Chemical Safety Data Sheet MSDS / SDS

4-methylpentan-2-one SDS

Revision Date:2024-04-25 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name: 4-methylpentan-2-one

CAS: 108-10-1

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.

Uses advised against: none

Company Identification

Company: Chemicalbook.in

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SECTION 2: Hazards identification

Classification of the substance or mixture

Flammable liquids, Category 2
Eye irritation, Category 2

Acute toxicity - Category 4, Inhalation
Specific target organ toxicity – single exposure, Category 3

GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H225 Highly flammable liquid and vapour
H319 Causes serious eye irritation
H332 Harmful if inhaled
H335 May cause respiratory irritation

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P264 Wash ... thoroughly after handling.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.

Response

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].
P370+P378 In case of fire: Use ... to extinguish.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P317 Get medical help.
P319 Get medical help if you feel unwell.

Storage

P403+P235 Store in a well-ventilated place. Keep cool.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	4-methylpentan-2-one
Common names and synonyms:	4-methylpentan-2-one
CAS number:	108-10-1
EC number:	203-550-1
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention.

Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention .

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth. Do NOT induce vomiting. Refer for medical attention .

Most important symptoms/effects, acute and delayed

Vapor causes irritation of eyes and nose; high concentrations cause anesthesia and depression. Liquid dries out skin and may cause dermatitis; irritates eyes but does not injure them. (USCG, 1999)

Indication of immediate medical attention and special treatment needed, if necessary

INHALATION: Symptoms: Cough. Diarrhea. Dizziness. Headache. Nausea. Sore throat. Unconsciousness. Vomiting. Weakness. Loss of appetite. First aid: Fresh air, rest. Refer for medical attention. SKIN: Symptoms: Dry skin. Redness. Pain. First aid: Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention. EYES: Symptoms: Redness. Pain. First aid: First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor. INGESTION: Symptoms: Abdominal pain. First aid: Rinse mouth. Do NOT induce vomiting. Refer for medical attention.

SECTION 5: Firefighting measures

Suitable extinguishing media

Water should not be used, since this may cause the fire to spread, though a water spray can be used to cool containers.

Specific hazards arising from the chemical

Special Hazards of Combustion Products: Irritating vapors are generated when heated. Behavior in Fire: Vapors may travel a considerable distance and ignite. (USCG, 1999)

Special protective actions for fire-fighters

Use powder, AFFF, foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Ventilation. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert

absorbent. Then store and dispose of according to local regulations.

Environmental precautions

Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Ventilation. Collect leaking and spilled liquid in sealable containers as far as possible. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

Methods and materials for containment and cleaning up

Evacuate and restrict persons not wearing protective equipment from area of spill or leak until cleanup is complete. Remove all ignition sources. Establish forced ventilation to keep levels below explosive limit. Absorb liquids in vermiculite, dry sand, earth, peat, carbon, or similar material and deposit in sealed containers. Oil-skimming equipment and sorbent foams can be applied to slick if done immediately. Keep this chemical out of a confined space ... because of the possibility of an explosion ... It may be necessary to contain and dispose of this chemical as a hazardous waste. If material or contaminated runoff enters waterways, notify downstream users of potentially contaminated waters. Contact your Department of Environmental Protection or your regional office of the federal EPA for specific recommendations. If employees are required to clean up spills, they must be properly trained and equipped. OSHA 1910.120(q) may be applicable.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidants. Well closed.... OPEN LIGHTS OR OTHER AGENCIES LIABLE TO IGNITE THE VAPOR SHOULD BE EXCLUDED FROM THOSE AREAS WHERE LIQUID IS BEING STORED OR USED. KETONES

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 20 ppm as TWA; 75 ppm as STEL; A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued.MAK: 83 mg/m3, 20 ppm; peak limitation category: I(2); skin absorption (H); pregnancy risk group: C.EU-OEL: 83 mg/m3, 20 ppm as TWA; 208 mg/m3, 50 ppm as STEL

Biological limit values

no data available

Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety spectacles.

Skin protection

Protective gloves. Protective clothing.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Liquid.
Colour:	Colorless liquid
Odour:	Pleasant odor
Melting point/freezing point:	-84.7 °C.

Boiling point or initial boiling point and boiling range:	117 - 118 °C. Atm. press.:1 013 hPa.
Flammability:	Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.
Lower and upper explosion limit/flammability limit:	Lower flammable limit: 1.2% by volume @ 200 deg F (93 deg C); Upper flammable limit: 8.0% by volume @ 200 deg F (93 deg C)
Flash point:	23 °C. Atm. press.:Atmospheric pressure was not reported.
Auto-ignition temperature:	448 °C. Atm. press.:Not reported. Remarks:The atmospheric pressure is not reported.
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	dynamic viscosity (in mPa s) = 0.545. Temperature:25.0°C.;dynamic viscosity (in mPa s) = 0.406. Temperature:50.0°C.
Solubility:	19 g / L (20 °C)
Partition coefficient n-octanol/water:	log Pow = 1.9.;Pow = 79.
Vapour pressure:	2.64 kPa. Temperature:25 °C. Remarks:2.64 kPa at 25°C.
Density and/or relative density:	0.801. Temperature:20 °C.
Relative vapour density:	3.5 (vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

The substance can form explosive peroxides on exposure to air. Reacts violently with strong oxidants and strong reducing agents.

