

Safety Data Sheet

1. Product and company identification

Product name : 4-Methyl-2-pentanone
Name of manufacturer : KANTO CHEMICAL CO., INC.
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SDS No. : GE00022

2. Summary of danger and Hazard

GHS classification

Physical and chemical hazard

Flammable liquids : Category 2
Pyrophoric liquids : Out of category

Human health hazard

Acute toxicity(oral) : Out of category
Acute toxicity(dermal) : Out of category
Acute toxicity(inhalation:vapors) : Category 3
Skin corrosion/irritation : Out of category
Serious eye damage/eye irritation : Category 2B
Carcinogenicity : Category 2
Specific target organ systemic toxicity(single exposure) : Category 3 (respiratory tract irritation) 、 Category 3 (anesthetic action)
Specific target organ systemic toxicity(repeated exposure) : Category 1

Environmental hazard

Hazardous to the aquatic environment-acute hazard : Out of category
Hazardous to the aquatic environment-chronic hazard : Out of category

Pictogram or symbol



Signal word : Danger

Hazard statement : Highly flammable liquid and vapor
Toxic if inhaled
Causes eye irritation
Suspected of causing cancer
May cause respiratory irritation
May cause drowsiness and dizziness
Causes damage to organs (central nervous system) through prolonged or repeated exposure

Cautions

Safety measurements : Do not handle until all safety precautions have been read and understood.
Keep away from ignition sources such as heat, sparks, or open flame.
Keep containers tightly closed.
Ground container and receiving equipment in case of transport and stirring.
Use explosion-proof apparatus.
Use only non-sparking tools.
Do not breathe dust, mist, and vapor.
Use only in a well-ventilated area.
Do not eat, drink or smoke when using this product.
Wear appropriate protective gloves, glasses, clothing, face shield, or mask.
Wash hands thoroughly after handling.

First-aid measures : If inhaled : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately get medical treatment.
If in eyes : Rinse cautiously with water for several minutes. Get medical treatment.
If on skin : Remove contaminated clothing and the substance. Get medical treatment, if you feel unwell.
Wash hands thoroughly after handling.
If exposed or concerned, get medical treatment.
Get medical treatment, if you feel unwell.

Storage : Tightly container closed and store in a well-ventilated area.
Store locked up.

Disposal : Dispose of contents and containers appropriately in accordance with related regulations.

3. Composition/Information on ingredients

Substance/Mixture : Substance

Chemical name or commercial name

: 4-Methyl-2-pentanone

Synonyms : Methyl isobutyl ketone, MIBK

Ingredients and composition

: 4-Methyl-2-pentanone min. 99.5%

Chemical formula : $(CH_3)_2CHCH_2COCH_3$

CAS No. : 108-10-1

TSCA Inventory : Registered
EINECS No. : 2035501
Dangerous and hazardous ingredients
: 4-Methyl-2-pentanone

4. First aid measures

Inhalation : Remove the victim to fresh air, and make him blow his nose and gargle.
Skin contact : Wash the affected areas under running water.
Eye contact : Wash the affected areas under running water for at least 15 minutes.
Get medical treatment.
Ingestion : The chemical is volatile. Do not induce vomiting because it increases the risk of aspiration into the lungs. Get medical attention immediately. If necessary, rinse mouth with water.

Anticipated acute and delayed symptoms

: Overexposure may cause anesthetic action, headache, dizziness, tunnel vision, nausea, or unconsciousness.

Protection for first aid person

: Rescuers should wear proper protective equipment like rubber gloves, goggles.

5. Fire fighting measures

Extinguishing media : Dry chemical powder, carbon dioxide, dry sand, foam

Prohibited extinguishing media

: Water spray

Particular fire fighting : Move containers from fire area if it can be done without risk, if not possible, apply water from a safe distance to cool and protect surrounding area.

Fight fire from windward.

Dry chemical powder, carbon dioxide or dry sand should be used for small fires. Foam extinguisher is effective for a large scale fire.

Protection for firefighters

: Firefighters should wear protective equipment.

6. Accidental release measures

Cautions for personnel : Wear proper protective equipment and avoid contact with skin and inhalation of vapor. Conduct operations from upwind and evacuate people downwind. Remove all sources of ignition. Keep away personnel except for authorized ones from spillage area by stretching ropes.

