



SIGMA-ALDRICH

# Material Safety Data Sheet

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Version 1.40

## Section 1 - Product and Company Information

<b>Product Name</b>	1-Butene, 99+%
<b>Product Number</b>	295051
<b>Brand</b>	Aldrich Chemical
<b>Company</b>	Sigma-Aldrich
<b>Street Address</b>	3050 Spruce Street
<b>City, State, Zip, Country</b>	SAINT LOUIS, MO 63103 US
<b>Technical Phone:</b>	800-325-5832
<b>Fax:</b>	800-325-5052
<b>Emergency Phone:</b>	314-776-6555

## Section 2 - Composition/Information on Ingredient

<u>Substance Name</u>	<u>CAS #</u>	<u>SARA 313</u>	<u>EC no</u>	<u>Annex I Index Number</u>
1-BUTENE	106-98-9	No	203-449-2	
<b>Formula</b>	C4H8			
<b>Synonyms</b>				

## Section 3 - Hazards Identification

**Emergency Overview**  
Flammable (USA) Extremely Flammable (EU)  
Danger: flammable high-pressure liquid and gas.

**HMIS Rating**  
Health: 1\* Flammability: 4 Reactivity: 0

**NFPA Rating**  
Health: 1 Flammability: 4 Reactivity: 0

\*additional chronic hazards present.  
For additional information on toxicity, please refer to Section 11.

## Section 4 - First Aid Measures

**Oral Exposure**  
If swallowed, wash out mouth with water provided person is conscious. Call a physician.

**Inhalation Exposure**  
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

**Dermal Exposure**  
In case of contact, immediately wash skin with soap and copious amounts of water.

**Eye Exposure**  
Contamination of the eyes should be treated by immediate and prolonged irrigation with copious amounts of water. Ensure adequate flushing of the eyes by separating the eyelids with fingers.

## Section 5 - Fire Fighting Measures

**Flammable Hazards** Yes

**Explosion Hazards**  
May form explosive mixtures with air  
Vapor may travel considerable distance to source of ignition and flash back.  
Container explosion may occur under fire conditions.

**Flash Point:** -112 °F -80 °C

**Explosion Limits:** Lower: 1.6 % Upper: 9.3 %

**Autoignition Temp:** 384 °C **Flammability:** Yes

### Extinguishing Media

**Suitable**  
For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be effective. Cool all affected containers with flooding quantities of water.

### Firefighting

**Protective Equipment**  
Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

**Specific Hazard(s)**  
Extremely flammable. Vapor may travel considerable distance to source of ignition and flash back. Emits toxic fumes under fire conditions.

**Specific Method(s) of Fire Fighting**  
Do not extinguish burning gas if flow cannot be shut off immediately. Use water spray or fog nozzle to keep cylinder cool. Move cylinder away from fire if there is no risk.

## Section 6 - Accidental Release Measures

**Procedure to be Followed in Case of Leak or Spill**  
Evacuate area and keep personnel upwind. Shut off all sources of ignition. Shut off leak if there is no risk.

**Procedure(s) of Personal Precaution(s)**  
Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves.

**Methods for Cleaning Up**  
Ventilate area and wash spill site after material pickup is complete.

## Section 7 - Handling and Storage

### Handling

**User Exposure**  
Do not breathe gas. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

### Storage

**Suitable**  
Keep tightly closed. Keep away from heat, sparks, and open flame. Use with equipment rated for cylinder pressure, and of compatible materials of construction. Close valve when not in use and when empty. Make sure cylinder is properly secured when in use or stored. Cylinder temperature should not exceed 125°F (52°C).

**Unsuitable**  
Store away from heat and direct sunlight.

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**Special Requirements**

Contents under pressure.

**Section 8 - Exposure Controls / PPE****Engineering Controls**

Warning: suck-back into cylinder may cause rupture. Use backflow-preventive device in piping.

