Material Safety Data Sheet
Lithium aluminium hydride, 2.4M solution in THF

ACC# 09528

Section 1 - Chemical Product and Company Identification

MSDS Name: Lithium aluminium hydride, 2.4M solution in THF
Catalog Numbers: AC377320000, AC377321000, AC377328000
Synonyms: Lithiumalanate
Company Identification:

Acros Organics N.V.
One Reagent Lane
Fair Lawn, NJ 07410

For information in North America, call: 800-ACROS-01
For emergencies in the US, call CHEMTREC: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
109-99-9	Tetrahydrofuran	90	203-726-8
16853-85-3	Lithium aluminum hydride	10	240-877-9

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: cloudy liquid.
Danger! Extremely flammable liquid and vapor. Vapor may cause flash fire. Water-reactive. Reacts violently and/or explosively with water, steam or moisture. Causes burns by all exposure routes. May be absorbed through intact skin. May be harmful if swallowed. May form explosive peroxides. May cause central nervous system depression. May cause lung damage. Light sensitive. May cause liver and kidney damage. Moisture sensitive. Heat sensitive.
Target Organs: Kidneys, central nervous system, liver, lungs, respiratory system, gastrointestinal system, eyes, skin, mucous membranes.

Potential Health Effects
Eye: Causes severe eye burns. Causes eye burns. Vapors may cause eye irritation. When substance becomes wet or comes in contact with moisture of the mucous membranes, it will cause irritation. Damage may be permanent.
Skin: Causes skin burns. May be absorbed through the skin. If absorbed, causes symptoms similar to those of inhalation. Causes severe burns. THF is not a skin sensitizer in animals.
Ingestion: Causes gastrointestinal tract burns. May cause central nervous system depression. May be harmful if swallowed.
Inhalation: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness and coma. Causes chemical burns to the respiratory tract. Vapors may cause dizziness or suffocation. Inhalation may cause coughing, difficulty breathing and loss of consciousness. Inhalation of tetrahydrofuran vapors may cause abnormal liver function as detected by laboratory tests. (Dupont)
Chronic: Prolonged or repeated eye contact may cause conjunctivitis. Prolonged or repeated skin contact may cause defatting and dermatitis. May cause liver and kidney damage. May cause lung damage. Narcotic in high concentrations. Chronic exposure may cause effects similar to those of acute exposure. Data show carcinogenic activity in the liver and kidneys of laboratory animals. The kidney tumors were by a mechanism that has no relevance in humans. (Dupont)

Section 4 - First Aid Measures

Eyes: Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid imme diately.
Skin: Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If water-reactive products are embedded in the skin, no water should be applied. The embedded products should be covered with a light oil.
Ingestion: Do not induce vomiting. Get medical aid immediately. If swallowed, do NOT induce vomiting. Get medical aid immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.
Inhalation: Get medical aid immediately. Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask.
Notes to Physician: Treat symptomatically and supportively. Persons with skin problems or liver, kidney, lung, or blood diseases may be at increased risk from exposure to this substance.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Will burn if involved in a fire. Water Reactive. Material will react with water and may release a flammable and/or toxic gas. Use water spray to keep fire-exposed containers cool. Extremely flammable liquid and vapor. May form explosive peroxides. May ignite or explode on contact with steam or moist air. May re-ignite after fire is extinguished. Extremely flammable liquid and vapor. Vapor may

cause flash fire. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.
Extinguishing Media: Use approved class D extinguishing agents or smother with dry sand, clay, or sodium bicarbonate. Do NOT use water, carbon dioxide, or foam. Contact professional fire-fighters immediately. Smother with dry sand, dry clay, dry ground limestone (CaCO3), or use approved Class D extinguishers.
Flash Point: Not available.
Autoignition Temperature: Not available.
Explosion Limits, Lower: Not available.
Upper: Not available.
NFPA Rating: (estimated) Health: 3; Flammability: 3; Instability: 2; Special Hazard: -W-

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Clean up spills immediately, observing precautions in the Protective Equipment section. Remove all sources of ignition. Use a spark-proof tool. Isolate area and deny entry. Provide ventilation. Do not expose spill to water.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Take precautionary measures against static discharges. Keep container tightly closed. Do not ingest or inhale. Handle under an inert atmosphere. Do not allow contact with water. Use only in a chemical fume hood. Discard contaminated shoes. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Keep away from heat, sparks and flame.
Storage: Keep away from sources of ignition. Store in a cool, dry place. Do not store in direct sunlight. Keep container closed when not in use. Store in a tightly closed container. Keep under a nitrogen blanket. Keep from contact with oxidizing materials. Flammables-area. Water free area. Store under nitrogen. Containers should be dated when opened and tested periodically for the presence of peroxides. Should crystals form in a peroxidizable liquid, peroxidation may have occurred and the product should be considered extremely dangerous. In this instance, the container should only be opened remotely by professionals. All peroxidizable substances should be stored away from heat and light and be protected from ignition sources.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use only under a chemical fume hood.
Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Tetrahydrofuran	50 ppm TWA; 100 ppm STEL; Skin - potential significant contribution to overall exposure by the cutaneous r oute	200 ppm TWA; 590 mg/m3 TWA 2000 ppm IDLH	200 ppm TWA; 590 mg/m3 TWA
Lithium aluminum hydride	none listed	none listed	none listed

