

MATERIAL SAFETY DATA SHEET**ALUMINUM NITRATE**

PRODUCT CODE NUMBER(S): 1120-1

PRODUCT IDENTIFICATION

Chemical Name and Synonyms: *Aluminum nitrate, 9-hydrate*
Chemical Family: *Inorganic salt*
Chemical Formula: $Al(NO_3)_3 \cdot 9H_2O$
Product Use: *Laboratory reagent*
Manufacturer's Name and Address:
Caledon Laboratories Ltd.
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HAZARDOUS INGREDIENTS OF MATERIALS

<i>Ingredients</i>	<i>%</i>	<i>TLV Units</i>	<i>CAS No.</i>
<i>Aluminum nitrate</i>	<i>>99</i>	<i>2 mg/m³ (Al)</i>	<i>7784-27-2</i>

PHYSICAL DATA

Physical State: *Solid*
Odour and Appearance: *White crystals and chunks, odourless*
Odour Threshold (ppm): *Not applicable*
Vapour Pressure (mm Hg): *Practically zero*
Vapour Density (Air = 1): *Not applicable*
Evaporation Rate: *Probably zero*
Boiling Point (°C): *Decomposes at 130°C*
Melting Point (°C): *73.5°C*
pH: *2.0-4.0 (5% aqueous solution)*
Specific Gravity: *Not available*
Coefficient of Water/Oil distribution: *Not available*

SHIPPING DESCRIPTION

UN: 1438
T.D.G. Class: 5.1
Pkg. Group: III

REACTIVITY DATA

Chemical Stability: *Normally stable. Deliquescent.*
Incompatibility with other substances: *Decomposes above 130°C to form corrosive nitric acid and toxic nitrogen oxides. Can react violently with combustible materials, reducing agents, and organic materials. May explode on heating with some phosphinates. May explode in contact with some metals, strong reducing agents, alkyl esters, thiocyanates, isocyanates, cyanides, or hypophosphates. When wet will corrode some metals.*
Reactivity: *Avoid excessive heat, moisture, ignition sources or open flames, all incompatible materials, generation of dust.*

Hazardous Decomposition Products: *Highly toxic fumes of NO_x, corrosive nitric acid.*

FIRE AND EXPLOSION DATA

Flammability: *Not combustible but strong oxidizer. Will increase the burning rate of combustible matter. Contact with easily oxidizable, organic, or other combustible materials may result in ignition, violent combustion or explosion. Containers may explode in heat of fire.*
Extinguishing Media: *Use any means suitable for extinguishing surrounding fire. Use flooding amounts of water to blanket fire, cool exposed containers, and to flush solid or vapours away from fire. Fight fire from upwind, from a safe distance. Firefighters must wear protective equipment (full face-piece, positive-pressure self-contained breathing apparatus) and clothing sufficient to prevent inhalation of dusts or vapours, and contact with skin and eyes.*

Flash Point (Method Used): *Not applicable*

Autoignition Temperature: *Not applicable*

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

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

Hazardous Combustion Products: *Toxic fumes of oxides of nitrogen, corrosive nitric acid.*

Sensitivity to Impact: *Stable material; not expected to be sensitive.*

Sensitivity to Static discharge: *Mixtures with combustible materials or mixtures of dust with air may be sensitive under certain conditions, when ignited by an electrostatic or other high-voltage spark, or other ignition source.*

TOXICOLOGICAL PROPERTIES AND HEALTH DATA**Toxicological Data:**

LD₅₀: (oral, rat) 3,671 mg/kg

LC₅₀: Not available

Effects of Acute Exposure to Product:

Inhaled: *No human or animal information available. Inhalation of dust may irritate the respiratory tract. Symptoms may include sore throat, coughing and shortness of breath. At high temperatures, exposure to toxic nitrogen oxides decomposition products can quickly cause acute respiratory problems. Absorption leads to systemic poisoning with headache, fall in blood pressure, the formation of methemoglobin which decreases the ability of the blood to carry oxygen, causing cyanosis, possible convulsions, coma, and death. Onset may be delayed 2 to 4 hours or longer. Severe overexposure can be fatal.*

In contact with skin: *Dust may cause mild irritation, symptoms including redness, itching and pain. Solutions may cause moderate to severe irritation, depending on concentration and duration of exposure (based on animal testing). No human information available.*

In contact with eyes: *Dust may cause mild irritation, symptoms including redness, itching and pain. Solutions may cause moderate to severe irritation, including severe corneal burns and permanent eye damage, depending on concen-*

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tration and duration of exposure (based on animal testing). No human information available.

Ingested: Low in oral toxicity based on animal testing. Large oral doses of nitrates may cause dizziness, abdominal pain, vomiting, bloody diarrhea, weakness, convulsions. Purging and diuresis can be expected. May cause methemoglobinemia and cyanosis (see "Inhaled").

