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

Product information
Product Name: AlphaPlus® 1-Butene
Material: 1036988, 1015419, 1037080, 1037081

Company: Chevron Phillips Chemical Company LP
Normal Alpha Olefins (NAO)
10001 Six Pines Drive
The Woodlands, TX 77380

Emergency telephone:
Health:
866.442.9628 (North America)
1.832.813.4984 (International)

Transport:
CHEMTREC 800.424.9300 or 703.527.3887 (int'l)
Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090
EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)
Mexico CHEMTREC 01-800-681-9531 (24 hours)
South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600
Argentina: +(54)-1159839431

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

SECTION 2: Hazards identification

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

Classification:
- Flammable gases, Category 1
- Gases under pressure, Liquefied gas

Labeling:
Symbol(s):

Signal Word: Danger
H280: Contains gas under pressure; may explode if heated.

Precautionary Statements: Prevention:  
P210  Keep away from heat/sparks/open flames/hot surfaces. No smoking.  
Response:  
P377  Leaking gas fire: Do not extinguish, unless leak can be stopped safely.  
P381  Eliminate all ignition sources if safe to do so.  
Storage:  
P410 + P403  Protect from sunlight. Store in a well-ventilated place.

Carcinogenicity:  
IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.  
NTP: No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

SECTION 3: Composition/information on ingredients

<table>
<thead>
<tr>
<th>Synonyms</th>
<th>Molecular formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene 1-Butylene</td>
<td>C4H8</td>
</tr>
<tr>
<td>Alpha-butene</td>
<td></td>
</tr>
<tr>
<td>Butene-1 (C4)</td>
<td></td>
</tr>
<tr>
<td>Alpha-Butylene</td>
<td></td>
</tr>
<tr>
<td>C4H8</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>n-Butane</td>
<td>106-97-8</td>
<td>0 - 1</td>
</tr>
</tbody>
</table>

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: If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.

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: Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
SECTION 5: Firefighting measures

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash point</td>
<td>-80 °C (-112 °F)</td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>383.89 °C (723.00 °F)</td>
</tr>
<tr>
<td>Suitable extinguishing media</td>
<td>Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical.</td>
</tr>
<tr>
<td>Unsuitable extinguishing media</td>
<td>High volume water jet.</td>
</tr>
<tr>
<td>Special protective equipment for fire-fighters</td>
<td>Wear self-contained breathing apparatus for firefighting if necessary.</td>
</tr>
<tr>
<td>Further information</td>
<td>For safety reasons in case of fire, cans should be stored separately in closed containments. Use a water spray to cool fully closed containers.</td>
</tr>
<tr>
<td>Fire and explosion protection</td>
<td>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.</td>
</tr>
<tr>
<td>Hazardous decomposition products</td>
<td>Carbon oxides.</td>
</tr>
</tbody>
</table>

SECTION 6: Accidental release measures

<table>
<thead>
<tr>
<th>Precaution</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal precautions</td>
<td>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.</td>
</tr>
<tr>
<td>Environmental precautions</td>
<td>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.</td>
</tr>
</tbody>
</table>

SECTION 7: Handling and storage

**Handling**

Advice on safe handling: 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
**SAFETY DATA SHEET**

**AlphaPlus® 1-Butene**

Version 2.1  
Revision Date 2017-08-14

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. 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**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Basis</th>
<th>Value</th>
<th>Control parameters</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Butene</td>
<td>ACGIH</td>
<td>TWA</td>
<td>250 ppm</td>
<td></td>
</tr>
<tr>
<td>n-Butene</td>
<td>ACGIH</td>
<td>STEL</td>
<td>1,000 ppm</td>
<td>CNS impair.</td>
</tr>
</tbody>
</table>

body weight eff  body weight effects  
CNS impair  Central Nervous System impairment

**Engineering measures**

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

**Personal protective equipment**

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

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

**Eye protection**: Eye wash bottle with pure water. 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
SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

**Appearance**
- Form: Liquefied gas, Gases under pressure
- Physical state: Gaseous
- Color: Colorless

**Safety data**
- Flash point: -80 °C (-112 °F)
- Lower explosion limit: 1.6 % (V)
- Upper explosion limit: 9.3 % (V)
- Oxidizing properties: no

- Autoignition temperature: 383.89 °C (723.00 °F)
- Molecular formula: C4H8
- Molecular weight: 56.12 g/mol
- pH: Not applicable
- Freezing point: -185 °C (-301 °F)

- Pour point: No data available
- Boiling point/boiling range: -6.26 °C (20.73 °F)
- Vapor pressure: 1,895.00 MMHG at 20 °C (68 °F)
- Relative density: 0.6 at 15.6 °C (60.1 °F)

- Density: 600.3 g/l
- Water solubility: Soluble in hydrocarbon solvents; insoluble in water.
- Partition coefficient: n-octanol/water: No data available
- Viscosity, kinematic: No data available
- Relative vapor density: 1.93 (Air = 1.0)
- Evaporation rate: No data available

