

MATERIAL SAFETY DATA SHEET**MONOETHANOLAMINE**

PRODUCT CODE NUMBER(S): 6400-1, 6400-4

PRODUCT IDENTIFICATION

Chemical Name and Synonyms: Monoethanolamine; 2-Hydroxyethylamine, 2-aminoethanol, ethanolamine -aminoethyl alcohol

Chemical Family: Aliphatic amino alcohol

Chemical Formula: HOCH₂CH₂NH₂

Product Use: Laboratory solvent

Manufacturer's Name and Address:

Caledon Laboratories Ltd.

40 Armstrong Avenue

Georgetown, Ontario L7G 4R9

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HAZARDOUS INGREDIENTS OF MATERIALS

Ingredients	%	TLV Units	CAS No.
Monoethanolamine	98	3 ppm	141-43-5

PHYSICAL DATA

Physical State: Liquid

Odour and Appearance: Colourless, viscous liquid, unpleasant, fishy, ammonia odour

Odour Threshold (ppm): 2-4 ppm (detection); 5 ppm (recognition). Poor warning properties; odour threshold about the same as TLV.

Vapour Pressure (mm Hg): 4 mm Hg @ 20°C

Vapour Density (Air = 1): 2.1

Evaporation Rate (n-butyl acetate = 1): <1

Boiling Point (degrees C): 171°C

Freezing Point (degrees C): 10.5°C

pH: 12.1 (25%, aqueous)

Specific Gravity: 1.018 @ 20°C

Coefficient of Water/Oil distribution: LogP (oct) = -1.31

SHIPPING DESCRIPTION

UN: 2491

T.D.G. Class: 8

Pkg. Group: III

REACTIVITY DATA

Chemical Stability: Normally stable. Hygroscopic; can react with carbon dioxide in air to form salts. Decomposed by light, slowly oxidized by air, turning yellow, then brown.

Incompatibility with other substances: Can react vigorously, violently, or explosively with strong acids, strong oxidizing agents, acid chlorides, acid anhydrides, strong reducing agents. Attacks copper and its alloys, reacts with aluminum above 60°C, releasing explosive hydrogen gas. Spontaneous ignition in contact with cellulose nitrate of high surface area. Monoethanolamine and iron form a complex molecule, triethanolamino-iron. This material can spontaneously decompose at temperatures between 130°C and 160°C

Reactivity: Avoid air, light, moisture, temperatures above 85°C, incompatible materials, generation of mist.

Hazardous Decomposition Products: CO_x, NO_x

FIRE AND EXPLOSION DATA

Flammability: Combustible liquid and vapour. Can form explosive mixtures with air at, or above 85°C.

Extinguishing Media: Water spray, carbon dioxide, dry chemical, alcohol or polymer foam. Water as spray or fog can be used for extinguishing, for cooling containers, dispersing vapours, and to flush materials away from fire. Fight fire from upwind, from a safe distance. Firefighters must wear protective equipment (face-piece, positive-pressure, self-contained breathing apparatus) and clothing (chemical splash suit) sufficient to prevent inhalation of mists and vapours and contact with skin and eyes (Bunker Gear will not be sufficient). Closed containers may rupture violently during fire; withdraw immediately in case of rising sound from vent or discoloration of tank.

Flash Point (Method Used): 85°C (CC)

Autoignition Temperature: 410°C

Upper Flammable Limit (% by volume): 17.0

Lower Flammable Limit (% by volume): 5.5

Hazardous Combustion Products: NO_x, CO_x

Sensitivity to Impact: None identified

Sensitivity to Static discharge: Liquid is probably not sensitive - high flash point. Mixtures of vapour and air may explode in the presence of an ignition source of sufficient energy.

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

LD₅₀: (oral, rat) 1,720 mg/kg; (oral, guinea pig) 620 mg/kg; (dermal, rabbit) 1 mL/kg; (eye, rabbit) 250 g, severe irritant
LC₅₀: Not available

Effects of Acute Exposure to Product:

Inhaled: Because of low vapour pressure, poses little inhalation hazard at normal temperatures. However, when heated, vapour can be released that is irritating and can cause coughing and discomfort in the nose, throat, and chest. Prolonged exposure or high concentrations may cause damage to the respiratory tract, with chemical pneumonitis and pulmonary edema, and liver and kidney damage.

In contact with skin: Contact may cause chemical burns. Undiluted methanolamine is corrosive; solutions greater than 10% can cause moderate irritation to severe burn depending on length of contact. Prolonged or widespread contact may result in absorption of harmful amounts.

In contact with eyes: Even dilute solutions may cause severe irritation, chemical burns and permanent corneal damage. Low vapour or mist concentrations may cause temporary blurring of vision, "halo vision", which usually disappears after exposure is discontinued.

Ingested: Low oral toxicity, but may cause burns in the mouth, throat, oesophagus, and stomach, with pain or discomfort in the mouth, chest, and abdomen, nausea, vomiting, diarrhea, dizziness, drowsiness, faintness, weakness, collapse, and coma. Because substance is corrosive, aspiration, which can easily occur during ingestion or vomit-

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ing, can result in severe, life-threatening lung damage, chemical pneumonitis, or pulmonary edema. Ingestion is not a normal route of industrial exposure.

