# S-Chem Laboratory Calibration Gas

Version 1.1 Revision Date 2020-10-14

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

**Product information**

Product Name : S-Chem Laboratory Calibration Gas

**Company** : Saudi Chevron Phillips Company
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**

: Skin irritation, Category 2
Germ cell mutagenicity, Category 1B
Carcinogenicity, Category 1A
Reproductive toxicity, Category 1A
Specific target organ toxicity - single exposure, Category 3, Central nervous system
Specific target organ toxicity - repeated exposure, Category 1, Inhalation, Blood
Specific target organ toxicity - repeated exposure, Category 2, Inhalation, Auditory organs, color vision
Simple Asphyxiant

**Labeling**

Symbol(s) :

Signal Word : Danger

Hazard Statements : H220: Extremely flammable gas.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H340: May cause genetic defects.
H350: May cause cancer.
H360D: May damage the unborn child.
H372: Causes damage to organs (Blood) through prolonged or repeated exposure if inhaled.
H373: May cause damage to organs (Auditory organs, color vision) through prolonged or repeated exposure if inhaled.
May displace oxygen and cause rapid suffocation.

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.
P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ 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:**
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 Eliminate all ignition sources if safe to do so.
**Storage:**
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
**Disposal:**
P501 Dispose of contents/ container to an approved waste disposal plant.

**Carcinogenicity:**

**IARC** Group 1: Carcinogenic to humans

1,3-Butadiene 106-99-0

**NTP** Known to be human carcinogen
1,3-Butadiene 106-99-0

## SECTION 3: Composition/information on ingredients

| Component | CAS-No. | Weight % |
|---|---|---|
| Ethylene | 74-85-1 | 0 - 99.9 |
| Propylene | 115-07-1 | 0 - 99 |
| Ethane | 74-84-0 | 0 - 95 |
| Isobutane | 75-28-5 | 0 - 95 |
| Methane | 74-82-8 | 0 - 70 |
| 1-Hexene | 592-41-6 | 0 - 66 |
| Propane | 74-98-6 | 0 - 25 |
| Alkenes, C6 | 68526-52-3 | 0 - 15 |
| n-Butane | 106-97-8 | 0 - 25 |
| 1,3-Butadiene | 106-99-0 | 0 - 12 |
| Toluene | 108-88-3 | 0 - 10 |
| Xylenes | 1330-20-7 | 0 - 7 |
| 2-Methylpentane | 107-83-5 | 0 - 6 |
| 1-Butene | 106-98-9 | 0 - 5 |
| Carbon Dioxide | 124-38-9 | 0 - 2 |
| Carbon Monoxide | 630-08-0 | 0 - 1.5 |
| Hydrogen Sulfide | 7783-06-4 | 0 - 1 |
| Propadiene | 463-49-0 | 0 - 1 |
| Methylacetylene | 74-99-7 | 0 - 1 |

## SECTION 4: First aid measures

General advice : Move out of dangerous area. Show this material safety data sheet to the doctor in attendance.

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 : Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.

If swallowed : Induce vomiting immediately and call a physician. Keep respiratory tract clear. Do not give milk or alcoholic beverages. 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 : 45°C (113°F)

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

media

| | | |
|---|---|---|
| Unsuitable extinguishing media | : | High volume water jet. |
| Specific hazards during fire fighting | : | 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 containments. Use a water spray to cool fully closed containers. |
| Fire and explosion protection | : | Do not spray on a naked flame or any 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. |

## 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. |

## SECTION 7: Handling and storage

**Handling**

| | | |
|---|---|---|
| Advice on safe handling | : | 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 a naked flame or any 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 : Prevent unauthorized access. 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 materials must comply with the technological safety standards.

