S-Chem Laboratory Calibration Gas

Version 1.0 Revision Date 2014-08-06

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

Product information

Trade 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:
North America: CHEMTREC 800.424.9300 or 703.527.3887
Asia: +800 CHEMCALL (+800 2436 2255)
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Responsible Department : Product Safety and Toxicology Group
E-mail address : MSDS@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.

Emergency Overview

Danger

Physical state: Gaseous **Color**: Colorless **Odor**: Aromatic Gasoline

OSHA Hazards : Flammable Gas, Carcinogen, Moderate skin irritant, Moderate eye irritant, Reproductive hazard, Mutagen, Target Organ Effects

Classification

: Flammable gases , Category 1
Skin irritation , Category 2
Eye irritation , Category 2A
Germ cell mutagenicity , Category 1B
Carcinogenicity , Category 1A
Reproductive toxicity , Category 1A
Specific target organ systemic toxicity - single exposure , Category 3 , Central nervous system
Specific target organ systemic toxicity - repeated exposure , Category 1 , Inhalation , Blood
Specific target organ systemic toxicity - repeated exposure ,

Category 2 , Auditory organs

Labeling

Symbol(s) :

Signal Word : Danger

Hazard Statements : H220: Extremely flammable gas.
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H336: May cause drowsiness or dizziness.
H340: May cause genetic defects.
H350: May cause cancer.
H360: May damage fertility or the unborn child.
H372: Causes damage to organs (Blood) through prolonged or repeated exposure if inhaled.
H373: May cause damage to organs (Auditory organs) through prolonged or repeated exposure.

Precautionary Statements : **Prevention:**
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/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 eye protection/ face protection.
P280 Wear protective gloves.
P281 Use personal protective equipment as required.
Response:
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
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.
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.
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 Store in a well-ventilated place.
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
ACGIH	Suspected 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
Benzene, dimethyl-	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	:	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	:	Induce vomiting immediately and call a physician. 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	:	45 °C (113 °F)
Suitable extinguishing media	:	Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.
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 fire fighting 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 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.

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 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 : Prevent unauthorized access. No smoking. Keep in a 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

Ingredients	Basis	Value	Control parameters	Note
Propylene	ACGIH	TWA	500 ppm,	A4,
Ethylene	ACGIH	TWA	200 ppm,	A4,
Ethane	ACGIH	TWA	1,000 ppm,	
Isobutane	ACGIH	TWA	1,000 ppm,	
	ACGIH	TWA	1,000 ppm,	varies,
Propane	ACGIH	TWA	1,000 ppm,	
	OSHA Z-1	TWA	1,000 ppm, 1,800 mg/m3	(b),
	OSHA Z-1-A	TWA	1,000 ppm, 1,800 mg/m3	
Methane	ACGIH	TWA	1,000 ppm,	
1-Hexene	ACGIH	TWA	50 ppm,	
n-Butane	OSHA Z-1-A	TWA	800 ppm, 1,900 mg/m3	
	ACGIH	TWA	1,000 ppm,	
	ACGIH	TWA	1,000 ppm,	varies,
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,	BEI, 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	
Benzene, dimethyl-	ACGIH	TWA	100 ppm,	BEI, A4,
	ACGIH	STEL	150 ppm,	BEI, A4,
	OSHA Z-1-A	TWA	100 ppm, 435 mg/m3	
	OSHA Z-1-A	STEL	150 ppm, 655 mg/m3	
	OSHA Z-1	TWA	100 ppm, 435 mg/m3	(b),
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	(b),
	OSHA Z-1-A	TWA	10,000 ppm, 18,000 mg/m3	e,
	OSHA Z-1-A	STEL	30,000 ppm, 54,000 mg/m3	
Carbon Monoxide	ACGIH	TWA	25 ppm,	BEI,
	OSHA Z-1	TWA	50 ppm, 55 mg/m3	(b),
	OSHA Z-1-A	TWA	35 ppm, 40 mg/m3	
	OSHA Z-1-A	C	200 ppm, 229 mg/m3	m,
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	(b),
	OSHA Z-1-A	TWA	1,000 ppm, 1,650 mg/m3	

(b) The value in mg/m3 is approximate.
* 2010 Adoption
A2 Suspected human carcinogen
A4 Not classifiable as a human carcinogen
BEI Substances for which there is a Biological Exposure Index or Indices (see BEI® section)
e Exposures under 10,000 ppm to be cited as de minimus.
m Sampling for the carbon monoxide ceiling shall be averaged over 5 minutes but an instantaneous reading over 1500 ppm shall not be exceeded.
varies varies

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
1,3-Butadiene	106-99-0	Immediately Dangerous to Life or Health Concentration Value 2000 parts per million	1995-03-01
Toluene	108-88-3	Immediately Dangerous to Life or Health Concentration Value 500 parts per million	1995-03-01
Benzene, dimethyl-	1330-20-7	Immediately Dangerous to Life or Health Concentration Value 900 parts per million	1995-03-01
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

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:. Full-Face Supplied-Air Respirator.

