



Cambridge Isotope Laboratories, Inc.
50 Frontage Road
Andover, MA 01810

Number:
Issue Date

CLM-4309
08/24/11

Page 1 of 8

MATERIAL SAFETY DATA SHEET

1 CHEMICAL PRODUCT AND COMPANY INFORMATION

Product Description 1-BUTENE (1,2-13C2, 99%)

Cambridge Isotope Laboratories, Inc.
50 Frontage Rd
ANDOVER, MA 01810
USA

E-mail cilsales@isotope.com
Web Site www.isotope.com

Phone Numbers

Emergency Contact Chemtrec
Emergency Phone 1-800-424-9300 (24 hours)

Customer Service 1-800-322-1174 (8:30-5:30 EST)
Phone
Transportation 1-202-483-7616 (24 hours)

2 HAZARDS IDENTIFICATION

OSHA Hazards

Flammable gas, Compressed Gas

GHS Classification

Flammable gases (Category 1)
Gases under pressure (Liquified gas)

GHS Label Information

Signal Word Danger

Hazards Identification

Flame
Gas cylinder

Hazard Statement(s)

Extremely flammable gas.
Contains gas under pressure; may explode if heated.

Precautionary Statement(s)

Keep away from heat/sparks/open flames/hot surfaces- No smoking.
Protect from sunlight. Store in a well-ventilated place.



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Number:
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CLM-4309
08/24/11

Page 2 of 8

MATERIAL SAFETY DATA SHEET

HMIS Ratings

Physical	3
Flammability	4
Health	0

NFPA Codes

Fire	4
Health	0
Reactivity	0

Potential Health Effects

Eyes	May cause eye irritation.
Ingestion	May be harmful if swallowed.
Inhalation	May be harmful if inhaled. May cause respiratory tract irritation.
Skin	May be harmful if absorbed through skin. May cause skin irritation.

3 COMPOSITION / INFORMATION ON INGREDIENTS

Composition / Information on Ingredients

CAS No.	106-98-9 (unlabeled)
EC No.	203-449-2
Index No.	601-012-00-4

4 FIRST AID MEASURES

First Aid Measures

Eyes	Flush eyes with water as a precaution.
Ingestion	Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.
Inhalation	If breathed in, move person to fresh air. If not breathing, give artificial respiration. Consult a physician.
Skin	Wash with soap and plenty of water. Consult a physician.
Additional Information	Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

5 FIRE FIGHTING MEASURE

Fire Fighting Measures



Cambridge Isotope Laboratories, Inc.
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Number:
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CLM-4309
08/24/11

Page 3 of 8

MATERIAL SAFETY DATA SHEET

Extinguishing Media	Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide.
Explosion Hazards	Flammable in the presence of an oxidizing gas (eg air), a source of ignition, and when the concentration of the gas is between the lower and upper explosive limits. Keep away from heat, sparks, open flames, hot surfaces, oxidizing gases. No smoking.
Fire Fighting Equipment	Wear self contained breathing apparatus for fire fighting if necessary.
Fire Fighting Procedures	Use water spray to cool unopened containers.

6 ACCIDENTAL RELEASE MEASURES

Accidental Release Measures

Personal Precautions	Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.
Environmental Precautions	Prevent further leakage or spillage if safe to do so. Do not let product enter drains.
Methods and materials for containment and cleanup	Clean up promptly by sweeping or vacuum.

7 HANDLING AND STORAGE

Precautions for Safe Handling

Handling	Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.
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Conditions for Safe Storage

Storage	Store at room temperature away from light and moisture.
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8 EXPOSURE CONTROL / PERSONAL PROTECTION

OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200)



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50 Frontage Road
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Number:
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CLM-4309
08/24/11

Page 4 of 8

MATERIAL SAFETY DATA SHEET

CHEMICAL NAME	TWA	OSHA PEL	ACGIH TLV
1-BUTENE			250 ppm

Personal Protection

Eyes - Face	Wear safety glasses with side shields (or goggles) and a face shield.
Skin	Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory	When appropriate, use NIOSH/CEN approved respirator.
Protective Clothing	Wear suitable protective clothing and gloves.
Work Hygienic Practices	Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9 PHYSICAL AND CHEMICAL PROPERTIES

Physical and Chemical Properties (Unlabeled Compound)

