

SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.0
Creation Date: July 15, 2019
Revision Date: July 15, 2019

SECTION 1: Identification

1.1 GHS Product identifier

Product name But-1-ene

1.2 Other means of identification

Product number -
Other names 1-BUTENE; 1-BUTYLENE; N-BUTENE

1.3 Recommended use of the chemical and restrictions on use

Identified uses Industrial and scientific research use.
Uses advised against no data available

1.4 Supplier's details

Company Shanghai Baishun Biotechnology Co., Ltd
Address No. 26, Lane 918, Lianye Road, Zhelin Town, Fengxian District, Shanghai, 201400, China
Telephone +86-21-37581181

1.5 Emergency phone number

Emergency phone number +86-21-37581181
Service hours Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Gases under pressure: Compressed gas
Flammable gases, Category 1A, Flammable gas

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word Danger
Hazard statement(s) H220 Extremely flammable gas
Precautionary statement(s) P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Response	P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
Storage	P381 In case of leakage, eliminate all ignition sources. P410+P403 Protect from sunlight. Store in a well-ventilated place. P403 Store in a well-ventilated place.
Disposal	none

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
But-1-ene	But-1-ene	106-98-9	203-449-2	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.

Following skin contact

ON FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention .

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

4.2 Most important symptoms/effects, acute and delayed

SYMPTOMS: This compound may be an asphyxiant or a slight anesthetic at high concentrations. It may also cause eye irritation. ACUTE/CHRONIC HAZARDS: This material may be narcotic in high concentrations and is an asphyxiant. This chemical is extremely flammable. (NTP, 1992)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Basic Treatment: Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Monitor for pulmonary edema and treat if necessary ... Anticipate seizures and treat as necessary ... For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport ... Do not use emetics. For ingestion, rinse mouth and administer 5 mL/kg up to 200 mL of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Administer activated charcoal ... Treat frostbite with rapid rewarming techniques ... Aliphatic hydrocarbons and related compounds

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Fire prevention: to reduce the likelihood of accidental leakage ... reserve valves & automatic closure devices should be provided ... sources of ignition should be prevented & fire-fighting equipment should be provided. hydrocarbons, aliphatic

5.2 Specific hazards arising from the chemical

This chemical is flammable. Vapor is heavier than air and may travel long distances to an ignition source and flash back. (NTP, 1992)

5.3 Special protective actions for fire-fighters

Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out. In other cases extinguish with powder, carbon dioxide. In case of fire: keep cylinder cool by spraying with water. Combat fire from a sheltered position.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Personal protection: complete protective clothing including self-contained breathing apparatus. Ventilation. Remove all ignition sources.

6.2 Environmental precautions

Evacuate danger area! Personal protection: complete protective clothing including self-contained breathing apparatus. Ventilation. Remove all ignition sources.

6.3 Methods and materials for containment and cleaning up

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Fireproof. Cool. Ventilation along the floor.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

TLV: 250 ppm as TWA

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear face shield or eye protection in combination with breathing protection.

Skin protection

Cold-insulating gloves.

Respiratory protection

Use ventilation.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	PHYSICAL DESCRIPTION: Colorless gas. (NTP, 1992)
Colour	Colorless
Odour	Slightly aromatic odor
Melting point/freezing point	-75°C(lit.)
Boiling point or initial boiling point and boiling range	26.3°C(lit.)
Flammability	Extremely flammable.
Lower and upper explosion limit/flammability limit	Lower flammable limit: 1.6% by volume; Upper flammable limit: 10.0% by volume
Flash point	-80°C
Auto-ignition temperature	723°F
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	7.76X10 ⁻³ mPa sec of saturated vapor at 298.15K; 0.186 mPa sec of saturated liquid at 266 K
Solubility	Insoluble (NTP, 1992)
Partition coefficient n-octanol/water	log Kow= 2.40
Vapour pressure	1939 mm Hg (21.1 °C)
Density and/or relative density	0.625 g/cm ³
Relative vapour density	1.93 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

The substance may polymerize. Reacts violently with oxygen and oxidants. This generates fire and explosion hazard.

10.2 Chemical stability

Stable

10.3 Possibility of hazardous reactions

Highly flammable ... Dangerous fire ... risk. The gas is heavier than air and may travel along the ground; distant ignition possible. The unsaturated aliphatic hydrocarbons, such as 1-BUTENE, are generally much more reactive than the alkanes. Strong oxidizers may react vigorously with them. Reducing agents can react exothermically to release gaseous hydrogen. In the presence of various catalysts (such as acids) or initiators, compounds in this class can undergo very exothermic addition polymerization reactions. May react with oxidizing materials. Aluminum borohydride reacts with alkenes and in the presence of oxygen, combustion is initiated even in the absence of moisture.

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Incompatible with/ oxidizing materials, aluminum tris-tetrahydroborate.

10.6 Hazardous decomposition products

When heated to decomposition it emits acrid smoke and fumes.

SECTION 11: Toxicological information

Acute toxicity

- Oral: no data available
- Inhalation: no data available
- Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

Rapid evaporation of the liquid may cause frostbite.

STOT-repeated exposure

no data available

Aspiration hazard

On loss of containment this substance can cause suffocation by lowering the oxygen content of the air in confined areas.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: no data available
- Toxicity to daphnia and other aquatic invertebrates: no data available
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

12.2 Persistence and degradability

Cell free extracts and suspensions of microorganisms isolated from soil or water and raised on ethylene were found to epoxidize 1-butene to butene-1,2-epoxide(1,2). Methanotrophic bacteria isolated from soil and water were found to epoxidize 1-butene(3). Pure cultures of *Pseudomonas oleovorans* grown on octane oxidized 1-butene to 1-butene-3-ol(4). Bacteria isolated from soil and water and raised on propane were found to epoxidize 1-butene(5). Alkenes can be utilized by a wide range of microorganisms and are catabolized via several routes(6). These include the oxidation of a terminal methyl group leaving the double bond intact and resulting in unsaturated alcohol, aldehyde and fatty acid or oxidation of the double bond resulting in the formation of epoxide, diol compounds and possibly hydroxyacids(6).

12.3 Bioaccumulative potential

An estimated BCF of 14 was calculated for 1-butene(SRC), using a log Kow of 2.40(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low.

12.4 Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc for 1-butene can be estimated to be 44(SRC). According to a classification scheme(2), this estimated Koc value suggests that 1-butene is expected to have very high mobility in soil.

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

14.1 UN Number

ADR/RID: UN1012 (For reference only, please check.)

IMDG: UN1012 (For reference only, please check.)

IATA: UN1012 (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID: BUTYLENE (For reference only, please check.)

IMDG: BUTYLENE (For reference only, please check.)

IATA: BUTYLENE (For reference only, please check.)

14.3 Transport hazard class(es)

ADR/RID: 2.1 (For reference only, please check.)

IMDG: 2.1 (For reference only, please check.)

IATA: 2.1 (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: (For reference only, please check.)

IMDG: (For reference only, please check.)

IATA: (For reference only, please check.)

14.5 Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
But-1-ene	But-1-ene	106-98-9	203-449-2
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.
Korea Existing Chemicals List (KECL)			Listed.

SECTION 16: Other information

Information on revision

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Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Other Information

Health effects of exposure to the substance have not been investigated. Check oxygen content before entering area.

Any questions regarding this SDS, Please send your inquiry to sds@xixisys.com

Disclaimer: 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. We as supplier shall not be held liable for any damage resulting from handling or from contact with the above product.