1. Identification of the substance/mixture and of the company/undertaking

Product identifier:
- Product name: 4-Methyl-2-pentanone
- SDS No.: 4897E-2

Details of the supplier of the safety data sheet
- Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.
- Address: 3-1, Honmachibashi, Chuo-ku, Osaka, JAPAN
- Division: Safety Management Dept. of Chemicals
- Telephone number: +81-6-6946-8061
- FAX: +81-6-6946-1607
- e-mail address: kagakuhinanzenkanri@kishida.co.jp

2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture
- PHYSICAL AND CHEMICAL HAZARDS
  - Flammable liquids: Category 2
- HEALTH HAZARDS
  - Acute toxicity (Inhalation): Category 3
  - Serious eye damage/eye irritation: Category 2B
  - Carcinogenicity: Category 2
  - Specific target organ toxicity – single exposure: Category 3 (Respiratory tract irritation)
  - Specific target organ toxicity – single exposure: Category 3 (Narcosis)
  - Specific target organ toxicity – repeated exposure: Category 1 (CNS)

(Note) GHS classification without description: Not classified/Classification not possible

Label elements

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 or dizziness
- Causes damage to organs through prolonged or repeated exposure (CNS)

PRECAUTIONARY STATEMENT
Prevention
- Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- Keep container tightly closed.
- Ground/bond container and receiving equipment.
- Use explosion-proof electrical/ventilating/lighting equipment.
- Use only non-sparking tools.
- Take precautionary measures against static discharge.
- Do not breathe dust/fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
Wash contaminated parts thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
Do not eat, drink or smoke when using this product.

Response
In case of fire: Use appropriate media other than water for extinction.
Get medical advice/attention if you feel unwell.
IF exposed or concerned: Get medical advice/attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.

Storage
Store in a well-ventilated place. Keep container tightly closed. Keep cool.

Disposal
Dispose of contents/container in accordance with local/national regulation.

Specific Physical and Chemical hazards
Highly flammable liquid. Vapor/air mixture may explode.

3. Composition/information on ingredients
Mixture/Substance selection:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Ingredient name</th>
<th>4-Methyl-2-pentanone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content (%)</td>
<td>99 (min)</td>
<td></td>
</tr>
<tr>
<td>Chemical formula</td>
<td>(CH₃)₂CHCH₂COCH₃</td>
<td></td>
</tr>
<tr>
<td>Chemicals No, Japan</td>
<td>2-542</td>
<td></td>
</tr>
<tr>
<td>CAS No.</td>
<td>108-10-1</td>
<td></td>
</tr>
<tr>
<td>MW</td>
<td>100.16</td>
<td></td>
</tr>
<tr>
<td>ECNO</td>
<td>203-550-1</td>
<td></td>
</tr>
</tbody>
</table>

Note: The figures shown above are not the specifications of the product.

4. First-aid measures
Descriptions of first-aid measures
General measures
Get medical attention/advice if you feel unwell.

IF INHALED
Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER or doctor/physician if you feel unwell.

IF ON SKIN (or hair)
Take off immediately all contaminated clothing. Rinse skin with water/shower.
If skin irritation or rash occurs: Get medical advice/attention.

IF IN EYES
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.

IF SWALLOWED
Rinse mouth.
Call a POISON CENTER or doctor/physician if you feel unwell.
5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

In case of fire, use foam, dry powder, CO2 to extinguish.

Unsuitable extinguishing media

Indoor firefighting equipment or outdoor firefighting equipment
Sprinkler equipment
Dry-powder firefighting equipment – except for phosphate etc., hydrogen carbonate etc.
Straight stream water extinguisher
Water mist extinguisher
Reinforcing liquid jet extinguisher
Dry-powder extinguisher – except for phosphate etc., hydrogen carbonate etc.
Bucket of water or tank of water

Specific hazards arising from the substance or mixture

Containers may explode when heated.
Fire may produce irritating, corrosive and/or toxic gases.

Advice for firefighters

Specific fire-fighting measures
Evacuate non-essential personnel to safe area.

Special protective equipment and precautions for fire-fighters

Wear fire/flame resistant/retardant clothing.
Wear protective gloves/protective clothing/eye protection/face protection.
Firefighters should wear self-contained breathing apparatus with full face piece operated positive pressure mode.

6. Accidental release measures

Personnel precautions, protective equipment and emergency procedures

Ventilate area until material pick up is complete.
Wear proper protective equipment.

