

**MATERIAL SAFETY DATA SHEET****ARSENIC TRIOXIDE**

PRODUCT CODE NUMBER(S): 1990-1, 1991-1

**PRODUCT IDENTIFICATION**

**Chemical Name and Synonyms:** *Arsenic trioxide; Arsenous trioxide; Arsenic (III) oxide; Arsenic sesquioxide*  
**Chemical Family:** *Metal oxide*  
**Chemical Formula:**  $As_2O_3$   
**Product Use:** *Laboratory reagent*  
**Manufacturer's Name and Address:**  
*Caledon Laboratories Ltd.  
40 Armstrong Avenue  
Georgetown, Ontario L7G 4R9*  
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**HAZARDOUS INGREDIENTS OF MATERIALS**

<i>Ingredients</i>	<i>%</i>	<i>TLV Units</i>	<i>CAS No.</i>
<i>Arsenic trioxide</i>	<i>&gt;99</i>	<i>0.002 mg/m<sup>3</sup></i>	<i>1327-53-3</i>

**PHYSICAL DATA**

**Physical State:** *Solid*  
**Odour and Appearance:** *White granular powder, or transparent crystals, odourless.*  
**Odour Threshold (ppm):** *Not applicable*  
**Vapour Pressure (mm Hg):** *Not available*  
**Vapour Density (Air = 1):** *Not available*  
**Evaporation Rate:** *Not applicable*  
**Boiling Point (degrees C):** *465°C*  
**Melting Point (degrees C):** *315°C*  
**pH:** *Not available*  
**Specific Gravity:** *3.738*  
**Coefficient of Water/Oil distribution:** *Not available*

**SHIPPING DESCRIPTION**

**UN:** *1561*  
**T.D.G. Class:** *6.1*  
**Pkg. Group:** *II*

**REACTIVITY DATA**

**Chemical Stability:** *Stable*  
**Incompatibility with other substances:** *Strong acids, strong bases, oxidizing agents, halogens and halogenated compounds, vegetable astringent infusions, rubidium carbide, iron solutions, zinc filings, other reactive metals, mercury. Corrosive to metals in the presence of moisture.*  
**Reactivity:** *May decompose on exposure to moist air or water. Avoid excessive heat, generation of dust, exposure to moist air or water, all incompatible materials.*  
**Hazardous Decomposition Products:** *Toxic fumes of arsenic, and arsenic oxides*

**FIRE AND EXPLOSION DATA**

**Flammability:** *Non combustible*  
**Extinguishing Media:** *Use any means suitable for surrounding fire. Fight fire from upwind, from a safe distance. Firefighters must wear protective equipment (NIOSH approved positive-pressure, full face-piece self-contained breathing apparatus) and clothing sufficient to prevent inhalation of dust or fumes, 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 arsenic, and arsenic oxides*  
**Sensitivity to Impact:** *None identified*  
**Sensitivity to Static discharge:** *None identified*

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

**LD<sub>50</sub>:** *(oral, rat) 14.6 mg/kg*  
**LC<sub>50</sub>:** *Not available*

**Effects of Acute Exposure to Product:**

**Inhaled:** *Toxic. Inhalation of fumes or dust may cause irritation of respiratory tract, perforated nasal septum, gastrointestinal disturbances and in severe overexposures, inflammation and edema of larynx and bronchi, with shortness of breath, cyanosis, weak, rapid pulse, frothy sputum, hypotension, hemoconcentration, and moist rales which may appear several hours after exposure. Absorption into the body leads to the formation of methemoglobin, with blood and central nervous system effects, weakness, depression, headache, respiratory distress, cyanosis, irregular heart rate, eventual coma and death. Symptoms of methemoglobinemia may also be delayed for two to four (2-4) hours or longer.*

**In contact with skin:** *Irritating. Causes redness, itching, pain. Exposure to arsenic compounds may produce hyperpigmentation of the skin and hyperkeratoses of plantar and palmar surfaces. May be absorbed through skin, with symptoms as in "Ingested".*

**In contact with eyes:** *Harmful. Causes irritation, burning, watering, possible damage to conjunctiva.*

**Ingested:** *May be fatal. Causes burning of the esophagus, vomiting, bloody diarrhea, cold, clammy skin, lowered blood pressure, weakness, headache, cramps, convulsions, coma and eventual death from circulatory failure. Estimated lethal dose, 120 mg. If the dosage is not fatal, it may cause kidney and liver damage.*

**Effects of Chronic Exposure to Product:**

*Chronic overexposure to arsenic compounds may cause skin and eye irritation, peripheral neuritis of the hands and*

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feet, increased risk of lung and skin cancer, damage to liver, kidneys, and nervous system. Symptoms of chronic exposure include weight loss, nausea, diarrhea, weakness, loss of appetite, garlic odour to the breath, bronzing of the skin, dermatitis, skin lesions.

