Product Information (203) 740-3471 / Emergency Assistance CHEMTREC 1-800-424-9300 or 202-483-7616

MATERIAL SAFETY DATA SHEETS

Part Number/Trade Name:Methyl Tert-butyl Ether
This MSDS is valid for all grades and catalog numbers

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General Information

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Company's Name: PHARMCO PRODUCTS, INC.
Company's Street: 58 VALE RD.
Company's City: BROOKFIELD
Company's State: CT
Company's Zip Code: 06804
Company's Emerg Ph #: (203) 740-3471
Company's Info Ph #: (203) 740-3471

Date MSDS Revised: 4/4/00
Safety Data Review Date: 4/5/00
Preparer's Company: PHARMCO PRODUCTS, INC.
Preparer's St Or P. O. Box: 58 VALE RD.
Preparer's City: BROOKFIELD
Preparer's State: CT
Preparer's Zip Code: 06804

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Ingredients/Identity Information

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Ingredient: Methyl tert-butyl Ether (MTBE)
Synonyms: 2-Methoxy-2-methylpropane; tert-Butyl methyl ether; Methyl 1,1-dimethyl ethyl ether: MTBE
Ingredient Sequence Number: 01
Hazardous: Yes

Percent: 99-100%
NIOSH (RTECS) Number: KN5250000
CAS Number: 1634-04-4
Chemical Formula: $C_5H_{12}O$
Molecular Weight: 88.15

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Physical/Chemical Characteristics

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Appearance: Colorless Liquid
Odor: Characteristic ethereal odor.
Boiling Point: 55C (131°F)
Melting Point: -110C (-166°F)
Vapor Pressure (mm Hg): 245 @ 25C (77°F)
Vapor Density (Air=1): No information found
Specific Gravity: 0.74
PH: No information found.
Evaporation Rate (BuAc=1): No information found
Solubility In Water: 4.8 g/100g of water

Percent Volatiles By Volume @ 21C (70°F): 100

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Fire and Explosion Hazard Data

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Flash Point: -27C (-17°F)
Autoignition Temperature: 435C (815°F)
Lower Explosive Limit: 1.6
Upper Explosive Limit: 8.4
Extremely Flammable Liquid and Vapor! Vapor may cause flash fire.
Extinguishing Media: Water spray, dry chemical, alcohol foam, or carbon dioxide. Water spray may be used to keep fire exposed containers cool.
Unusual Fire And Explosion Hazards: Above the flash point, explosive vapor-air mixtures may be formed. Vapors can flow along surfaces to distant ignition source and flash back. Sealed containers may rupture when heated. Sensitive to static discharge.
Special Information: In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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Reactivity Data

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Stability: Stable under ordinary conditions of use and storage. Unstable in acid solutions.
Cond To Avoid (Stability): Heat, flames, ignition sources and incompatibles.
Materials To Avoid:
Hazardous Decomp Products: Carbon dioxide and carbon monoxide may form when heated to decomposition.
Hazardous Poly Occur: Will not occur
Incompatibilities: Oxidizers, acids.

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Health Hazard Data

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Emergency Overview: WARNING! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. MAY AFFECT CENTRAL NERVOUS SYSTEM, BLOOD, AND KIDNEYS. A CENTRAL NERVOUS SYSTEM DEPRESSSANT. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
Oral rat LD50: 4 gm/kg**;**
Inhalation rat LC50: 23576 ppm/4H.
Cancer List:

Ingredient	Known	NTP Carcinigen Anticipated	IARC Category
Methyl tert-butyl Ether (1634-04-4)	No	No	None

Route Of Entry - Inhalation: Inhalation of vapor can irritate respiratory tract. Causes central nervous system effects. Breathing high concentrations in air can cause lightheadedness, dizziness, weakness, nausea, headache.
Route Of Entry - Skin: A mild skin irritant which causes loss of natural oils. May be route of absorption into the body.
Route Of Entry - Ingestion: May cause nausea, vomiting. Other symptoms similar to inhalation may occur. Laryngeal, ocular. And respiratory muscles are affected in severe poisoning.
Route Of Entry – Eyes: Vapors can irritate eyes; splashes may cause damage to eye tissue.
Chronic Exposure: Symptoms noted above may be produced by cumulative exposure.
Carcinogenicity - NTP:

Carcinogenicity - IARC:
Carcinogenicity - OSHA:
Explanation Carcinogenicity:
Signs/Symptoms Of Overexp:
Med Cond Aggravated By Exp: Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.
Emergency/First Aid Proceedures:
Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion: Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
Skin Contact: Remove any contaminated clothing. Wash skin with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.
Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