## SECTION 8: Exposure controls/personal protection

**Ingredients with workplace control parameters**

**US**

| Components | Basis | Value | Control parameters | Note |
|---|---|---|---|---|
| Propylene | ACGIH | TWA | 500 ppm, | A4, |
| Ethylene | ACGIH | TWA | 200 ppm, | A4, |
| Isobutane | ACGIH | STEL | 1,000 ppm, | CNS impair, EX, |
| | ACGIH | STEL | 1,000 ppm, | |
| Propane | OSHA Z-1 | TWA | 1,000 ppm, 1,800 mg/m3 | |
| | OSHA Z-1-A | TWA | 1,000 ppm, 1,800 mg/m3 | |
| 1-Hexene | ACGIH | TWA | 50 ppm, | |
| n-Butane | OSHA Z-1-A | TWA | 800 ppm, 1,900 mg/m3 | |
| | ACGIH | STEL | 1,000 ppm, | CNS impair, EX, |
| | ACGIH | STEL | 1,000 ppm, | |
| 1,3-Butadiene | ACGIH | TWA | 2 ppm, | A2, |
| | OSHA Z-1 | TWA | 1 ppm, | |
| | OSHA Z-1 | STEL | 5 ppm, | |
| | OSHA CARC | PEL | 1 ppm, | |
| | OSHA 29 CFR 1910.1051(c) | TWA | 1 ppm, | |
| | OSHA CARC | STEL | 5 ppm, | |
| | OSHA 29 CFR 1910.1051(c) | STEL | 5 ppm, | |
| Toluene | ACGIH | TWA | 20 ppm, | A4, |
| | OSHA Z-2 | TWA | 200 ppm, | |
| | OSHA Z-2 | CEIL | 300 ppm, | |
| | OSHA Z-2 | Peak | 500 ppm, | |
| | OSHA Z-1-A | TWA | 100 ppm, 375 mg/m3 | |
| | OSHA Z-1-A | STEL | 150 ppm, 560 mg/m3 | |
| Xylenes | OSHA Z-1 | TWA | 100 ppm, 435 mg/m3 | |
| | OSHA Z-1-A | STEL | 150 ppm, 655 mg/m3 | |
| | OSHA Z-1-A | TWA | 100 ppm, 435 mg/m3 | |
| | ACGIH | TWA | 100 ppm, | A4, |
| | ACGIH | STEL | 150 ppm, | A4, |
| 2-Methylpentane | ACGIH | TWA | 500 ppm, | |
| | ACGIH | STEL | 1,000 ppm, | |
| | OSHA Z-1-A | TWA | 500 ppm, 1,800 mg/m3 | |
| | OSHA Z-1-A | STEL | 1,000 ppm, 3,600 mg/m3 | |
| 1-Butene | ACGIH | TWA | 250 ppm, | |
| Carbon Dioxide | ACGIH | TWA | 5,000 ppm, | |
| | ACGIH | STEL | 30,000 ppm, | |
| | OSHA Z-1 | TWA | 5,000 ppm, 9,000 mg/m3 | |
| | OSHA Z-1-A | TWA | 10,000 ppm, 18,000 mg/m3 | |
| | OSHA Z-1-A | STEL | 30,000 ppm, 54,000 mg/m3 | |
| Carbon Monoxide | ACGIH | TWA | 25 ppm, | |
| | OSHA Z-1 | TWA | 50 ppm, 55 mg/m3 | |
| | OSHA Z-1-A | TWA | 35 ppm, 40 mg/m3 | |
| | OSHA Z-1-A | C | 200 ppm, 229 mg/m3 | |
| Hydrogen Sulfide | ACGIH | TWA | 1 ppm, | |
| | ACGIH | STEL | 5 ppm, | |
| | OSHA Z-2 | CEIL | 20 ppm, | |
| | OSHA Z-2 | Peak | 50 ppm, | |
| | OSHA Z-1-A | TWA | 10 ppm, 14 mg/m3 | |
| | OSHA Z-1-A | STEL | 15 ppm, 21 mg/m3 | |
| Methylacetylene | ACGIH | TWA | 1,000 ppm, | |

| | | | | |
|---|---|---|---|---|
| | OSHA Z-1 | TWA | 1,000 ppm, 1,650 mg/m3 | |
| | OSHA Z-1-A | TWA | 1,000 ppm, 1,650 mg/m3 | |
| | ACGIH | TWA | 1,000 ppm, | EX, |

A2 Suspected human carcinogen
A4 Not classifiable as a human carcinogen
CNS impair Central Nervous System impairment
EX Explosion hazard: the substance is a flammable asphyxiant or excursions above the TLV ® could approach 10% of the lower explosive limit.

Hazardous components without workplace control parameters

### Immediately Dangerous to Life or Health Concentrations (IDLH)

| Substance name | CAS-No. | Control parameters | Update |
|---|---|---|---|
| Propane | 74-98-6 | Immediately Dangerous to Life or Health Concentration Value 2100 parts per million | 1995-03-01 |
| n-Butane | 106-97-8 | Immediately Dangerous to Life or Health Concentration Value 1600 parts per million | 2017-02-03 |
| 1,3-Butadiene | 106-99-0 | Immediately Dangerous to Life or Health Concentration Value 2000 parts per million | 2017-02-03 |
| Toluene | 108-88-3 | Immediately Dangerous to Life or Health Concentration Value 500 parts per million | 1995-03-01 |
| Xylenes | 1330-20-7 | Immediately Dangerous to Life or Health Concentration Value 900 parts per million | 2017-09-01 |
| Carbon Dioxide | 124-38-9 | Immediately Dangerous to Life or Health Concentration Value 40000 parts per million | 1995-03-01 |
| Carbon Monoxide | 630-08-0 | Immediately Dangerous to Life or Health Concentration Value 1200 parts per million | 1995-03-01 |
| Hydrogen Sulfide | 7783-06-4 | Immediately Dangerous to Life or Health Concentration Value 100 parts per million | 1995-03-01 |
| Methylacetylene | 74-99-7 | Immediately Dangerous to Life or Health Concentration Value 1700 parts per million | 1995-03-01 |

