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SAFETY DATA SHEET

Section 1. Identification

Product Name: Lithium borohydride.
Product Type: Solid.
CAS Number: 16949-15-8
Product Number: [LI9158](#)
Product Manufacturer: Ereztech LLC
11555 Medlock Bridge Road, Suite 100
Johns Creek, GA 30097
Product Information: (888) 658-1221
In case of an emergency: CHEMTREC: 1-800-424-9300 (USA);
+1 703-527-3887 (International); CCN836180
*** Contact manufacturer for all non-emergency calls.

Section 2. Hazards Identification

Hazards Identification

Classification: SUBSTANCES AND MIXTURES WHICH, IN CONTACT WITH WATER, EMIT FLAMMABLE GASES – Category 1, H260
ACUTE TOXICITY, ORAL – Category 3, H301
ACUTE TOXICITY, DERMAL – Category 3, H311
SKIN CORROSION/IRRITATION; - Category 1B, H314
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1, H318
ACUTE TOXICITY, INHALATION – Category 3, H331
SPECIFIC TARGET ORGAN TOXICITY, SINGLE EXPOSURE;
RESPIRATORY TRACT IRRITATION – Category 3, H335

GHS label elements

Hazard pictograms:



Signal word: DANGER.
Hazard statements: H260: In contact with water releases flammable gases which may ignite spontaneously.
H301: Toxic if swallowed.

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Section 2. Hazards Identification

Hazard statements (cont.):

H311: Toxic in contact with skin.
H314: Causes severe skin burns and eye damage.
H318: Causes serious eye damage.
H331: Toxic if inhaled.
H335: May cause respiratory irritation.

Precautionary statements

Prevention:

P223: Keep away from any possible contact with water, because of violent reaction and possible flash fire.
P231 + P232: Handle under inert gas. Protect from moisture.
P260: Do not breathe dusts or mists.
P261: Avoid breathing dusts/aerosols/vapors.
P264: Wash skin thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P271: Use only outdoors or in well-ventilated area.
P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P301 + P330 + P331: IF SWALLOWED: Rinse mouth. Do not induce vomiting.
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
P303 + P361 + P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present. Continue rinsing.
P310: Immediately call a POISON CENTER or doctor/physician.
P335 + P334: Brush off loose particles from skin and immerse in cool water/wrap in wet bandages.
P361: Remove/Take off immediately all contaminated clothing.
P363: Wash contaminated clothing before reuse.
P370 + P378: In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P402 + P404: Store in a dry place. Store in a closed container.
P403 + P233: Store in a well ventilated place. Keep container tightly closed.
P405: Store locked up.
P501: Dispose of contents/ container to an approved waste disposal plant.

Storage:

Disposal:

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Section 2. Hazards Identification

OSHA/HCS status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Hazards not otherwise classified: Reacts violently with water to release hydrogen gas and diborane.

Section 3. Composition/Information on Ingredients

Substances

Formula : LiBH_4
Molecular Weight : 21.77 g/mol.
Synonyms : Lithium boranate; lithium boron hydride.
CAS-No. : 16949-15-8

Ingredient Name	%	CAS Number
Lithium borohydride	≥ 98	16949-15-8

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First Aid Measures

Description of Necessary First Aid Measures

General Advice: Move out of dangerous area. Call a physician or POISON CONTROL CENTER immediately. Show this safety data sheet to the doctor in attendance.

Eye Contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue rinsing. Call a physician or POISON CONTROL CENTER immediately.

Skin Contact: Take off contaminated clothing and shoes immediately. Wash off contaminated skin with soap and plenty of water. Call a POISON CENTER or doctor/physician immediately.

Inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Call a POISON CENTER or doctor/physician immediately.

Ingestion: Rinse mouth. Do NOT induce vomiting. Remove dentures if any. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person.

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Section 4. First Aid Measures

Ingestion (cont.): If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Call a physician or POISON CONTROL CENTER immediately.

Most Important Symptoms/Effects, Acute And Delayed Potential Acute Health Effects

Eye Contact: Causes eye damage. Symptoms may include itching, pain, watering, redness and temporary/permanent loss of vision.

