

MATERIAL SAFETY DATA SHEET

Issue Date: July 4, 2004

Revision Date: October 9, 2008

Revision Number: 3

1-Butene

Contact Phone Number: (713) 840-7474
CHEMTREC (800) 424-9300

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Name: 1-Butene Manufacturer: Texas Petrochemicals 5151 San Felipe, # 800 Houston, TX 77056	Chemical Name: 1-Butene Synonyms: Butene-1, Butylene, Ethylethylene
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2. HAZARDS IDENTIFICATION

Emergency Overview	DANGER Extremely flammable. May cause flash fire or explosion. Vapors may cause flash fire or explosion. Will be easily ignited by heat, spark or flames. Harmful if inhaled. Irritating to eyes and skin. Contact with gas or liquefied gas may cause burns, severe injury and/or frostbite. May cause heritable genetic damage. Prolonged exposure may cause chronic effects.
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OSHA Regulatory Status	This product is considered hazardous under <u>29CFR1910.1200</u> (Hazard Communication).
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Potential Health Effects

Routes of Exposure	Inhalation. Skin contact. Eye contact.
Eyes	Direct contact with cold gas may cause eye damage from frostbite. Contact may irritate or burn eyes. Eye contact may result in corneal injury. Do not get this material in contact with eyes.
Skin	Contact with evaporating liquid may cause frostbite or freezing of skin. Irritating to skin.
Inhalation	Inhalation of mists/vapors of this product may cause dizziness, nausea, and respiratory tract congestion.
Ingestion	This material is a gas under normal atmospheric conditions and ingestion is unlikely. Contact with liquefied gas might cause frostbites, in some cases with tissue damage.

Target Organs

Chronic Effects

Signs and Symptoms

Potential Environmental Effects	Ecological injuries are not known or expected under normal use.
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3. COMPOSITION INFORMATION/INGREDIENTS

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Component	CAS #	Percent
1-Butene	25167-67-3	98 – 99
N-Butane	106-97-8	0 – 1
Other Butenes	Mixture	0 – 1

4. FIRST AID MEASURES

First aid procedures

Eye Contact	Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists. Remove contact lenses, if present and easy to do. Continue rinsing.
Skin Contact	Frostbite: Do not remove clothes, but flush with copious amounts of lukewarm water. Call an ambulance and continue to flush during transportation to hospital. For minor skin contact, avoid spreading material on unaffected skin. Immediately flush skin with plenty of water. Get medical attention if irritation develops or persists.
Inhalation	Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth method if victim inhaled the substance. Get medical attention, if needed.
Ingestion	Rinse mouth. Do not use mouth-to-mouth method if victim ingested the substance. If ingestion of a large amount does occur, call a poison control center immediately.
Notes to Physician	Keep victim warm. Keep victim under observation. Symptoms may be delayed.
General Advice	If you feel unwell, seek medical advice (show the label where possible). Keep victim under observation. Keep victim warm.

5. FIRE FIGHTING MEASURES

Flash Point -112 °F (-80 °C) Tag Closed Cup	Auto-Ignition Temperature 723 °F (383.9 °C)
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Flammability Limits in Air

Lower (% by volume): 1.6% Upper (% by volume): 9.3%

Flammable Properties	Flammable by OSHA criteria. Containers may explode when heated. Vapor or gas may spread to distant ignition sources and flash back. Runoff to sewer may cause fire or explosion hazard.
Extinguishing Media	
Suitable Extinguishing Media	Water. Water fog. Foam. Dry chemical powder. Carbon dioxide (CO ₂).

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**Unsuitable
Extinguishing Media**

Do not use a solid water stream as it may scatter and spread fire.

Protection of firefighters
**Specific Hazards
Arising from the
Chemical**

Vapors are heavier than air and may travel along the floor and in the bottom of containers. Vapors may be ignited by a spark, a hot surface or an ember. Pressurized container may explode when exposed to heat or flame. Irritating and toxic gases or fumes may be released during a fire.