### Biological exposure indices

**US**

| Substance name | CAS-No. | Control parameters | Sampling time | Update |
|---|---|---|---|---|
| 1,3-Butadiene | 106-99-0 | 1,2 Dihydroxy-4-(N-acetylcysteinyl)-butane: 2.5 mg/l Background (Urine) Semi-quantitative () | End of shift (As soon as possible after exposure ceases) | 2010-03-01 |
| | | Mixture of N-1 and N-2(hydroxybutenyl)valine: 2.5 picomoles per gram Hemoglobin Semi-quantitative (Hemoglobin (Hb) adducts in blood) | Not critical | 2010-03-01 |
| Toluene | 108-88-3 | Toluene: 0.02 mg/l (In blood) | Prior to last shift of workweek | 2010-03-01 |
| | | Toluene: 0.03 mg/l (Urine) | End of shift (As soon as possible after exposure ceases) | 2010-03-01 |
| | | o-Cresol: 0.3 mg/g Creatinine Background (Urine) With hydrolyses () | End of shift (As soon as possible after exposure ceases) | 2010-03-01 |
| Xylenes | 1330-20-7 | Methylhippuric acids: 1.5 g/g creatinine (Urine) | End of shift (As soon as possible after exposure ceases) | 2013-03-01 |

| | | | | |
|---|---|---|---|---|
| Carbon Monoxide | 630-08-0 | Carboxyhemoglobin: 3.5 % Hb Nonspecific (In blood) Background () | End of shift (As soon as possible after exposure ceases) | 2010-03-01 |
| | | Carbon monoxide: 20 parts per million Nonspecific (In end-exhaled air) Background () | End of shift (As soon as possible after exposure ceases) | 2010-03-01 |

**Engineering measures**

Adequate ventilation to control airborned 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:. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, aerosolization, 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. Safety glasses.

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 : Gaseous
Color : Colorless
Odor : Aromatic Gasoline

**Safety data**

| | | |
|---|---|---|
| Flash point | : | 45°C (113°F) |
| Lower explosion limit | : | 1.2 %(V) |
| Upper explosion limit | : | 75 %(V) |
| Molecular weight | : | 4.5 - 34 g/mol |
| pH | : | Not applicable |
| Melting point/range | : | -169°C (-272°F) |
| Vapor pressure | : | 51,000.00 hPa |
| Density | : | 1.1 kg/m3 |
| Water solubility | : | 0.14 g/l |

## SECTION 10: Stability and reactivity

**Reactivity** : Stable under recommended storage conditions.

**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** : 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.

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

## SECTION 11: Toxicological information

**S-Chem Laboratory Calibration Gas**
**Acute oral toxicity** : Negligible or unlikely exposure pathways

**S-Chem Laboratory Calibration Gas**
**Acute inhalation toxicity** : No data available

**S-Chem Laboratory Calibration Gas**
**Acute dermal toxicity** : Negligible or unlikely exposure pathways

**S-Chem Laboratory Calibration Gas**
**Skin irritation** : May cause skin irritation in susceptible persons.

**S-Chem Laboratory Calibration Gas**
**Eye irritation** : May irritate eyes.
Vapors may cause irritation to the eyes, respiratory system and the skin.

**S-Chem Laboratory Calibration Gas**
**Sensitization** : No data available.

**S-Chem Laboratory Calibration Gas**
**Repeated dose toxicity** : No data available

**Genotoxicity in vitro**

| | |
|---|---|
| Ethylene | : Test Type: Ames test<br>Test system: TA100<br>Metabolic activation: with and without metabolic activation<br>Method: OECD Test Guideline 471<br>Result: negative<br><br>Test Type: Chromosome aberration test in vitro<br>Test system: Chinese hamster ovary cells<br>Metabolic activation: with and without metabolic activation<br>Method: OECD Test Guideline 473<br>Result: negative |
| Propylene | Test Type: Ames test<br>Metabolic activation: with and without metabolic activation<br>Method: OECD Test Guideline 471<br>Result: negative<br><br>Test Type: Mammalian cell gene mutation assay<br>Metabolic activation: with and without metabolic activation<br>Method: OECD Test Guideline 476<br>Result: Ambiguous |
| Isobutane | Test Type: Ames test<br>Result: negative |
| 1-Hexene | Test Type: Ames test<br>Metabolic activation: with and without metabolic activation<br>Method: Mutagenicity (Escherichia coli - reverse mutation assay)<br>Result: negative |