Form	Liquefied gas
Color	No data available
Odor	No data available
Odor Threshold	No data available
pH	No data available
Melting Point	-185 °C (-301 °F)
Boiling Point	6.3 °C (43.3 °F)
Flashpoint	-80 °C (-112 °F) - closed cup
Evaporation Rate	No data available
Lower Explosion Limit	1.6% (V)
Upper Explosion Limit	9.3% (V)
Vapor Pressure	4,346 hPa (3,260 mmHg) at 37.7 °C (99.9 °F)
Vapor Density	1.94 - (Air = 1.0)
Solubility in Water	No data available
Partition Coefficient	No data available
Auto Ignition Temperature	No data available



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Number:
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CLM-4309
08/24/11

Page 5 of 8

MATERIAL SAFETY DATA SHEET

10 STABILITY AND REACTIVITY

Stability and Reactivity

Chemical Stability	Stable if stored under recommended conditions.
Conditions to Avoid	Heat, flames and sparks. Extremes of temperature and direct sunlight.
Hazardous decomposition products	Formed under fire conditions: Carbon oxides
Materials to avoid	Strong oxidizing agents, Strong acids

11 TOXICOLOGICAL INFORMATION

Acute Toxicity

Serious Damage/Eye Irritation No data available

Skin Corrosion/Irritation No data available

Inhalation No data available

Respiratory or Skin Sensitization Not available

Germ Cell Mutagenicity Not available

IARC No component of this product present at levels greater than or equal to 0.1% is identifiable as probable, possible, or confirmed human carcinogen by IARC.

ACGIH No component of this product present at levels greater than or equal to 0.1% is identifiable as a carcinogen or potential carcinogen by ACGIH.

NTP No component of this product present at levels greater than or equal to 0.1% is identifiable as a known or anticipated carcinogen by NTP.

OSHA No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive Toxicity Not available

Specific Target Organ Toxicity



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Number:
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CLM-4309
08/24/11

Page 6 of 8

MATERIAL SAFETY DATA SHEET

Single Exposure No data available
Repeated Exposure No data available

Signs and Symptoms of Exposure

Dizziness
Heartburn
Central nervous system depression

12 ECOLOGICAL INFORMATION

Toxicity

Persistence and Degradability Not available

Bioaccumulative Potential Not available

Mobility in Soil Not available

PBT and vPvB Assessment Not available

Other Adverse Effects Not available

13 DISPOSAL CONSIDERATIONS

Disposal Considerations

Product Disposal Waste materials should be disposed of under conditions which meet Federal, State, and Local environmental control regulations.

14 TRANSPORT INFORMATION

Transportation Information-DOT/IATA/IMDG

UN Number 1012
Prop. Ship. Name Butylene
Hazard Class 2.1
Marine Pollutant No
Poison Inhalation Hazard No



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Number:
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CLM-4309
08/24/11

Page 7 of 8

MATERIAL SAFETY DATA SHEET

Special Shipping Notes IATA Passenger: Not permitted for transport.

15 REGULATORY INFORMATION

Regulatory Information

Flammable gas, Compressed Gas

SARA

Sara 302 Component No chemicals in this material are subject to the reporting requirements.

Sara 313 Component No chemicals in this material are subject to the reporting requirements.

SARA 311/312 Hazards

Fire (Y/N) Y

Pressure Generating (Y/N) Y

STATE REGULATIONS

Massachusetts Right to Know Yes

Pennsylvania Right to Know Yes

New Jersey Right to Know Yes

California Proposition 65 This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Canada

DSL Status All components are on the Canadian DSL list.

EU

Hazard Extremely flammable

Safety Statements

Keep container in a well-ventilated place.
Keep away from sources of ignition - No smoking.
Take precautionary measures against static discharges.

Risk Statements

Extremely flammable.



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50 Frontage Road
Andover, MA 01810

Number:
Issue Date

CLM-4309
08/24/11

Page 8 of 8

MATERIAL SAFETY DATA SHEET

16 OTHER INFORMATION

Additional MSDS Information This product is not radioactive. The data given for this product are those of the corresponding unlabeled compound, unless specifically indicated otherwise. Health and safety data for labeled compounds are generally not available, but are assumed to be similar or identical to the corresponding unlabeled compound.

Approved On 08/24/11
Version Number 1