

MATERIAL SAFETY DATA SHEET

LITHIUM ALUMINUM HYDRIDE

PRODUCT CODE NUMBER(S): 4570-1

PRODUCT IDENTIFICATION

Chemical Name and Synonyms: *Lithium aluminum hydride; (LAH)*

Chemical Family: *Lithium and compounds/complex hydrides*

Chemical Formula: *LiAlH₄*

Product Use: *Laboratory reagent*

Manufacturer's Name and Address:

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HAZARDOUS INGREDIENTS OF MATERIALS

Ingredients	%	TLV Units	CAS No.
Lithium aluminum hydride	97	2 mg/m ³ (as Al) 0.25 mg/m ³ (as Lithium hydride)	16853-85-3

PHYSICAL DATA

Physical State: *Solid*

Odour and Appearance: *White to gray pellets or powder, odourless*

Odour Threshold (ppm): *Not applicable*

Vapour Pressure (mm Hg): *Zero*

Vapour Density (Air = 1): *Not applicable*

Evaporation Rate: *Not applicable*

Boiling Point (degrees C): *Not applicable*

Melting Point (degrees C): *Decomposes above 125 °C without melting*

pH: *Decomposes in water to a strongly alkaline solution of lithium hydroxide*

Specific Gravity: *0.917*

Coefficient of Water/Oil distribution: *Not applicable*

SHIPPING DESCRIPTION

UN: *1410*

T.D.G. Class: *4.3*

Pkg. Group: *I*

REACTIVITY DATA

Chemical Stability: *Stable under cool, dry conditions. Decomposes when exposed to moist air or water. Above 125°C can detonate.*

Incompatibility with other substances: *VERY REACTIVE. Reacts with a wide variety of chemicals, often violently. Reactions with oxidizers and ethers may result in explosions. Not corrosive, but reacts with moisture to form corrosive lithium hydroxide.*

Reactivity: *Avoid excessive heat, all ignition sources, all incompatible materials, generation of dust, friction. Dry lithium*

aluminum hydride can detonate at approximately 125°C. Reacts violently with hydroxy compounds (water, carboxylic acids, alcohols, sugars, cellulose), to release flammable/explosive hydrogen gas, which may be ignited by the heat of the reaction. Contact with ethyl acetate, acetonitrile or their vapours results in a violent, explosive reaction. Addition to ether solvents such as p-dioxane, tetrahydrofuran, bis (2-methoxyethyl)ether, etc. when peroxides are present may result in explosion. Reduction of amides of fluorinated carboxylic acids has resulted in violent explosions. Addition to pyridine is highly exothermic and must be done slowly in very, very small portions with cooling. Reactions with peroxides, hydroperoxides, acyl peroxides, etc. is explosive. In the preparation of 4-bromocyclopentene from crude 3,5-dibromocyclopentene, explosions have occurred about 1 hour after the addition of dibromide.

Hazardous Decomposition Products: *Flammable/explosive hydrogen gas, aluminum oxide, lithium hydroxide.*

FIRE AND EXPLOSION DATA

Flammability: *Flammable solid. Can ignite spontaneously due to friction or sparks. Can detonate at approximately 125°C. See "Reactivity", above.*

Extinguishing Media: *Dry chemical powder, dry sand, powdered limestone, CO₂, or Class D extinguisher. DO NOT USE WATER, or halogenated extinguishers. Fight fire from upwind, from a safe distance. Firefighters must use protective equipment (positive-pressure, full face-piece self-contained breathing apparatus) and clothing (chemical splash suit) sufficient to prevent inhalation of dust, fumes, or vapours, and contact with skin, eyes, and clothing.*

Flash Point (Method Used): *Not applicable (flammable solid)*

Autoignition Temperature: *Not available*

Upper Flammable Limit (% by volume): *Not applicable*

Lower Flammable Limit (% by volume): *Not applicable*

Hazardous Combustion Products: *Aluminum oxide, hydrogen gas, lithium hydroxide.*

Sensitivity to Impact: *None identified; may ignite on grinding*

Sensitivity to Static discharge: *May be ignited by sparks from static discharge*

TOXICOLOGICAL PROPERTIES AND HEALTH DATA

Toxicological Data:

LD₅₀: *Not available*

LC₅₀: *Not available*

Effects of Acute Exposure to Product:

Inhaled: *Corrosive. Extremely destructive to the mucous membranes of upper respiratory tract. Causes severe irritation, with coughing, choking, pain in the nose, mouth and throat, possible lesions of the nasal septum and burns of the mucous membranes. Severe overexposure can cause pulmonary edema which may be fatal. Symptoms (shortness of breath, cyanosis, weak, rapid pulse, frothy sputum, hypotension, hemoconcentration, and moist rales) may appear several hours after exposure.*

In contact with skin: *Corrosive. Reacts with moisture on the skin to form corrosive lithium hydroxide which causes severe irritation, chemical burns, tissue destruction.*

In contact with eyes: *Corrosive. Causes severe irritation, corneal burns and possible permanent damage.*

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Ingested: Corrosive. Extremely destructive to the mucous membranes of gastrointestinal tract. Causes severe burns, nausea, vomiting, diarrhea. Vomiting may result in aspiration which could cause severe lung damage, pulmonary edema (see "Inhaled"). May be fatal.

