



SIGMA-ALDRICH



Material Safety Data Sheet

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Version 1,100

Section 1 - Product and Company Information

Product Name: tert-Butyl methyl ether, CHROMASOLV®, for HPLC, >=99.8%
Product Number: 34875
Brand: Sigma-Aldrich
Company: Sigma-Aldrich
Street Address: 3050 Spruce Street
City, State, Zip, Country: SAINT LOUIS, MO 63103 US
Technical Phone: 314 771 5765
Fax: 800 325 5052
Emergency Phone: 414 273 3850 Ext. 5996

Section 2 - Composition/Information on Ingredient

Table with 5 columns: Substance Name, CAS #, SARA 313, EC no, Annex I Index Number. Row: METHYL TERT BUTYL ETHER, 1634-04-4, Yes, 216-653-1, 603-181-00-X

Formula: C5H12O
Synonyms: tert-Butyl methyl ether, 1,1-Dimethylethyl methyl ether, 2-Methoxy-2-methylpropane, Methyl tert-butyl ether (ACGIH), Methyl 1,1-dimethylethyl ether, Propane, 2-methoxy-2-methyl- (9CI), tert-Butoxymethane2-methoxy-2-methylpropane, MTBE

Section 3 - Hazards Identification

Emergency Overview
Flammable (USA) Highly Flammable (EU), Harmful.
Irritating to skin. Limited evidence of a carcinogenic effect.
Target organ(s): Kidneys. Central nervous system. Possible Carcinogen (US).

HMIS Rating
Health: 2* Flammability: 3 Reactivity: 0

NFPA Rating
Health: 2 Flammability: 3 Reactivity: 0

*additional chronic hazards present.
For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

Oral Exposure: If swallowed, wash out mouth with water provided person is conscious. Call a physician.
Inhalation Exposure: If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.
Dermal Exposure: In case of contact, immediately wash skin with soap and copious amounts of water.

Eye Exposure
In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Section 5 - Fire Fighting Measures

Flammable Hazards: Yes
Explosion Hazards: Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.
Flash Point: -27 °F -33 °C
Explosion Limits: Lower: 1.6 % Upper: 15.1 %
Autoignition Temp: 374 °C Flammability: Yes
Extinguishing Media: Suitable: Carbon dioxide, dry chemical powder, or appropriate foam. Unsuitable: Carbon Dioxide, dry chemical powder, or appropriate foam. Water can be applied as a spray or fog and if properly applied is capable of extinguishing the fire by sweeping the flames off the surface of the burning liquid.
Firefighting Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Flammable liquid.
Specific Method(s) of Fire Fighting: Use water spray to cool fire-exposed containers.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill: Evacuate area. Shut off all sources of ignition. Use nonsparking tools.
Procedure(s) of Personal Precaution(s): Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.
Methods for Cleaning Up: Cover with an activated carbon adsorbent, take up and place in closed containers. Transport outdoors. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

Handling
User Exposure: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

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Storage**Suitable**

Keep tightly closed. Keep away from heat, sparks, and open flame.

Section 8 - Exposure Controls / PPE**Engineering Controls**

Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

Personal Protective Equipment**Respiratory**

Government approved respirator.

Hand

Compatible chemical-resistant gloves.

Eye

Chemical safety goggles.

General Hygiene Measures

Remove and wash contaminated clothing promptly. Wash thoroughly after handling.

Exposure Limits, RTECS

| Country | Source | Type | Value |
|---------|--------|------|--------|
| USA | ACGIH | TWA | 40 PPM |

Section 9 - Physical/Chemical Properties**Appearance****Physical State**

Liquid

Molecular Weight: 88.15 AMU

Property **Value** **At Temperature or Pressure**

| | | |
|-----------------------|-------------------------------|--------------------|
| pH | N/A | |
| BP/BP Range | 55 - 56 °C | 760 mmHg |
| MP/MP Range | N/A | |
| Freezing Point | N/A | |
| Vapor Pressure | 209.385 mmHg | 20 °C |
| Vapor Density | 3.1 g/l | |
| Saturated Vapor Conc. | N/A | |
| SG/Density | 0.74 g/cm ³ | |
| Bulk Density | N/A | |
| Odor Threshold | N/A | |
| Volatile% | 100 % | |
| VOC Content | N/A | |
| Water Content | N/A | |
| Solvent Content | N/A | |
| Evaporation Rate | N/A | |
| Viscosity | N/A | |
| Partition Coefficient | Log Kow: 0.94 | |
| Decomposition Temp. | N/A | |
| Flash Point °F | -27 °F | Method: closed cup |
| Flash Point °C | -33 °C | Method: closed cup |
| Explosion Limits | Lower: 1.6 % Upper: 15.1 % | |
| Flammability | N/A | |
| Autoignition Temp | 374 °C | |
| Refractive Index | 1.369 | |

Solubility

Other Solvents: VERY SOLUBLE IN ETHANOL, ETHYL, ETHER.

N/A = not available

Section 10 - Stability and Reactivity**Stability**

Stable

Stable.

Materials to Avoid

Oxidizing agents, Strong acids.

Hazardous Decomposition Products**Hazardous Decomposition Products**

Carbon monoxide, Carbon dioxide.