OSHA Vacated PELs: Tetrahydrofuran: 200 ppm TWA; 590 mg/m3 TWA Lithium aluminum hydride: No OSHA Vacated PELs are listed for this chemical.
Personal Protective Equipment
Eyes: Wear chemical splash goggles.
Skin: Wear appropriate protective gloves to prevent skin exposure.
Clothing: Wear appropriate protective clothing to prevent skin exposure.
Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Liquid
Appearance: grey - cloudy
Odor: solvent odor
pH: >7
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: vigorous reaction
Specific Gravity/Density:0.900
Molecular Formula:H4AlLi
Molecular Weight:37.95

Section 10 - Stability and Reactivity

Chemical Stability: Combines vigorously or explosively with water. Light sensitive. Under normal storage conditions, peroxidizable compounds can form and accumulate peroxides which may explode when subjected to heat or shock. This material is most hazardous when peroxide levels are concentrated by distillation or evaporation. THF should never be distilled to dryness. Heat sensitive
Conditions to Avoid: Incompatible materials, light, ignition sources, excess heat, exposure to moist air or water, evaporating to near dryness, confined spaces.
Incompatibilities with Other Materials: Oxidizing agents, acids, alcohols, carbon dioxide, water, halides.
Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, oxides of lithium.
Hazardous Polymerization: Has not been reported

Section 11 - Toxicological Information

RTECS#:
CAS# 109-99-9: LU5950000
CAS# 16853-85-3: BD0100000
LD50/LC50:
CAS# 109-99-9:
Inhalation, rat: LC50 = 21000 ppm/3H;
Oral, rat: LD50 = 1650 mg/kg;
.

CAS# 16853-85-3:
Oral, mouse: LD50 = 85 mg/kg;
.

Carcinogenicity:
CAS# 109-99-9:

- **ACGIH:** A3 - Confirmed animal carcinogen with unknown relevance to humans
- **California:** Not listed.
- **NTP:** Not listed.
- **IARC:** Not listed.

CAS# 16853-85-3: Not listed by ACGIH, IARC, NTP, or CA Prop 65.

Epidemiology: No information found
Teratogenicity: Animal data show developmental effects only at exposure levels producing other toxic effects in the adult animal.
Reproductive Effects: Animal testing for reproductive effects shows no change in reproductive performance.
Mutagenicity: THF has not produced genetic damage in mammalian cell cultures or in animals. It has not been tested for its ability to cause permanent genetic damage in reproductive cells of mammals (not tested for heritable genetic damage).
Neurotoxicity: No information found
Other Studies:

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: LC50 = 2160 mg/L; 96 Hr; Flow through bioassay (pH 7.5)
Water flea Daphnia: EC50 =5930 mg/L; 24 HrFish: Pseudomonas putida:

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.
RCRA P-Series: None listed.
RCRA U-Series:
CAS# 109-99-9: waste number U213 (Ignitable waste).

Section 14 - Transport Information

	US DOT	Canada TDG
Shipping Name:	LITHIUM ALUMINUM HYDRIDE, ETHEREAL	LITHIUM ALUMINUM HYDRIDE, ETHEREAL
Hazard Class:	4.3	4.3
UN Number:	UN1411	UN1411
Packing Group:	I	I

Section 15 - Regulatory Information

US FEDERAL

TSCA
CAS# 109-99-9 is listed on the TSCA inventory.
CAS# 16853-85-3 is listed on the TSCA inventory.

Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules
CAS# 109-99-9: Testing required by manufacturers, processors; Test for Health Effects
Section 12b
CAS# 109-99-9: Section 4
TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
CAS# 109-99-9: 1000 lb final RQ; 454 kg final RQ
SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.
SARA Codes
CAS # 109-99-9: immediate, fire, reactive.
Section 313 No chemicals are reportable under Section 313.
Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.
Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.
STATE
CAS# 109-99-9 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
CAS# 16853-85-3 can be found on the following state right to know lists: New Jersey, Pennsylvania, Massachusetts.

California Prop 65

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols:
F C
Risk Phrases:
R 11 Highly flammable.
R 14/15 Reacts violently with water liberating extremely flammable gases.
R 19 May form explosive peroxides.
R 35 Causes severe burns.

Safety Phrases:
S 16 Keep away from sources of ignition - No smoking.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 33 Take precautionary measures against static discharges.
S 36/37/39 Wear suitable protective clothing, gloves and eye/face pr otection.
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 7/8 Keep container tightly closed and dry.
S 6A Keep under nitrogen.
S 43B In case of fire, use fire-fighting equipment on basis of sodiu m chloride, sodium bicarbonate (never use water).

WGK (Water Danger/Protection)
CAS# 109-99-9: 1
CAS# 16853-85-3: 1
Canada - DSL/NDSL
CAS# 109-99-9 is listed on Canada's DSL List.
CAS# 16853-85-3 is listed on Canada's DSL List.
Canada - WHMIS
This product has a WHMIS classification of B2, F, E.
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
Canadian Ingredient Disclosure List
CAS# 109-99-9 is listed on the Canadian Ingredient Disclosure List.
CAS# 16853-85-3 is listed on the Canadian Ingredient Disclosure List.

Section 16 - Additional Information

MSDS Creation Date: 9/20/2004
Revision #1 Date: 11/11/2004