Environmental precautions

Prevent spills from entering sewers, watercourses or low areas.

Methods and materials for containment and cleaning up

Absorb spill with inert material (dry sand, earth, etc.), then place in a chemical waste container.

Preventive measures for secondary accident
Collect spillage.

7. Handling and storage

Precautions for safe handling

Preventive measures

(Exposure Control for handling personnel)

Do not breathe dust/fume/gas/mist/vapors/spray.

(Protective measures against fire and explosion)

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.

(Exhaust/ventilator)

Exhaust/ventilator should be available.

(Safety treatments)
Avoid contact with skin.
Avoid contact with eyes.

Safety Measures
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
When using do not eat, drink or smoke.

Any incompatibilities
See “10. Stability and Reactivity”

Advice on general occupational hygiene
Wash contaminated parts thoroughly after handling.
Do not eat, drink or smoke when using this product.

Storage
Conditions for safe storage
Keep container tightly closed.
Store in a cool, dry place. Do not store in direct sunlight.

Container and packaging materials for safe handling
Glass
Iron

8. Exposure controls/personal protection

Control parameters
Adopted value
(4-Methyl-2-pentanone)
ACGIH(2009) TWA: 20 ppm;
STEL: 75 ppm (URT irr; dizziness; headache)

OSHA-PEL
4-Methyl-2-pentanone TWA: 100 ppm, 410 mg/m3

Exposure controls
Appropriate engineering controls
Do not use in areas without adequate ventilation.
Eye wash station should be available.
Washing facilities should be available.

Individual protection measures
Respiratory protection
Wear respiratory protection.
Hand protection
Wear protective gloves.
Eye protection
Wear eye/face protection.

9. Physical and Chemical Properties

Information on basic physical and chemical properties
Physical state: Liquid
Color: Colorless, Clear
Odor: Characteristic odour
pH data is not available.
Boiling point or initial boiling point: 117 through 118°C
Boiling range data is not available.
Melting point/Freezing point: -84.7°C
Decomposition temperature data is not available.
Flammability (gases, liquids and solids) data is not available.
Flash point: (C.C.)(4-Methyl-2-pentanone) 14°C
4-Methyl-2-pentanone, 4897E-2, 31/03/2020

Auto-ignition temperature: 460°C
Lower and upper explosion limit/flammability limit:
   Lower explosion limit: 1.4 vol %
   Upper explosion limit: 7.5 vol %
Vapor pressure: 2.1 kPa (20 C)
Relative vapor density (Air=1): 3.45
Density and/or relative density: 0.80
Dynamic viscosity: 0.55 mPas (25°C)
Kinematic viscosity data is not available.
Solubility:
   Solubility in water: 1.91 g/100 ml (20°C)
n-Octanol/water partition coefficient: log Pow 1.38
No Particle characteristics data is not available.

10. Stability and Reactivity
Reactivity
   Not available.
Chemical stability
   Stable under normal storage/handling conditions.
Possibility of hazardous reactions
   The vapour mixes well with air, explosive mixtures are easily formed.
   The substance can form explosive peroxides on exposure to air. Reacts violently with strong oxidants and strong reducing agents. (ICSC 0511)
Conditions to avoid
   Contact with incompatible materials.
   Contact with fire source.
Incompatible materials
   Strong oxidizing agents, Strong reducing agents
Hazardous decomposition products
   Carbon oxides, Explosive peroxides

11. Toxicological Information
Information on toxicological effects
Acute toxicity
   Acute toxicity (Oral)
      [GHS Cat. Japan, base data]
      (4-Methyl-2-pentanone)
      rat LD50=2080mg/kg (ACGIH, 2010)
   Acute toxicity (Inhalation)
      [GHS Cat. Japan, base data]
      (4-Methyl-2-pentanone)
      vapor: rat LC50=8.2mg/L/4hr (NTP TR 538, 2007)
Irritant properties
   Skin corrosion/irritation data is not available.
   Serious eye damage/irritation
      [GHS Cat. Japan, base data]
      (4-Methyl-2-pentanone)
      rabbit recover within 7 days (ECETOC TR48, 1992)
Allergenic and sensitizing effects data is not available.
Mutagenic effects data is not available.
Carcinogenicity
   [GHS Cat. Japan, base data]
(4-Methyl-2-pentanone)
cat.2; IARC Gr. 2B (IARC 101, 2012)
(4-Methyl-2-pentanone)
IARC-Gr.2B: Possibly carcinogenic to humans
(4-Methyl-2-pentanone)
ACGIH-A3(2009): Confirmed Animal Carcinogen with Unknown Relevance to Humans

Reproductive toxicity data is not available.

