SAFETY DATA SHEET

Isoprene Feedstock
Version 3.0
Revision Date 2019-04-17

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

Product information

Product Name : Isoprene Feedstock
Material : 1059202, 1059201, 1037432, 1015403

Use : Chemical intermediate

Company : Chevron Phillips Chemical Company LP
10001 Six Pines Drive
The Woodlands, TX 77380

Emergency telephone:

Health:
866.442.9628 (North America)
1.832.813.4984 (International)

Transport:
CHEMTREC 800.424.9300 or 703.527.3887(int'l)
Asia: CHEMWATCH (+612.9186.1132) China: 0532 8388 9090
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431

Responsible Department: Product Safety and Toxicology Group
E-mail address: SDS@CPChem.com
Website: www.CPChem.com

SECTION 2: Hazards identification

Classification of the substance or mixture
This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Classification:
- Flammable liquids, Category 1
- Acute toxicity, Category 4, Oral
- Skin irritation, Category 2
- Eye irritation, Category 2A
- Germ cell mutagenicity, Category 1B
- Carcinogenicity, Category 1A
- Reproductive toxicity, Category 2

SDS Number: 100000013397
Specific target organ systemic toxicity - single exposure,
Category 3, Central nervous system
Specific target organ systemic toxicity - repeated exposure,
Category 1, Blood
Specific target organ systemic toxicity - repeated exposure,
Category 2, Auditory organs, Liver, Kidney, Nervous system
Specific target organ systemic toxicity - repeated exposure,
Category 2, Inhalation, Auditory organs
Aspiration hazard, Category 1

Labeling

Symbol(s): 

Signal Word: Danger

H302: Harmful if swallowed.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H336: May cause drowsiness or dizziness.
H340: May cause genetic defects.
H350: May cause cancer.
H361: Suspected of damaging fertility or the unborn child.
H372: Causes damage to organs (Blood, Auditory organs, Liver, Kidney, Nervous system) through prolonged or repeated exposure.
H373: May cause damage to organs (Auditory organs) through prolonged or repeated exposure if inhaled.

Precautionary Statements : 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.
P260 Do not breathe dust/fume/gas/mist/vapor/spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P312 IF INHALED: Remove person to fresh...
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air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P331 Do NOT induce vomiting.
P332 + P313 If skin irritation occurs: Get medical advice/attention.
P337 + P313 If eye irritation persists: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

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

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

Carcinogenicity:

IARC
Group 1: Carcinogenic to humans
Benzene 71-43-2
1,3-Butadiene 106-99-0
Group 2B: Possibly carcinogenic to humans
Isoprene 78-79-5
Ethylbenzene 100-41-4

NTP
Known to be human carcinogen
Benzene 71-43-2
1,3-Butadiene 106-99-0
Reasonably anticipated to be a human carcinogen
Isoprene 78-79-5

SECTION 3: Composition/information on ingredients

Synonyms:
C5 Amylene
C5 Diolefin Stream
Crude Isoprene

Molecular formula: UVCB

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naphtha, (Petroleum), Light Steam-Cracked, Isoprene-Rich</td>
<td>68514-39-6</td>
<td>100</td>
</tr>
<tr>
<td>Isopentane</td>
<td>78-78-4</td>
<td>0 - 60</td>
</tr>
<tr>
<td>n-Pentane</td>
<td>109-66-0</td>
<td>0 - 60</td>
</tr>
<tr>
<td>Isoprene</td>
<td>78-79-5</td>
<td>0 - 60</td>
</tr>
<tr>
<td>Cyclopentadiene</td>
<td>542-92-7</td>
<td>0 - 30</td>
</tr>
</tbody>
</table>

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SECTION 4: First aid measures

General advice: Move out of dangerous area. Show this material safety data sheet to the doctor in attendance. Material may produce a serious, potentially fatal pneumonia if swallowed or vomited.

If inhaled: Consult a physician after significant exposure. If unconscious, place in recovery position and seek medical advice.

In case of skin contact: If skin irritation persists, call a physician. If on skin, rinse well with water. If on clothes, remove clothes.

In case of eye contact: Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed: Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.

SECTION 5: Firefighting measures

Flash point: -54 °C (-65 °F)
Method: Tag closed cup

Autoignition temperature: 220 °C (428 °F)

Suitable extinguishing media: Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.

Unsuitable extinguishing media: High volume water jet.