**Protective Equipment
and Precautions for
Firefighters**

In case of fire and/or explosion do not breathe fumes. Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. ALWAYS stay away from tanks engulfed in flame. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Withdraw immediately in case of rising sound from venting safety devices or any discoloration of tanks due to fire. Move containers from fire area if you can do it without risk. Use water spray to cool unopened containers. Cool containers with flooding quantities of water until well after fire is out. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Specific Methods

In the event of fire and/or explosion do not breathe fumes. In the event of fire, cool tanks with water spray. Use water spray to cool unopened containers.

**Hazardous Combustion
Products**

Carbon monoxide and carbon dioxide.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions

Keep unnecessary personnel away. Stay upwind. Keep out of low areas. Keep people away from and upwind of spill/leak. Ventilate closed spaces before entering. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

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Methods for Containment Prevent further leakage or spillage if safe to do so. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Prevent entry into waterways, sewers, basements or confined areas.

Methods for Cleaning Up Wipe up with absorbent material (e.g. cloth, fleece).
Large Spills: Dike far ahead of liquid spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal.
Small Spills: Clean contaminated surface thoroughly. After removal flush contaminated area thoroughly with water. This material and its container must be disposed of as hazardous waste.

Other information Clean up in accordance with all applicable regulations.

7. HANDLING AND STORAGE

Handling Avoid exposure - obtain special instructions before use. Keep away from sources of ignition - No smoking. Do not smoke. May be ignited by open flame. Vapors may form explosive mixtures with air. Use only in area provided with appropriate exhaust ventilation. Do not breathe dust/fume/gas/mist/vapors/spray. Handle and open container with care. Avoid prolonged exposure. Do not handle or store near an open flame, heat or other sources of ignition. All equipment used when handling the product must be grounded. Wash thoroughly after handling.

Storage Avoid exposure - obtain special instructions before use. The pressure in sealed containers can increase under the influence of heat. Do not handle or store near an open flame, heat or other sources of ignition. This material can accumulate static charge which may cause spark and become an ignition source. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in cool place. Keep in a well-ventilated place. Keep container tightly closed. Keep in an area equipped with sprinklers. Use care in handling/storage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components	Type	Value
ACGIH		
1,3-Butadiene (106-99-0)	TWA	2 ppm

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ACGIH

1-Butene (25167-67-3)

TWA 250 ppm

N-Butane (106-97-8)

TWA 1000 ppm

US – OSHA

N-Butane (106-97-8)

 TWA 800 ppm (1900 mg/m³)

Engineering Controls

Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

Personal Protective Equipment
Eye / Face Protection

Avoid exposure - obtain special instructions before use. Wear safety glasses with side shields.

Skin Protection

Wear chemical protective equipment that is specifically recommended by the manufacturer. Avoid exposure - obtain special instructions before use.

Respiratory Protection

Avoid exposure - obtain special instructions before use. Wear positive pressure self-contained breathing apparatus (SCBA). A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever work place conditions warrant a respirator's use.

General Hygiene Considerations

When using do not smoke. Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL/CHEMICAL PROPERTIES

Appearance	Colorless Liquefied gas.	Color	Colorless
Odor	Mild. Aromatic.	Odor Threshold	Not available.
Physical State	Gas	Form	Gaseous.
pH	Not Applicable	Melting Point	-301 °F (-185 °C)
Freezing Point	Not available	Boiling Point	21.2 °F (-6 °C)
Evaporation Rate	Not available.	Vapor Pressure	67 psia (70°F)
Vapor Density	1.9 (Air=1)	Specific Gravity	0.6 (Water=1)
Solubility (water)	Negligible	Partition Coefficient (n-octanol/water)	Not available
Decomposition Temperature	Not Available	Percent Volatile	100 %
Molecular Weight	56.1		

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10. CHEMICAL STABILITY REACTIVITY