| | |
|---|---|
| | Test Type: Unscheduled DNA synthesis assay<br>Result: negative |
| | Test Type: Mouse lymphoma assay<br>Result: negative |
| | Test Type: Chromosome aberration test in vitro<br>Method: OECD Guideline 473<br>Result: negative |
| Propane | Test Type: Ames test<br>Result: negative |
| n-Butane | Test Type: Ames test<br>Result: negative |
| 1,3-Butadiene | Test Type: Ames test<br>Metabolic activation: with and without metabolic activation<br>Result: Positive results were obtained in some in vitro tests. |
| | Test Type: Chromosome aberration test in vitro<br>Test system: Chinese hamster cells<br>Method: OECD Guideline 473<br>Result: positive |
| Toluene | Test Type: Ames test<br>Result: negative |
| | Test Type: Sister Chromatid Exchange Assay<br>Result: negative |
| | Test Type: Mouse lymphoma assay<br>Result: negative |
| | Test Type: Cytogenetic assay<br>Result: negative |
| Xylenes | Test Type: Ames test<br>Result: negative |
| | Test Type: Mouse lymphoma assay<br>Result: negative |
| 1-Butene | Test Type: Ames test<br>Metabolic activation: with and without metabolic activation<br>Result: negative |

**Genotoxicity in vivo**

| | | |
|---|---|---|
| Ethylene | : | Test Type: Micronucleus test<br>Species: Rat<br>Route of Application: inhalation (gas)<br>Exposure time: 5 days and 13 weeks<br>Dose: 10000 ppm<br>Result: negative |

| | |
|---|---|
| | Test Type: Micronucleus test<br>Species: Rat<br>Route of Application: inhalation (gas)<br>Exposure time: 4 weeks<br>Dose: 40, 1000, 3000 ppm<br>Method: OECD Test Guideline 474<br>Result: negative |
| Propylene | Test Type: Micronucleus test<br>Species: Rat<br>Route of Application: inhalation (gas)<br>Method: OECD Test Guideline 474<br>Result: negative |
| 1-Hexene | Test Type: Mouse micronucleus assay<br>Species: Mouse<br>Method: Mutagenicity (micronucleus test)<br>Result: negative |
| 1,3-Butadiene | Test Type: Mouse micronucleus assay<br>Species: mice<br>Route of Application: inhalation (gas)<br>Exposure time: 6 h per day for 5 days<br>Dose: 50, 200, 500, 1300 ppm<br>Method: OECD Test Guideline 474<br>Result: positive<br><br>Test Type: Dominant lethal assay<br>Species: mice<br>Method: OECD Test Guideline 478<br>Result: Positive results were obtained in some in vivo tests. |
| Toluene | Test Type: Cytogenetic assay<br>Result: negative<br><br>Test Type: Mouse micronucleus assay<br>Result: negative |
| Xylenes | Test Type: Mouse micronucleus assay<br>Result: negative |
| 1-Butene | Test Type: Micronucleus test<br>Species: Mouse<br>Dose: 1000, 3260, 10000 ppm<br>Method: Mutagenicity (micronucleus test)<br>Result: negative |

**Carcinogenicity**

| | | |
|---|---|---|
| Ethylene | : | Species: Rat<br>Dose: 0. 300, 1000, 3000 ppm<br>Exposure time: 2 yrs<br>Number of exposures: 6 h/d, 5 d/wk<br>Remarks: no increase incidence of tumors |
| Propylene | | Species: Rat<br>Dose: 0, 5000, 10000 ppm<br>Exposure time: 103 wks<br>Number of exposures: 6 h/d, 5 d/wk |

