

Ethyl methanesulfonate

sc-257504



The Power is Question

Material Safety Data Sheet

Hazard Alert Code Key: **EXTREME** **HIGH** **MODERATE** **LOW**

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

Ethyl methanesulfonate

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER

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EMERGENCY

ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS

C3-H8-O3-S, CH3SO3C2H5, EMS, Ent-26396, "ethyl ester of methanesulfonic acid", "ethyl ester of methanesulphonic acid", "ethyl ester of methylsulfonic acid", "ethyl ester of methylsulphonic acid", "ethyl methylsulphonate", "ethyl methanesulfonate", "ethyl methansulphonate", half-Myerlan, "NSC 26805", "RCRA Waste No.: U119"

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

| | | Min | Max | |
|---------------|---|-----|-----|--|
| Flammability: | 1 | | | |
| Toxicity: | 3 | | | |
| Body Contact: | 2 | | | |
| Reactivity: | 1 | | | |
| Chronic: | 3 | | | |

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4



CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

Harmful if swallowed.
May cause CANCER.
May cause heritable genetic damage.
Possible risk of impaired fertility.
Possible risk of harm to the unborn child.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

EYE

■ Although the liquid is not thought to be an irritant, direct contact with the eye may produce transient discomfort characterized by tearing or conjunctival redness (as with windburn).

SKIN

■ The liquid may be miscible with fats or oils and may degrease the skin, producing a skin reaction described as non-allergic contact dermatitis.

The material is unlikely to produce an irritant dermatitis as described in EC Directives .

■ Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.

■ Open cuts, abraded or irritated skin should not be exposed to this material.

■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.

Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

■ The material is not thought to produce respiratory irritation (as classified using animal models).

Nevertheless inhalation of vapors, fumes or aerosols, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.

■ Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may produce serious damage to the health of the individual.

■ Inhalation hazard is increased at higher temperatures.

■ Limited evidence exists that the substance may cause irreversible but non-lethal mutagenic effects following a single exposure.

CHRONIC HEALTH EFFECTS

■ Based on experiments and other information, there is ample evidence to presume that exposure to this material can cause genetic defects that can be inherited.

Ample evidence from experiments exists that there is a suspicion this material directly reduces fertility.

Results in experiments suggest that this material may cause disorders in the development of the embryo or fetus, even when no signs of poisoning show in the mother.

There is ample evidence that this material can be regarded as being able to cause cancer in humans based on experiments and other information.

There is some evidence that inhaling this product is more likely to cause a sensitization reaction in some persons compared to the general population.

Exposure to the material may result in a possible risk of irreversible effects. The material may produce mutagenic effects in man. This concern is raised, generally, on the basis of appropriate studies with similar materials using mammalian somatic cells in vivo. Such findings are often supported by positive results from in vitro mutagenicity studies.

Exposure to Sulfonates can cause an imbalance in cellular salts and therefore cellular function. Airborne sulfonates may be responsible for respiratory allergies and, in some instances, minor dermal allergies.

When administered to newborn mice as a single subcutaneous injection or five daily injections, ethyl methanesulfonate induced adenomas or adenocarcinomas of the lung. When administered by intraperitoneal injection in mice, lung and kidney tumours were induced in males and lung adenomas in both sexes. In similar studies female rats showed renal carcinomas and a variety of benign and malignant tumours, including lung carcinomas. When administered in drinking water, ethyl methanesulfonate induced multiple moderately differentiated mammary adenocarcinomas in young rats of both sexes and mature female rats.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

| NAME | CAS RN | % |
|------------------------|---------|-----|
| ethyl methanesulfonate | 62-50-0 | >98 |

Section 4 - FIRST AID MEASURES

SWALLOWED

· IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY. · Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:

EYE

■ If this product comes in contact with the eyes: · Immediately hold eyelids apart and flush the eye continuously with running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

SKIN

■ If skin contact occurs: · Immediately remove all contaminated clothing, including footwear · Flush skin and hair with running water (and soap if available).

INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested.