Specific hazards during firefighting: Do not allow run-off from fire fighting to enter drains or water courses.

Special protective equipment for fire-fighters: Wear self-contained breathing apparatus for firefighting if necessary.

Further information: Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. For safety reasons in case of fire, cans should be stored separately in closed...
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SECTION 6: Accidental release measures

Personal precautions: Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

Environmental precautions: Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.

Methods for cleaning up: 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).

SECTION 7: Handling and storage

Handling

Advice on safe handling: Avoid formation of aerosol. Do not breathe vapors/dust. Avoid exposure - obtain special instructions before use. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharges. Provide sufficient air exchange and/or exhaust in work rooms. Container may be opened only under exhaust ventilation hood. Open drum carefully as content may be under pressure. Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion: Do not spray on an open flame or any other incandescent material. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use only explosion-proof equipment. Keep away from open flames, hot surfaces and sources of ignition.

Storage

Requirements for storage areas and containers: No smoking. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Electrical installations / working
SECTION 8: Exposure controls/personal protection

Ingredients with workplace control parameters

<table>
<thead>
<tr>
<th>US</th>
<th>Components</th>
<th>Basis</th>
<th>Value</th>
<th>Control parameters</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Isopentane</td>
<td>ACGIH</td>
<td>TWA</td>
<td>1,000 ppm.</td>
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<tr>
<td></td>
<td>n-Pentane</td>
<td>OSHA Z-1</td>
<td>TWA</td>
<td>1,000 ppm, 2,950 mg/m³</td>
<td>(b).</td>
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<td>OSFA Z-1-A</td>
<td>TWA</td>
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<td>US WEEL</td>
<td>TWA</td>
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<td>URT irr, LRT irr, eye irr.</td>
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<td>STEL</td>
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<td>Benzene, dimethyl</td>
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<td>TWA</td>
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<tr>
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<td>ACGIH</td>
<td>TWA</td>
<td>100 ppm.</td>
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<tr>
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<td>ACGIH</td>
<td>STEL</td>
<td>150 ppm.</td>
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<td>(b).</td>
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<td>OSFA Z-1-A</td>
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<td>OSFA Z-1-A</td>
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<td>n-Heptane</td>
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<tr>
<td></td>
<td>ACGIH</td>
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<td>400 ppm.</td>
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<tr>
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<td>ACGIH</td>
<td>STEL</td>
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<td>ACGIH</td>
<td>TWA</td>
<td>50 ppm.</td>
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<td>OSFA Z-1</td>
<td>TWA</td>
<td>500 ppm, 1,800 mg/m³</td>
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<tr>
<td></td>
<td>OSFA Z-1-A</td>
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<td>OSFA Z-1</td>
<td>TWA</td>
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<td>ACGIH</td>
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<td>600 ppm.</td>
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<td>Toluene</td>
<td>ACGIH</td>
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<td>OSFA Z-2</td>
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<td>Benzene</td>
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<td>0.5 ppm.</td>
<td>leukemia, BEI, A1, Skin.</td>
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<td>ACGIH</td>
<td>STEL</td>
<td>2.5 ppm.</td>
<td>leukemia, BEI, A1, Skin.</td>
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<td>OSFA Z-1-A</td>
<td>TWA</td>
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<tr>
<td></td>
<td>OSFA Z-1-A</td>
<td>CEIL</td>
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<td>OSFA Z-2</td>
<td>Peak</td>
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<tr>
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<td>OSFA 29 CFR 1910.1028(c)</td>
<td>TWA</td>
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<td>OSFA 29 CFR 1910.1028(c)</td>
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<td>OSFA CARC</td>
<td>PEL</td>
<td>1 ppm.</td>
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</tr>
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<td>OSFA CARC</td>
<td>STEL</td>
<td>5 ppm.</td>
<td></td>
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</tr>
<tr>
<td>1,3-Butadiene</td>
<td>ACGIH</td>
<td>TWA</td>
<td>2 ppm.</td>
<td>cancer, A2.</td>
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</tr>
<tr>
<td></td>
<td>OSFA Z-1</td>
<td>TWA</td>
<td>1 ppm.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSFA Z-1</td>
<td>STEL</td>
<td>5 ppm.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OSFA CARC</td>
<td>PEL</td>
<td>1 ppm.</td>
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</tbody>
</table>