| | |
|---|---|
| | Remarks: No evidence of carcinogenicity<br><br>Species: Mouse<br>Dose: 0, 5000, 10000 ppm<br>Exposure time: 103 wks<br>Number of exposures: 6 h/d, 5 d/wk<br>Remarks: No evidence of carcinogenicity |
| 1,3-Butadiene | Species: Mouse<br>Sex: male and female<br>Dose: 6.25, 20, 62.5, 200, 625 ppm<br>Exposure time: 6hr/day. 5day/wk for up to 2 y<br>Test substance: yes<br>Print Date: OECD Test Guideline 453<br>Remarks: Clear evidence of multiple organ carcinogenicity.<br><br>Species: Rat<br>Sex: male and female<br>Dose: 1000, 8000 ppm<br>Exposure time: 6 hr/day, 5 day/wk for 2 years<br>Test substance: yes<br>Remarks: weak oncogen |
| Toluene | Species: Rat<br>Dose: 0, 600, 1200 ppm<br>Exposure time: 2 yrs<br>Number of exposures: 6.5 h/d, 5 d/wk<br>Remarks: No evidence of carcinogenicity<br><br>Species: Mouse<br>Dose: 0, 600, 1200 ppm<br>Exposure time: 2 yrs<br>Number of exposures: 6.5 h/d, 5 d/wk<br>Remarks: No evidence of carcinogenicity |
| Xylenes | Species: Rat<br>Dose: 0, 250, 500 mg/kg<br>Exposure time: 103 wks<br>Number of exposures: 5 d/wk<br>Remarks: No evidence of carcinogenicity<br><br>Species: Mouse<br>Dose: 0, 500, 1000 mg/kg<br>Exposure time: 103 wks<br>Number of exposures: 5 d/wk<br>Remarks: No evidence of carcinogenicity |
| 1-Butene | Species: Rat<br>Sex: male<br>Dose: 0, 500, 2000, 8000 ppm<br>Exposure time: 2 years<br>Number of exposures: 6 hr/d, 5 d/wk<br>Remarks: increased incidence of thyroid tumors, Information given is based on data obtained from similar substances. |

Species: Rat
Sex: female
Dose: 0, 500, 2000, 8000 ppm
Exposure time: 2 years
Number of exposures: 6 hr/d, 5 d/wk
Remarks: no increase incidence of tumors, Information given is based on data obtained from similar substances.

Species: Mouse
Sex: male
Dose: 0, 500, 2000, 8000 ppm
Exposure time: 2 years
Number of exposures: 6 hr/d, 5 d/wk
Remarks: no increase incidence of tumors, Information given is based on data obtained from similar substances.

Species: Mouse
Sex: female
Dose: 0, 500, 2000, 8000 ppm
Exposure time: 2 years
Number of exposures: 6 hr/d, 5 d/wk
Remarks: no increase incidence of tumors, Information given is based on data obtained from similar substances.

**Reproductive toxicity**

Ethylene : Species: Rat
Application Route: Inhalation
Dose: 0. 200, 1000, 5000 ppm
Number of exposures: 6 h/d
NOAEL Parent: 5000 ppm
NOAEL F1: 5000 ppm
no abnormalities observed

Propylene Species: Rat
Sex: male and female
Application Route: Inhalation
Dose: 0, 5000, 10000 ppm
Number of exposures: 6 hrs/d, 5 d/wk
Test period: 103 wks
NOAEL Parent: 10000 ppm

Species: Mouse
Sex: male and female
Application Route: Inhalation
Dose: 0, 5000, 10000 ppm
Number of exposures: 6 hrs/d, 5 d/wk
Test period: 103 wks
NOAEL Parent: 10000 ppm

Ethane Species: Rat
Sex: male and female
Application Route: Inhalation
Dose: 0, 1600, 5000, 16000 ppm
Exposure time: 6 weeks
Number of exposures: 6 hours/day, 7 days/week
Test period: 6 weeks
Test substance: yes
Method: OECD Guideline 422

NOAEL Parent: 16000 ppm
NOAEL F1: 16000 ppm
no abnormalities observed

1-Hexene

Species: Rat
Sex: males
Application Route: oral gavage
Dose: 0, 100, 500, 1000 mg/kg
Number of exposures: daily
Test period: 44 d
Test substance: yes
Method: OECD Guideline 421
NOAEL Parent: 1,000 mg/kg
NOAEL F1: 1,000 mg/kg

Species: Rat
Sex: females
Application Route: oral gavage
Dose: 0, 100, 500, 1000 mg/kg
Number of exposures: daily
Test period: 41-51 d
Test substance: yes
Method: OECD Guideline 421
NOAEL Parent: 1,000 mg/kg
NOAEL F1: 1,000 mg/kg

Propane

Species: Rat
Sex: male and female
Application Route: Inhalation
Dose: 0, 1200, 4000, 12000 ppm
Exposure time: 6 weeks
Number of exposures: 6 hours/day, 7 days/week
Test period: 6 weeks
Test substance: yes
Method: OECD Guideline 422
NOAEL Parent: 12000 ppm
NOAEL F1: 12000 ppm