Hazardous Polymerization**Hazardous Polymerization**

Will not occur.

Section 11 - Toxicological Information**Route of Exposure****Skin Contact**

Causes skin irritation.

Skin Absorption

May be harmful if absorbed through the skin.

Eye Contact

May cause eye irritation.

Inhalation

May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.

Ingestion

May be harmful if swallowed.

Sensitization**Sensitization**

Will not occur

Target Organ(s) or System(s)

Kidneys. Central nervous system.

Signs and Symptoms of Exposure

Exposure can cause: Nausea. Vomiting. Dizziness. CNS depression. Aspiration or inhalation may cause chemical pneumonitis. MTBE (methyl-tert-butyl ether) is reported to metabolize to tert-butyl alcohol and formaldehyde by microsomal demethylation. According to an article in Toxicology and Industrial Health, volume II, number 2, pages 119-149, 1995; MTBE (methyl-tert-butyl ether) should be considered a "potential human carcinogen" due to "an increase in Leydig interstitial cell tumors of testes in male rats" and an "increase in lymphomas, leukemias, and uterine sarcomas" in female rats. In another unpublished study MTBE was shown to be carcinogenic due to "increased incidence of a rare type of kidney tumor" in male rats and an "increase in the incidence of hepatocellular adenomas" in female mice. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

RTECS Number: KN5250000

Toxicity Data

Oral - Rat: 4000 mg/kg (LD50)

Inhalation - Rat: 23,576 ppm (LC50)

Oral - Mouse: 5960 UL/KG (LD50)

Inhalation - Mouse: 141,000 mg/m³ (LC50)

Remarks: Behavioral: General anesthetic.

Intraperitoneal - Mouse: 1700 UL/KG (LD50)

Irritation Data

Eyes - Rabbit:
Remarks: No irritation effect

Eyes - Rabbit:
Remarks: Mild irritation effect

Chronic Exposure - Carcinogen

Result: This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

IARC Carcinogen List

Rating
Group 3

ACGIH Carcinogen List

Rating
A3

Chronic Exposure - Teratogen

| <u>Species</u> | <u>Dose</u> | <u>Route of Application</u> | <u>Exposure Time</u> |
|----------------|-------------|-----------------------------|----------------------|
| Mouse | 4000 PPM/6H | Inhalation | (6-15D PREG) |

Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).
Specific Developmental Abnormalities: Musculoskeletal system.

Chronic Exposure - Reproductive Hazard

| <u>Species</u> | <u>Dose</u> | <u>Route of Application</u> | <u>Exposure Time</u> |
|----------------|-------------|-----------------------------|----------------------|
| Rat | 8000 PPM/6H | Inhalation | (MULTIGENERATION) |
| Mouse | 6 GM/KG | Oral | (5D MALE) |
| Mouse | 8000 PPM/6H | Inhalation | (6-15D PREG) |

Result: Effects on Newborn: Viability index (e.g., # alive at day 4 per # born alive). Effects on Newborn: Growth statistics (e.g., reduced weight gain).

Result: Paternal Effects: Testes, epididymis, sperm duct.

Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).
Specific Developmental Abnormalities: Craniofacial (including nose and tongue). Specific Developmental Abnormalities: Musculoskeletal system.

Section 12 - Ecological Information

Acute Ecotoxicity Tests

| | |
|------------------|--------------------------------------|
| Test Type | LC50 Fish |
| Species | Pimephales promelas (Fathead minnow) |
| Time: | Value: |
| 96.0 h | 672 mg/l |
| Test Type | LC50 Fish |
| Species | other fish |
| Time: | Value: |
| 96.0 h | > 1,000 mg/l |

Section 13 - Disposal Considerations

Appropriate Method of Disposal of Substance or Preparation

Contact a licensed professional waste disposal service to dispose of this material.
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable.
Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: Methyl tert-butyl ether
UN#: 2398
Class: 3
Packing Group: Packing Group II
Hazard Label: Flammable liquid
PIH: Not PIH

IATA

Proper Shipping Name: Methyl tert-butyl ether
IATA UN Number: 2398
Hazard Class: 3
Packing Group: II

Section 15 - Regulatory Information

EU Directives Classification

Symbol of Danger: F Xi
Indication of Danger
Highly Flammable. Irritant.
Risk Statements R: 11 38
Highly flammable. Irritating to skin.
Safety Statements S: 9 16 24
Keep container in a well-ventilated place. Keep away from sources of ignition - no smoking. Avoid contact with skin.

US Classification and Label Text

Indication of Danger
Flammable (USA) Highly Flammable (EU). Harmful.
Risk Statements
Irritating to skin. Limited evidence of a carcinogenic effect.
Safety Statements
Keep container in a well-ventilated place. Keep away from sources of ignition - no smoking. Wear suitable protective clothing.
US Statements
Target organ(s): Kidneys. Central nervous system. Possible Carcinogen (US).

United States Regulatory Information

SARA Listed: Yes
Deminimis: 1 %
Notes: This product is subject to SARA section 313 reporting requirements.

TSCA Inventory Item: Yes

Canada Regulatory Information

WHMIS Classification
This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSDL: Yes
NDSL: No

Section 16 - Other Information

Disclaimer

For R&D use only. Not for drug, household or other uses.

Warranty

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for

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