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THE POWER OF THREE³

PHARMCO-AAPER

AND COMMERCIAL ALCOHOLS

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 Isobutyl Ketone

General Information

Manufacturer: Pharmco Products Inc.
58 Vale Road
Brookfield, Connecticut 06804, USA
Phone (203) 740-3471
Fax (203) 740-3481

1101 Isaac Shelby Drive
Shelbyville, KY 40065
Phone (502) 633-0650
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Ingredients/Identity Information

| | |
|--|--|
| Ingredient: Methyl Isobutyl Ketone | Hazardous: Yes |
| Synonyms: 4-methyl-2-Pentanone; Hexone; | CAS Number: 108-10-1 |
| MIBK; Isopropylacetone; isobutylmethyl ketone, | Molecular Weight: 100.16 |
| MIBK, isohexanone; | Chemical Formula: CH ₃ COCH ₂ CH(CH ₃) ² |
| Percent: 90-100% | |

Physical/Chemical Characteristics

Appearance: Clear, colorless liquid
Odor: Slight camphor odor
Boiling Point: 117C (243oF)
Melting Point: -85C (-121oF)
PH: No information found
Vapor Pressure (mmHg): 16 @ 20C (68oF)
Vapor Density (Air=1): 3.5
Specific Gravity: 0.80 @ 20C
Evaporation Rate (BuAc=1): 5.6 (Ether=1)
Solubility In Water: Moderately soluble in water (1-10%).
Percent Volatiles By Volume@ 21C (70oF): 100

Fire and Explosion Hazard Data

DANGER! HARMFUL OR FATAL IF SWALLOWED. FLAMMABLE LIQUID AND VAPOR. MAY FORM EXPLOSIVE PEROXIDES IN AIR. HARMFUL IF INHALED. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

Flash Point: 18C (64°F)CC

Autoignition temperature: 448C (838°F)

Lower Explosive Limit: 1.2

Upper Explosive Limit: 8.0

Explosion: Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Vapors can flow along surfaces to distant ignition source and flash back. Contact with strong oxidizers may cause fire. Sealed containers may rupture when heated. Sensitivity to mechanical impact: Yes, if peroxides are formed. Sensitive to static discharge.

Extinguishing Media: Dry chemical, foam or carbon dioxide. Water may be ineffective. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixture, protect personnel attempting to stop leak and disperse vapors.

Special Fire Fighting Proc: 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.

Health Rating: 2 – Moderate

Flammability Rating: 3 – Severe (Flammable)

Reactivity Rating: 1 – Slight

Contact Rating: 1 – Slight

Lab Protective Equipment: Goggles; Lab Coat; Vent Hood; Proper Gloves; Class B Extinguisher

Storage Color Code: Red (Flammable)

Reactivity Data

Stability: Stable under ordinary conditions of use and storage. May form explosive peroxides in air.

Materials To Avoid: Aldehydes, Nitric Acid, Perchloric Acid, Strong Oxidizers. Violent reaction with Potassium-tert-butoxide.

Hazardous Decomp Products: Carbon dioxide and carbon monoxide may form when heated to decomposition.

Hazardous Poly Occur: Will not occur.

Conditions To Avoid (Poly): Heat, flame, ignition sources, air, incompatibles.

Health Hazard Data

Route Of Entry - Inhalation: Causes irritation to the nose and throat. Concentrations above the TLV may cause headache, dizziness, nausea, shortness of breath, and vomiting. Higher concentrations may cause central nervous system depression and unconsciousness.

Route Of Entry - Skin: Causes irritation to skin. Symptoms include redness, itching, and pain.

Route Of Entry – Eyes: Vapors can irritate the eyes. Splashes cause severe pain and irritation.

Route Of Entry - Ingestion: May produce abdominal pain, nausea. Aspiration into lungs can produce severe lung damage and is a medical emergency. Other symptoms expected to parallel inhalation.

Health Hazard Acute And Chronic: Prolonged skin contact may defat the skin and produce dermatitis. Based on animal studies, chronic exposure may affect liver and kidneys.

Med Cond Aggravated By Exp: Persons with pre-existing skin disorders, eye problems, impaired respiratory function or central nervous system conditions may be more susceptible to the effects of this substance.

Emergency/First Aid Procedures:

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately.

Skin Contact: Immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention.

Eye Contact: Flush eye with plenty of water for at least 15 minutes. Get medical attention.

Precautions for Safe Handling and Use

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 material (e.g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as sawdust. 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 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.

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. Before using bulk quantities of this material. Test for presence of explosive peroxides. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for other product.

Control Measures

Respiratory Protection (NIOSH Approved): If the exposure limit is exceeded, a full face-piece respirator with organic vapor cartridge 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 Practices*, most recent edition, for details.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Polyvinyl alcohol (PVA) is a recommended material for personal protective equipment.

