

Methyl isobutyl ketone (MIBK)

SECTION 1 IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Trade name	Methyl isobutyl ketone (MIBK)
Synonyms	2-methyl-4-pentanone, 2-methylproyl methyl ketone, 2-pentanoe, hexone, isobutyl methyl ketone
Use	Catalyst production, Industrial use, Intermediate, Paint and Coatings, Pharmaceutical, Process/Extraction Solvent, Process material, Raw material for chemical processes, Raw material for industry, Solvent

SECTION 2 HAZARDS IDENTIFICATION

GHS Hazards

Flammable liquids	Category 2
Acute toxicity (Inhalation)	Category 4
Eye irritation	Category 2A
Specific target organ toxicity - single exposure	Category 3 (Resp. irritation)
Carcinogenicity	Category 2

LABEL ELEMENTS

Hazard symbols



Signal word Danger

Hazard statements	H225 Highly flammable liquid and vapour.
	H319 Causes serious eye irritation.
	H332 Harmful if inhaled.
	H335 May cause respiratory irritation.
	H351 Suspected of causing cancer.

Precautionary statements

SAFETY DATA SHEET

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Prevention P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.

Response P303 + P361 + P353 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P370 + P378 In case of fire: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide for extinction.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P312 Call a POISON CENTER or doctor/ physician if you feel unwell.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.

Storage P403 + P405 + P235 Store locked up in a well-ventilated place. Keep cool.

SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS

<u>Components</u>	<u>CAS-No.</u>	<u>Weight percent</u>
Methyl isobutyl ketone	108-10-1	100

See Section 8 for Exposure Guidelines and Section 15 for Regulatory Classifications.

SECTION 4 FIRST AID MEASURES

Eye contact Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. When symptoms persist or in all cases of doubt seek medical advice. Wash contaminated clothing before re-use.

Inhalation Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. In case of shortness of breath, give oxygen. Call a physician immediately.

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Ingestion If swallowed, call a poison control centre or doctor immediately. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.

SECTION 5 FIREFIGHTING MEASURES

FLAMMABLE PROPERTIES

Fire/explosion Vapours may form explosive mixture with air. Flash back possible over considerable distance. Use water spray to disperse the vapors. NFPA Class IB flammable liquid.

Suitable extinguishing media Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Protective equipment and precautions for firefighters In the event of fire, wear self-contained breathing apparatus.

Further information Keep containers and surroundings cool with water spray. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Methods and materials for containment and cleaning up Evacuate personnel to safe areas. Remove all sources of ignition. Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Do not flush into surface water or sanitary sewer system.

SECTION 7 HANDLING AND STORAGE

Safe handling advice Ensure all equipment is electrically grounded before beginning transfer operations. Keep away from heat and sources of ignition.

Storage/Transport pressure Ambient

Load/Unload temperature Ambient

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING MEASURES

Air contaminant levels should be controlled below the PEL or TLV for this product (see Exposure Guidelines). Ensure adequate ventilation, especially in confined areas. Use explosion-proof equipment.

PERSONAL PROTECTIVE EQUIPMENT

Eyes Chemical resistant goggles must be worn., Face-shield

Skin Wear suitable protective clothing, gloves and eye/face protection.

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Inhalation Respiratory protection is normally not required except in emergencies or when conditions cause excessive airborne levels of mists or vapors. Use NIOSH approved respiratory protection.

EXPOSURE GUIDELINES

<u>Components</u>	<u>Exposure limit(s)</u>
Methyl isobutyl ketone	OSHA PEL 100 ppm 410 mg/m ³ ACGIH TLV (8-hour) 20 ppm ACGIH STEL 75 ppm

PEL= Permissible Exposure Limits
TLV= Threshold Limit Value
EL= Excursion Limit

TWA= Time Weighted Average (8 hr.)
STEL= Short Term Exposure Limit (15 min.)
WEEL= Workplace Environmental Exposure Level

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance liquid;

Colour Clear, colorless

Form liquid

Odour characteristic

Odour Threshold no data available

Flash point 14 °C, 57.2 °F;

Flammability Upper explosion limit: 8.0 %(V)

Lower explosion limit: 1.2 %(V)

Boiling point/boiling range 117 °C, 243 °F;

Melting point/range -84 °C, -119.2 °F;

Auto-ignition temperature 460 °C, 860 °F;

Decomposition temperature Distills without decomposition at atmospheric pressure.

Flammability (solid, gas) no data available

Vapour pressure 20.2 hPa @ 20 °C, 68 °F;

Vapour density 3.45

Density 0.7978 g/cm³ @ 20 °C, 68 °F;

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Specific gravity	no data available
Water solubility	immiscible
Viscosity	no data available
Viscosity, dynamic	0.585 mPa.s @ 20 °C, 68 °F;
pH	no data available
Evaporation rate	no data available
Partition coefficient: n-octanol/water	Pow: 79; log Pow: 1.9;
Volatile organic compounds (VOC) content	100 %

SECTION 10 STABILITY AND REACTIVITY

Reactivity	Vapours may form explosive mixture with air.
Chemical stability	No decomposition if stored and applied as directed.
Conditions to avoid	Extremes of temperature and direct sunlight.
Hazardous decomposition products	None known.
Materials to avoid	Oxidizing agents
Hazardous polymerisation	May form explosive peroxides.