Cautions for environment : Attention should be given to avoid damage to the environment by flowing of spillage to rivers.

Removal measure : Absorb spill with inert material (e.g., diatomaceous earth, sand) and flush spillage area with copious amounts of water.

Prevention of second accident

: Remove nearby sources of ignition and prepare extinguishing media.

7. Cautions of handling and storage

Handling

Engineering measures : Wear proper protective equipment to avoid contact with skin or inhalation of vapor. Pay attention to fire.

Cautions for safety handling

: Use with an enclosed system or a local exhaust ventilation. Use in well-ventilated areas.

Storage

Adequate storage condition

: Store in a dark, cool place and tightly closed.

Safety adequate container materials

: Glass, fluorine resin, stainless steel

Do not use vinyl chloride resin, acrylic resin, polystyrene etc.

8. Exposure control/Personal protection

Engineering measures : Use with an enclosed system or a local exhaust ventilation.

Control parameters

ACGIH(2015) : 20ppm(TLV-TWA)
75ppm (TLV-STEL)

Protective equipment

Respiration protective equipment

: If necessary, wear chemical cartridge respirator with an organic vapor cartage

Hands protective equipment

: Organic solvents resistant gloves

Eyes protective equipment

: Safety goggles

Skin and body protective equipment

: Protective clothing, protective boots

9. Physical and chemical properties

Appearance : Liquid

Color : Colorless

Odor : Slight ketone odor

Odor threshold : 100ppm

Boiling point : 115.9°C

Melting point : -84.7°C

Flash point : 18°C

Auto-ignition point : 449°C

Explosion characteristics

Explosion limit : upper : 7.6vol% lower : 1.4vol%

Vapor pressure : 2.13kPa (20°C)

Vapor density : 3.45

Density : 0.7960g/cm³ (25°C)

Solubility

Solubility in solvents : Water ; 1.91% (25°C)

Organic solvents : Readily soluble in ethanol, diethyl ether, benzene.

Other data : Viscosity : 0.542cP(25°C)

10. Stability and reactivity

Stability : Stable under normal conditions.

Reactivity : May react with oxidizing substances.

Incompatible conditions : Light, heat

Incompatible materials : Oxidizing substances

Hazardous decomposition products

: Carbon monoxide

11. Toxicological information

Acute toxicity : Oral : Out of category

Dermal : Out of category

Toxic if inhaled(vapor)(category 3)

Inhalation(dust, mist) : Not possible to classify because of insufficient data.

rat oral LD50=2080mg/kg

rat inhalation LC50=8.2-16.4mg/L/4H(vapor)

rabbit skin LD50>3000mg/kg

Skin corrosion/irritation : Out of category

There is a result that a 10-hour occluded application to the skin of rabbits produced erythema, which occurred immediately after the application and persisted for up to 24-hour (which means that the effect resolved after 24-hour). There are results of slightly irritating and not irritating in other test by 24-hour application to the skin of guinea pigs and rabbits. Therefore it was classified into out of category.

Serious eye damage/eye irritation

: Causes eye irritation(category 2B)

There was a report that irritation was observed within 10 min when instilled in the rabbit eye; conjunctival swelling occurred within 8-hour. The inflammation, swelling and exudate present at 24-hour disappeared by 3 days. The result of "mildly irritative" was reported in a rabbit Draize test where the irritation score was 5 (max 110). Based on these data, it was classified into category 2B. As relevant information, it was classified into "Eye Dam.1 H318" in EU CLP.

Respiratory sensitization or Skin sensitization

: Respiratory sensitization : Not possible to classify because of insufficient data.

Skin sensitization : Not possible to classify because of insufficient data.

Mutagenicity : Not possible to classify because of insufficient data.

There is a negative result by the micronucleus test which uses the mammalian erythrocyte, which is the in vivo mutagenicity test using a somatic.

Carcinogenic effects : Suspected of causing cancer(category 2)



In a rat 2-year inhalation test, there were increases in the incidence of renal tubule adenoma and carcinoma in males and increases in the incidence of mononuclear cell leukemia in males. The incidences in the higher dose groups were also significantly increased. Additionally, in a mouse 2-year inhalation test, significantly increased incidences of liver neoplasms were observed in males and females. Based on the conclusion that there was some evidence of carcinogenic activity for the substance, it was classified into category 2.

