in Transportation: Isolate any damaged containers

Type Packages:

Large Quantities: 7 to 14 gallon DOT 5C (1A1, 1B1, 1N1, 1H1, 6HA1 overpacked in 1A2 or 1H2) stainless steel kegs.