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-methylpropyl methyl ketone, 2-pentanone, 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

Company
Sasol Chemicals (USA) LLC
(an affiliate of Sasol Chemicals North America LLC)

Address
12120 Wickchester Lane   Houston TX 77079

Telephone
CHEMTREC North America Transportation Emergency (24-hr) (800) 424-9300
CHEMTREC World Wide (703) 527-3887
Other Emergencies (24-hr) (337) 494-5142
SDS and Product Information (8:00am-4:30pm CST) (281) 588-3491
Health and Safety Information (7:30am-4:00pm CST) (281) 588-3492

E-mail address
SasolElectronicSDS@us.sasol.com

SECTION 2 HAZARDS IDENTIFICATION

OSHA/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)

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.
SAFETY DATA SHEET

Methyl isobutyl ketone (MIBK)

Precautionary statements

Prevention
- 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.
- P260 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/doctor if you feel unwell.

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

Disposal
- P501 Dispose of contents/container to an approved waste disposal plant.

SECTION 3 COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl isobutyl ketone</td>
<td>108-10-1</td>
<td>100</td>
</tr>
</tbody>
</table>

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.
Methyl isobutyl ketone (MIBK)

**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.

**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 1B 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.

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

<table>
<thead>
<tr>
<th>Components</th>
<th>Exposure limit(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl isobutyl</td>
<td>OSHA PEL (Permissible Exposure Limit) 100 ppm 410 mg/m3</td>
</tr>
<tr>
<td>ketone</td>
<td>ACGIH TLV (8-hour) 20 ppm</td>
</tr>
<tr>
<td></td>
<td>ACGIH STEL (Short Term Exposure Limit) 75 ppm</td>
</tr>
</tbody>
</table>

PEL= Permissible Exposure Limits  TWA= Time Weighted Average (8 hr.)
TLV= Threshold Limit Value       STEL= Short Term Exposure Limit (15 min.)
EL= Excursion Limit              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.
Methyl isobutyl ketone (MIBK)

**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)

### Serious eye damage/eye irritation
(Rabbit) irritating, (literature value)

### Respiratory or skin sensitisation
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
Methyl isobutyl ketone (MIBK)

Carcinogenicity

Assessment carcinogenicity:
MIBK has caused cancer in some laboratory animals. These effects are believed to be species-specific and unlikely to occur in humans.

Carcinogenicity ratings

Methyl isobutyl ketone
IARC Group 2B: Possibly 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

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)

Bioaccumulative potential
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 and 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 ILLUMINATION; 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

SECTION 15 REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

TSCA Inventory Listing

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Pentanone, 4-methyl-</td>
<td>108-10-1</td>
</tr>
</tbody>
</table>

SARA 302 Status

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

SARA 311/312 Classification

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

SARA 313 Chemical

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Pentanone, 4-methyl-</td>
<td>108-10-1</td>
<td>100 %</td>
</tr>
</tbody>
</table>

US. EPA CERCLA Hazardous Substances (40 CFR 302)

<table>
<thead>
<tr>
<th>Components</th>
<th>Reportable Quantity</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

Methyl isobutyl ketone (MIBK)

2-Pentanone, 4-methyl- 5,000 LB 100 %

INTERNATIONAL REGULATIONS

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

European Union
Classification according to Regulation (EU) 1272/2008.
Flammable liquids, Category 2
Acute toxicity (Inhalation), Category 4
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. ISHL - Inventory of Chemical Substances Listed
Canada. Domestic Substances List (DSL) Inventory Listed
Canada. Non-Domestic Substance Listing (NDSL) Not listed
Philippines. Inventory of Chemicals / Chemical Substances (PICCS) Listed
Korea. Existing Chemicals Inventory (KECI) Listed
China. Inventory of Existing Chemical Substances (IECSC) Listed
Mexico Listed
New Zealand. Inventory of Chemical Substances Listed
Switzerland 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.
Methyl isobutyl ketone (MIBK)

STATE REGULATIONS

California Prop. 65
Components
2-Pentanone, 4-methyl-

CAS-No.
108-10-1

SECTION 16 OTHER INFORMATION

HAZARD RATINGS

<table>
<thead>
<tr>
<th>HMIS®</th>
<th>Health</th>
<th>Flammability</th>
<th>Physical Hazard/</th>
<th>Instability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>NFPA</td>
<td>2</td>
<td>3</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

THE DATA AND INFORMATION CONTAINED HEREBIN ARE BEING FURNISHED FOR INFORMATIONAL PURPOSES ONLY, UPON THE EXPRESS CONDITION THAT EACH CUSTOMER SHALL MAKE ITS OWN ASSESSMENT OF APPROPRIATE USE AND APPROPRIATE SHIPPING, TRANSFER AND STORAGE MATERIALS AND PROCEDURES FOR SASOL CHEMICALS (USA) LLC'S PRODUCTS. ALTHOUGH BASED ON INFORMATION SOURCES WHICH SASOL CHEMICALS (USA) LLC CONSIDERS ACCURATE AND RELIABLE, SASOL CHEMICALS (USA) LLC MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, REGARDING THE VALIDITY OF THIS INFORMATION, THE INFORMATION SOURCES UPON WHICH THE SAME ARE BASED, OR THE RESULTS TO BE OBTAINED, AND EXPRESSLY DISCLAIMS LIABILITIES FOR DAMAGES OR INJURIES RESULTING FROM THE USE THEREOF.