

Material Safety Data Sheet

Material Name: CALCIUM NITRATE TETRAHYDRATE SOLUTION

ID: MRD-016

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

Chemical Name: Inorganic Nitrate Solution

Product Use: Variety of Industrial Applications

Manufacturer Information

MINERAL RESEARCH AND DEVELOPMENT

5910 Pharr Mill Road

P. O. Box 1330

Harrisburg, NC 28075

Phone: 704-454-4811

Fax: 704-454-7390

Emergency # CHEMTREC: (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 - Composition / Information on Ingredients ***

CAS #	Component	Percent
13477-34-4	Calcium Nitrate Tetrahydrate	60-72
7732-18-5	Water	28-40

Component Related Regulatory Information

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

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).

*** Section 3 - Hazards Identification ***

Emergency Overview

WARNING! This product may be harmful or fatal if swallowed. This product is irritating to the eyes, respiratory system and skin. This product is an aqueous solution which will not burn. However, if evaporated to dryness this product is an oxidizer and can sustain combustion. Irritating and toxic fumes and gases may be released upon thermal processing or during combustion.

Potential Health Effects: Eyes

Contact with the eyes can cause moderate irritation. Symptoms may include discomfort or pain and redness. Severe over exposure can result in swelling of the conjunctiva along with tissue damage which may lead to blindness.

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

This product may be harmful or fatal if swallowed. If ingested, this product will immediately cause burns to the mouth, throat, esophagus and possibly the digestive tract. Ingestion can cause gastrointestinal irritation, nausea, vomiting and diarrhea. This product may cause methemoglobinemia 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.

Medical Conditions Aggravated by Exposure

Pre-existing skin and eye conditions.

HMIS Ratings: Health: 2 Fire: 0 Reactivity: 0

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

Material Safety Data Sheet

Material Name: CALCIUM NITRATE TETRAHYDRATE SOLUTION

ID: MRD-016

*** 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. 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

Provide general supportive measures and treat symptomatically.

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

Flash Point: Not flammable

Upper Flammable Limit (UFL): Not applicable

Auto Ignition: Not flammable

Rate of Burning: Not applicable

General Fire Hazards

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

Decomposition may yield calcium compounds and oxides of nitrogen.

Extinguishing Media

Dry chemical, foam, carbon dioxide, water fog.

Fire Fighting Equipment/Instructions

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

NFPA Ratings: Health: 2 Fire: 0 Reactivity: 0 Other: none

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

Method Used: Not applicable

Lower Flammable Limit (LFL): Not applicable

Flammability Classification: Non-flammable

*** 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.

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

Isolate exposure. Wear appropriate personal protective equipment. 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.

Material Safety Data Sheet

Material Name: CALCIUM NITRATE TETRAHYDRATE SOLUTION

ID: MRD-016

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, and NIOSH 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.

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

Appearance:	Colorless	Odor:	None
Physical State:	Liquid	pH:	@ 59°F (15°C): 3.0 - 8.0
Vapor Pressure:	Not Applicable	Vapor Density:	Not Applicable
Boiling Point:	>212°F (>100°C)	Melting Point:	Not Determined
Solubility (H2O):	Completely	Specific Gravity:	@ 59°F (15°C): 1.38 - 1.50
Freezing Point:	-31°F (-35°C)	Evaporation Rate:	Similar to water
Octanol/H2O Coeff.:	Not Available		

Physical Properties: Additional Information

No additional information available.

*** 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

This product is incompatible with flammable and combustible materials, strong reducing agents and finely powdered metals.

Hazardous Decomposition

Decomposition may yield calcium compounds and oxides of nitrogen.

Material Safety Data Sheet

Material Name: CALCIUM NITRATE TETRAHYDRATE SOLUTION

ID: MRD-016

Hazardous Polymerization

Will not occur.

*** Section 11 - Toxicological Information ***

Acute and Chronic Toxicity

A: General Product Information

No information available for the product.

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

Calcium Nitrate Tetrahydrate (13477-34-4)

Oral LD50 Rat : 3900 mg/kg

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.

Chronic Toxicity

No information available for the product.

Epidemiology

No epidemiological data is available for this product.

Neurotoxicity

No data available for this product.

Mutagenicity

No data available for this product.

Teratogenicity

No data available for this product.

Other Toxicological Information

No additional information available.

*** 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 data available for this product.

*** Section 13 - Disposal Considerations ***

US EPA Waste Number & Descriptions

A: General Product Information

You must test your waste 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.

Material Safety Data Sheet

Material Name: CALCIUM NITRATE TETRAHYDRATE SOLUTION

ID: MRD-016

*** Section 14 - Transportation Information ***

US DOT Information

This material is not hazardous as defined by 49CFR 172.101 by the US Department of Transportation.

Canada Transportation of Dangerous Goods Information

This material is not considered as dangerous goods, per regulations of Transport Canada.

International Transportation Regulations

No additional information available.

*** 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).

Calcium Nitrate Tetrahydrate (13477-34-4)

SARA 313: form R reporting required for 1.0% de minimis concentration; Chemical Category N511 (related to Water Dissociable Nitrate Compounds)

SARA 311/312: Acute Health Yes Chronic Health No 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

None of this product's components are listed on the state lists from CA, FL, MA, MN, NJ, or PA.

Canadian WHMIS Information

A: General Product Information

All components are on the Canadian Domestic Substances or Non-Domestic Substances Inventory Lists.

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.

Calcium Nitrate Tetrahydrate is a hydrate of an anhydrous form that is on the US TSCA and Canadian DSL inventories, and can be referenced under the parent compound name.

B: Component Analysis - Inventory Component Analysis - Inventory

Component	CAS #	TSCA	DSL	NDSL	EINECS	AUST	MITI	PHIL	KOREA	ELINCS	CHINA	CAN
Calcium Nitrate Tetrahydrate	13477-34-4	No	No	No	No	Yes	Yes	Yes	No	No	Yes	No
Water	7732-18-5	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No	Yes	DSL

Material Safety Data Sheet

Material Name: CALCIUM NITRATE TETRAHYDRATE SOLUTION

ID: MRD-016

* * * 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.

This is the end of MSDS # MRD-016