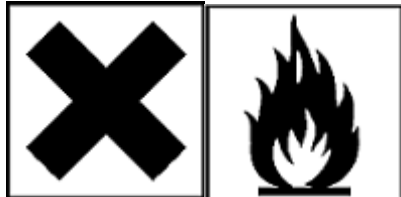




# Material Safety Data Sheet



## SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

### 1-Hexene (C6H12)

**Product Use:** Chemical Intermediate

**Product Number(s):** 0001015415, 0001017828, 0001070002, 0001081271, 0001017829, 0001066515, 0001088135, 0001011442, 0001026835, 0001032321, 0001026834, 0001025308, 0001028630, 0001084562

**Synonyms:** alpha-Hexene; Hexene-1; Butyl Ethylene; Hex-1-ene; Hexylene

**Product CAS No.:** 592-41-6

#### Company Identification:

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

Chevron Phillips Chemicals International N.V.  
Brusselsesteenweg 355  
B-3090 Overijse  
Belgium

#### Product Information:

MSDS Requests: 1 - (800) 852-5530  
Technical Information: 1 - (800) 852-5531  
Responsible Party: Product Safety Group  
Email:msds@cpchem.com

#### 24-Hour Emergency Telephone Numbers

HEALTH:Chevron Phillips Emergency Information Center 866.442.9628 (North America) and 1.832.813.4984 (International)

TRANSPORTATION: North America: CHEMTREC 800.424.9300 or 703.527.3887  
ASIA: +1.703.527.3887  
EUROPE: BIG .32.14.584545 (phone) or .32.14.583516 (telefax)  
SOUTH AMERICA SOS-Cotec Inside Brazil: 0800.111.767  
Outside Brazil: 55.19.3467.1600

## SECTION 2 HAZARDS IDENTIFICATION

### EMERGENCY OVERVIEW

Clear, colorless liquid.

- HIGHLY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE
- HARMFUL OR FATAL IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE
- INHALATION MAY CAUSE NERVOUS SYSTEM EFFECTS
- CONTAINS MATERIAL THAT CAUSES CENTRAL NERVOUS SYSTEM EFFECTS

**IMMEDIATE HEALTH EFFECTS:**

**Eye:** Not expected to cause prolonged or significant eye irritation.

**Skin:** Prolonged or repeated skin contact may cause drying or defatting of the skin. Symptoms may include pain, itching, discoloration, swelling, and blistering. Not expected to be harmful to internal organs if absorbed through the skin.

**Ingestion:** This material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death.

**Inhalation:** Breathing this material at elevated concentrations causes central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

**DELAYED OR OTHER HEALTH EFFECTS:**

**Reproduction and Birth Defects:** This material is not expected to cause birth defects or other harm to the developing fetus based on animal data.

**SECTION 3 COMPOSITION/ INFORMATION ON INGREDIENTS**

COMPONENT	CAS NUMBER	AMOUNT	EINECS	SYM	R-PHRASES
1-Hexene	592-41-6	> 99 % weight	209-753-1	F Xn	R52, R11, R67, R65
2-Ethyl-1-butene	760-21-4	< 1 % weight	212-078-5	NA	NA

**Occupational Exposure Limits:**

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
1-Hexene	CPCHEM	50 ppm	NA	NA	NA
2-Ethyl-1-butene	CPCHEM	Not Established	NA	NA	NA

**MEDICAL APPLICATION CAUTION:** Do not use this Chevron Phillips Chemical Company LP material in medical applications involving permanent implantation in the human body or permanent contact with internal body fluids or tissues.

Do not use this Chevron Phillips Chemical Company LP material in medical applications involving brief or temporary implantation in the human body or contact with internal body fluids or tissues unless the material has been provided directly from Chevron Phillips Chemical Company LP under an agreement which expressly acknowledges the contemplated use.

Chevron Phillips Chemical Company LP makes no representation, promise, express warranty or implied warranty concerning the suitability of this material for use in implantation in the human body or in contact with internal body fluids or tissues.

**SECTION 4 FIRST AID MEASURES**

**Eye:** Flush eyes with running water immediately while holding the eyelids open. Remove contact lenses, if worn, after initial flushing, and continue flushing for at least 15 minutes. Get immediate medical attention.

