

SAFETY DATA SHEET



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METHYL ISOBUTYL KETONE

SDS No. M0152

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Methyl Isobutyl Ketone

Synonyms: 4-Methyl-2-pentanone; Hexone; MIBK; Isopropylacetone

Recommended Use: This product is recommended for laboratory and manufacturing use only. It is not recommended for drug, food or household use.

2. HAZARDS IDENTIFICATION



Classification:

Flammable Liquids: GHS Category 2

Acute Toxicity, Inhalation: GHS Category 4

Eye Irritation: GHS Category 2A

Specific Target Organ Toxicity, single exposure: GHS Category 3

Label Elements

Signal Word: DANGER!

Hazard Statements:

H225 – Highly flammable liquid and vapor.

H319 – Causes serious eye irritation.

H332 – Harmful if inhaled.

H335 – May cause respiratory irritation.

Precautionary Statements:

P210 – Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

P243 – Take precautions against static discharge.

P280 – Wear protective gloves/protective clothing/eye protection/face protection.

P303+P361+P353 – If on skin or hair: Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.

Emergency Overview

Causes irritation to eyes and respiratory system. May cause liver damage. May cause central nervous system depression. Aspiration hazard. Highly flammable liquid and vapor. Vapor may cause flash fire. This material has been reported to be

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susceptible to autoxidation and should be considered peroxidizable.. May form explosive peroxides. Target Organs: Central nervous system, respiratory system, liver, eyes, and skin.

HMIS Rating:

Health – 2* Flammability – 3 Physical Hazard – 0 PPE – User supplied

NOTE: HMIS ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. These ratings are based on the inherent properties of this chemical under expected conditions of normal use and are not intended to be used in emergency situations. PPE is determined by the user based on their needs and conditions.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

<u>Ingredient</u>	<u>CAS No</u>	<u>Percent</u>	<u>Hazardous</u>
Methyl Isobutyl Ketone	108-10-1	>99%	Yes

4. FIRST-AID MEASURES

Inhalation: If inhaled, remove to fresh air. If breathing is labored or with coughing, give 100% supplemental oxygen. If not breathing, begin artificial respiration. Get medical aid.

Ingestion: Aspiration hazard. Get medical aid. Do not induce vomiting unless directed by medical personnel. Never give anything by mouth to an unconscious person. If vomiting occurs naturally, have person lean forward.

Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if irritation develops and persists. Wash clothing before reuse. Thoroughly clean clothing and shoes before reuse.

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention.

Notes to Physician: Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Flammability: Highly flammable liquid and vapor (GHS Category 2)

Auto-ignition Temperature: 448° C (838° F)

Flash Point: 14° C (57° F)

Flammable Limits: Lower Limit – 1.2 vol % at 93° C, Upper Limit – 8.0 vol % at 93° C

Products of Combustion: Will decompose into highly toxic and irritating gases (carbon monoxide, carbon dioxide) under fire conditions.

Specific Fire Hazards: As in any fire, always wear self-contained breathing apparatus in pressure-demand (MSA/NIOSH approved or equivalent), and full protective gear. May accumulate static electric charge and may cause ignition of its own vapors. Use water spray to keep fire exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas. Material floats on water and may travel to a source of ignition and spread fire.

Specific Explosion Hazards: May form explosive peroxides

Fire Fighting Media: Use dry chemical, carbon dioxide, or appropriate foam. Solid streams of water may be ineffective and spread material.

National Fire Protective Association: Health - 2, Flammability - 3, Reactivity - 0

NOTE: NFPA ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. They are for use by emergency personnel to address the hazards that are presented by short term, acute exposure to this product under fire, spill, or similar emergencies. Ratings involve data and interpretations that may vary from company to company.

6. ACCIDENTAL RELEASE MEASURES

Absorb spilled liquid with sorbent pads, socks, or other inert material such as vermiculite, sand, or earth. Provide ventilation to the affected area and remove all ignition sources. Avoid run-off into storm sewers and ditches that lead to waterways. Approach the spill from upwind and pick up absorbed material and place it in a suitable container. Use only non-sparking tools and equipment. A vapor suppressing foam may be used. Always use proper personal protective equipment as described in section 8.

7. HANDLING AND STORAGE

Precautions: Always use proper personal protective equipment as described in section 8. Wash thoroughly after handling. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Remove contaminated clothing and wash before reuse. Empty containers contain product residue (liquid and vapor) and can be dangerous. Keep container tightly closed and away from heat, spark, and flame. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks, or open flames. Use with adequate ventilation. Avoid breathing vapor or mist.

Storage: Keep in a flammables area away from all sources of ignition and oxidizing materials. Keep in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Containers should be dated when opened and tested periodically for the presence of peroxides. Should crystals form, the product may have peroxidized and should be considered extremely dangerous.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or using the material should be equipped with eyewash station and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Personal Protection: Wear protective chemical goggles or appropriate eye protection. Use appropriate protective gloves and protective clothing to prevent skin exposure. A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever possible. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Exposure Limits:

- ACGIH – 50 ppm TWA; 75 ppm STEL
- NIOSH – 50 ppm TWA; 205 mg/m³ TWA; 500 ppm IDLH
- OSHA Final PELs – 100 ppm TWA; 410 mg/m³ TWA
- OSHA Vacated PELs – 50 ppm TWA; 205 mg/m³ TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance: Clear, colorless liquid.

Odor: Sweetish camphor-like odor

Odor Threshold: <1 ppm

Molecular Formula: C₆H₁₂O

Molecular Weight: 100.16

Auto-ignition Temperature: 448° C (838° F)

Flash Point: 14° C (57° F)

Flammable Limits: Lower Limit – 1.2 vol % at 93° C, Upper Limit – 8.0 vol % at 93° C

pH: Not available.