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OSHA 29 CFR 1910.1051(c) | TWA | 1 ppm, 2019-04-17
OSHA CARC | STEL | 5 ppm, 2019-04-17
OSHA 29 CFR 1910.1051(c) | STEL | 5 ppm, 2019-04-17

(a) This standard applies to the industry segments exempt from the 1 ppm 8-hour TWA and 5 ppm STEL of the benzene standard at 1910.1028.
(b) The value in mg/m3 is approximate.
A1 Confirmed human carcinogen
A2 Suspected human carcinogen
A3 Confirmed animal carcinogen with unknown relevance to humans
A4 Not classifiable as a human carcinogen
BEI Substances for which there is a Biological Exposure Index or Indices (see BEI® section)
cancer Cancer
CNS impair Central Nervous System impairment
cochlear imp Cochlear impairment
EX Explosion hazard: the substance is a flammable asphyxiant or excursions above the TLV® could approach 10% of the lower explosive limit.
eye irr Eye irritation
female repro Female reproductive
kidney dam Kidney damage (nephropathy)
leukemia Leukemia
LRT irr Lower Respiratory Tract irritation
neuropathy Peripheral neuropathy
pregnancy loss Pregnancy loss
Skin Danger of cutaneous absorption
skin irr Skin irritation
URT irr Upper Respiratory Tract irritation
visual impair Visual impairment

Hazardous components without workplace control parameters

Immediately Dangerous to Life or Health Concentrations (IDLH)

<table>
<thead>
<tr>
<th>Substance name</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Update</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Pentane</td>
<td>109-66-0</td>
<td>Immediately Dangerous to Life or Health Concentration Value 1500 parts per million</td>
<td>1995-03-01</td>
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<tr>
<td>Cyclopentadiene</td>
<td>542-92-7</td>
<td>Immediately Dangerous to Life or Health Concentration Value 750 parts per million</td>
<td>1995-03-01</td>
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<tr>
<td>Benzene, dimethyl-</td>
<td>1330-20-7</td>
<td>Immediately Dangerous to Life or Health Concentration Value 900 parts per million</td>
<td>1995-03-01</td>
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<tr>
<td>Ethylbenzene</td>
<td>100-41-4</td>
<td>Immediately Dangerous to Life or Health Concentration Value 800 parts per million</td>
<td>1995-03-01</td>
</tr>
<tr>
<td>n-Heptane</td>
<td>142-82-5</td>
<td>Immediately Dangerous to Life or Health Concentration Value 750 parts per million</td>
<td>1995-03-01</td>
</tr>
<tr>
<td>n-hexane</td>
<td>110-54-3</td>
<td>Immediately Dangerous to Life or Health Concentration Value 1100 parts per million</td>
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<tr>
<td>Toluene</td>
<td>108-88-3</td>
<td>Immediately Dangerous to Life or Health Concentration Value 500 parts per million</td>
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<tr>
<td>Benzene</td>
<td>71-43-2</td>
<td>Immediately Dangerous to Life or Health Concentration Value 500 parts per million</td>
<td>1995-03-01</td>
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<tr>
<td>1,3-Butadiene</td>
<td>106-99-0</td>
<td>Immediately Dangerous to Life or Health Concentration Value 2000 parts per million</td>
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</tbody>
</table>

Biological exposure indices

US

<table>
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<tr>
<th>Substance name</th>
<th>CAS-No.</th>
<th>Control parameters</th>
<th>Sampling time</th>
<th>Update</th>
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<td>Immediately Dangerous to Life or Health Concentration Value 1500 parts per million</td>
<td>1995-03-01</td>
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</tbody>
</table>
### Engineering measures

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

### Personal protective equipment

**Respiratory protection**: Wear a supplied-air NIOSH approved respirator unless ventilation or other engineering controls are adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure. Wear a NIOSH approved respirator that provides protection when working with this material if exposure to harmful levels of airborne material may occur, such as: Air-Purifying Respirator for Organic Vapors. Full-Face Air-Purifying Respirator for Organic Vapors, Dusts and Mists. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

**Hand protection**: The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the
product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Eye protection: Eye wash bottle with pure water. Tightly fitting safety goggles.

Skin and body protection: Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place. Wear as appropriate.: Flame retardant antistatic protective clothing. Workers should wear antistatic footwear.