**Skin:** To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse. Get medical attention if any symptoms develop.

**Ingestion:** If swallowed, do not induce vomiting. Give the person a glass of water or milk to drink and get immediate medical attention. Never give anything by mouth to an unconscious person.

**Inhalation:** Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

**Note to Physicians:** Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

## SECTION 5 FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

### FIRE CLASSIFICATION:

OSHA Classification (29 CFR 1910.1200): Flammable liquid.

**NFPA RATINGS:** Health: 2 Flammability: 3 Reactivity: 0

### FLAMMABLE PROPERTIES:

**Flashpoint:** -26°C (-14.8°F) (Closed Cup)

**Autoignition:** 272°C (521.6°F)

**Flammability (Explosive) Limits (% by volume in air):** Lower: 2 Upper: 7

**EXTINGUISHING MEDIA:** Use water fog, foam, dry chemical or carbon dioxide (CO<sub>2</sub>) to extinguish flames.

### PROTECTION OF FIRE FIGHTERS:

**Fire Fighting Instructions:** For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

**Combustion Products:** Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

## SECTION 6 ACCIDENTAL RELEASE MEASURES

**Protective Measures:** Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator. Wear appropriate personal protective equipment when cleaning up spills. Refer to Section 8.

**Spill Management:** Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible sorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.

**Reporting:** U.S.A. regulations may require reporting spills of this material that could reach any surface waters. Report spills to local authorities and/or the National Response Center at (800) 424-8802 as appropriate or required.

## SECTION 7 HANDLING AND STORAGE

**READ AND OBSERVE ALL PRECAUTIONS ON PRODUCT LABEL . REFER TO PRODUCT LABEL OR MANUFACTURERS TECHNICAL BULLETINS FOR THE PROPER USE AND HANDLING OF THIS MATERIAL .**

**Precautionary Measures:** This material presents a fire hazard. Liquid quickly evaporates and forms vapor (fumes) which can catch fire and burn with explosive violence. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 15°F.

**General Handling Information:** Avoid work practices that may release volatile components in the atmosphere. Local air pollution regulations should be consulted to determine if the release of volatile components is regulated or restricted in the area in which this material is used. Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

**Static Hazard:** Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations, which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA

Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids, National Fire Protection Association (NFPA 77), Recommended Practice on Static Electricity' (liquids, powders and dusts), and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents' (liquids).

**General Storage Information:** Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner, or disposed of properly. **DO NOT USE OR STORE** near heat, sparks or open flames. **USE AND STORE ONLY IN WELL VENTILATED AREA.** Keep container closed when not in use.

**Container Warnings:** Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

## SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

### GENERAL CONSIDERATIONS:

Consider the potential hazards of this material (see Section 3), 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.

### ENGINEERING CONTROLS:

Use in a well-ventilated area.

### PERSONAL PROTECTIVE EQUIPMENT:

**Eye/Face Protection:** Wear eye protection such as safety glasses, chemical goggles, or faceshields if engineering controls or work practices are not adequate to prevent eye contact.

**Skin Protection:** Wear impervious protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Users should determine acceptable performance characteristics of protective clothing. Consider physical requirements and other substances present when selecting protective clothing. Suggested materials for protective gloves include: Responder, or Teflon, or Viton

**Respiratory Protection:** If exposure is anticipated to be greater than applicable exposure limits, wear a NIOSH approved respirator that provides adequate protection from measured concentrations of this material. Use the following elements for air-purifying respirators: Air-Purifying Respirator for Organic Vapors 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.

### Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling / Peak	Notation
1-Hexene	CPCHEM	50 ppm	NA	NA	NA
2-Ethyl-1-butene	CPCHEM	Not Established	NA	NA	NA

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

**APPEARANCE AND ODOR:** Clear, colorless liquid.

**pH:** NA

**Flashpoint:** -26°C (-14.8°F) (Closed Cup)

**VAPOR PRESSURE:** 176 mmHg @ 24 °C (75°F)

**VAPOR DENSITY (AIR=1):** 2.9  
**BOILING POINT:** 63.5°C (146.3°F)  
**SOLUBILITY (in water):** Soluble in hydrocarbon solvents; insoluble in water.  
**VISCOSITY:** 0.34 cSt @ 40 °C (104°F)  
**PERCENT VOLATILE:** 100 % volume  
**MELTING POINT:** -140°C (-220°F)  
**SPECIFIC GRAVITY:** 0.68 @ 15.6 °C (60°F)  
**DENSITY:** 5.64 lb/gal @ 15.6 °C (60°F)

## 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.

**Conditions to Avoid:** No Data Available

**Incompatibility With Other Materials:** No data available

**Hazardous Decomposition Products:** No Data.

**Hazardous Polymerization:** Hazardous polymerization will not occur.

## SECTION 11 TOXICOLOGICAL INFORMATION

### IMMEDIATE HEALTH EFFECTS:

**Acute Oral Toxicity:** 1-Hexene: LD50 / rat / > 10.0 g/kg

**Acute Dermal Toxicity:** 1-Hexene: LD50 / rabbit / > 10 g/kg

**Acute Inhalation Toxicity:** 1-Hexene: LC50 / rat / 32,000 ppm / 4 hour(s)

**Eye Irritation:** 1-Hexene: This material is not expected to be irritating to the eyes.

**Skin Irritation:** 1-Hexene: This material is not expected to be irritating to the skin.

### ADDITIONAL TOXICOLOGY INFORMATION:

This product contains 1-HEXENE.

Repeated Dose Toxicity: 90 days/ inhalation / rat / 0, 300, 1000, 3000 ppm / 6 hrs/day, 5 days/week / NOEL = 1000 ppm / LOAEL = 3000 ppm

Reproduction and Developmental Toxicity: Oral / rat / 0, 100, 500, 1000 mg/kg/day / NOAEL = 1000 mg/kg/day (Microscopic kidney changes were seen in males at all dose levels. This effect is consistent with alpha 2u-globulin associated hydrocarbon nephropathy, which is specific to young adult male rats and is not considered a potential risk to humans.)

Genetic Toxicity: AMES Test - Negative; Mouse Bone Marrow Micronucleus Test - Negative

## SECTION 12 ECOLOGICAL INFORMATION

### ECOTOXICITY:

This material is expected to be harmful to aquatic organisms. Toxicity is expected in the immediate area of an accidental release but this material rapidly volatilizes from water to the atmosphere.

1-Hexene - 96 hour(s) / LC50 / rainbow trout (*Oncorhynchus mykiss*) / 5.6 mg/l

1-Hexene - 48 hour(s) / EC50 / water flea (*Daphnia magna*) / 10.0 - 230.0 mg/l

### ENVIRONMENTAL FATE:

This material is expected to be readily biodegradable.

## SECTION 13 DISPOSAL CONSIDERATIONS

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.

## SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

### Shipping Descriptions per regulatory authority.

#### US DOT

UN2370, 1-HEXENE , 3, II

#### ICAO / IATA

1-HEXENE, 3, UN2370, II

#### IMO / IMDG

1-HEXENE, 3, UN2370, II, (-26°C )

#### RID / ADR

UN2370, 1-HEXENE, 3, II, ADR

## SECTION 15 REGULATORY INFORMATION

### SARA 311/312 CATEGORIES:

1. Immediate (Acute) Health Effects:	YES
2. Delayed (Chronic) Health Effects:	NO
3. Fire Hazard:	YES
4. Sudden Release of Pressure Hazard:	NO
5. Reactivity Hazard:	NO