Inhalation: Product reacts violently when exposed to moisture/water and may be expected to be corrosive to mucous membranes and tissues of the upper respiratory tract. Symptoms may include coughing, shortness of breath, difficulty in breathing, nausea and headaches. Diborane produces toxic bronchopulmonary effects.

Skin Contact: Skin contact with this product may be expected to cause chemical burns and possible toxic effects similar to inhalation and ingestion. Symptoms may include burning, itching, pain, swelling, redness and tissue necrosis.

Ingestion: Compounds released when product is exposed to moisture/water may be expected to be corrosive to mucous membranes and tissues of the mouth, esophagus and digestive tract. Borate poisoning causes nausea, vomiting, diarrhea and abdominal pain. Symptoms may also include weakness, lethargy, headache, restlessness, tremors and convulsions. Lithium in large doses can cause dizziness and weakness with additional central nervous system symptoms of slurred speech, blurred vision, numbness, incoordination and convulsions.

Chronic Symptoms: Chronic exposure may produce bronchial irritation with cough and frequent attacks of bronchial pneumonia, dermatitis and/or conjunctivitis and respiratory distress.

Indication of Immediate Medical Attention and Special Treatment Needed, If Necessary

Notes to Physician: Treat symptomatically.

Specific Treatments: No specific treatment.

Protection of First Responders: No action taken shall be taken involving any personal risk without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See toxicological information (Section 11)

Section 5. Fire Fighting Measures

General Hazards: Product reacts violently with water to release diborane and hydrogen gas.

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Section 5. Fire Fighting Measures

Suitable Extinguishing Media:

THE MOST EFFECTIVE FIRE EXTINGUISHING AGENT IS DRY CHEMICAL POWDER PRESSURIZED WITH NITROGEN. Vermiculite, sand, dry chemical or carbon dioxide (CO₂) may also be used.

Unsuitable Extinguishing Media:

DO NOT USE WATER OR FOAM as product reacts to produce extremely flammable vapors upon contact with water. DO NOT USE halogenated fire extinguishing agents.

Unusual Fire and Explosion Hazards:

This material reacts violently with water and compounds containing active hydrogen such as alcohols and acids to produce diborane and hydrogen gas. Product runoff to sewer may create a fire or explosion hazard. Product may reignite after fire is extinguished. Gases generated in fire and after contact with water or moist air may be poisonous, corrosive or irritating.

Product of Combustion:

Lithium oxides, borane/boron oxides.

Protection of Firefighters:

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Avoid contact with skin or eyes. Avoid breathing dusts, aerosols, gases and vapors.

Fire-fighters should wear appropriate protection equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in a positive pressure mode.

Section 6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures**For Non-emergency Personnel:**

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid inhalation of dusts, aerosols or gases. Provide adequate ventilation. Wear respiratory protection. Put on appropriate personal protective equipment.

For Emergency Responders:

If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For nonemergency personnel".

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Section 6. Accidental Release Measures

Environmental Precautions:

Do not allow dispersal of spilled material and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for Containment

Small/Large Spill:

Eliminate all ignition sources. Move containers from spill area if safe to do so. Do not walk through spilled material. Approach spill from upwind. Cover spill with WET earth, sand or other non-combustible material. Use clean non-sparking tools to collect absorbed material and place in dry, sealed container for disposal according to local regulations (see Section 13). Avoid the creation and inhalation of dusts and aerosols. Use spark-proof tools and explosion-proof equipment. Dispose of via a licensed waste disposal contractor.

Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and Storage

Precautions:

Avoid contact with skin, eyes and clothing. Avoid the formation and inhalation of dusts and aerosols. Do not ingest. Ensure adequate ventilation.

Protective Measures:

Put on appropriate personal protective equipment (see Section 8). Keep in the original container kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

General Occupational Hygiene:

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking or smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Safe Storage Conditions:

Product is moisture sensitive. Handle and store under an inert gas. Nitrogen with less than 5 ppm each of moisture and oxygen is recommended. Keep away from air/moisture. Store in original container in a dry and well-ventilated area, away from incompatible materials and food and drink. Keep container tightly closed and sealed until ready for use. Store locked up.