NOTES TO PHYSICIAN

■ for poisons (where specific treatment regime is absent):

-----BASIC TREATMENT

· Establish a patent airway with suction where necessary.
· Watch for signs of respiratory insufficiency and assist ventilation as necessary.
Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

| | |
|-----------------------------|---------------|
| Vapour Pressure (mmHG): | Not available |
| Upper Explosive Limit (%): | Not available |
| Specific Gravity (water=1): | 1.167 |
| Lower Explosive Limit (%): | Not available |

EXTINGUISHING MEDIA

· Foam.
· Dry chemical powder.

FIRE FIGHTING

· Alert Emergency Responders and tell them location and nature of hazard.
· Wear full body protective clothing with breathing apparatus.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

· Combustible.
· Slight fire hazard when exposed to heat or flame.
Combustion products include: carbon dioxide (CO₂), sulfur oxides (SO_x), other pyrolysis products typical of burning organic material.
May emit poisonous fumes.

FIRE INCOMPATIBILITY

■ Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

PERSONAL PROTECTION

Glasses:
Chemical goggles.
Gloves:
Respirator:
Type A Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

· Remove all ignition sources.
· Clean up all spills immediately.

MAJOR SPILLS

· Clear area of personnel and move upwind.
· Alert Emergency Responders and tell them location and nature of hazard.
· Clear area of personnel and move upwind.
· Alert Emergency Responders and tell them location and nature of hazard.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

· Avoid all personal contact, including inhalation.
· Wear protective clothing when risk of exposure occurs.

RECOMMENDED STORAGE METHODS

- Lined metal can, Lined metal pail/drum
- Plastic pail.

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis of inhalation toxicity criteria, must be hermetically sealed.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

PERSONAL PROTECTION



RESPIRATOR

- type a filter of sufficient capacity.

EYE

- Safety glasses with side shields
- Chemical goggles.

HANDS/FEET

- Wear chemical protective gloves, eg. PVC.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

- Neoprene gloves.

OTHER

- Employees working with confirmed human carcinogens should be provided with, and be required to wear, clean, full body protective clothing (smocks, coveralls, or long-sleeved shirt and pants), shoe covers and gloves prior to entering the regulated area.
- Employees engaged in handling operations involving carcinogens should be provided with, and required to wear and use half-face filter-type respirators with filters for dusts, mists and fumes, or air purifying canisters or cartridges. A respirator affording higher levels of protection may be substituted.
- Emergency deluge showers and eyewash fountains, supplied with potable water, should be located near, within sight of, and on the same level with locations where direct exposure is likely.
- Prior to each exit from an area containing confirmed human carcinogens, employees should be required to remove and leave protective clothing and equipment at the point of exit and at the last exit of the day, to place used clothing and equipment in impervious containers at the point of exit for purposes of decontamination or disposal. The contents of such impervious containers must be identified with suitable labels. For maintenance and decontamination activities, authorized employees entering the area should be provided with and required to wear clean, impervious garments, including gloves, boots and continuous-air supplied hood.
- Prior to removing protective garments the employee should undergo decontamination and be required to shower upon removal of the garments and hood.
- Overalls.
- Eyewash unit.

ENGINEERING CONTROLS

- Employees exposed to confirmed human carcinogens should be authorized to do so by the employer, and work in a regulated area.
- Work should be undertaken in an isolated system such as a "glove-box" . Employees should wash their hands and arms upon completion of the assigned task and before engaging in other activities not associated with the isolated system.
- Within regulated areas, the carcinogen should be stored in sealed containers, or enclosed in a closed system, including piping systems, with any sample ports or openings closed while the carcinogens are contained within.
- Open-vessel systems are prohibited.

- Each operation should be provided with continuous local exhaust ventilation so that air movement is always from ordinary work areas to the operation.
 - Exhaust air should not be discharged to regulated areas, non-regulated areas or the external environment unless decontaminated. Clean make-up air should be introduced in sufficient volume to maintain correct operation of the local exhaust system.
 - For maintenance and decontamination activities, authorized employees entering the area should be provided with and required to wear clean, impervious garments, including gloves, boots and continuous-air supplied hood. Prior to removing protective garments the employee should undergo decontamination and be required to shower upon removal of the garments and hood.
 - Except for outdoor systems, regulated areas should be maintained under negative pressure (with respect to non-regulated areas).
 - Local exhaust ventilation requires make-up air be supplied in equal volumes to replaced air.
 - Laboratory hoods must be designed and maintained so as to draw air inward at an average linear face velocity of 150 feet/ min. with a minimum of 125 feet/ min. Design and construction of the fume hood requires that insertion of any portion of the employees body, other than hands and arms, be disallowed.
- Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Liquid.

