

MATERIAL SAFETY DATA SHEET**MERCUROUS NITRATE, DIHYDRATE**

PRODUCT CODE NUMBER(S): 5310-1

PRODUCT IDENTIFICATION**Chemical Name and Synonyms:** *Mercurous nitrate, dihydrate***Chemical Family:** *Inorganic salt***Chemical Formula:** $Hg_2(NO_3)_2 \cdot 2H_2O$ **Product Use:** *Laboratory reagent***Manufacturer's Name and Address:***Caledon Laboratories Ltd.**40 Armstrong Avenue**Georgetown, Ontario L7G 4R9***Telephone No:** *(905) 877-0101***Fax No:** *(905) 877-6666***Emergency Telephone No:** *CANUTEC (613) 996-6666***HAZARDOUS INGREDIENTS OF MATERIALS**

Ingredients	%	TLV Units	CAS No.
<i>Mercurous nitrate</i>	<i>97</i>	<i>0.025 mg/m³ (as Hg)</i>	<i>14836-60-3</i>

PHYSICAL DATA**Physical State:** *Solid***Odour and Appearance:** *Colourless or white crystals; slight odour of HNO₃***Odour Threshold (ppm):** *Not available***Vapour Pressure (mm Hg):** *Not available***Vapour Density (Air = 1):** *1.90***Evaporation Rate:** *Not available***Boiling Point (degrees C):** *Not available***Melting Point (degrees C):** *70°C (decomposes)***pH:** *Not available***Specific Gravity:** *4.78***Coefficient of Water/Oil distribution:** *Not available***SHIPPING DESCRIPTION****UN:** *1627***T.D.G. Class:** *5.1 (6.1)***Pkg. Group:** *I***REACTIVITY DATA****Chemical Stability:** *Stable, hygroscopic.***Incompatibility with other substances:** *Reducing agents, combustible materials, water, cyanides, thiocyanates, isothiocyanates, hypophosphites, phosphorus, ammonia. Sensitive to light. Solutions may corrode metals. Contact with combustible material may cause fire. Mixtures with phosphorus explodes on contact. Contact with hot carbon causes mild explosion. Mixtures with aluminum and water or mixtures with alkyl esters may explode. Mixtures with phosphorus, tin(II) chloride or other reducing agents may react explosively. Mixtures with phosphinates explode on heating. Mixtures with organic materials are potentially dangerous, especially in the presence of acidic materials and heavy metals.***Reactivity:** *Avoid heat, sparks, all ignition sources, shock, friction, contaminants, all incompatible and organic materials, generation of dust. May explode when heated or shocked.***Hazardous Decomposition Products:** *Hg, HgO_x, NO_x***FIRE AND EXPLOSION DATA****Flammability:** *Non combustible; however, substance is a powerful oxidizing material, forms explosive mixtures with combustible, organic or many other substances (see "Incompatibility with . . ."). Releases oxygen in fire situation, which promotes combustion. Heating to decomposition may cause explosion with emission of highly toxic fumes.***Extinguishing Media:** *Use flooding amounts of water to fight fire. CO₂ may extinguish small fires, but dry chemical powder is ineffective. Use water as spray or fog to minimize dust, absorb heat, cool containers, and disperse vapours. Prevent runoff from entering sewers or waterways. Fight fire from upwind, from a safe distance. Firefighters must wear protective equipment (positive pressure full facepiece self-contained breathing apparatus) and clothing (chemical splash suit) sufficient to prevent inhalation of vapours and contact with skin and eyes.***Flash Point (Method Used):** *Not available***Autoignition Temperature:** *218°C***Upper Flammable Limit (% by volume):** *Not available***Lower Flammable Limit (% by volume):** *Not available***Hazardous Combustion Products:** *Toxic fumes of mercury compounds, and nitrous oxides.***Sensitivity to Impact:** *May explode when shocked, particularly if mixed with organic or combustible materials.***Sensitivity to Static discharge:** *Mixtures of dust with air may act as initiation source for dust or vapour explosions, particularly when contaminated with organic materials, when ignited by an electrostatic or other spark, or other ignition source.***TOXICOLOGICAL PROPERTIES AND HEALTH DATA****Toxicological Data:****LD₅₀:** *(oral, rat) 182 mg/kg***LC₅₀:** *Not available***Effects of Acute Exposure to Product:***Danger of cumulative effects.***Inhaled:** *Dust and vapour are very irritating and very toxic. Can cause burns and severe respiratory tract damage with sore throat, coughing, pain, tightness in chest, breathing difficulties, shortness of breath, bronchitis and pneumonitis. Readily absorbed, causing systemic mercury poisoning, with headache, muscle weakness, anorexia, gastrointestinal disturbance, rapid and weak pulse, shallow breathing, paleness, ringing in the ears, liver changes, fever, kidney damage, exhaustion and collapse. Delayed death may occur due to renal failure. 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:** *Toxic. Skin contact may cause irritation, with itching, redness, scaling, Readily absorbed through skin,*