Toluene

Species: Rat
Application Route: Inhalation
Dose: 0, 100, 500, 2000 ppm
Test period: 95 d
NOAEL Parent: 2000 ppm

1-Butene

Species: Rat
Sex: male and female
Application Route: Inhalation
Dose: 0, 500, 2000, 8000 ppm
Method: OECD Guideline 422
NOAEL Parent: 8000 ppm
NOAEL F1: 8000 ppm

**Developmental Toxicity**

Ethylene : Species: Rat
Application Route: Inhalation
Dose: 0. 200, 1000, 5000 ppm
Number of exposures: 6 h/d
NOAEL Teratogenicity: 5000 ppm

NOAEL Maternal: 5000 ppm
No toxicity to reproduction
Animal testing did not show any effects on fertility.

Propylene

Species: Rat
Application Route: Inhalation
Dose: 0, 200, 1000, 10000 ppm
Number of exposures: 6 hrs/d
Test period: 14 d
Method: OECD Guideline 414
NOAEL Teratogenicity: 10000 ppm
NOAEL Maternal: 10000 pmm

Toluene

Species: Rat
Application Route: Inhalation
Dose: 0, 100, 500, 2000 ppm
Test period: 95 d
NOAEL Teratogenicity: 400-750 ppm

Xylenes

Species: Rat
Application Route: Inhalation
Dose: 0, 805, 1610 ppm
Number of exposures: 6 h/d
Test period: GD 7-16
NOAEL Maternal: 1610 ppm

Species: Mouse
Application Route: oral gavage
Dose: 0, 780, 1960, 2619 mg/kg
Number of exposures: 3 times/d
Test period: GD 6-15
NOAEL Teratogenicity: 780 mg/kg
NOAEL Maternal: 780 mg/kg

**S-Chem Laboratory Calibration Gas**
**Aspiration toxicity** : No aspiration toxicity classification.
**Toxicology Assessment**

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

**S-Chem Laboratory Calibration Gas**
**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**

| | | |
|---|---|---|
| Propylene | : | No data available |
| 1-Hexene | | LC50: 5.6 mg/l<br>Exposure time: 96 h<br>Species: Oncorhynchus mykiss (rainbow trout)<br>semi-static test Test substance: yes<br>Method: OECD Test Guideline 203 |
| Alkenes, C6 | | LC50: 6.6 mg/l<br>Exposure time: 96 h<br>Species: Oncorhynchus mykiss (rainbow trout)<br>semi-static test Test substance: yes<br>Method: OECD Test Guideline 203 |
| 1,3-Butadiene | | LC50: 71.5 mg/l<br>Exposure time: 24 h<br>Species: Lagodon rhomboides (Pinfish) |
| Toluene | | LC50: 18 - 36 mg/l<br>Exposure time: 96 h<br>Species: Pimephales promelas (fathead minnow) |
| Xylenes | | LC50: 8.2 mg/l<br>Exposure time: 96 h<br>Species: Salmo gairdneri (Rainbow trout) |
| 1-Butene | | No data available |
| Carbon Dioxide | | 35 mg/l<br>Exposure time: 96 h<br>Species: Salmo gairdneri (Rainbow trout) |
| Methylacetylene | | No data available |

**Toxicity to daphnia and other aquatic invertebrates**

| | | |
|---|---|---|
| 1-Hexene | : | EC50: 4.4 mg/l<br>Exposure time: 48 h<br>Species: Daphnia magna (Water flea)<br>static test Test substance: no<br>Method: OECD Test Guideline 202<br>Information given is based on data obtained from similar substances. |
| Toluene | | EC50: 3.78 mg/l<br>Exposure time: 48 h<br>Species: Daphnia magna (Water flea) |
| 2-Methylpentane | | 3.649 mg/l<br>Exposure time: 48 h<br>Species: Daphnia<br>Method: Value calculated using ECOSAR. |

| | |
|---|---|
| 1-Butene | No data available |
| Hydrogen Sulfide | EC50: 0.12 mg/l<br>Exposure time: 48 h<br>Species: Daphnia magna (Water flea)<br>static test Analytical monitoring: yes<br>Test substance: yes<br>Method: OECD Test Guideline 202 |
| Methylacetylene | No data available |