Hygiene measures: When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance
Physical state: Liquid
Color: Colorless
Odor: distinct, hydrocarbon-like

Safety data
Flash point: -54 °C (-65 °F)
Method: Tag closed cup
Lower explosion limit: 1.5 %(V)
Upper explosion limit: 8.9 %(V)
Oxidizing properties: No
Autoignition temperature: 220 °C (428 °F)
Thermal decomposition: No data available
Molecular formula: UVCB
Molecular weight: Not applicable
pH: Not applicable
Freezing point: -147 °C (-233 °F)
Pour point: No data available

Boiling point/boiling range: 33.9 °C (93.0 °F)
Vapor pressure: 400.00 MMHG at 20 °C (68 °F)
Relative density: 0.66 - 0.69 at 15.6 °C (60.1 °F)
Isoprene Feedstock

SECTION 10: Stability and reactivity

Chemical stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

Possibility of hazardous reactions

Hazardous reactions: Hazardous polymerization does not occur.
Further information: No decomposition if stored and applied as directed.
Hazardous reactions: Vapors may form explosive mixture with air.

Conditions to avoid: Heat, flames and sparks.

Materials to avoid: May react with oxygen and strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.

Thermal decomposition: No data available

Hazardous decomposition products: Carbon oxides

Other data: No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

Isoprene Feedstock
Acute oral toxicity: LD50: 310.56 mg/kg
Species: Rat
Method: Acute toxicity estimate

Isoprene Feedstock
Acute inhalation toxicity: LC50: > 20 mg/l
Species: Rat
Test atmosphere: vapor
### Isoprene Feedstock

#### Acute dermal toxicity
- **LD50 Dermal**: > 2,000 mg/kg
- **Species**: Rabbit
- **Method**: Acute toxicity estimate

#### Skin irritation
- **Irritating to skin.**
- **May cause skin irritation in susceptible persons.**

#### Eye irritation
- **Irritating to eyes.**
- **Vapors may cause irritation to the eyes, respiratory system and the skin.**

#### Sensitization
- **Did not cause sensitization on laboratory animals.**
- **Information refers to the main ingredient.**

#### Repeated dose toxicity
- **This information is not available.**

### Genotoxicity in vitro

#### Isopentane
- **Test Type**: Ames test
- **Concentration**: 1, 2, 5, 8, 10%
- **Metabolic activation**: with and without metabolic activation
- **Method**: OECD Test Guideline 471
- **Result**: negative

- **Test Type**: Ames test
- **Concentration**: 1, 2, 5, 8, 10, 25, 50%
- **Metabolic activation**: with and without metabolic activation
- **Method**: OECD Test Guideline 471
- **Result**: negative
- **Remarks**: Information given is based on data obtained from similar substances.

- **Test Type**: Chromosome aberration test in vitro
- **Metabolic activation**: with and without metabolic activation
- **Method**: Mutagenicity (in vitro mammalian cytogenetic test)
- **Result**: negative
- **Remarks**: Information given is based on data obtained from similar substances.

#### n-Pentane
- **Test Type**: Ames test
- **Metabolic activation**: with and without metabolic activation
- **Result**: negative

- **Test Type**: Chromosome aberration test in vitro
- **Metabolic activation**: with and without metabolic activation
- **Result**: Ambiguous

#### Isoprene
- **Test Type**: Ames test
<table>
<thead>
<tr>
<th>Chemical</th>
<th>Test Type</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzene, dimethyl-</td>
<td>Ames test</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Mouse lymphoma assay</td>
<td>negative</td>
</tr>
<tr>
<td>Ethylbenzene</td>
<td>Ames test</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Unscheduled DNA synthesis assay</td>
<td>negative</td>
</tr>
<tr>
<td>n-Butane</td>
<td>Ames test</td>
<td>negative</td>
</tr>
<tr>
<td>n-Heptane</td>
<td>Ames test</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Mutagenicity (Escherichia coli - reverse mutation assay)</td>
<td>negative</td>
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<tr>
<td></td>
<td>Mammalian cell gene mutation assay</td>
<td>negative</td>
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<tr>
<td></td>
<td>Chromosome aberration test in vitro</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Mitotic recombination</td>
<td>negative</td>
</tr>
<tr>
<td>n-hexane</td>
<td>Ames test</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Metabolic activation: with and without metabolic activation</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Mammalian cell gene mutation assay</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Chromosome aberration test in vitro</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Mitotic recombination</td>
<td>negative</td>
</tr>
<tr>
<td>Cyclopentane</td>
<td>Modified Ames test</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Metabolic activation: with and without metabolic activation</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Mouse lymphoma assay</td>
<td>Positive results were obtained in some in vitro tests.</td>
</tr>
<tr>
<td></td>
<td>Metabolic activation: with and without metabolic activation</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>modified Ames test</td>
<td>negative</td>
</tr>
<tr>
<td></td>
<td>Concentration: 1250 microgram/plate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Metabolic activation: with and without metabolic activation</td>
<td>negative</td>
</tr>
</tbody>
</table>

Remarks: In vitro tests did not show mutagenic effects.
Isoprene Feedstock

Test Type: Mouse lymphoma assay
Concentration: 200 microgram/milliliter
Metabolic activation: with and without metabolic activation
Result: negative
Remarks: In vitro tests did not show mutagenic effects

Toluene
Test Type: Ames test
Result: negative

Test Type: Sister Chromatid Exchange Assay
Result: negative

Test Type: Mouse lymphoma assay
Result: negative

Test Type: Cytogenetic assay
Result: negative

Benzene
Test Type: Ames test
Result: negative

Test Type: Cytogenetic assay
Result: positive

Test Type: Mouse lymphoma assay
Result: positive

Test Type: Sister Chromatid Exchange Assay
Result: negative

1,3-Butadiene
Test Type: Ames test
Metabolic activation: with and without metabolic activation
Result: Positive results were obtained in some in vitro tests.

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster cells
Method: OECD Guideline 473
Result: positive

Genotoxicity in vivo

Isopentane
Test Type: In vivo micronucleus test
Species: Rat
Cell type: Bone marrow
Route of Application: inhalation (vapor)
Remarks: Information given is based on data obtained from similar substances.

n-Pentane
Test Type: Micronucleus test
Species: Rat
Cell type: Bone marrow
Result: negative

Isoprene
Result: negative
<table>
<thead>
<tr>
<th>Chemical</th>
<th>Test Type</th>
<th>Species</th>
<th>Route of Application</th>
<th>Exposure Time</th>
<th>Dose</th>
<th>Result</th>
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</thead>
<tbody>
<tr>
<td>Benzene, dimethyl</td>
<td>Micronucleus test</td>
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<td>Ethylbenzene</td>
<td>Mouse micronucleus assay</td>
<td>Mouse</td>
<td></td>
<td></td>
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<td>n-hexane</td>
<td>Dominant lethal assay</td>
<td>Mouse</td>
<td>Inhalation (gas)</td>
<td>6 h per day for 5 days</td>
<td>100 and 400 ppm</td>
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<tr>
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<td>Cytogenetic assay</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Species: Rat</td>
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<td>Result: negative</td>
<td></td>
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<td>Micronucleus test</td>
<td>Mouse</td>
<td></td>
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<td>28.7 mg/l</td>
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<td>Cytogenetic assay</td>
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<td></td>
<td>Species: Rat</td>
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<tr>
<td></td>
<td>Dose: 900, 3000, 9000 ppm</td>
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<td>Result: negative</td>
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</tr>
<tr>
<td>Benzene</td>
<td>Mouse micronucleus assay</td>
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<td>positive</td>
</tr>
<tr>
<td>1,3-Butadiene</td>
<td>Mouse micronucleus assay</td>
<td>mice</td>
<td>Inhalation (gas)</td>
<td>6 h per day for 5 days</td>
<td>50, 200, 500, 1300 ppm</td>
<td>positive</td>
</tr>
<tr>
<td></td>
<td>Species: mice</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Dose: 50, 200, 500, 1300 ppm</td>
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<td>Method: OECD Test Guideline 474</td>
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<tr>
<td></td>
<td>Result: positive</td>
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</tr>
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<td></td>
<td>Mouse micronucleus assay</td>
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<td>negative</td>
</tr>
<tr>
<td></td>
<td>Species: mice</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Dose: 50, 200, 500, 1300 ppm</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Method: OECD Test Guideline 478</td>
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</tr>
</tbody>
</table>

**Isoprene Feedstock**

**Carcinogenicity**
- Remarks: This information is not available.

**Isoprene Feedstock**

**Reproductive toxicity**
- This information is not available.

**Isoprene Feedstock**

**Developmental Toxicity**
- This information is not available.
**Isoprene Feedstock**

**Aspiration toxicity**
- May be fatal if swallowed and enters airways. Substances known to cause human aspiration toxicity hazards or to be regarded as if they cause human aspiration toxicity hazard.

