Safety Data Sheet
cis-2-Butene

Section 1: Product and Company Identification

Middlesex Gases & Technologies
292 Second Street
P.O. Box 490249
Everett, MA 02149
(617) 387-5050
(800) 649-6704
Fax (617) 387-3537
http://www.middlesexgases.com/

Product Code: cis-2-Butene

Section 2: Hazards Identification

Warning

Hazard Classification:
Gases Under Pressure

Hazard Statements:
Contains gas under pressure; may explode if heated

Precautionary Statements

Storage:
Protect from sunlight.
Store in well-ventilated place.

Section 3: Composition/Information on Ingredients

CAS #
590-18-1

Chemical Substance	Chemical Family	Trade Names
CIS-2-BUTENE	hydrocarbons, aliphatic	2-BUTENE-CIS; CIS-1,2-DIMETHYLETHYLENE; CIS-BUTYLENE; 2-BUTENE (CIS); SYM-DIMETHYLETHYLENE; DIMETHYLETHYLENE; PSEUDO-BUTYLENE; CIS-BUTENE-2; 'HIGH-BOILING' BUTENE-2; (Z)-2-BUTENE; CIS-2-BUTYLENE; BETA-CIS-BUTYLENE; (2Z)-2-BUTENE; (Z)-BUT-2-ENE; CIS-BUT-2-ENE; CIS-BUTENE; UN1012; C4H8

Section 4: First Aid Measures

Skin Contact	Eye Contact	Ingestion	Inhalation	Note to Physicians
If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.	Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.	If a large amount is swallowed, get medical attention.	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.	For inhalation, consider oxygen.

Section 5: Fire Fighting Measures

Suitable Extinguishing Media	Products of Combustion	Protection of Firefighters
Carbon dioxide, regular dry chemical Large fires: Flood with fine water spray.	Carbon monoxide, carbon dioxide, water and toxic and irritating fumes.	▪ Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode. ▪ Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode.

Section 6: Accidental Release Measures

Personal Precautions	Environmental Precautions	Methods for Containment
Keep unnecessary people away, isolate hazard area and deny entry. Do not touch spilled material. Ventilate closed spaces before entering.	Avoid heat, flames, sparks and other sources of ignition.	Stop leak if possible without personal risk. Reduce vapors with water spray. Remove sources of ignition.

Methods for Cleanup	Other Information
Not available	None

Section 7: Handling and Storage

Handling	Storage
Store and handle in accordance with all current regulations and standards. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.110. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.	Keep separated from incompatible substances.

Section 8: Exposure Controls/Personal Protection

Exposure Guidelines
TLV-TWA: ACGIH 250 ppm

Engineering Controls

Handle only in fully enclosed systems.

Eye Protection	Skin Protection	Respiratory Protection
For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.	For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.	Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode.

General Hygiene considerations

- Avoid breathing vapor or mist
- Avoid contact with eyes and skin
- Wash thoroughly after handling and before eating or drinking

Section 9: Physical and Chemical Properties

Physical State	Appearance	Color	Change in Appearance	Physical Form	Odor	Taste
Gas	Colorless	Colorless	N/A	Gas	Distinct odor	N/A

Flash Point	Flammability	Partition Coefficient	Autoignition Temperature	Upper Explosive Limits	Lower Explosive Limits
-99 F (-73 C) (gas)	Not available	Not available	617 F (325 C)	0.09	0.017

Boiling Point	Freezing Point	Vapor Pressure	Vapor Density	Specific Gravity	Water Solubility	pH	Odor Threshold	Evaporation Rate	Viscosity
39 F (4 C)	-218 F (-139 C)	Not available	1.9 (Air=1)	0.6	Insoluble	Not applicable	Not available	Not applicable	Not available

Molecular Weight	Molecular Formula	Density	Weight per Gallon	Volatility by Volume	Volatility	Solvent Solubility
56.11	C4-H8	Not available	Not available	100%	Not applicable	Soluble: Alcohol, ether, benzene

Section 10: Stability and Reactivity

Stability	Conditions to Avoid	Incompatible Materials
Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Halogens, oxidizing materials

Hazardous Decomposition Products	Possibility of Hazardous Reactions
Oxides of carbon	May polymerize. Avoid contact with heat, air, light, initiators or curing agents. Can polymerize in the presence of catalysts.

Section 11: Toxicology Information

Acute Effects

Oral LD50	Dermal LD50	Inhalation
Not available	Not available	Irritation, nausea, vomiting, irregular heartbeat, headache, drowsiness, symptoms of drunkenness, suffocation, lung congestion

Eye Irritation	Skin Irritation	Sensitization
Frostbite, blurred vision	Burns, frostbite	Difficulty breathing

Chronic Effects

Carcinogenicity	Mutagenicity	Reproductive Effects	Developmental Effects
Not available	Not available	Not available	No data

Section 12: Ecological Information

Fate and Transport

Eco toxicity	Persistence / Degradability	Bioaccumulation / Accumulation	Mobility in Environment
Fish toxicity: Not available Invertibrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Not available	Not available	Not available

Section 13: Disposal Considerations

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 62. Hazardous Waste Number(s): D001.

Section 14: Transportation Information

U.S. DOT 49 CFR 172.101

Proper Shipping Name	ID Number	Hazard Class or Division	Packing Group	Labeling Requirements	Passenger Aircraft or Railcar Quantity Limitations	Cargo Aircraft Only Quantity Limitations	Additional Shipping Description
Butylene	UN1012	2.1	Not applicable	2.1	Forbidden	150 kg	N/A

Canadian Transportation of Dangerous Goods

Shipping Name	UN Number	Class	Packing Group / Risk Group
Butylene	UN1012	2.1	Not applicable

Section 15: Regulatory Information

U.S. Regulations

CERCLA Sections	SARA 355.30	SARA 355.40
Not regulated.	Not regulated.	Not regulated.

SARA 370.21

Acute	Chronic	Fire	Reactive	Sudden Release
Yes	No	Yes	No	Yes

SARA 372.65

Not regulated.

OSHA Process Safety

Not regulated.

State Regulations

CA Proposition 65
Not regulated.

Canadian Regulations

WHMIS Classification
A, B1.

National Inventory Status

US Inventory (TSCA)	TSCA 12b Export Notification	Canada Inventory (DSL/NDSL)
Listed on inventory.	Not listed.	Listed on inventory.

Section 16: Other Information

NFPA Rating
HEALTH=1 FIRE=4 REACTIVITY=0

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard