

MATERIAL SAFETY DATA SHEET**FERRIC NITRATE**

PRODUCT CODE NUMBER(S): 3620-1

PRODUCT IDENTIFICATION

Chemical Name and Synonyms: Ferric nitrate, nonahydrate
Chemical Family: Inorganic salt
Chemical Formula: $Fe(NO_3)_3 \cdot 9H_2O$
Product Use: Laboratory reagent
Manufacturer's Name and Address:
Caledon Laboratories Ltd.
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Georgetown, Ontario L7G 4R9
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HAZARDOUS INGREDIENTS OF MATERIALS

Ingredients	%	TLV Units	CAS No.
Ferric nitrate	~98	1 mg/m ³ (as Fe)	7782-61-8

PHYSICAL DATA

Physical State: Solid
Odour and Appearance: Violet crystals. Slight nitric acid odour.
Odour Threshold (ppm): Not available
Vapour Pressure (mm Hg): Not available
Vapour Density (Air = 1): Not available
Evaporation Rate: Not available
Boiling Point (degrees C): <100°C (decomposes)
Melting Point (degrees C): 47°C
pH: Not available
Specific Gravity: 1.684 @ 21°C
Coefficient of Water/Oil distribution: Not available

SHIPPING DESCRIPTION

UN: 1466
T.D.G. Class: 5.1, (9.2)
Pkg. Group: III

REACTIVITY DATA

Chemical Stability: Stable, hygroscopic.
Incompatibility with other substances: Metals, oxidizable materials, reducing agents. Increases burning rate of combustible materials. Solutions are corrosive to most metals.
Reactivity: Avoid excessive heat, generation of dust. Avoid contact with combustible or incompatible materials. May discolour on exposure to light.
Hazardous Decomposition Products: Highly toxic fumes of nitrogen oxides, nitric acid vapour.

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: NO_x, nitric acid vapour. Will increase intensity of fire.
Sensitivity to Impact: May explode when shocked, particularly if contaminated by organic materials.
Sensitivity to Static discharge: Mixtures of dust with air may be sensitive under certain conditions, particularly when contaminated with organic materials, when ignited by an electrostatic or other high-voltage spark, or other ignition source.

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

LD₅₀: (oral, rat) 3,250 mg/kg
LC₅₀: Not available

Effects of Acute Exposure to Product:

Inhaled: Very irritating to the mucous membranes, symptoms may include coughing, sore throat, 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: Irritating; causes redness, itching and pain. Extent of irritation depends on concentration and duration of exposure.

In contact with eyes: Dust or solutions cause redness, watering, itching, pain, blurred vision. Extent of tissue damage depends on concentration and duration of exposure.

Ingested: Large oral doses of nitrates may cause dizziness, abdominal pain, vomiting, bloody diarrhea, weakness, convulsions, and collapse. May cause methemoglobinemia and cyanosis (see "Inhaled"). Ingestion of large amounts of iron salts can cause iron poisoning with black stool, pink urine discolouration, liver damage, coma, and even death.

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Symptoms of both iron poisoning and methemoglobinemia may be delayed for two to three days.

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. Pink urine discoloration is a strong indicator of iron poisoning. Liver damage, coma, and death from iron poisoning has been recorded.

Persons with pre-existing skin or eye disorders, or impaired liver, kidney or respiratory functions may be more susceptible to the effects of this substance.

Carcinogenicity: Not listed as a carcinogen by NTP, IARC, or OSHA

Teratogenicity: No information available

Reproductive Effects: No information available

Mutagenicity: No information available

Synergistic Products: None known

PREVENTIVE MEASURES

Engineering Controls: Local exhaust ventilation recommended.

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: Rubber or neoprene gloves. Other protective clothing, sleeves, apron, boots, or coveralls, sufficient to prevent contact.

Other Personal Protective Equipment: Safety shower and eye wash 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: Comply with local, provincial and federal regulations.

Handling Procedures and Equipment: OXIDIZER, TOXIC. 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: Give several glasses of water to drink to dilute. If large amounts were ingested, and if victim is conscious, alert and NOT convulsing, induce vomiting immediately, under medical supervision, after giving two to four (2-4) glasses of water to drink to dilute the product. Have victim lean forward with head down to avoid breathing of vomitus. Get medical attention.

REFERENCES USED

CCINFO disc: MSDS's, February 2007
Budavari: The Merck Index, 12th ed., 1997
Hawley's Condensed Chemical Dictionary, 11th ed., 1987
Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION

Date Issued: February 20, 1990

Revision: February 2010

MSDS: 3620-1

Proposed WHMIS Designation: C; D2B

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