SECTION 11 TOXICOLOGICAL INFORMATION

Acute dermal toxicity	LD50 rabbit: > 2,000 mg/kg(literature value)
Acute inhalation toxicity	LC50 rat (4 hours): > 10 - 20 mg/l (literature value)
Acute oral toxicity	LD50 rat: > 2,000 mg/kg (literature value)
Skin corrosion/irritation	(rabbit) slight irritation, (literature value)
Eye damage/irritation	(rabbit) irritating, (literature value)

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Respiratory or skin sensitization	guinea pig: not sensitizing; Maximisation Test (literature value)
Germ cell mutagenicity	Genotoxicity in vitro: Type: Ames test System: Salmonella typhimurium; with and without metabolic activation Result: In vitro tests did not show mutagenic effects. (literature value) Genotoxicity in vivo: no data available Assessment Mutagenicity: Based on available data, the classification criteria are not met.
Reproductive toxicity	Reproductive toxicity: no data available Assessment Reproductive toxicity: no data available Teratogenicity: no data available Assessment teratogenicity: no data available
STOT - single exposure	The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.
STOT - repeated exposure	no data available
Aspiration toxicity	no data available
Carcinogenicity	Assessment carcinogenicity: Suspected of causing cancer.
Carcinogenicity ratings	
Methyl isobutyl ketone	
IARC	Probably carcinogenic to humans.

SECTION 12 ECOLOGICAL INFORMATION

Toxicity to fish	LC50 (Danio rerio (zebra fish)) 96 hours: > 100 mg/l; static test (literature value)
Toxicity to aquatic invertebrates	EC50 (Daphnia magna (Water flea)) 48 hours: > 100 mg/l; static test (literature value)
Toxicity to algae	no data available

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Chronic toxicity to aquatic invertebrates	NOEC (Daphnia magna (Water flea)) 21 d: > 10 - 100 mg/l; semi-static test; OECD Test Guideline 211 (literature value)
Biodegradation	Readily biodegradable. OECD Test Guideline 301F (28 d): > 60 % (literature value)
Bioaccumulation	No bioaccumulation is to be expected (log Pow <= 4).
Mobility in soil	no data available
Other adverse effects	This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).;

SECTION 13 DISPOSAL CONSIDERATIONS

Waste Code	D001 - Ignitability (RQ 100 LB).U161 (RQ 5,000 LB). Re-evaluation of the product may be required by the user at the time of disposal, since the product uses, transformations, mixtures, contamination, and spillage may change the classification.
Disposal methods	Dispose of only in accordance with local, state, and federal regulations. Do not contaminate any lakes, streams, ponds, groundwater or soil.
Empty containers.	Empty containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Empty drums should be completely drained, triple-rinsed, properly bunged and promptly returned to a drum reconditioner, or properly disposed.

SECTION 14 TRANSPORT INFORMATION

DOT	UN 1245, Methyl Isobutyl Ketone, 3, II When shipped in quantities greater than 5,000 lbs, RQ must be added to the shipping description.
IATA	UN 1245, Methyl Isobutyl Ketone, 3, II When shipped in quantities greater than 5,000 lbs, RQ must be added to the shipping description.
IMDG	UN 1245, Methyl Isobutyl Ketone, 3, II When shipped in quantities greater than 5,000 lbs, RQ must be added to the shipping description.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Remarks no data available

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SECTION 15 REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

OSHA Hazards (HCS 1994)

Flammable liquid, Respiratory irritant, Eye irritant

TSCA Inventory Listing

Components

2-Pentanone, 4-methyl-

CAS-No.

108-10-1

SARA 302 Status

Components

CAS-No.

Weight percent

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 311/312 Classification

"Fire hazard", "Delayed (chronic) health hazard", "Immediate (acute) health hazard"

SARA 313 Chemical

Components

2-Pentanone, 4-methyl-

CAS-No.

108-10-1

Weight percent

100 %

US. EPA CERCLA Hazardous Substances (40 CFR 302)

Components

2-Pentanone, 4-methyl-

Reportable Quantity

5,000 LB

Weight percent

100 %

INTERNATIONAL REGULATIONS

WHMIS Classification

Class B, Division 2: Flammable liquid.

Class D, Division 2, Subdivision A: Very toxic material

Class D, Division 2, Subdivision B: Toxic material.

European Union

Classification according to Regulation (EU) 1272/2008.

Flammable liquids, Category 2

Acute toxicity (Inhalation), Category 4

Carcinogenicity, Category 2

Eye irritation, Category 2

Specific target organ toxicity - single exposure, Category 3 (Resp. irritation)

Australia. Inventory of Chemical Substances (AICS)

Listed

Japan. Inventory of Existing and New Chemical Substances (ENCS)

Listed

Japan. Industrial Safety & Health Law (ISHL) Inventory

Listed

Canada. Domestic Substances List (DSL) Inventory

Listed

Canadian Non-Domestic Substance Listing (NDSL)

Not listed

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European Inventory of Existing Commercial Chemical Substances (EINECS) Listing	Listed
Philippines. Inventory of Chemicals / Chemical Substances (PICCS)	Listed
Korea. Existing Chemicals Inventory (KECI)	Listed
China. Inventory of Existing Chemical Substances (IECSC)	Listed
Mexico. National Inventory of Chemical Substances (INSQ)	Listed
New Zealand. Inventory of Chemicals (NZIoC)	Listed
Switzerland. Inventory of Notified New Substances (CHINV)	Listed
Taiwan. National Existing Chemical Inventory (NECI)	Listed

Please note: The names and CAS numbers which are used for this product in the stated inventories may deviate from the information which is listed in Section 3.

STATE REGULATIONS

California Prop. 65

Components

2-Pentanone, 4-methyl-

CAS-No.

108-10-1

SECTION 16 OTHER INFORMATION

HAZARD RATINGS

	<u>Health</u>	<u>Flammability</u>	<u>Physical Hazard/ Instability</u>
HMIS®	2	3	0
NFPA	2	3	0

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