

Material Safety Data Sheet

Material Name: LITHIUM NITRATE SOLUTION

MSDS ID: MRD-110

*** Section 1 - Chemical Product and Company Identification ***

Chemical Name: Aqueous Lithium Nitrate Solution

Product Use: Various Industrial Applications

Manufacturer Information

Mineral Research and Development
5910 Pharr Mill Road
Harrisburg, NC 28075

Phone: 800-454-4805
Fax: 704-455-6507
Emergency # 1-800-424-9300

General Comments

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

*** Section 2 - Hazards Identification ***

Emergency Overview

This product is irritating to the eyes, respiratory system and skin. This product releases oxygen upon decomposition. Irritating and toxic fumes and gases may be released upon thermal processing or during combustion.

Potential Health Effects: Eyes

This product is irritating to the eyes. Symptoms may include redness and tearing.

Potential Health Effects: Skin

This product is irritating to the skin. Depending on the duration of contact, symptoms will include reddening, discomfort, irritation, and possible tissue damage. Repeated contact with this material may produce dermatitis.

Potential Health Effects: Ingestion

Ingestion can cause gastrointestinal irritation, nausea, vomiting and diarrhea. Lithium poisoning may occur and produce symptoms such as difficulty speaking, drowsiness, twitching, visual disturbances, tremors, dehydration, electrolyte imbalance, mental confusion, and in extreme case of ingestion, cardiac disturbances, convulsions and coma. As a nitrate compound, this product may cause methemoglobinemia (a condition in which the oxygen-carrying capacity of the blood is adversely impacted.) upon ingestion characterized by cyanosis, headache, dizziness, fatigue, nausea, vomiting, drowsiness, stupor, coma and rarely death.

Potential Health Effects: Inhalation

This product is irritating to the respiratory system. Inhalation of vapors or mists of the product can cause sneezing, coughing and difficulty breathing.

HMIS Ratings: Health: 1 Fire: 0 Physical Hazard: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

*** Section 3 - Composition / Information on Ingredients ***

CAS #	Component	Percent
7732-18-5	Water	70
7790-69-4	Lithium nitrate	30

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Nitrate compounds, Water Dissociable Nitrate Compounds, Lithium salts.

Component Information/Information on Non-Hazardous Components

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication). This product is considered hazardous under the criteria specified in the Canadian Workplace Hazardous Materials Information System (WHMIS).

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The balance of this product's composition contains water and other components. Each of the other components are present in less than 1% concentration (0.1% concentration for potential carcinogens, reproductive toxins, sensitizers, and mutagens. None of the other components contribute significant additional hazards at the concentrations in this product.

*** Section 4 - First Aid Measures ***

First Aid: Eyes

Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Seek medical attention at once.

First Aid: Skin

For skin contact, wash immediately with soap and water for 15 minutes. If irritation persists get medical attention.

First Aid: Ingestion

If material is ingested, immediately contact a physician or poison control center. Give one to two glasses of water or milk. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to a victim who is unconscious or is having convulsions.

First Aid: Inhalation

If inhaled, immediately remove the affected person to fresh air. If the affected person is not breathing, apply artificial respiration. If irritation persists get medical attention.

First Aid: Notes to Physician

Antidote: The following antidote is recommended for lithium poisoning and treatment. The decision as to the severity of poisoning requires administration of any antidote, and actual dose required should be made by qualified medical personnel.

NITRATE POISONING: 1) Emergency measures: Delay absorption of ingested nitrates by giving milk, water or activated charcoal and then remove by gastric lavage or emesis. Remove poison from skin by scrubbing with soap and water. 2) General measures: Treat methemoglobinemia with dyspnea by methylene blue injection.