Effects of Chronic Exposure to Product:

Because of severe nature of acute effects, long-term exposure is not expected.

Carcinogenicity: Not listed as a carcinogen.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Mutagenicity: No information available.

Synergistic Products: None known

PREVENTIVE MEASURES

Engineering Controls: Non-sparking, grounded, corrosion-resistant ventilation system separate from other exhaust ventilation systems.

Respiratory Protection: Dust mask. Fumehood. Up to 0.25 mg/m³ (lithium hydride): NIOSH approved supplied-air respirator. Up to 0.5 mg/m³ (lithium hydride): continuous-flow supplied-air respirator, or powered, air-purifying respirator with a high-efficiency particulate filter, or full facepiece self-contained breathing apparatus, or full facepiece supplied-air respirator. For high or unknown concentrations, as in fire or spill conditions, full face-piece, positive-pressure self-contained breathing apparatus or supplied-air respirator with auxiliary positive-pressure self-contained breathing apparatus.

Eye Protection: Chemical safety goggles, face shield.

Skin Protection: Impervious apron, natural rubber, neoprene, or nitrile rubber gantlet gloves. Flameproof coveralls treated with an antistatic coating, boots.

Other Personal Protective Equipment: Safety shower and eye-wash fountain in work area.

Leak and Spill Procedure: Eliminate all ignition sources. Remove combustible material from area of spill. Use non-sparking tools. Evacuate area. Cleanup personnel must be thoroughly trained in the handling of hazardous materials, and must wear protective equipment and clothing sufficient to prevent any contact with skin and eyes, or inhalation of dust or vapours. DO NOT TOUCH SPILLED MATERIAL. DO NOT USE WATER. Cover spilled chemical with soda ash, or a 1:1:1 mixture of soda ash, clay cat litter, and sand, transfer carefully into covered container, and arrange removal by disposal company. Do not get water on spilled material or in containers of collected material. Prevent from entering sewers or waterways. After spilled material has been removed, wash site thoroughly with copious amounts of water and detergent.

Waste Disposal: Follow all federal, provincial and local regulations for disposal.

Handling Procedures and Equipment: FLAMMABLE, CORROSIVE. Workers using this substance must be thoroughly trained in its hazards and its safe use, and must wear appropriate protective equipment and clothing. Handle under argon or other inert gas. Use non-sparking tools. Keep away from all sources of ignition. Post "DO NOT USE WATER" signs. Have all equipment perfectly dry. Avoid generating dust; use good-housekeeping procedures to prevent accumulation of dust. Keep workplace free of extraneous, particularly combustible, materials. Avoid friction. Avoid all contact with skin, eyes and clothing. Use the smallest amount possible for the purpose, in a designated area with adequate ventilation. Empty containers may contain hazardous residues; treat with caution.

Storage Requirements: Store under argon in suitable, labelled containers, in a cool, dry, well-ventilated area, out of direct sunlight, away from ignition sources, water and incompatible or combustible materials. Keep containers tightly closed when not in use and when empty. Protect from damage and inspect frequently for signs of damage or leakin. Post "DO NOT USE WATER" signs.

FIRST AID MEASURES**Specific Measures:**

Eyes: Immediately flush eyes with gently running water or normal saline for sixty (60) minutes, holding eyelids open during flushing. Wear protective gloves and other clothing to avoid contact during first aid measures. Take care not to flush contaminated water into unaffected eye. Get medical attention IMMEDIATELY. Flushing may be continued while victim is transported to medical facility.

Skin: IMMEDIATELY brush away excess chemical. IWear protective gloves and other clothing to avoid contact during first aid procedures. IMMEDIATELY flush affected areas with running water for twenty to thirty (20-30) minutes. Get medical attention immediately. Remove contaminated clothing (including shoes, watches, belts, and rings) and put in vented containers in a well-ventilated area. Decontaminate clothing, including shoes, completely before reuse, or discard (inform laundry of hazard - contaminated clothing can release flammable/explosive hydrogen gas).

Inhalation: IMMEDIATELY move victim to fresh air (caution must be used by rescuers to avoid exposure to contaminating fumes - use buddy system). Get IMMEDIATE medical attention. Give oxygen for any breathing difficulty. Give artificial respiration ONLY if breathing has stopped.

Ingestion: If victim is alert and not convulsing, rinse mouth thoroughly with water and give 2 to 4 glasses of water to drink to dilute. DO NOT INDUCE VOMITING. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. Avoid contact with emesis. Get medical attention IMMEDIATELY.

REFERENCES USED

- Budavari: The Merck Index, 12th ed., 1997
Sax, Lewis: Hawley's Condensed Chemical Dictionary, 11th ed., 1987
Sax: Dangerous Properties of Industrial Materials, 5th ed., 1979
Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION

Date Issued: July 15, 1991

Revision: July 2010

MSDS: 4570-1

Proposed WHMIS Designation: B4; B6; E

Prepared by: Caledon Laboratories Ltd. (905) 877-0101
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