**Toxicity to algae**

| | | |
|---|---|---|
| 1-Hexene | : | NOEC: 1.8 mg/l<br>Exposure time: 96 h<br>Species: Pseudokirchneriella subcapitata (green algae)<br>Growth inhibition Method: OECD Test Guideline 201<br>Information given is based on data obtained from similar substances.<br><br>EC50: > 5.5 mg/l<br>Exposure time: 96 h<br>Species: Pseudokirchneriella subcapitata (green algae)<br>Growth inhibition Method: OECD Test Guideline 201<br>Information given is based on data obtained from similar substances. |
| Toluene | | EC50: 134 mg/l<br>Exposure time: 72 h<br>Species: Chlamydomonas angulosa (Green algae) |
| 2-Methylpentane | | 4.321 mg/l<br>Exposure time: 96 h<br>Species: green algae<br>Method: Value calculated using ECOSAR. |
| 1-Butene | | No data available |
| Hydrogen Sulfide | | EC50: 1.87 mg/l<br>Exposure time: 24 h<br>Species: Selenastrum capricornutum (algae)<br>static test Test substance: yes |
| Methylacetylene | | No data available |

| | | |
|---|---|---|
| Biodegradability | : | No data available |

Elimination information (persistence and degradability)

| | | |
|---|---|---|
| Bioaccumulation | : | No data available |
| Mobility | : | No data available |
| Results of PBT assessment | : | This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or |

very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

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)**

UN3501, CHEMICAL UNDER PRESSURE, FLAMMABLE, N.O.S., (ETHYLENE, PROPYLENE), 2.1, RQ (1,3-BUTADIENE, XYLENES)

**IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)**

UN3501, CHEMICAL UNDER PRESSURE, FLAMMABLE, N.O.S., (ETHYLENE, PROPYLENE), 2.1, (45°C), MARINE POLLUTANT, (ALKENES, C6, XYLENES)

**IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)**

UN3501, CHEMICAL UNDER PRESSURE, FLAMMABLE, N.O.S., (ETHYLENE, PROPYLENE), 2.1

**ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))**
UN3501, CHEMICAL UNDER PRESSURE, FLAMMABLE, N.O.S., (ETHYLENE, PROPYLENE), 2.1, ENVIRONMENTALLY HAZARDOUS, (ALKENES, C6, XYLENES)

**RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))**
UN3501, CHEMICAL UNDER PRESSURE, FLAMMABLE, N.O.S., (ETHYLENE, PROPYLENE), 2.1, ENVIRONMENTALLY HAZARDOUS, (ALKENES, C6, XYLENES)

**ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)**
UN3501, CHEMICAL UNDER PRESSURE, FLAMMABLE, N.O.S., (ETHYLENE, PROPYLENE), 2.1, ENVIRONMENTALLY HAZARDOUS, (ALKENES, C6, XYLENES)

**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** | : | Simple Asphyxiant<br>Germ cell mutagenicity<br>Carcinogenicity<br>Reproductive toxicity<br>Specific target organ toxicity (single or repeated exposure)<br>Skin corrosion or irritation |

**EPCRA - EMERGENCY PLANNING COMMUNITY RIGHT - TO – KNOW**

| | | |
|---|---|---|
| CERCLA Reportable Quantity | : | 83 lbs<br><br>1,3-Butadiene |
| SARA 302 Reportable Quantity | : | Calculated RQ exceeds reasonably attainable upper limit.<br><br>Hydrogen Sulfide |
| SARA 302 Threshold Planning Quantity | : | The following components are subject to reporting levels established by SARA Title III, Section 302:<br><br>Hydrogen Sulfide 7783-06-4 500 lbs |
| SARA 304 Reportable Quantity | : | Calculated RQ exceeds reasonably attainable upper limit.<br><br>Hydrogen Sulfide 7783-06-4 100 lbs |

SARA 313 Components : The following components are subject to reporting levels established by SARA Title III, Section 313:

: Propylene - 115-07-1
Ethylene - 74-85-1
1,3-Butadiene - 106-99-0
Toluene - 108-88-3
Xylenes - 1330-20-7
Hydrogen Sulfide - 7783-06-4

**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 112 (40 CFR 61):

: 1,3-Butadiene - 106-99-0
Toluene - 108-88-3
Xylenes - 1330-20-7

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):

: Propylene - 115-07-1
Ethylene - 74-85-1
Ethane - 74-84-0
Isobutane - 75-28-5
Propane - 74-98-6
Hydrogen - 1333-74-0
Methane - 74-82-8
n-Butane - 106-97-8
1,3-Butadiene - 106-99-0
1-Butene - 106-98-9
Hydrogen Sulfide - 7783-06-4
Propadiene - 463-49-0
Methylacetylene - 74-99-7

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):