Chemical stability

Stable liquid

Possibility of hazardous reactions

Flammable liquid when exposed to heat, flame, or oxidizers.The vapour mixes well with air, explosive mixtures are easily formed.METHYL ISOBUTYL KETONE is incompatible with caustic soda and other strong alkalis, hydrochloric acid, sulfuric acid and other strong inorganic acids, amines and oxidizing agents such as hydrogen peroxide, nitric acid, perchloric acid and chromium trioxide. It reacts violently with potassium tert-butoxide. It reacts vigorously with reducing materials. (NTP, 1992).

Conditions to avoid

no data available

Incompatible materials

Able to form unstable and explosive peroxides on contact with air. Reacts violently with strong oxidizers, potassium tert-butoxide, strong acids, aliphatic amines, reducing agents.

Hazardous decomposition products

no data available

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 - rat - 2.08 g/kg body weight.

Inhalation: LC50 - rat (male) - > 2 000 - < 4 000 ppm.

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Epa-1, tlv-a3

Reproductive toxicity

No information is available on the reproductive or developmental effects of methyl isobutyl ketone in humans. Maternal toxicity and neurological effects and increased liver and kidney weights in fetuses were observed in rats and mice exposed to methyl isobutyl ketone by inhalation.

STOT-single exposure

The substance and the vapour are irritating to the eyes, skin and respiratory tract. If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis. The substance may cause effects on the central nervous system at high concentrations. This may result in narcosis.

STOT-repeated exposure

Repeated or prolonged contact with skin may cause dermatitis.

Aspiration hazard

A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: LC50 - Danio rerio (previous name: Brachydanio rerio) - > 179 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna - > 200 mg/L - 48 h.

Toxicity to algae: TGK (Toxische Grenzkonzentration or "toxicity threshold concentration") - Scenedesmus quadricauda - 725 mg/L - 8 d.

Toxicity to microorganisms: TGK (Toxische Grenzkonzentration or "toxicity threshold concentration") - Pseudomonas putida - 275 mg/L - 16 h.

Persistence and degradability

AEROBIC: The theoretical BOD of methyl isobutyl ketone (5 ppm) in seawater was measured as 27.6% and 30.6% over a 5 day incubation period(1). The theoretical BOD of methyl isobutyl ketone in freshwaters seeded with settled domestic sewage was 56%, 66%, 69% and 69%, over 5, 10, 15 and 20 day incubation periods(2). The theoretical BOD of methyl isobutyl ketone in synthetic seeded seawaters with settled domestic sewage was 15%, 46%, 50% and 53%, over 5, 10, 15 and 20 day incubation periods(2). The theoretical BOD of a 100 mg/L sample of methyl isobutyl ketone in an activated sludge inoculum was 84% over a 2 week incubation period(3). Methyl isobutyl ketone was degraded 78-84% with a degradation rate of 0.24 1/hr in experiments using activated sludge inoculum, 100 mg/L of methyl isobutyl ketone, 30 mg/L biomass and a temperature of 28 deg C for 28 days(4). Methyl isobutyl ketone had influent concns of 8100, 8100 and 190 ug/L and effluent concns of 27.5, 40.5 and <10 ug/L using an activated sludge with a daily mass loading of COD/bacterial mass ratios of 0.1, 0.36 and 0.48, respectively(5). Methyl isobutyl ketone was degraded from 855 ug/L to 143 ug/L in 12 hours and from 3385 ug/L to 1098 ug/L in 8 hours using activated sludge that was acclimated for 3 weeks(6). In a wastewater stream, a BOD of 2.06 g of oxygen/g and a COD of 2.16 g of oxygen/g for methyl isobutyl ketone were found(7).

Bioaccumulative potential

An estimated BCF of 2 was calculated in fish for methyl isobutyl ketone(SRC), using a log Kow of 1.31(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

Mobility in soil

The Koc of methyl isobutyl ketone is estimated as 120(SRC), using a log Kow of 1.31(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that methyl isobutyl ketone is expected to have high mobility in soil.

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: UN1245 (For reference only, please check.)
IMDG: UN1245 (For reference only, please check.)
IATA: UN1245 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: METHYL ISOBUTYL KETONE (For reference only, please check.)
IMDG: METHYL ISOBUTYL KETONE (For reference only, please check.)
IATA: METHYL ISOBUTYL KETONE (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 3 (For reference only, please check.)
IMDG: 3 (For reference only, please check.)
IATA: 3 (For reference only, please check.)

Packing group, if applicable

ADR/RID: II (For reference only, please check.)
IMDG: II (For reference only, please check.)
IATA: II (For reference only, please check.)

Environmental hazards

ADR/RID: No
IMDG: No
IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home

HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm

IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple

ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg

Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp

ECHA - European Chemicals Agency, website: https://echa.europa.eu/

Other Information

Check for peroxides prior to distillation; eliminate if found.