Effects of Chronic Exposure to Product:

May cause kidney, liver, or neurological damage. Prolonged or repeated contact may cause dermatitis. Prolonged or repeated inhalation may aggravate existing respiratory conditions

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

Teratogenicity: No human information available. Animal studies inconclusive.

Reproductive Effects: No human information available. Animal studies inconclusive.

Mutagenicity: No human or animal information available. Negative in Ames test and in cultured mammalian cells.

Synergistic Products: No information available

PREVENTIVE MEASURES

Engineering Controls: Non-sparking, grounded, corrosion-resistant ventilation system, separate from other ventilation systems, and electrical equipment that does not provide a source of ignition.

Respiratory Protection: Up to 30 ppm: NIOSH/OSHA approved chemical cartridge respirator or powered air-purifying respirator, both with cartridges to protect against ethanolamine. Higher or unknown concentrations: positive-pressure, full face-piece, self-contained breathing apparatus, or full face-piece, supplied-air respirator with an auxiliary positive-pressure, self-contained breathing apparatus.

Eye Protection: Chemical safety goggles and/or face shield.

Skin Protection: Butyl or nitrile rubber, neoprene, Silver Shield/4H™ (polyethylene ethylene vinyl alcohol), Viton™, Tychem BR/LV, or Tychem TK gloves and chemical apron made of rubber or PVC coated. Other impervious protective clothing 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. Do not touch spilled material. Eliminate all ignition sources. Cleanup personnel must be thoroughly trained in the hazards of this material and must wear protective equipment and clothing sufficient to prevent inhalation of dust or fumes, and contact with skin and eyes. Prevent from entering sewers or waterways. Contain with sand or inert absorbent, collect and transfer carefully into labelled, covered container(s) for removal by disposal company. Wash site of spillage thoroughly with water and detergent. Monoethanolamine is rapidly biodegraded at very low concentration (10 ppm), in water. However, large spill is detrimental to the environment.

Waste Disposal: Monoethanolamine is toxic to aquatic life at relatively low concentrations in water. Incineration is the preferred method of disposal. Follow all federal, provincial, and local regulations.

Handling Procedures and Equipment: COMBUSTIBLE, TOXIC, CORROSIVE MATERIAL. Workers handling this material must be thoroughly trained in its hazards and its safe use, and must wear appropriate protective equipment and clothing. Keep away from heat, sparks, flame, and all ignition sources. Ground and bond during liquid transfer. Post "No Smoking" signs. Use the smallest amount possible for the purpose, in a designated area with adequate ventilation. Wear appropriate protective equipment and clothing. Avoid inhaling vapour. Avoid contact with skin, eyes, and clothing.

Keep away from all incompatible and combustible materials. Keep containers closed when not in use. Handle with extreme care. Treat empty containers with care as they may contain hazardous residues.

Storage Requirements: Store in suitable, labelled containers, in a cool, dry, well-ventilated area, out of direct sunlight, and away from all sources of ignition and incompatible materials. Keep tightly closed. Avoid incompatible metals, e.g. iron, aluminum, copper and its alloys. Storage facilities should be made of fire-resistant materials, and should have sealed floors to prevent absorption, and raised sills to contain material. Protect from damage, and inspect frequently for signs of leaking.

FIRST AID MEASURES

Specific Measures:

Eyes: IMMEDIATELY FLUSH EYES with warm, gently running water for at least thirty (30) minutes, holding eyelids open during flushing. Take care not to flush contaminated water into unaffected eye. Wear gloves to avoid contact during first aid procedures. Obtain MEDICAL ATTENTION immediately.

Skin: Remove contaminated clothing (including rings, watches, belts and shoes) under running water. IMMEDIATELY flush exposed area with large amounts of warm running water for twenty to thirty (20-30) minutes. Wear protective gloves to avoid contact. Obtain medical attention immediately. Decontaminate clothing thoroughly before re-use, or discard.

Inhalation: Immediately remove to fresh air (rescuers must use caution to avoid exposure to contaminating fumes). Give oxygen and get medical attention for any breathing difficulty. If breathing has stopped begin artificial respiration immediately. GET MEDICAL ATTENTION. Onset of pulmonary edema may be delayed; if victim feels unwell during the next 48 hours, get medical attention immediately.

Ingestion: DO NOT INDUCE VOMITING. Danger of aspiration with vomiting. If the casualty is alert and NOT convulsing give 2 to 4 glasses of water to drink to dilute the material. Get medical attention immediately. If spontaneous vomiting occurs, have casualty lean forward to avoid breathing in of emesis. Rinse mouth and administer more water.

REFERENCES USED

CCINFO disc

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

Royal Society of Chemistry: Chemical Safety Data Sheets, Vol.1, 1992

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

Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION

Date Issued: October 28, 1992

Revision: September 2011

MSDS: 6400-1, 6400-4

Proposed WHMIS Designation: B3; D2B; E

Prepared by: Caledon Laboratories Ltd.

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