Does not mix with water.

Sinks in water.

Toxic or noxious vapours/gas.

| | | | |
|---------------------------|---------------------|--------------------------------|-----------------|
| State | Liquid | Molecular Weight | 124.16 |
| Melting Range (°F) | Not available | Viscosity | Not Available |
| Boiling Range (°F) | 185- 187 (10 mm Hg) | Solubility in water (g/L) | Partly miscible |
| Flash Point (°F) | 212 | pH (1% solution) | Not applicable. |
| Decomposition Temp (°F) | Not Available | pH (as supplied) | Not applicable |
| Autoignition Temp (°F) | Not available | Vapour Pressure (mmHG) | Not available |
| Upper Explosive Limit (%) | Not available | Specific Gravity (water=1) | 1.167 |
| Lower Explosive Limit (%) | Not available | Relative Vapor Density (air=1) | >1 |
| Volatile Component (%vol) | Not available | Evaporation Rate | Not available |

APPEARANCE

Colourless to yellow liquid; does not mix well with water.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

STORAGE INCOMPATIBILITY

- Avoid strong bases.

Avoid reaction with oxidizing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

ethyl methanesulfonate

TOXICITY AND IRRITATION

ETHYL METHANESULFONATE:

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

| TOXICITY | IRRITATION |
|---|--------------|
| Intraperitoneal (rat) LD50: 350 mg/kg | Nil Reported |
| Oral (mouse) LD50: 470 mg/kg | |
| Intraperitoneal (mouse) LD50: 435 mg/kg | |

■ NOTE: Substance has been shown to be mutagenic in at least one assay, or belongs to a family of chemicals producing damage or change to cellular DNA.

Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).

WARNING: This substance has been classified by the IARC as Group 2B: Possibly Carcinogenic to Humans.

Tenth Annual Report on Carcinogens: Substance anticipated to be Carcinogen

[National Toxicology Program: U.S. Dep. of Health & Human Services 2002].

Tumours of the brain, lungs, kidney, skin, lymphoma, paternal effects, effects on fertility, foetotoxicity, foetoletality, specific developmental abnormalities (craniofacial, musculoskeletal system), transplacental tumourigenesis, effects on newborn recorded

CARCINOGEN

| | | | |
|------------------------|---|--------------|--------------------------|
| Ethyl methanesulfonate | International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs | Group | 2B |
| ethyl methanesulfonate | US - Rhode Island Hazardous Substance List | IARC | C |
| ETHYL METHANESULFONATE | US Environmental Defense Scorecard Recognized Carcinogens | Reference(s) | P65 |
| ETHYL METHANESULFONATE | US Environmental Defense Scorecard Suspected Carcinogens | Reference(s) | P65 |
| VPVB_(VERY~ | US - Maine Chemicals of High Concern List | Carcinogen | CA Prop 65; NTP 11th ROC |

Section 12 - ECOLOGICAL INFORMATION

This material and its container must be disposed of as hazardous waste.

Ecotoxicity

| Ingredient | Persistence: Water/Soil | Persistence: Air | Bioaccumulation | Mobility |
|------------------------|-------------------------|------------------|-----------------|----------|
| ethyl methanesulfonate | LOW | MED | LOW | HIGH |

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

B. Component Waste Numbers

When ethyl methanesulfonate is present as a solid waste as a discarded commercial chemical product, off-specification species, as a container residue, or a spill residue, use EPA waste number U119 (waste code T).

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

‡ Puncture containers to prevent re-use and bury at an authorized landfill.

Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult Waste Management Authority for disposal.