Effects on the reproductive system

: Not possible to classify because of insufficient data.

In the animal test results of only the inhalation route, adverse effects of sexual function and fertility were not observed, even if doses that liver to the parent animals, the general toxic effects to the kidneys to express. Even in the developmental toxicity test, minor impact (fetal weight low value, delayed ossification) at a dose that express the mother animal toxicity in test using pregnant rats were only observed. Although the inhalation route is a possibility of out of category, since this is material which is a central nervous system agents, information about the adverse effects of the next generation of neurogenesis development has been insufficient, it was not possible to classify.

Specific target organ systemic toxicity single exposure

: May cause respiratory irritation(category 3) • May cause drowsiness and dizziness(category 3)

In an inhalation test in guinea pigs, irritation of the eyes and nose was observed in relatively low concentrations. Irritation of the nose and throat was reported in humans after inhalation exposure, and in some cases individuals complained about respiratory irritation. Based on these results, it was classified into category 3 (respiratory tract irritation). Furthermore, there is the description that symptoms of inhalation exposure of guinea pig and mouse was anesthetic action, and other inhalation exposure test using rats were observed depression of central nervous system, deprivation of coordination, collapse.

Moreover, at human inhalation cases, depression of central nervous system, dizziness, narcotic were reported, so it was classified into category 3 (anesthetic action).

Specific target organ systemic toxicity repeated exposure

: Cause damage to organs (central nervous system) through prolonged or repeated exposure(category 1)

For humans, more than half of the 19 workers exposed to the substance in a work environment complained of weakness, loss of appetite, headache, stomach ache, nausea and vomiting, and a few of the workers experienced insomnia, somnolence, heartburn and intestinal pain. 5 years later, when the working environment had been significantly improved, a few workers still complained of gastrointestinal and central nervous system effects. There are two further case reports of peripheral neuropathy probably associated with exposure of the substance. Based on the epidemiological information, the substance was classified into Category 1 (central nervous system).

Aspiration hazard

: Not possible to classify because of insufficient data.

Kinematic viscosity is estimated less than 0.691mm²/s at 25°C, 20.5mm²/s at 40°C, but the substance is not hydrocarbons, so it was not possible to classify.

12. Ecological information

Ecotoxicity

Fish toxicity

: Acute aquatic toxicity : Out of category

Chronic aquatic toxicity : Out of category

Brine shrimp EC50=1250mg/L/24H

Persistence and degradability

: High biodegradability

Bioaccumulative potential : Not available

Mobility in soil : Not available

13. Disposal consideration

Residual disposal : Burn in a chemical incinerator equipped with an afterburner and a scrubber. Or entrust approved waste disposal companies with the disposal.

Containers : In case of disposal of empty bottles, dispose bottles after removing the content thoroughly.

14. Transport information

UN class : Class 3(Flammable liquids) P. G. II

UN number : 1245

Marine regulation information

UN No. : 1245

Proper shipping name : METHYL ISOBUTYL KETONE

Class : 3

Sub risk : -

Packing group : II

Marine pollutant : Not applicable

Aviation regulation information

UN No. : 1245

Proper shipping name : Methyl isobutyl ketone

Class : 3

Sub risk : -

Packing group : II

15. Regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

16. Other information

References

Dictionary of Organic Compounds, The society of Synthetic Organic Chemistry, Kodansha Ltd. (1985)

Solvents Handbook, T, Asahara et al, Kodansha Scientific Ltd. (1976)

Dangerous Properties of Industrial Materials, 6th ed. N. I. Sax Van Nostrand Reinhold Company (1984)

Handbook of 16817 Chemical Products, The Chemical Daily Co. (2017)

The information contained herein is based on several references and the present state of our knowledge. However the SDS does not always cover all information about the product, handle the product carefully. The information is intended to ordinary usage, in case of particular handlings, conduct appropriate safety measurements. The information herein is only provision of information, and it does not represent a guarantee the properties of the product. The Safety Data Sheet (SDS) is prepared based on JIS Z7253, and it has the same required elements on the Material Safety Data Sheet (MSDS) which is prepared based on JIS Z7250:2010.