Hygiene measures: Wash hands before breaks and at the end of workday.
**AlphaPlus® 1-Butene**

**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, sparks, fire, and oxidizing agents. Heat, flames and sparks.

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

**Hazardous decomposition products**: Carbon oxides

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

**Section 11: Toxicological information**

**AlphaPlus® 1-Butene Acute oral toxicity**: Negligible or unlikely exposure pathways

**AlphaPlus® 1-Butene Acute inhalation toxicity**: LC50: > 10000 ppm
- Exposure time: 4 h
- Species: Rat
- Test atmosphere: vapor
- Method: OECD Test Guideline 403

Information given is based on data obtained from similar substances.

**AlphaPlus® 1-Butene Acute dermal toxicity**: Negligible or unlikely exposure pathways

**AlphaPlus® 1-Butene Skin irritation**: No skin irritation. Rapid evaporation of the liquid may cause frostbite.

**AlphaPlus® 1-Butene Eye irritation**: No eye irritation. Contact with liquid or refrigerated gas can cause cold burns and frostbite.

**AlphaPlus® 1-Butene Sensitization**: No data available.

**Repeated dose toxicity 1-Butene**: Species: Rat, Male and female
Sex: Male and female
Application Route: Inhalation
Dose: 0, 500, 2000, 8000 ppm
Exposure time: 28 d
Number of exposures: 6 hr/d, 7 d/wk
NOEL: 8000 ppm
Method: OECD Guideline 422
No adverse effect has been observed in chronic toxicity tests.

**n-Butane**
Species: Rat, Male and female
Sex: Male and female
Application Route: Inhalation
Dose: 0, 1017, 4489 ppm
Exposure time: 90 day
Number of exposures: 6 hr/d, 5 d/wk
NOEL: 4489 ppm

**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: 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**
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

CMR effects
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.

AlphaPlus® 1-Butene
Further information: No data available.

SECTION 12: Ecological information

Elimination information (persistence and degradability)
Biodegradability: This material is expected to be readily biodegradable.

Ecotoxicology Assessment
Results of PBT assessment
1-Butene: Non-classified PBT substance, Non-classified vPvB substance

Additional ecological information: No data available

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: Do not dispose of waste into sewer. 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)**

UN1012, BUTYLENE, 2.1
NON-ODORIZED

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

UN1012, BUTYLENE, 2.1, (-80 °C)
NON-ODORIZED

**IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)**

UN1012, BUTYLENE, 2.1
NON-ODORIZED

**ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))**

UN1012, 1-BUTYLENE, 2.1, (B/D)
NON-ODORIZED

**RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF DANGEROUS GOODS (EUROPE))**

UN1012, 1-BUTYLENE, 2.1
NON-ODORIZED

**ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)**

UN1012, 1-BUTYLENE, 2.1
NON-ODORIZED

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**

<table>
<thead>
<tr>
<th></th>
<th>Fire Hazard</th>
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<tbody>
<tr>
<td></td>
<td>Sudden Release of Pressure Hazard</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Reportable</th>
<th>Calculated RQ exceeds reasonably attainable upper limit.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>1,3-Butadiene</td>
</tr>
</tbody>
</table>

SDS Number:100000068452

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SAFETY DATA SHEET

AlphaPlus® 1-Butene

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SARA 302 Reportable Quantity : This material does not contain any components with a SARA 302 RQ.

SARA 302 Threshold Planning Quantity : This material does not contain any components with a section 302 EHS TPQ.

SARA 304 Reportable Quantity : This material does not contain any components with a section 304 EHS RQ.

SARA 313 Ingredients : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

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).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

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):

1-Butene - 106-98-9
n-Butane - 106-97-8

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):

1-Butene - 106-98-9

US State Regulations

Pennsylvania Right To Know : 1-Butene - 106-98-9
n-Butane - 106-97-8

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 : On the inventory, or in compliance with the inventory
United States of America (USA) : On the inventory, or in compliance with the inventory
TSCA : On the inventory, or in compliance with the inventory
Canada DSL : On the inventory, or in compliance with the inventory
Australia AICS : On the inventory, or in compliance with the inventory
New Zealand NZIoC : On the inventory, or in compliance with the inventory
Japan ENCS : On the inventory, or in compliance with the inventory
Korea KECI : On the inventory, or in compliance with the inventory
Philippines PICCS : On the inventory, or in compliance with the inventory
China IECSC : On the inventory, or in compliance with the inventory

SECTION 16: Other information

**NFPA Classification**
- Health Hazard: 1
- Fire Hazard: 4
- Reactivity Hazard: 0

**Further information**
- Legacy SDS Number: PE0015

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

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

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

<table>
<thead>
<tr>
<th>Key or legend to abbreviations and acronyms used in the safety data sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH</td>
</tr>
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<td>LD50</td>
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<td>AICS</td>
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