Effects of Chronic Exposure to Product:

Chronic overexposure to nitrates can lead to methemoglobinemia (see "Inhaled"), and conversion of nitrate to nitrite in the stomach, causing nausea and vomiting, blood and central nervous system effects, weakness, depression, headache, irregular heart rate; severe overexposure can cause coma and death. Question of link to Alzheimer's disease and impaired mental function, but evidence is inadequate.

Carcinogenicity: Not listed as carcinogenic. Has inhibited tumour growth in mice and rats.

Teratogenicity: No human information available. Fetotoxic only at maternally toxic doses in animal testing.

Reproductive Effects: No human or animal information available

Mutagenicity: No specific information available. Aluminum compounds have been found to be negative in tests with cultured mammalian and non-mammalian cells.

Synergistic Products: None known

PREVENTIVE MEASURES

Engineering Controls: Local exhaust ventilation required.

Respiratory Protection: Dust/mist mask. Up to 10x TLV, or the maximum use specified by the respirator supplier, whichever is lowest, NIOSH/MSHA approved half-face dust/mist filter respirator. Up to 50x TLV, or the maximum use specified by the respirator supplier, whichever is lowest, NIOSH/MSHA approved full face-piece dust/mist filter respirator. Higher or unknown concentrations, or for fire or spill conditions, self-contained breathing apparatus, or full face-piece, positive-pressure supplied-air respirator.

Eye Protection: Chemical safety goggles. Do not wear contact lenses when working with chemicals.

Skin Protection: Impervious gloves. Other impervious protective clothing, sleeves, apron, coverall, boots, sufficient to prevent contact.

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

Leak and Spill Procedure: Restrict access to area of spill. Eliminate all sources of ignition and combustible materials. Cleanup personnel must be thoroughly trained in the hazards of this chemical and its safe use, and must wear protective equipment and clothing sufficient to prevent inhalation of dust or fumes, and contact with skin and eyes. Wet if necessary to avoid generating dust. Prevent from entering sewers and waterways. Contain spill with inert material (earth, sand, inert absorbent). Use non-sparking tools to collect material, in suitable, labelled, covered containers for disposal. Contaminated absorbent may pose the same hazards as the chemical; treat with caution. Flush area of spill with large amounts of running water.

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

Handling Procedures and Equipment: OXIDIZER, EYE IRRITANT. Workers using this chemical must be thoroughly trained in its hazards and its safe use, and must wear appropriate protective equipment and clothing. Keep away from combustible or organic materials, and all sources of ignition. Use non-sparking tools. Avoid all contact and inhalation. Do

not shock. Use the smallest amount possible for the purpose, in designated areas with adequate ventilation. Keep work area clean and free of extraneous, particularly combustible, materials. Do not use on porous surfaces (wood); use surfaces that can be easily and thoroughly cleaned. Clean up spills immediately and thoroughly. Keep containers closed when not in use and when empty. Empty containers may contain hazardous residues; treat with caution. Wash hands thoroughly after use.

Storage Requirements: Store in suitable, labelled containers, in a cool, dry, well-ventilated area, out of direct sunlight, and away from incompatible, combustible or organic materials. Storage facilities (shelves, floors) should be constructed of non-combustible materials. Keep away from all ignition sources. Keep containers tightly closed when not in use and when empty. Protect from damage, and inspect frequently for signs of leaking; unattended spillage onto combustible materials (wood, paper, etc.) could result in fire.

FIRST AID MEASURES

Specific Measures:

Eyes: Flush eyes immediately with large amounts of gently running water or normal saline, holding eyelids open, for at least fifteen (15) minutes, or until no evidence of chemical remains. Take care not to flush contaminated water into unaffected eye. Get medical attention if irritation persists.

Skin: Remove contaminated clothing, including watches, rings, belts, and shoes. Wash skin with plenty of running water for five to ten (5-10) minutes, or until no trace of chemical remains. If irritation develops get medical attention. Decontaminate clothing before reuse, or discard; clothing may become dangerously flammable after contact with this chemical.

Inhalation: Remove to fresh air. Rescuer should take precaution to limit his own exposure. Eliminate all sources of ignition. Give oxygen and get medical attention for any breathing difficulty. Because exposure to nitrates can cause methemoglobinemia, the symptoms of which may be delayed, unless exposure is minor, the victim needs to be monitored for several hours for cyanosis, irregular heart rate, loss of consciousness.

Ingestion: If victim is alert and not convulsing, give 2 to 4 glasses of water to dilute. If large doses are ingested, or if victim feels unwell, get medical attention.

REFERENCES USED

CCCINFO disc: Cheminfo, February 2007

Budavari: The Merck Index, 12th ed., 1997

Sax, Lewis: Hawley's Condensed Chemical Dictionary, 11th ed., 1987

Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION

Date Issued: December 1, 1988

Revision: February 2010

MSDS: 1120-1

Proposed WHMIS Designation: C; D2B

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