: Propylene - 115-07-1
Ethylene - 74-85-1
1,3-Butadiene - 106-99-0
Toluene - 108-88-3
Xylenes - 1330-20-7
1-Butene - 106-98-9

**US State Regulations**

Pennsylvania Right To Know : Propylene - 115-07-1
Ethylene - 74-85-1
Nitrogen - 7727-37-9
Ethane - 74-84-0
Isobutane - 75-28-5
Propane - 74-98-6
Hydrogen - 1333-74-0
Methane - 74-82-8
1-Hexene - 592-41-6
n-Butane - 106-97-8
Alkenes, C6 - 68526-52-3
1,3-Butadiene - 106-99-0
Toluene - 108-88-3
Xylenes - 1330-20-7
2-Methylpentane - 107-83-5
1-Butene - 106-98-9
Carbon Dioxide - 124-38-9
Carbon Monoxide - 630-08-0
Hydrogen Sulfide - 7783-06-4
Methylacetylene - 74-99-7

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.

| | |
|---|---|
| 1,3-Butadiene | 106-99-0 |
| Ethylbenzene | 100-41-4 |
| Arsine | 7784-42-1 |

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.

| | |
|---|---|
| 1,3-Butadiene | 106-99-0 |
| Toluene | 108-88-3 |
| Carbon Monoxide | 630-08-0 |
| Methanol | 67-56-1 |

**Notification status**

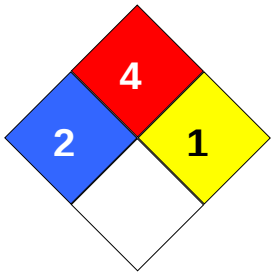
Europe REACH : Not in compliance with the inventory
United States of America (USA) TSCA : Product contains substance(s) not active on TSCA inventory.
Canada NDSL : This product contains one or several components listed

in the Canadian NDSL.

| | | |
|---|---|---|
| Australia AICS | : | Not in compliance with the inventory |
| New Zealand NZIoC | : | Not in compliance with the inventory |
| Japan ENCS | : | Not in compliance with the inventory |
| Korea KECI | : | Not in compliance with the inventory |
| Philippines PICCS | : | Not in compliance with the inventory |
| China IECSC | : | Not in compliance with the inventory |
| Taiwan TCSI | : | Not in compliance with the inventory |

## SECTION 16: Other information

**NFPA Classification** : Health Hazard: 2
Fire Hazard: 4
Reactivity Hazard: 1




**Further information**

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.

| Key or legend to abbreviations and acronyms used in the safety data sheet | | | |
|---|---|---|---|
| ACGIH | American Conference of Government Industrial Hygienists | LD50 | Lethal Dose 50% |
| AICS | Australia, Inventory of Chemical Substances | LOAEL | Lowest Observed Adverse Effect Level |
| DSL | Canada, Domestic Substances List | NFPA | National Fire Protection Agency |
| NDSL | Canada, Non-Domestic Substances List | NIOSH | National Institute for Occupational Safety & Health |
| CNS | Central Nervous System | NTP | National Toxicology Program |
| CAS | Chemical Abstract Service | NZIoC | New Zealand Inventory of Chemicals |
| EC50 | Effective Concentration | NOAEL | No Observable Adverse Effect Level |
| EC50 | Effective Concentration 50% | NOEC | No Observed Effect Concentration |
| EGEST | EOSCA Generic Exposure Scenario Tool | OSHA | Occupational Safety & Health Administration |
| EOSCA | European Oilfield Specialty Chemicals Association | PEL | Permissible Exposure Limit |
| EINECS | European Inventory of Existing Chemical Substances | PICCS | Philippines Inventory of Commercial Chemical Substances |
| MAK | Germany Maximum Concentration Values | PRNT | Presumed Not Toxic |
| GHS | Globally Harmonized System | RCRA | Resource Conservation Recovery Act |
| >= | Greater Than or Equal To | STEL | Short-term Exposure Limit |

| | | | |
|---|---|---|---|
| IC50 | Inhibition Concentration 50% | SARA | Superfund Amendments and Reauthorization Act. |
| IARC | International Agency for Research on Cancer | TLV | Threshold Limit Value |
| IECSC | Inventory of Existing Chemical Substances in China | TWA | Time Weighted Average |
| ENCS | Japan, Inventory of Existing and New Chemical Substances | TSCA | Toxic Substance Control Act |
| KECI | Korea, Existing Chemical Inventory | UVCB | Unknown or Variable Composition, Complex Reaction Products, and Biological Materials |
| <= | Less Than or Equal To | WHMIS | Workplace Hazardous Materials Information System |
| LC50 | Lethal Concentration 50% | | |