**Carcinogenicity:** Carcinogenicity designation A1, confirmed human carcinogen (ACGIH, IARC, NTP)

**Teratogenicity:** Developmental abnormalities in animal tests (RTECS No. CG 3325000)

**Reproductive Effects:** Harmful effects in animal testing

**Mutagenicity:** May alter genetic material.

**Synergistic Products:** None known

## PREVENTIVE MEASURES

**Engineering Controls:** Local exhaust ventilation required

**Respiratory Protection:** Dust mask. Use only in a fumehood. At concentrations above the NIOSH Recommended Exposure Limit ( $0.002 \text{ mg/m}^3$ ), or at any detectable concentration, NIOSH-approved positive-pressure, full face-piece self-contained breathing apparatus, or positive-pressure, full face-piece supplied-air respirator with auxiliary positive-pressure self-contained breathing apparatus. DO NOT BREATHE DUST.

**Eye Protection:** Chemical safety goggles

**Skin Protection:** Rubber gloves. Other impervious protective clothing, sleeves, coveralls, boots sufficient to prevent contact.

**Other Personal Protective Equipment:** An eyewash and safety shower should be nearby and ready for use.

**Leak and Spill Procedure:** Evacuate area. Cleanup personnel must be trained in the hazards of this chemical and its safe handling, and must wear protective equipment and clothing sufficient to prevent inhalation of dust or fumes, and contact with skin and eyes. Mix with dry lime, soda ash or other inert material. Clean up using a method that does not generate dust; wet if necessary. Prevent from entering sewers or waterways. Transfer carefully into container and arrange removal by disposal company. Wash site of spillage thoroughly with water and detergent.

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

**Handling Procedures and Equipment:** VERY TOXIC, CARCINOGEN, TERATOGEN, MUTAGEN, REPRODUCTIVE EFFECTOR. Workers using this material must be thoroughly trained in its hazards and its safe use, and must wear appropriate protective equipment and clothing. Follow routine safe handling procedures. Use good housekeeping practices to prevent generation or accumulation of dust. Use the smallest amount possible for the purpose in a designated area with adequate ventilation. Avoid all contact and inhalation. Wash hands thoroughly after working with this product. Keep away from all incompatible materials (see "Incompatibility with other substances").

**Storage Requirements:** Store in suitable, labelled containers, in a cool, dry, well-ventilated area, out of direct sunlight. Store away from incompatible materials. Keep containers tightly closed when not in use and when empty. Protect from damage.

## FIRST AID MEASURES

### Specific Measures:

**Eyes:** Flush thoroughly with gently running water for at least twenty (20) minutes, holding eyelids open while flushing. Avoid contact; wear impervious gloves if necessary.

Avoid flushing contaminated water into unaffected eye. Get medical attention.

**Skin:** Remove contaminated clothing (including shoes, watches, belts, rings). Drench skin with plenty of running water for at least fifteen (15) minutes. Get medical attention immediately. Decontaminate clothing completely before re-use, or discard; inform laundry of hazards of contaminated clothing.

**Inhalation:** Immediately remove to fresh air (caution must be used by rescuers to avoid exposure to contaminating dust or fumes). Give oxygen or get medical attention for any breathing difficulty. If breathing has stopped begin artificial respiration immediately. GET MEDICAL ATTENTION. Onset of symptoms may be delayed; if victim feels unwell during the next 24 hours, get medical attention immediately.

**Ingestion:** If victim is alert and not convulsing, rinse mouth thoroughly with water, give 2 to 4 glasses of water to drink to dilute, and induce vomiting by sticking a finger down the throat, or by giving syrup of ipecac. GET MEDICAL ATTENTION. If spontaneous vomiting occurs, rinse mouth thoroughly with water, and give 2 to 4 more glasses of water to drink. Onset of symptoms may be delayed; if victim feels unwell during the next 24 hours, get medical attention immediately.

**Note to physician:** If emesis is unsuccessful after two doses of ipecac, consider gastric lavage. Monitor urine arsenic level. Alkalinization of urine may help prevent disposition of red cell breakdown products in renal cell tubular cells. Abdominal x-rays should be done for all ingestions. Chelation therapy with BAL, followed by n-penicillamine may be useful, but dosing guidelines are not clearly established.

## REFERENCES USED

- NIOSH Pocket Guide to Chemical Hazards; Pub. # 2005-151  
CCINFO disc: MSDS's  
Budavari: The Merck Index, 12th ed., 1997  
Sax, Lewis: Hawley's Condensed Chemical Dictionary, 11th ed., 1987  
Sax: Dangerous Properties of Industrial Materials, 5th ed., 1979  
Suppliers' Material Safety Data Sheets

## ADDITIONAL INFORMATION

**Date Issued:** May 6, 1991

**Revision:** September 2010

**MSDS:** 1990-1, 1991-1

**Proposed WHMIS Designation:** D1A; D2A; D2B

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