Chemical Stability	Stable under normal temperature conditions and recommended use. Risk of explosion. Risk of ignition.
Conditions to Avoid	Heat, flames and sparks.
Incompatible Materials	
Hazardous Decomposition Products	Carbon oxides.
Possibility of Hazardous Reactions	Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

Toxicological Data

Components	Test Results
N-Butane (106-97-8)	Acute Inhalation LC50 Mouse: 680 mg/l 2 Hours Acute Inhalation LC50 Rat: 658 mg/l 4 Hours
Sensitization	Not available.
Acute Effects	Harmful if inhaled. Vapors may cause drowsiness and dizziness. Contact with evaporating liquid may cause freeze injury.
Local Effects	Contact may irritate or burn eyes. Contact with compressed gas can cause damage (frostbite) due to rapid evaporative cooling.
Chronic Effects	Prolonged inhalation may be harmful.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.
Epidemiology	Not available.
Mutagenicity	Not available.
Neurological Effects	Not available.
Reproductive Effects	Possible reproductive hazard.
Teratogenicity	Not available.
Further Information	Symptoms may be delayed.

12. ECOLOGICAL INFORMATION

Ecotoxicity	This material is not expected to be harmful to aquatic life.
Environmental Effects	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

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Persistence and Degradability	Volatile substances are degraded in the atmosphere within a few days.
Bioaccumulation/ Accumulation	The product is not bioaccumulating.
Partition Coefficient	Not available
Mobility in Environmental Media	May evaporate quickly.

13. DISPOSAL CONSIDERATIONS

Waste Codes	D001: Waste Flammable material with a flash point <140 F.
Disposal Instructions	Dispose of this material and its container at hazardous or special waste collection point. Incinerate the material under controlled conditions in an approved incinerator. Do not incinerate sealed containers. Do not dispose of waste into sewer. If discarded, this product is considered a RCRA ignitable waste, D001. Dispose in accordance with all applicable regulations.

14. TRANSPORTATION INFORMATION

	DOT	IATA	IMDG
Basic Shipping Requirements			
UN Number	UN1075	UN1075	UN1075
Proper Shipping Name	Petroleum gases, liquefied	Petroleum gases, liquefied	Petroleum gases, liquefied
Hazard Class	2.1	2.1	2.1
Additional Information			
Special Provisions	T50		
Packaging Exceptions	306	306	306
Packaging Non-Bulk	304	304	
Packaging Bulk	314, 315	314, 315	
ERG Number	115		
Labels Required		2.1	2.1

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15. REGULATORY INFORMATION

US Federal Regulations

OSHA

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA

All components are on the U.S. EPA TSCA Inventory List.

CERCLA (Superfund) RQ

N-Butane: 100

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Section 313

De-Minimis Concentration

1,3-Butadiene (106-99-0) 0.1%

Listed Substance

1,3-Butadiene (106-99-0) Listed

Hazard Categories

Immediate Hazard – Yes

Delayed Hazard – No

Fire Hazard – Yes

Pressure Hazard – No

Reactivity Hazard – No

Section 302 Extremely Hazardous Substance

No

Section 311 Hazardous Chemical

Yes

Chemical Inventory Status

Country	Inventory Name	On Inventory*
Australia	Australian Inventory of Chemical Substances (AICS)	No
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	No

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Europe	European Inventory of New and Existing Chemicals (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	No
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No

* A 'Yes' indicates that all components of this product comply with the inventory requirements administered by the governing country(s).

State Regulations

This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US - New Jersey Community RTK (EHS Survey): Reportable threshold

1-Butene (25167-67-3) 500 LBS

N-Butane (106-97-8) 500 LBS

US - Pennsylvania RTK - Hazardous Substances: Listed substance

N-Butane (106-97-8) Listed

16. OTHER INFORMATION

HMIS [®]	HMIS [®] is a registered trade and service mark of the NPCA. Health: 1 Flammability: 4 Physical hazard: 0
NFPA	Health: 1 Flammability: 4 Instability: 0

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.