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

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

Possibility of hazardous reactions

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 : LC50: unknown

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.

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

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

Carcinogenicity

Ethylene : Species: rat
Dose: 0. 300, 1000, 3000 ppm
Exposure time: 2 yrs
Number of exposures: 6 h/d, 5 d/wk
Remarks: no increase incidence of tumors

Propylene Species: rat
Dose: 0, 5000, 10000 ppm
Exposure time: 103 wks
Number of exposures: 6 h/d, 5 d/wk
Remarks: No evidence of carcinogenicity

	Species: mouse Dose: 0, 5000, 10000 ppm Exposure time: 103 wks Number of exposures: 6 h/d, 5 d/wk Remarks: No evidence of carcinogenicity
1,3-Butadiene	Species: mouse Sex: male and female Dose: 6.25, 20, 62.5, 200, 625 ppm Exposure time: 6hr/day. 5day/wk for up to 2 y Test substance: yes Print Date: OECD Test Guideline 453 Remarks: Clear evidence of multiple organ carcinogenicity. Species: rat Sex: male and female Dose: 1000, 8000 ppm Exposure time: 6 hr/day, 5 day/wk for 2 years Test substance: yes Remarks: weak oncogen
Toluene	Species: rat Dose: 0, 600, 1200 ppm Exposure time: 2 yrs Number of exposures: 6.5 h/d, 5 d/wk Remarks: No evidence of carcinogenicity Species: mouse Dose: 0, 600, 1200 ppm Exposure time: 2 yrs Number of exposures: 6.5 h/d, 5 d/wk Remarks: No evidence of carcinogenicity
Benzene, dimethyl-	Species: rat Dose: 0, 250, 500 mg/kg Exposure time: 103 wks Number of exposures: 5 d/wk Remarks: No evidence of carcinogenicity Species: mouse Dose: 0, 500, 1000 mg/kg Exposure time: 103 wks Number of exposures: 5 d/wk Remarks: No evidence of carcinogenicity
1-Butene	Species: rat Sex: male Dose: 0, 500, 2000, 8000 ppm Exposure time: 2 years Number of exposures: 6 hr/d, 5 d/wk 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
Benzene, dimethyl-	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

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Aspiration toxicity : No aspiration toxicity classification.

CMR effects

Propylene	: Carcinogenicity: Animal testing did not show any carcinogenic effects. Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Teratogenicity: Animal testing did not show any effects on fetal development. Reproductive toxicity: Animal testing did not show any effects on fertility.
1-Hexene	Carcinogenicity: Not available Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Teratogenicity: Animal testing did not show any effects on fetal development. Reproductive toxicity: Animal testing did not show any effects on fertility.
1,3-Butadiene	Carcinogenicity: Human carcinogen. Mutagenicity: In vivo tests showed mutagenic effects Teratogenicity: Embryotoxicity classification not possible from

	current data. Reproductive toxicity: Fertility classification not possible from current data.
Toluene	Carcinogenicity: Not classifiable as a human carcinogen. Mutagenicity: Animal testing did not show any mutagenic effects. Teratogenicity: Some evidence of adverse effects on development, based on animal experiments. Reproductive toxicity: Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.
Benzene, dimethyl-	Carcinogenicity: Limited evidence of carcinogenicity in animal studies Mutagenicity: Did not show mutagenic effects in animal experiments. Teratogenicity: Damage to fetus not classifiable
1-Butene	Carcinogenicity: Not classifiable as a human carcinogen. Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Teratogenicity: Animal testing did not show any effects on fetal development. Reproductive toxicity: Animal testing did not show any effects on fertility.
Carbon Monoxide	Reproductive toxicity: Positive evidence of adverse effects on sexual function, fertility and/or development from human epidemiological studies.

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

SECTION 12: Ecological information

Toxicity to fish

1-Hexene :	LC50: 5.6 mg/l Exposure time: 96 h Species: Oncorhynchus mykiss (rainbow trout) semi-static test Test substance: yes Method: OECD Test Guideline 203
Alkenes, C6	LC50: 6.6 mg/l Exposure time: 96 h Species: Oncorhynchus mykiss (rainbow trout) semi-static test Test substance: yes Method: OECD Test Guideline 203
1,3-Butadiene	LC50: 71.5 mg/l Exposure time: 24 h Species: Lagodon rhomboides (Pinfish)
Toluene	LC50: 18 - 36 mg/l Exposure time: 96 h

	Species: Pimephales promelas (fathead minnow)
Benzene, dimethyl-	LC50: 8.2 mg/l Exposure time: 96 h Species: Salmo gairdneri (Rainbow trout)
1-Butene	LC50: 19 mg/l Exposure time: 96 h Species: Fish Method: QSAR
Carbon Dioxide	35 mg/l Exposure time: 96 h Species: Salmo gairdneri (Rainbow trout)