### REGULATORY LISTS SEARCHED:

01 = CA Prop 65	17 = FDA 178	33 = RCRA Waste Appendix VIII
02 = LA RTK	18 = FDA 179	34 = RCRA Waste D-List
03 = MA RTK	19 = FDA 180	35 = RCRA Waste P-List
04 = MN Hazardous Substance	20 = FDA 181	36 = RCRA Waste U-List
05 = NJ RTK	21 = FDA 182	37 = SARA Section 302
06 = PA RTK	22 = FDA 184	38 = SARA Section 313
07 = CAA Section 112 HAPs	23 = FDA 186	39 = TSCA 12 (b)
08 = CWA Section 307	24 = FDA 189	40 = TSCA Section 4
09 = CWA Section 311	25 = IARC Group 1	41 = TSCA Section 5(a)
10 = DOT Marine Pollutant	26 = IARC Group 2A	42 = TSCA Section 8(a) CAIR
11 = FDA 172	27 = IARC Group 2B	43 = TSCA Section 8(a) PAIR
12 = FDA 173	28 = IARC Group 3	44 = TSCA Section 8(d)
13 = FDA 174	29 = IARC Group 4	45 = WHIMS - IDL
14 = FDA 175	30 = NTP Carcinogen	46 = Germany D TAL
15 = FDA 176	31 = OSHA Carcinogen	47 = Germany WKG
16 = FDA 177	32 = OSHA Highly Hazardous	48 = DEA List 1
		49 = DEA List 2

**The following components of this material are found on the regulatory lists indicated.**

2-Ethyl-1-butene

3, 5, 6

**WHMIS CLASSIFICATION:**

Class B, Division 2: Flammable Liquids

**CHEMICAL INVENTORY LISTINGS:**

AUSTRALIA: All the components of this material are listed on the Australian Inventory of Chemical Substances (AICS).

CANADA: All the components of this material are on the Canadian Domestic Substances List (DSL) or are exempt from notification.

PEOPLE'S REPUBLIC OF CHINA: All the components of this product are listed on the Inventory of Existing Chemical Substances in China.

EUROPEAN UNION: All the components of this material are in compliance with the EU Seventh Amendment Directive 92/32/EEC.

JAPAN: All the components of this product are on the Existing & New Chemical Substances (ENCS) inventory in Japan, or have an exemption from listing.

KOREA: All the components of this product are on the Existing Chemicals List (ECL) in Korea.

PHILIPPINES: All the components of this product are listed on the Philippine Inventory of Chemicals and Chemical Substances (PICCS).

UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

**EU RISK AND SAFETY PHRASES:**

R11: Highly flammable.

R65: Harmful: may cause lung damage if swallowed.

R52/53: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R66: Repeated exposure may cause skin dryness or cracking.

S9: Keep container in a well-ventilated place.

S16: Keep away from sources of ignition - No smoking.

S33: Take precautionary measures against static discharges.

S51: Use only in well-ventilated areas.

S62: If swallowed do not induce vomiting: seek medical advice immediately and show this container or label.

**EU Symbols:** Xn - Harmful F - Flammable

**SECTION 16 OTHER INFORMATION**

**NFPA RATINGS:** Health: 2 Flammability: 3 Reactivity: 0 Special: NA

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, \*-Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA).

**REVISION STATEMENT:** This revision updates all sections of the MSDS please review.

**ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:**

TLV - Threshold Limit Value

TWA - Time Weighted Average

STEL - Short-term Exposure Limit

PEL - Permissible Exposure Limit

ACGIH - American Conference of Government

OSHA - Occupational Safety & Health

NIOSH	- Industrial Hygienists - National Institute for Occupational Safety & Health	NFPA	- Administration - National Fire Protection Agency
WHMIS	- Workplace Hazardous Materials Information System	IARC	- Intl. Agency for Research on Cancer
EINECS	- European Inventory of existing Commercial Chemical Substances	RCRA	- Resource Conservation Recovery Act
SARA	- Superfund Amendments and Reauthorization Act.	TSCA	- Toxic Substance Control Act
EC50	- Effective Concentration	LC50	- Lethal Concentration
LD50	- Lethal Dose	CAS	- Chemical Abstract Service
NDA	- No Data Available	NA	- Not Applicable
<=	- Less Than or Equal To	>=	- Greater Than or Equal To
CNS	- Central Nervous System	MAK	- Germany Maximum Concentration Values

**This data sheet is prepared according to the latest adaptation of the EEC Guideline 67/548.**

**This data sheet is prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200).**

**This data sheet is prepared according to the ANSI MSDS Standard (Z400.1).**

**This data sheet was prepared by EHS Product Stewardship Group, Chevron Phillips Chemical Company LP, 10001 Six Pines Drive, The Woodlands, TX 77380.**

**The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.**