Section 14 - TRANSPORTATION INFORMATION

DOT:

Symbols: None Hazard class or Division: 6.1

Identification Numbers: UN2810 PG: II

Label Codes: 6.1 Special provisions: IB2, T11,

TP2, TP13,

TP27

Packaging: Exceptions: 153 Packaging: Non- bulk: 202

Packaging: Exceptions: 153 Quantity limitations: 5 L

Passenger aircraft/rail:

Quantity Limitations: Cargo 60 L Vessel stowage: Location: B

aircraft only:

Vessel stowage: Other: 40

Hazardous materials descriptions and proper shipping names:

Toxic, liquids, organic, n.o.s.

Air Transport IATA:

UN/ID Number: 2810 Packing Group: II

Special provisions: A3

Cargo Only

Packing Instructions: 60 L Maximum Qty/Pack: 662

Passenger and Cargo Passenger and Cargo

Packing Instructions: 5 L Maximum Qty/Pack: 654

Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity

Packing Instructions: 1 L Maximum Qty/Pack: Y641

Shipping Name: TOXIC LIQUID, ORGANIC, N.O.S. *(CONTAINS

ETHYL METHANESULFONATE)

Maritime Transport IMDG:

IMDG Class: 6.1 IMDG Subrisk: None

UN Number: 2810 Packing Group: II

EMS Number: F-A , S-A Special provisions: 274

Limited Quantities: 100 ml

Shipping Name: TOXIC LIQUID, ORGANIC, N.O.S.(contains ethyl methanesulfonate)

Section 15 - REGULATORY INFORMATION

ethyl methanesulfonate (CAS: 62-50-0) is found on the following regulatory lists;

"Canada - Saskatchewan Occupational Health and Safety Regulations - Designated Chemical Substances", "Canada Ingredient Disclosure List (SOR/88-64)", "Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)", "International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs", "US - California Air Toxics ""Hot Spots"" List (Assembly Bill 2588) Substances for which production, use or other presence must be reported", "US - California Occupational Safety and Health Regulations (CAL/OSHA) - Hazardous Substances List", "US - California Proposition 65 - Carcinogens", "US - California Proposition 65 - Priority List for the Development of NSRLs for Carcinogens", "US - Maine Chemicals of High Concern List", "US - Massachusetts Oil & Hazardous Material List", "US - Minnesota Hazardous Substance List", "US - New Jersey Right to Know Hazardous Substances", "US - Pennsylvania - Hazardous Substance List", "US - Rhode Island Hazardous Substance List", "US - Vermont Hazardous Constituents", "US - Vermont Hazardous wastes which are Discarded Commercial Chemical Products or Off-Specification Batches of Commercial Chemical Products or Spill Residues of Either", "US - Washington Dangerous waste constituents list", "US - Washington Discarded Chemical Products List - ""U"" Chemical Products", "US Department of Transportation (DOT) List of Hazardous Substances and Reportable Quantities - Hazardous Substances Other Than Radionuclides", "US DOE Temporary Emergency Exposure Limits (TEELs)", "US List of Lists - Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112(r) of the Clean Air Act", "US National Toxicology Program (NTP) 11th Report Part B. Reasonably Anticipated to be a Human Carcinogen", "US RCRA (Resource Conservation & Recovery Act) - Appendix IX to Part 264 Ground-Water Monitoring List 1", "US RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261", "US RCRA (Resource Conservation & Recovery Act) - List of Hazardous Inorganic and Organic Constituents 1", "US RCRA (Resource Conservation & Recovery Act) - List of Hazardous Wastes", "US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory", "US TSCA Section 12(b) - List of Chemical Substances Subject to Export Notification Requirements", "US TSCA Section 5(a)(2) - Significant New Use Rules (SNURs)"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

- Skin contact may produce health damage*.
- Inhalation may produce serious health damage*.
- Possible respiratory sensitiser*.
- Exposure may produce irreversible effects*.

* (limited evidence).

Denmark Advisory list for selfclassification of dangerous substances

Substance CAS Suggested codes ethyl methanesulfonate 62- 50- 0 Mut3; R68 Xn; R22 Xi; R38

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■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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