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causing systemic poisoning, as in "Inhaled". May cause allergic skin reaction.

In contact with eyes: Causes severe irritation; even ulceration of the conjunctiva and cornea with possible permanent eye damage.

Ingested: Very toxic. Average lethal dose for inorganic mercury salts ~1g. Ingestion may cause burning of the mouth and pharynx, abdominal pain, vomiting, bloody diarrhea, and systemic poisoning, with symptoms as in "Inhaled".

Effects of Chronic Exposure to Product:

Danger of cumulative effects. May cause damage to liver, kidneys, blood, gastrointestinal system (RTECS No. OW8000000). May cause neurological damage with such symptoms as headaches, trembling or shaking of muscles, mental disturbances, personality changes, memory impairment. Other symptoms include loose teeth, metallic taste in the mouth, dark line on the gums, digestive upsets, loss of appetite, skin eruptions. Persons with preexisting kidney or respiratory function, nervous disorders, or known sensitivity to mercury may be more susceptible to the effects of this material. 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.

Carcinogenicity: Not listed as a carcinogen

Teratogenicity: No information available; related mercury compounds cause teratogenic effects.

Reproductive Effects: No information available for this chemical; related mercury compounds can decrease fertility.

Mutagenicity: No specific information available. Hg compounds are mutagenic in bacterial and mammalian assays.

Synergistic Products: None known

PREVENTIVE MEASURES

Engineering Controls: Local exhaust ventilation required.

Respiratory Protection: Dust mask; fumehood. NIOSH/MSHA approved half-faced dust/mist respirator for concentrations up to 10x TLV, or the maximum use specified by the respirator supplier, whichever is lowest; full facepiece respirator with dust/mist filter for up to 50x TLV or the maximum use specified by the respirator supplier, whichever is lowest. For higher or unknown concentrations, as in fire or spill conditions, positive-pressure, full face-piece self-contained breathing apparatus.

Eye Protection: Chemical safety goggles and/or face shield. Do not wear contact lenses when working with chemicals.

Skin Protection: Impervious protective gloves and other clothing, apron, sleeves, coveralls, sufficient to prevent all 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: VERY TOXIC, CUMULATIVE, OXIDIZER. 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: IMMEDIATELY flush eyes with gently running water for at least twenty (20) minutes, holding eyelids open while flushing. Take care not to flush contaminated water into unaffected eye. Wear protective gloves to avoid contact during first aid procedures. Obtain medical advice.

Skin: Remove contaminated clothing, including watches, rings, belts, and shoes. Rescuer should wear impervious gloves to avoid contact with this chemical. Wash skin with plenty of running water for at least fifteen (15) minutes. Get medical attention. Decontaminate clothing and leather goods (shoes, belts) before reuse, or discard; clothing contaminated with oxidizing material can be dangerously and/or spontaneously flammable.

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 the person is alert and not convulsing, give 2 to 4 glasses of water to drink and induce vomiting (under medical supervision) by touching the back of throat with finger. Get medical attention immediately.

REFERENCES USED

CCINFO disc: MSDS's February 2007

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

Sax: Dangerous Properties of Industrial Materials, 5th ed., 1979
Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION

Date Issued: December 24, 1991

Revision: February 2010

MSDS: 5310-1

Proposed WHMIS Designation: C; D1B; D2A

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