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Section 8. Exposure Controls/Personal Protection

Introductory Remarks:

These recommendations provide general guidance for handling this product. Because work environments and material handling practices vary, safety procedures should be developed for each intended application. While developing safe handling procedures, do not overlook the need to clean equipment and conduct regular repairs. Waste from these procedures should be handled in accordance with Section 13.

Occupational Exposure Limits:

Product contains no substances with occupational exposure limit values.

Engineering Controls:

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute. Provide an eyewash/shower station.

Environmental Exposure Controls:

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual Protection Measures

Hygiene Measures:

Avoid all unnecessary exposure. Wash all exposed skin (hands, forearms and face) thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Remove all soiled and contaminated clothing immediately. Do not inhale dusts, aerosols or gases. Avoid contact with eyes and skin. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/Face Protection:

Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to mists, vapors or sprays. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles, faceshield (8-inch minimum). Refer to 29 CFR 1910.133, ANSI Z87.1, or European Standard EN166.

Skin Protection

Hand Protection:

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

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Section 8. Exposure Controls/Personal Protection

Hand Protection (cont.):

Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: Chemical-resistant gloves.

Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. For full contact, use Neoprene or nitrile rubber.

Other Skin Protection:

Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory Protection:

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Section 9. Physical and Chemical Properties

Physical State:

Solid (powder).

Color:

White.

Odor:

No data available.

Odor Threshold:

No data available.

pH:

No data available.

Melting Point:

280 °C (536 °F).

Boiling Point:

No data available.

Flash Point:

No data available.

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Section 9. Physical and Chemical Properties

Flammability:	No data available.
Flammability or explosive limits	
Upper Explosive Limit (UEL):	75.6 vol. %.
Lower Explosive Limit (LEL):	4.0 vol. %.
Auto-ignition temperature:	No data available.
Decomposition temperature:	> 280 °C (>536 °F).
Relative Density:	0.666 g/cm ³ @ 25 °C (77 °F).
Vapor Pressure:	No data available.
Relative Vapor Density:	>1 (air=1).
Water Solubility:	Reacts violently with water to produce flammable gases which may ignite spontaneously.
Evaporation Rate:	No data available.
Viscosity:	No data available.
VOC Content:	No data available.

VOCs are calculated following the requirements under 40 CFR, Part 59, Subpart C for Consumer Products and Subpart D for Architectural Coatings.

Section 10. Stability and Reactivity

Reactivity:	This product reacts violently with water and compounds containing active hydrogen such as alcohols and acids to produce flammable and potentially toxic gases.
Chemical Stability:	This product is stable when stored under a dry, inert atmosphere and away from heat. Nitrogen containing less than 5 ppm each moisture and air is recommended. This product is not sensitive to impact.
Conditions to Avoid:	Keep away from water/moisture.
Incompatible Materials:	Water/moisture, amines, ammonia, chloroformates, halogens, phosphorus halides, strong acids, strong bases, strong oxidizing agents.
Hazardous Decomposition Products:	Under normal conditions of storage and use, hazardous decomposition products should not be produced. In contact with water, product violently releases flammable and potentially toxic gases. Hazardous decomposition products formed under fire conditions: lithium oxides, borane/boron oxides, and hydrogen gas. In the event of a fire: see section 5.

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Section 10. Stability and Reactivity

Possibility of Hazardous Reactions:

Under normal conditions of storage and use noted above, hazardous reactions will not occur. Hazardous reactions or instability may occur under certain conditions of storage or use. Product reacts violently with water to release flammable and potentially toxic gases.

Section 11. Toxicological Information

Information on Toxicological Effects

Acute Toxicity

: No specific data is available for this product.

Component	CAS No	Result	Species	Dose	Exposure
Lithium borohydride	16949-15-8	LD50 Oral	Mouse	87.8 mg/kg	-

Irritation/Corrosion

: Causes burns by all exposure routes.

Sensitization

: No specific data available.

Germ Cell Mutagenicity

: No specific data available.

Carcinogenicity

IARC

: No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH

: No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by ACGIH.

NTP

: No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by NTP.

OSHA

: No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by OSHA.

Reproductive Toxicity

: This product is not expected to cause reproductive or developmental effects.

Teratogenicity

: No specific data available.

Specific Target Organ Toxicity (single exposure)

: Respiratory irritation.