Boiling Point: 117° C @ 760 mm Hg

Freezing/Melting Point: -84° C

Decomposition Temperature: Not available

Specific Gravity: 0.80 g/cm³ @ 20° C

Vapor Density (Air=1): 3.45

Vapor Pressure: 19.9 mm Hg @ 25° C.

Evaporation Rate (Butyl acetate =1): 1.6

Viscosity: 0.61 cP 20° C

Solubility: Moderately Soluble

Conductivity: Conductive; Conductivity = $<5.2 \times 10^6$ pS/m; Dielectric Constant = 13.11; Relaxation Time Constant = $>2.2 \times 10^{-5}$ seconds

10. STABILITY AND REACTIVITY

Stability: Under normal storage conditions, peroxidizable compounds can form and accumulate peroxides which may explode when exposed to heat or shock.

Conditions to Avoid: Ignition sources, excess heat, and confined spaces.

Incompatibility With Various Substances: Strong oxidizing agents, strong reducing agents, strong bases.

Hazardous Decomposition Products: Carbon monoxide and carbon dioxide.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, skin absorption, skin contact

Acute Exposure Hazards:

INHALATION HAZARD: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness, and coma. Causes respiratory tract irritation. May cause liver abnormalities.

INGESTION HAZARD: May cause effects similar to those of inhalation exposure. Aspiration into the lungs may cause chemical pneumonitis which may be fatal.

SKIN CONTACT HAZARD: Irritation and dermatitis may result from prolonged or repeated exposure. A single long skin exposure is not likely to result in material being absorbed in harmful amounts.

EYE CONTACT HAZARD: Contact causes irritation, tearing, and burning pain. Vapors cause eye irritation.

Chronic Exposure Hazards: Repeated or prolonged skin contact may defat the skin and produce irritation and dermatitis. Animal studies have reported kidney effects in rats that are not considered relevant to humans.

Animal Toxicity:

Draize test, rabbit, eye: 40 mg Severe;

Draize test, rabbit, skin: 100 uL/24H Moderate;

Draize test, rabbit, skin: 500 mg/24H Mild;

Inhalation, mouse: LC50 = 23,300 mg/m³/4H;

Inhalation, rat: LC50 = 100 g/m³/4H;

Oral, mouse: LD50 = 1900 mg/kg;

Oral, rat: LD50 = 2880 mg/kg;

Carcinogenicity: IARC Group 2B carcinogen; California Prop 65 known carcinogen

Epidemiology: No information available.

Teratogenicity: One animal study showed that MIBK was not teratogenic, embryotoxic, or fetotoxic at exposures which did not cause maternal toxicity.

Reproductive Effects: One unverifiable animal study showed changes in the testis of mice exposed dermally to MIBK for four months...

Mutagenicity: Most mutagenicity tests have shown negative results.

Neurotoxicity: MIBK was not considered to be toxic when male rats were exposed to 1500 ppm for up to five months.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Fish: Fathead minnow: LC50 = 505 mg/L; 96H, flow through;

Fish: Goldfish: LC50 = 460 mg/L; 246H, unspecified;

Flea: Daphnia: EC50 = 4280 mg/L; 24H, unspecified;

Bacteria: Phytobacterium phosphoreum: EC50 = 79.6 mg/L; 5M, Microtox test;

Environmental Fate: In soil, material will undergo direct photolysis, volatilization or aerobic biodegradation. Substance is highly mobile and may also leach into ground water. In water, substance will undergo direct photolysis and volatilization. Bioaccumulation is not highly predicted. In air, substance will react with hydroxyl radicals or undergo photolysis.

13. DISPOSAL CONSIDERATIONS

Material that cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Processing, use or contamination of this product may change the waste management options. Waste generators must decide if discarded material is a hazardous waste. State and local disposal regulations may differ from federal disposal definitions found in 40 CFR 261.3. Dispose of container and unused contents in accordance with federal, state and local requirements. This material is a "U" listed waste (U161 – ignitable, toxic).

14. TRANSPORT INFORMATION

US DOT

Proper Shipping Name: Methyl Isobutyl Ketone

Hazard Class: 3

UN Number: UN1245

Packing Group: II

IMDG

Proper Shipping Name: Methyl Isobutyl Ketone

Hazard Class: 3

UN Number: UN1245

Packing Group: II

IATA

Proper Shipping Name: Methyl Isobutyl Ketone

Hazard Class: 3

UN Number: UN1245

Packing Group: II

15. REGULATORY INFORMATION

US Federal Regulations:

CERCLA Hazardous Substances: CAS# 78-93-3 – 5000 lb (2270 kg) final RQ

SARA Section 302: Does not have a TPQ

SARA Codes: CAS# 78-93-3 – acute, chronic, flammable, reactive

Section 313: Methyl Isobutyl Ketone (CAS# 78-93-3) is subject to SARA Title III Section 313 and 40 CFR 373 reporting requirements.

Clean Air Act: CAS# 78-93-3 is listed as a hazardous air pollutant (HAP).

OSHA: Not considered highly hazardous by OSHA.

US State Regulations:

CAS# 78-93-3 is on the following state right-to-know lists: California, New Jersey, Pennsylvania, and Massachusetts

California Prop 65: This product contains Methyl Isobutyl Ketone (4-Methyl-2-pentanone), a chemical known to the State of California to cause cancer.

16. OTHER INFORMATION

Originally Prepared: 10/24/2006

Last Revised: 11/13/2014 – Updated hazard categories, hazard statements, and precautionary statements in Section 2 and carcinogenicity in Section 11.

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.

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