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:

-OSHA Permissible Exposure Limit (PEL): 100ppm (TWA)

-ACGIH Threshold Limit Value (TLV): 50 ppm (TWA), 75 ppm (STEL)

Toxicological Information

Oral rat LD50: 2080 mg/kg; **Skin rabbit > 20 mL/kg;** irritation eye rabbit, Standard Draize, 40 mg severe; investigated as a reproductive effector.

Cancer Lists

| <u>Ingredient</u> | NTP Carcinogen | | <u>IARC Category</u> |
|-----------------------------------|----------------|--------------------|----------------------|
| | <u>Known</u> | <u>Anticipated</u> | |
| Methyl Isobutyl Ketone (108-10-1) | No | No | None |

Ecological Information

Environmental Fate: When released into the soil, this material may biodegrade to a moderate extent. When released into the soil, this material may leach into groundwater. When released into the soil, this material may evaporate to a moderate extent. When released into water, this material may evaporate to a moderate extent. 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 photolysis. When released into the air, this material is expected to have a half-life between 1 and 10 days.

Environmental Toxicity: This material is not expected to be toxic to terrestrial life. The LC50/96-hour values for fish are over 100 mg/l.

Transportation Data

Domestic (Land, D.O.T.)

Proper Shipping Name: METHYL ISOBUTYL KETONE

Hazard Class: 3

UN/NA: UN1245

Packing Group: II

Information reported for product/size: 20 L

International (Water, I.M.O.)

Proper Shipping Name: METHYL ISOBUTYL KETONE

Hazard Class: 3.2

UN/NA: UN1245

Packing Group: II

Information reported for product/size: 20L

Regulatory Information

Chemical Inventory Status – Part 1

| <u>Ingredient</u> | <u>TSCA</u> | <u>EC</u> | <u>Japan</u> | <u>Australia</u> |
|-----------------------------------|-------------|-----------|--------------|------------------|
| Methyl Isobutyl Ketone (108-10-1) | Yes | Yes | Yes | Yes |

Chemical Inventory Status – Part 2

| <u>Ingredient</u> | <u>Korea</u> | <u>DSL</u> | <u>NDSL</u> | <u>Phil.</u> |
|-----------------------------------|--------------|------------|-------------|--------------|
| Methyl Isobutyl Ketone (108-10-1) | Yes | Yes | No | Yes |

Federal, State & International Regulations – Part 1

| <u>Ingredient</u> | <u>RQ</u> | <u>TPQ</u> | <u>LIST</u> | <u>Chemical Catg.</u> |
|-----------------------------------|-----------|------------|-------------|-----------------------|
| Methyl Isobutyl Ketone (108-10-1) | No | No | Yes | No |

Federal, State & International Regulations – Part 2

| <u>Ingredient</u> | <u>CERCLA</u> | <u>-RCRA- 261.33</u> | <u>-TSCA- 8 (d)</u> |
|-----------------------------------|---------------|--------------------------|-------------------------|
| Methyl Isobutyl Ketone (108-10-1) | 5000 | U161 | No |

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

Australian Hazchem Code: 3 [Y] E

Poison Schedule: S5

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.

Disposal Data

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 RCRA 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.

Label Data

Common Name: Methyl Isobutyl Ketone

Label Hazard Warning: DANGER! HARMFUL OR FATAL IF SWALLOWED. FLAMMABLE LIQUID AND VAPOR. MAY FORM EXPLOSIVE PEROXIDES IN AIR. HARMFUL IF INHALED. AFFECTS CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEYS. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

Label Precautions: Keep away from heat, sparks and flame. Avoid contact with eyes, skin and clothing. Avoid breathing vapor. Keep container tightly closed. Use only with adequate ventilation. Wash thoroughly after handling.

Label First Aid: Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. 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. Get medical attention.

Product Use: Laboratory Reagent.

Acute Health Hazard: 3

Fire Hazard: 3

Reactivity Hazard: 1

Protect Eye: Yes

Protect Skin: Yes

Protect Respiratory: YES

Regulatory Data

Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) requires notification of the National Response Center of release of quantities of Hazardous Substances equal or greater than the reportable quantities (RQs) in 40 CFR 302.4. Components present in this product at a level which could require reporting under the statute are:

| Chemical Name | CAS Number | RQ |
|------------------------|------------|---------|
| Methyl isobutyl ketone | 108-10-1 | 5,000lb |

The information contained herein is based on data considered to be accurate. However, no warranty is expressed regarding the accuracy of these data or the results to be obtained from the use thereof. It is the user's obligation to determine the conditions of safe use of the product.