**Toxicology Assessment**

**CMR effects**
- Carcinogenicity: May cause cancer.
- Mutagenicity: May cause genetic defects.
- Teratogenicity: Not available
- Reproductive toxicity: May damage the unborn child.

**Further information**
- Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Concentrations substantially above the TLV value may cause narcotic effects. Solvents may degrease the skin.

**SECTION 12: Ecological information**

**Ecotoxicity effects**

**Toxicity to fish**
- Toxic to fish. Information given is based on data obtained from similar substances.

**Toxicity to daphnia and other aquatic invertebrates**
- Toxic to aquatic organisms. Information given is based on data obtained from similar substances.

**Toxicity to algae**
- Toxic to algae. Information given is based on data obtained from similar substances.

**Toxicity to fish (Chronic toxicity)**

- n-Heptane: NOELR: 1.284 mg/l
  - Exposure time: 28 d
  - Species: Oncorhynchus mykiss (rainbow trout)
  - Method: QSAR modeled data

**Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)**

- Ethylbenzene: NOEC: 1 mg/l
  - Exposure time: 7 d
## Isoprene Feedstock

**SAFETY DATA SHEET**

**Version 3.0**

**Revision Date 2019-04-17**

### Species

Species: Daphnia pulex (Water flea)

semi-static test

Analytical monitoring: yes

### Biodegradability

Expected to be ultimately biodegradable

### Elimination information (persistence and degradability)

Bioaccumulation: This material is not expected to bioaccumulate.

Results of PBT assessment: This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT).

### Additional ecological information

Biodegradability:

Expected to be ultimately biodegradable

Elimination information (persistence and degradability):

Bioaccumulation:

This material is not expected to bioaccumulate.

Results of PBT assessment:

This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT).

Additional ecological information:

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Toxic to aquatic life with long lasting effects.

### Ecotoxicology Assessment

**Short-term (acute) aquatic hazard**

Toxic to aquatic life.

**Long-term (chronic) aquatic hazard**

Toxic to aquatic life with long lasting effects.

### SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

**Product**

The product should not be allowed to enter drains, water courses or the soil. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

**Contaminated packaging**

Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.

### SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

**US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)**

UN3295, HYDROCARBONS, LIQUID, N.O.S., 3, I, MARINE POLLUTANT, (ISOPRENE), RQ

SDS Number:100000013397

16/21
Isoprene Feedstock

(BENZENE, 1,3-BUTADIENE)

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN3295, HYDROCARBONS, LIQUID, N.O.S., 3, I, (-54 °C), MARINE POLLUTANT, (NAPHTHA, (PETROLEUM), LIGHT STEAM-CRACKED, ISOPRENE-RICH)

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)
UN3295, HYDROCARBONS, LIQUID, N.O.S., 3, I

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))
UN3295, HYDROCARBONS, LIQUID, N.O.S., 3, I, (D/E), ENVIRONMENTALLY HAZARDOUS, (NAPHTHA, (PETROLEUM), LIGHT STEAM-CRACKED, ISOPRENE-RICH)

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))
UN3295, HYDROCARBONS, LIQUID, N.O.S., 3, I, ENVIRONMENTALLY HAZARDOUS, (NAPHTHA, (PETROLEUM), LIGHT STEAM-CRACKED, ISOPRENE-RICH)

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)
UN3295, HYDROCARBONS, LIQUID, N.O.S., 3, I, ENVIRONMENTALLY HAZARDOUS, (NAPHTHA, (PETROLEUM), LIGHT STEAM-CRACKED, ISOPRENE-RICH)

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

SECTION 15: Regulatory information

National legislation

SARA 311/312 Hazards: Flammable (gases, aerosols, liquids, or solids)
Acute toxicity (any route of exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation
Germ cell mutagenicity
Carcinogenicity
Reproductive toxicity
Specific target organ toxicity (single or repeated exposure)
Aspiration hazard