Toxicity to daphnia and other aquatic invertebrates

1-Hexene	:	EC50: 4.4 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) static test Test substance: no Method: OECD Test Guideline 202 Information given is based on data obtained from similar substances.
Toluene		EC50: 3.78 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea)
1-Butene		LC50: 11 mg/l Exposure time: 48 h Species: Daphnia Method: QSAR
Hydrogen Sulfide		EC50: 0.12 mg/l Exposure time: 48 h Species: Daphnia magna (Water flea) static test Analytical monitoring: yes Test substance: yes Method: OECD Test Guideline 202

Toxicity to algae

1-Hexene	:	NOEC: 1.8 mg/l Exposure time: 96 h Species: Pseudokirchneriella subcapitata (green algae) Growth inhibition Method: OECD Test Guideline 201 Information given is based on data obtained from similar substances. EC50: > 5.5 mg/l Exposure time: 96 h Species: Pseudokirchneriella subcapitata (green algae) Growth inhibition Method: OECD Test Guideline 201 Information given is based on data obtained from similar substances.
Toluene		EC50: 134 mg/l

	Exposure time: 72 h Species: Chlamydomonas angulosa (Green algae)
1-Butene	EC50: 6.5 mg/l Exposure time: 96 h Method: QSAR
Hydrogen Sulfide	EC50: 1.87 mg/l Exposure time: 24 h Species: Selenastrum capricornutum (algae) static test Test substance: yes

Elimination information (persistence and degradability)

Bioaccumulation	:	No data available
Biodegradability	:	No data available

Ecotoxicology Assessment

Acute aquatic toxicity	:	Toxic to aquatic life.
Chronic aquatic toxicity	:	Harmful to aquatic life with long lasting effects.
Toxicity Data on Soil	:	No data available
Other organisms relevant to the environment	:	No data available
Impact on Sewage Treatment	:	No data available

Results of PBT assessment

1-Hexene	:	Non-classified PBT substance, Non-classified vPvB substance
Propane	:	This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT)., This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).
1-Butene	:	Non-classified PBT substance, Non-classified vPvB substance
Additional ecological information	:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal., Toxic to aquatic life., Harmful 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 MSDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)
UN3501, CHEMICAL UNDER PRESSURE, FLAMMABLE, N.O.S., (ETHYLENE, PROPYLENE), 2.1

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)
UN3501, CHEMICAL UNDER PRESSURE, FLAMMABLE, N.O.S., (ETHYLENE, PROPYLENE), 2.1, (45 °C)

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

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

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

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 : Acute Health Hazard
Chronic Health Hazard

CERCLA Reportable Quantity : 83 lbs

1,3-Butadiene

SARA 302 Reportable Quantity : Calculated RQ exceeds reasonably attainable upper limit.

Hydrogen Sulfide

SARA 302 Threshold Planning Quantity : The following components are subject to reporting levels established by SARA Title III, Section 302:

Hydrogen Sulfide 7783-06-4 500 lbs

SARA 304 Reportable Quantity : Calculated RQ exceeds reasonably attainable upper limit.

Hydrogen Sulfide 7783-06-4 100 lbs

SARA 313 Ingredients : 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
Benzene, dimethyl- - 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 12 (40 CFR 61):

: 1,3-Butadiene - 106-99-0
Toluene - 108-88-3
Benzene, dimethyl- - 1330-20-7
Ethylbenzene - 100-41-4
Methanol - 67-56-1
Carbonyl Sulfide - 463-58-1
Arsine - 7784-42-1

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
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
Acetylene - 74-86-2
Ethyl Mercaptan - 75-08-1
Ammonia - 7664-41-7
Carbonyl Sulfide - 463-58-1
Arsine - 7784-42-1

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
Benzene, dimethyl- - 1330-20-7
1-Butene - 106-98-9
Acetylene - 74-86-2
Ethylbenzene - 100-41-4
Methanol - 67-56-1
Propanol - 71-23-8
Ethanol - 64-17-5

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
Benzene, dimethyl- - 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

New Jersey 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
1,3-Butadiene - 106-99-0
Toluene - 108-88-3
Benzene, dimethyl- - 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
Propadiene - 463-49-0
Methylacetylene - 74-99-7

California Prop. 65 Ingredients : WARNING! This product contains a chemical known in the State of California to cause cancer.

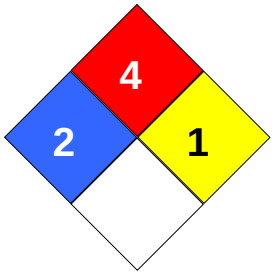
WARNING: This product contains a chemical known in the State of California to cause birth defects or other reproductive harm.

Notification status

Europe REACH	:	Not in compliance with the inventory
United States of America TSCA	:	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

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 Material 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%		