**Personal Protective Equipment****Respiratory**

Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a fullface respirator with multi-purpose combination (US) or type AXBEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a fullface supplied air respirator.

**Hand**

Compatible chemical-resistant gloves.

**Eye**

Chemical safety goggles

**General Hygiene Measures**

Wash contaminated clothing before reuse. Wash thoroughly after handling.

**Section 9 - Physical/Chemical Properties****Appearance****Physical State**

Compressed gas

**Molecular Weight** 56.11 AMU**pH** N/A**BP/BP Range** -6.3 °C**MP/MP Range** -185 °C**Freezing Point** N/A**Vapor Pressure** 1939 mmHg 21.1 °C**Vapor Density** 1.93 g/l**Saturated Vapor Conc.** N/A**SG/Density** 0.595 g/cm<sup>3</sup>**Bulk Density** N/A**Odor Threshold** N/A**Volatile%** N/A**VOC Content** N/A**Water Content** N/A**Solvent Content** N/A**Evaporation Rate** N/A**Viscosity** N/A**Partition Coefficient** N/A**Decomposition Temp.** N/A**Flash Point °F** -112 °F**Flash Point °C** -80 °C

Method: closed cup

Method: closed cup

**Explosion Limits** Lower: 1.6 %

Upper: 9.3 %

**Flammability** N/A**Autoignition Temp** 384 °C**Solubility** N/A

N/A = not available

**Section 10 - Stability and Reactivity****Stability****Stable**

Stable.

**Materials to Avoid**

Strong oxidizing agents, Strong acids

**Hazardous Decomposition Products****Hazardous Decomposition Products**

Carbon monoxide, Carbon dioxide

**Section 11 - Toxicological Information****Route of Exposure****Skin Contact**

Can cause severe frostbite.

**Skin Absorption**

May be harmful if absorbed through the skin.

**Eye Contact**

May cause eye irritation.

**Inhalation**

May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract. Can cause rapid suffocation.

**Ingestion**

May be harmful if swallowed.

**Signs and Symptoms of Exposure**

Acts as a simple asphyxiant. Symptoms of overexposure include dizziness, disorientation, headache, excitation, central nervous system depression and anesthesia. Exposure can cause CNS depression.

**RTECS Number:** N/A**Section 12 - Ecological Information**

No data available.

**Section 13 - Disposal Considerations****Appropriate Method of Disposal of Substance or Preparation**

Contact a licensed professional waste disposal service to dispose of this material.

**Appropriate Method of Disposal of Contaminated Packaging**

Caution: no-return cylinder. Do not reuse. Empty cylinder will contain hazardous residue. Follow proper disposal techniques.

**Section 14 - Transport Information****DOT****Proper Shipping Name:** BUTYLENE**UN#:** 1012**Class:** 2.1**Packing Group:** None**Hazard Label:** Flammable gas**PIH:** Not PIH**IATA****Proper Shipping Name:** BUTYLENE**IATA UN Number:** 1012

**Hazard Class:** 2.1

**Not Allowed - Aircraft:** Cargo aircraft only. Not permitted on passenger aircraft

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### Section 15 - Regulatory Information

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#### EU Additional Classification

**Symbol of Danger:** F+

**Indication of Danger**

Extremely Flammable

**Risk Statements** R: 12

Extremely flammable.

**Safety Statements** S: 9 16 33

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

#### US Classification and Label Text

**Indication of Danger**

Flammable (USA) Extremely Flammable (EU).

**Safety Statements**

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

**US Statements**

Danger: flammable high-pressure liquid and gas.

#### United States Regulatory Information

**SARA Listed:** No

#### Canada Regulatory Information

**WHMIS Classification**

This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

**DSL:** Yes

**NDSL:** No

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### Section 16 - Other Information

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#### Disclaimer

For R&D use only. Not for drug, household or other uses.

#### Warranty

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. SigmaAldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2007 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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