STOT
STOT-single exposure
[cat.3 (resp. irrit.)]
[GHS Cat. Japan, base data]
(4-Methyl-2-pentanone)
respiratory tract irritation (PATTY 6th, 2012)
[cat.3 (drow./dizz.)]
[GHS Cat. Japan, base data]
(4-Methyl-2-pentanone)
narcosis (PATTY 6th, 2012)

STOT-repeated exposure
[cat.1]
[GHS Cat. Japan, base data]
(4-Methyl-2-pentanone)
CNS (ACGIH 7th, 2010; SIDS, 2011)

Aspiration hazard data is not available.

12. Ecological Information
Ecotoxicity
Aquatic toxicity
Aquatic acute toxicity component(s) data
[GHS Cat. Japan, base data]
(4-Methyl-2-pentanone)
Fish (fat head minnow) LC50=505mg/L/96hr (ECETOC TR91, 2003)

Aquatic chronic toxicity component(s) data
[GHS Cat. Japan, base data]
(4-Methyl-2-pentanone)
Fish (fat head minnow) NOEC=57mg/L/31days (MOE Japan, 2008)

Water solubility
(4-Methyl-2-pentanone)
1.91g/100 ml (20°C) (ICSC, 1997)

Persistence and degradability
(4-Methyl-2-pentanone)
Degradate rapidly (BOD_Degradation: 84%/14 days; TOC_Degradation: 97.1%/14 days; GC_Degradation: 100%/14 days (MITI official bulletin))

Bioaccumulative potential
(4-Methyl-2-pentanone)
log Pow=1.38 (ICSC, 1997)

Mobility in soil
Mobility in soil data is not available.
Other adverse effects
Ozone depleting chemical data is not available.
13. Disposal considerations
Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging.
Waste treatment methods
Dispose of contents/container in accordance with local/national regulation.

14. Transport Information
UN No.: 1245
Proper Shipping Name: METHYL ISOBUTYL KETONE
Class or division: 3
Packing group: II
ERG GUIDE No.: 127
IMDG Code (International Maritime Dangerous Goods Regulations)
UN No.: 1245
Proper Shipping Name: METHYL ISOBUTYL KETONE
Class or division: 3
Packing group: II
IATA Dangerous Goods Regulations
UN No.: 1245
Proper Shipping Name: METHYL ISOBUTYL KETONE
Class or division: 3
Hazard labels: Flamm.liquid
Packing group: II
Environmental hazards
MARPOL Annex III – Prevention of pollution by harmful substances
Marine pollutants (yes/no): no
MARPOL Annex V – Prevention of pollution by garbage discharge
Specific target organ toxicity – repeated exposure: cat.1
4-Methyl-2-pentanone
Transport in bulk according to Annex II of MARPOL73/78 and IBC Code
Noxious Liquid: Cat. Z
4-Methyl-2-pentanone

15. Regulatory Information
Safety, health and environmental regulations/legislation specific for the substance or mixture
US major regulations
Chemicals listed in TSCA Inventory
4-Methyl-2-pentanone
Other regulatory information
Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

16. Other information
GHS classification and labelling
Flam. Liq. 2: H225 Highly flammable liquid and vapor
Acute Tox. 3: H331 Toxic if inhaled
Eye Irrit. 2B: H320 Causes eye irritation
Carc. 2: H351 Suspected of causing cancer
STOT SE 3: H335 May cause respiratory irritation
STOT SE 3: H336 May cause drowsiness or dizziness
STOT RE 1: H372 Causes damage to organs through prolonged or repeated exposure

Reference Book
- Globally Harmonized System of classification and labelling of chemicals, (6th ed., 2015), UN
- Recommendations on the TRANSPORT OF DANGEROUS GOODS 20th edit., 2017 UN
- IMDG Code, 2018 Edition (Incorporating Amendment 39–18)
- IATA Dangerous Goods Regulations (60th Edition) 2019
- Classification, labelling and packaging of substances and mixtures (table3–1 ECNO6182012)
- 2016 EMERGENCY RESPONSE GUIDEBOOK (US DOT)
- 2019 TLVs and BEIs. (ACGIH)

Supplier's data/information

General Disclaimer
This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety.

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products’ properties.

The GHS classification data given here is based on current Japan official data (NITE published in 2018).