LITHIUM POISONING: 1) In single ingestion episodes, give syrup of ipecac and/or perform gastric lavage if productive vomiting has not already occurred. 2) Fluid electrolyte replacement for the correction of dehydration and acid-base imbalances. Over hydration may precipitate pulmonary edema. 3) Infusion of urea or mannitol, alkanlinization of the urine, and aminophyline increase lithium excretion in patients with good renal function. 4) Extracorporeal or peritoneal hemodialysis to decrease lithium levels and control uremia in severe intoxications. If a massive overdose is known with certainty to have been ingested, it may be prudent to institute these measures even in the absence of positive clinical findings because of severe delayed toxicity. 5) Diazepam for the suppression of abnormal motor activity. 6) Support treatment for central nervous depression. 7) Frequent electrocardiograms to assess cardiac status (Groleau, Smith, Hodge-Clinical Toxicology of Commercial Products, Fifth Edition)

Activated charcoal does not bind lithium effectively and is not useful in isolated lithium toxicity. (Groleau, Lithium Toxicity, Emergency Medicine Clinics of North America, Volume 12, Number 2, May, 1994)

Raising the sodium intake does not increase lithium clearance (Thomasen, K. Renal lithium elimination in man and active treatment of lithium poisoning. Acta Psychiatr. Scand., Suppl. No. 207:83-84, 1969)

*** Section 5 - Fire Fighting Measures ***

General Fire Hazards

See Section 9 for Flammability Properties.

This product is an aqueous solution which will not burn. However, if evaporated to dryness this product is an oxidizer and can sustain combustion.

Hazardous Combustion Products

Thermal decomposition products may include irritating vapors and toxic gases including oxides of lithium and nitrogen. If heated to evaporation, this product may evolve oxygen and increase fire hazard.

Extinguishing Media

Dry chemical, foam, carbon dioxide, water fog.

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Fire Fighting Equipment/Instructions

Firefighters should wear full protective clothing including self contained breathing apparatus.

NFPA Ratings: Health: 1 Fire: 0 Reactivity: 1

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

*** Section 6 - Accidental Release Measures ***

Containment Procedures

Stop the flow of material, if this is without risk. Wear appropriate protective equipment and clothing during clean-up. Contain the discharged material and dike the spilled material where possible. Prevent entry into sewers, drains, underground or confined spaces, water intakes and waterways. Avoid contact with combustible materials.

Clean-Up Procedures

Absorb spill with inert material such as: lime, polypads, or other suitable absorbent material. Shovel the absorbed material into appropriate container for disposal.

Evacuation Procedures

Isolate area. Keep unnecessary personnel away.

Special Procedures

Follow all Local, State, Federal and Provincial regulations for disposal.

*** Section 7 - Handling and Storage ***

Handling Procedures

Open container carefully, as needed to relieve any build up of pressure. Do not get this material in your eyes, on your skin, or on your clothing. Do not inhale vapors or mists of this product. Use this product with adequate ventilation. Wash thoroughly after handling.

Storage Procedures

Store in a cool, dry area. Do not freeze. Store away from direct sunlight and any sources of heat. Empty product containers may contain product residue. Do not reuse empty containers. Do not store this material in open or unlabeled containers.

*** Section 8 - Exposure Controls / Personal Protection ***

Exposure Guidelines

A: General Product Information

Keep formation of airborne mists to a minimum.

B: Component Exposure Limits

ACGIH, OSHA, NIOSH or the provinces of Canada have not developed exposure limits for any of this product's components.

Engineering Controls

Provide local and general exhaust ventilation to effectively remove and prevent buildup of any vapors or mists generated from the handling of this product.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear chemical goggles and face shield.

Personal Protective Equipment: Skin

Wear impervious (neoprene) gloves, impervious apron.

Personal Protective Equipment: Respiratory

If ventilation is not sufficient to effectively prevent buildup of vapors or mists, appropriate approved NIOSH respiratory protection must be provided. Respirators should be selected by and used under the direction of a trained health and safety professional following requirements found in OSHA's respirator standard (29 CFR 1910.134) and ANSI's standard for respiratory protection (Z88.2-1992). A written respiratory protection program, including provisions for medical certification, training, fit testing, exposure assessments, maintenance, inspection, cleaning, and convenient, sanitary storage must be implemented.

Personal Protective Equipment: General

Eye wash fountain and emergency showers are recommended. An emergency spill response will necessitate the use of more stringent personal protective equipment.

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*** Section 9 - Physical & Chemical Properties ***

Appearance:	Clear and colorless	Odor:	Odorless
Physical State:	Liquid	pH:	3-6
Vapor Pressure:	Not Available	Vapor Density:	Not Available
Boiling Point:	>212°F (>100°C)	Melting Point:	Not Available
Solubility (H2O):	Soluble	Specific Gravity:	@ 59°F (15°C): 1.19 - 1.21
Flash Point:	Not flammable	Flash Point Method:	Not applicable
Auto Ignition:	Not flammable	LFL:	Not applicable
UFL:	Not applicable	Evaporation Rate:	Similar to water

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability

This is a stable material.