Specific Target Organ Toxicity (repeated exposure)

: No specific data available.

Aspiration Hazard

: No specific data available.

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Section 11. Toxicological Information

Information on the likely routes of exposure

: No specific data available.

Additional Information

: To the best of our knowledge, the chemical, physical and toxicological properties of this product have not been thoroughly investigated.

Section 12. Ecological Information

Numerical Measures of Toxicity

Toxicity to Fish

: No specific data available.

Toxicity to daphnia and other aquatic invertebrates

: No specific data available.

Toxicity to algae

: No specific data available.

Persistence and Degradability

Biodegradability

: No specific data available.

Bioaccumulative potential

: No specific data available.

Mobility in soil

: No specific data available.

Other Adverse Effects

: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Section 13. Disposal Considerations

Waste Treatment Methods

Product

: Dispose of in accordance with local, state, and federal regulations. Refer to 40 CFR 260-299 for complete waste disposal regulations. Consult your local, state, or federal agency before disposing of any chemicals.

Contaminated Packaging

: Empty containers retain product residue (dusts, vapors and gases) and can be dangerous. DO NOT EXPOSE SUCH CONTAINERS TO MOISTURE, HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

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Section 14. Transport Information

	DOT	IMDG	IATA
UN Number	UN 1413	UN 1413	UN 1413
UN Proper Shipping Name	Lithium borohydride	LITHIUM BOROHYDRIDE	Lithium borohydride
Transport Hazard Classes	4.3	4.3	4.3
Packing Group	1	1	1
Environmental Hazards	No	No	No
Additional Information	-	EMS-No: F-G, S-O	-

Special Precautions for User

: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transporting in Bulk According to Annex II of MARPOL 73/78 and the IBC Code

: Not applicable.

Section 15. Regulatory Information

TSCA (Toxic Substance Control Act):

This product is listed on the U.S. Toxic Substances Control Act Chemical Inventory (TSCA Inventory).

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

Acute Health Hazard (Acute Toxicity – Dermal, Oral, Inhalation; Skin Corrosion), Reactivity Hazard (In contact with water emits flammable gas).

Massachusetts Right to Know Components

No components are subject to Massachusetts Right to Know Act.

Pennsylvania Right to Know Components

Compound

Lithium tetrahydroborate

CAS-No.

16949-15-8

Revision Date

-

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Section 15. Regulatory Information

New Jersey Right to Know Components

Compound

Lithium tetrahydroborate

CAS-No.

16949-15-8

Revision Date

-

California Proposition 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Section 16. Other Information

National Fire Protection Association (U.S.A.)



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

HMIS Rating

HEALTH	3
FLAMMABILITY	3
PHYSICAL HAZARD	2

History

Date of printing : 12/17/19

Date of issue/Date of Revision : 12/17/19

Date of previous issue : None.

References : None available.

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Section 16. Other Information

Abbreviations and Acronyms

ACGIH: American Conference of Governmental Industrial Hygienists.

ATE: Acute Toxicity Estimate

CAS: Chemical Abstracts Service (division of the American Chemical Society).

DOT: US Department of Transportation.

GHS: Globally Harmonized System of Classification and Labeling of Chemicals.

HMIS: Hazardous Materials Identification System.

IARC: International Agency for Research on Cancer.

IATA: International Air Transport Association.

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA).

IDLH: Immediately Dangerous to Life or Health (US National Institute for Occupation Health and Safety (NIOSH)).

IMDG: International Maritime Code for Dangerous Goods.

NFPA: National Fire Protection Association.

NIOSH: National Institute of Occupational Safety and Health.

NTP: National Toxicology Program.

OSHA: Occupational Safety and Health Administration.

PEL: Permissible Exposure Limits.

REL: Recommended Exposure Limits.

SARA: Superfund Amendments and Reauthorization Act.

STOT: Specific Target Organ Toxicity.

TLV: Threshold Limit Values (ACGIH).

TWA: Time Weighted Average.

VOC: Volatile Organic Compound.

Disclaimer

The information herein is believed to be accurate and is presented in good faith; however, no warranties or representations are made by Ereztech LLC regarding the accuracy or completeness of the information. Ereztech LLC shall not be liable for any damages resulting from the handling, or from the contact with the above product.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.