EPCRA - EMERGENCY PLANNING COMMUNITY RIGHT - TO – KNOW

CERCLA Reportable Quantity: 167 lbs
Isoprene

SDS Number: 100000013397 17/21
Isoprene Feedstock

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SARA 302 Reportable Quantity</td>
<td>This material does not contain any components with a SARA 302 RQ.</td>
</tr>
<tr>
<td>SARA 302 Threshold Planning Quantity</td>
<td>No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.</td>
</tr>
<tr>
<td>SARA 304 Reportable Quantity</td>
<td>This material does not contain any components with a section 304 EHS RQ.</td>
</tr>
<tr>
<td>SARA 313 Components</td>
<td>The following components are subject to reporting levels established by SARA Title III, Section 313:</td>
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<tr>
<td></td>
<td>Dicyclopentadiene - 77-73-6</td>
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<tr>
<td></td>
<td>Benzene, dimethyl- - 1330-20-7</td>
</tr>
<tr>
<td></td>
<td>Ethylbenzene - 100-41-4</td>
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<tr>
<td></td>
<td>n-hexane - 110-54-3</td>
</tr>
<tr>
<td></td>
<td>Toluene - 108-88-3</td>
</tr>
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<td></td>
<td>Benzene - 71-43-2</td>
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<td></td>
<td>1,3-Butadiene - 106-99-0</td>
</tr>
<tr>
<td></td>
<td>Styrene - 100-42-5</td>
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</table>

Clean Air Act

Ozone-Depletion Potential: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):
- Ethylbenzene - 100-41-4
- n-hexane - 110-54-3
- Toluene - 108-88-3
- Benzene - 71-43-2

The following chemical(s) are listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F):
- Isopentane - 78-78-4
- Isoprene - 78-79-5
- n-Butane - 106-97-8
- cis-2-Pentene - 627-20-3
- trans-2-Pentene - 646-04-8
- 3-Methyl-1-Butene - 563-45-1
- 2-methyl-1-butene - 563-46-2

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489):
- Isopentane - 78-78-4
- Isoprene - 78-79-5
Isoprene Feedstock

Benzene, dimethyl - 1330-20-7
Ethylbenzene - 100-41-4
Toluene - 108-88-3
Benzene - 71-43-2

US State Regulations

Pennsylvania Right To Know:
- Isopentane - 78-78-4
- n-Pentane - 109-66-0
- Isoprene - 78-79-5
- Cyclopentadiene - 542-92-7
- Benzene, dimethyl - 1330-20-7
- Ethylbenzene - 100-41-4
- n-Butane - 106-97-8
- n-Heptane - 142-82-5
- n-hexane - 110-54-3
- Cyclopentane - 287-92-3
- Toluene - 108-88-3
- Benzene - 71-43-2
- 1,3-Butadiene - 106-99-0
- Methylcyclopentane - 96-37-7

California Prop. 65 Components:
WARNING: This product can expose you to chemicals including [listed below], which is [are] known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov/food.

- Isoprene 78-79-5

WARNING: This product can expose you to chemicals including [listed below], which is [are] known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

- Toluene 108-88-3

Notification status
Europe REACH: Not in compliance with the inventory
Switzerland CH INV: On the inventory, or in compliance with the inventory
United States of America (USA) TSCA: On the inventory, or in compliance with the inventory
Canada NDSL: On the inventory, or in compliance with the inventory
Australia AICS: Not in compliance with the inventory
New Zealand NZIoC: Not in compliance with the inventory
Japan ENCS: On the inventory, or in compliance with the inventory
Korea KECI: On the inventory, or in compliance with the inventory
Isoprene Feedstock

SECTION 16: Other information

NFPA Classification: Health Hazard: 2
Fire Hazard: 4
Reactivity Hazard: 2

Further information
Legacy SDS Number: PE0052

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

<table>
<thead>
<tr>
<th>Key or legend to abbreviations and acronyms used in the safety data sheet</th>
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SDS Number:100000013397  20/21
<table>
<thead>
<tr>
<th>IECSC</th>
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<th>TWA</th>
<th>Time Weighted Average</th>
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<td>ENCS</td>
<td>Japan, Inventory of Existing and New Chemical Substances</td>
<td>TSCA</td>
<td>Toxic Substance Control Act</td>
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<tr>
<td>KECI</td>
<td>Korea, Existing Chemical Inventory</td>
<td>UVCB</td>
<td>Unknown or Variable Composition, Complex Reaction Products, and Biological Materials</td>
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<tr>
<td>&lt;=</td>
<td>Less Than or Equal To</td>
<td>WHMIS</td>
<td>Workplace Hazardous Materials Information System</td>
</tr>
<tr>
<td>LC50</td>
<td>Lethal Concentration 50%</td>
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