Chemical Stability: Conditions to Avoid

Avoid contact with extreme heat and incompatible materials.

Incompatibility

Strong reducing agents, flammable or combustible materials, powdered metals.

Hazardous Decomposition

Decomposition may yield carbon monoxide, carbon dioxide, oxides of lithium and nitrogen.

Possibility of Hazardous Reactions

Will not occur.

*** Section 11 - Toxicological Information ***

Acute Dose Effects

A: General Product Information

This product may be moderately irritating to contaminated tissues.

The nitrate component of this product may cause methemoglobinemia upon ingestion characterized by cyanosis, headache, dizziness, fatigue, nausea, vomiting, drowsiness, stupor, coma and rarely death.

B: Component Analysis - LD50/LC50

Water (7732-18-5)

Oral LD50 Rat: >90 mL/kg

Epidemiology

No epidemiological data is available for this product.

Carcinogenicity

A: General Product Information

No carcinogenicity data available for this product.

B: Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Mutagenicity

11-MUT-12

Teratogenicity

This product is not reported to cause teratogenic effects in humans.

Neurological Effects

No data available for this product.

Other Toxicological Information

No additional information available.

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*** Section 12 - Ecological Information ***

Ecotoxicity

A: General Product Information

In high concentrations, this product may be harmful to both terrestrial and aquatic plant or animal life.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

No ecotoxicity data are available for this product's components.

Environmental Fate

No information available for the product.

*** Section 13 - Disposal Considerations ***

US EPA Waste Number & Descriptions

A: General Product Information

Wastes must be tested using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations. Wastes must be tested using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes.

See Section 7 for Handling Procedures. See Section 8 for Personal Protective Equipment recommendations.

*** Section 14 - Transportation Information ***

US DOT Information

Shipping Name: This product is not regulated as a hazardous material for transportation.

Canada Transportation of Dangerous Goods Information

Shipping Name: This product is not regulated as a hazardous material for transportation.

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

No additional information available.

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Lithium nitrate (7790-69-4)

SARA 313: 1.0 % de minimis concentration (reportable only when in aqueous solution, Chemical Category N511) (related to Nitrate Compounds, water dissociable)

SARA 311/312: Acute Health Yes Chronic Health Yes Fire No Pressure No Reactive No

State Regulations

A: General Product Information

Other state regulations may apply. Check individual state requirements.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA	RI
Lithium nitrate	7790-69-4	No	No	No	Yes	No	No

Canadian WHMIS Information

A: General Product Information

No additional information available.

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B: Component Analysis - WHMIS IDL

No components are listed in the WHMIS IDL.

WHMIS Classification: Class D2B: Material Causing Other Toxic Effects

Additional Regulatory Information

A: General Product Information

All components are on the U.S. EPA TSCA Inventory List.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	NDSL	EINECS	AUST	MITI	PHIL	KOREA	ELINCS	CHINA
Water	7732-18-5	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes
Lithium nitrate	7790-69-4	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes

*** Section 16 - Other Information ***

Other Information

Disclaimer: Supplier gives no warranty of merchantability or of fitness for a particular purpose. Any product purchased is sold on the assumption the purchaser will make his own tests to determine the quality and suitability of the product. Supplier expressly disclaims any and all liability for incidental and/or consequential property damage arising out of the use of this product. No information provided shall be deemed to be a recommendation to use any product in conflict with any existing patent rights. Read the Material Safety Data Sheet before handling product.

Key/Legend

NA = Not available or Not Applicable. CERCLA = Comprehensive Environmental Response Compensation & Liability Act; SARA = Superfund Amendments & Reauthorization Act; RCRA = Resource Conservation & Recovery Act. TLV = Threshold Limit Value. NFPA = National Fire Protection Association. HMIS = Hazardous Material Information System. CFR = Code of Federal Regulations. HEPA = High Efficiency Particulate Air EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration., NJTSR = New Jersey Trade Secret Registry.

End of Sheet MRD-110