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Precautions for Safe Handling and Use

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Steps If Matl Released/Spill: Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert materiel (e.g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802. J.T. Baker SOLUSORB (TM) solvent absorbent is recommended for spills of this product**.**
Precautions-Handling/Storing: Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

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Control Measures

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Respiratory Protection: If the exposure limit is exceeded, a full face-piece respirator with dust/mist filter may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face-piece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
Ventilation: A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practice, most recent edition, for details. Use explosion-proof equipment**.**
Skin Protection: Wear protective gloves and clean body-covering clothing.
Eye Protection: Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.
Airborne Exposure Limits: -ACGIH Threshold Limit Value (TLV): 40 ppm (TWA)
Other Protective Equipment: (Lab Protective Equipment) Goggles & Shield; Lab Coat & Apron; Vent Hood; Proper Gloves; Class B Extinguisher.

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Transportation Data

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Domestic (Land, D.O.T.)
Proper Shipping Name: Methyl Tert-Butyl Ether
Hazard Class: 3
UN/NA: UN2398
Packing Group: II
Info. Reported for product/size: 335LB

International (Water, I.M.O.):
Hazard Class: 3.1
UN/NA: UN2398
Packing Group: II
Information reported for product/size: 335LB

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Disposal Data

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Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCTA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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Ecological Information

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Environmental Fate:
When released into the soil, this material is not expected to biodegrade. When released into the air, this material is expected to adversely affect the ozone layer. When released into the soil, this material is expected to quickly evaporate. When released to water, this material is expected to quickly evaporate. When released into the water, this material is expected to have a half-life between 1 and 10 days. This material has an estimated bio-concentration factor (BCF) of less than 100. This material is not expected to significantly bio-accumulate. When released into the air, this material is expected to be readily degraded by reaction with photo-chemically produced hydroxyl radicals. When released into the air, this material is not expected to be degraded by photolysis. When released into the air, this material is expected to have a half-life between 1 and 10 days.
Environmentally Toxicity: No Information Found.

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Label Data

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Common Name: Methyl Tert-Butyl Ether
Label Hazard Warning: WARNING! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. MAY AFFECT CENTRAL NERVOUS SYSTEM, BLOOD, AND KIDNEYS. A CENTRAL NERVOUS SYSTEM DEPRESSANT. CAUSES IRRITATION TO SKIN, EYES AND REPIRATORY TRACT.
Label Precautions: Keep away from heat, sparks and flame. Avoid contact with eyes, skin and clothing, Avoid breathing vapor. Keep container closed. Use only with adequate venilation. Wash thoroughly after handling.
Label First Aid: If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give

artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases call a physician.
Product Use: Laboratory Reagent
NFPA Ratings: Health: 2 Flammability: 4 Reactivity: 0
Signal Word:
Lab Protective
Health Rating: 3-Severe (Poison)
Contact Rating: 1-Slight
Flammability Rating: 4-Extreme (Flammable)
Reactivity Rating: 2-Moderate
Special Hazard Precautions:
Protect Eye: Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.
Protect Skin: Wear protective gloves and clean body-covering clothing.
Protect Respiratory: (NIOSH Approved) If the exposure limit is exceeded, a full face-piece respirator with dust/mist filter may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face-piece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
Lab Protective Equipment: Goggles & Shield; Lab Coat & Apron; Vent Hood; Proper Gloves; Class B Extinguisher.

Regulatory Information

Chemical Inventory Status-Part 1

Ingredient	TSCA	EC	Japan	Australia
Methyl tert-butyl Ether (1634-04-4)	Yes	Yes	Yes	Yes

Chemical Inventory Status-Part 2

Ingredient	Korea	DSL	NSDL	Phil.
Methyl tert-butyl Ether (1634-04-4)	Yes	Yes	No	Yes

Federal, State & International Regulations-Part 1

Ingredient	RQ	TPQ	List	Chemical Catalog
Methyl tert-butyl Ether (1634-04-4)	No	No	Yes	No

Federal, State & International Regulations-Part 2

	-RCRA-		-TSCA-
Ingredients	CERCLA	261.33	8(D)
Methyl tert-butyl Ether (1634-04-4)	1000	No	No

Chemical Weapons Convention: No TSCA 12 (b): Yes CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No Reactivity: No (Pure/ Liquid)

Australian Hazchem Code: 3[Y] E
Poison Schedule: No information found.
WHMIS: This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.