

Chemical Safety Data Sheet MSDS / SDS

n-Butane

Revision Date:2024-03-16 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name : n-Butane
CBnumber : CB6152626
CAS : 106-97-8
EINECS Number : 203-448-7
Synonyms : butane,n-Butane

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses : For R&D use only. Not for medicinal, household or other use.
Uses advised against : none

Company Identification

Company : Chemicalbook
Address : Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing
Telephone : 400-158-6606

SECTION 2: Hazards identification

Classification of the substance or mixture

Gases under pressure: Liquefied gas
Flammable gases, Category 1A, Flammable gas
Germ cell mutagenicity, Category 1B
Carcinogenicity, Category 1A

Label elements**Pictogram(s)**

☐

Signal word : Danger

Hazard statement(s)

H220 Extremely flammable gas
H280 Contains gas under pressure; may explode if heated

Precautionary statement(s)

P210 Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P403 Store in a well-ventilated place.

P410 Protect from sunlight.

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P203 Obtain, read and follow all safety instructions before use.

P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...

Response

P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381 In case of leakage, eliminate all ignition sources.

P318 IF exposed or concerned, get medical advice.

Storage

P410+P403 Protect from sunlight. Store in a well-ventilated place.

P403 Store in a well-ventilated place.

P405 Store locked up.

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards

no data available

SECTION 3: Composition/information on ingredients

Substance

Product name	: n-Butane
Synonyms	: butane,n-Butane
CAS	: 106-97-8
EC number	: 203-448-7
MF	: C4H10
MW	: 58.12

SECTION 4: First aid measures

Description of 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.

Most important symptoms and effects, both acute and delayed

High exposure produces drowsiness but no other evidence of systemic effect. (USCG, 1999)

Indication of any immediate medical attention and special treatment needed

FIRST AID: Skin--ON CONTACT WITH LIQUID FROSTBITE: rinse with plenty of water, do NOT remove clothes. Refer for medical attention; Eyes--ON CONTACT WITH LIQUID FROSTBITE. First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

SECTION 5: Firefighting measures

Extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Specific Hazards Arising from the Chemical

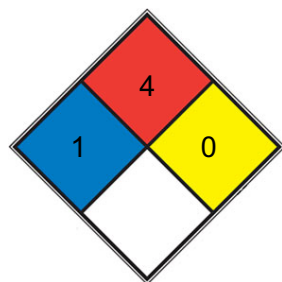
Excerpt from ERG Guide 115 [Gases - Flammable (Including Refrigerated Liquids)]: EXTREMELY FLAMMABLE. Will be easily ignited by heat, sparks or flames. Will form explosive mixtures with air. Vapors from liquefied gas are initially heavier than air and spread along ground.

CAUTION: Hydrogen (UN1049), Deuterium (UN1957), Hydrogen, refrigerated liquid (UN1966) and Methane (UN1971) are lighter than air and will rise. Hydrogen and Deuterium fires are difficult to detect since they burn with an invisible flame. Use an alternate method of detection (thermal camera, broom handle, etc.) Vapors may travel to source of ignition and flash back. Cylinders exposed to fire may vent and release flammable gas through pressure relief devices. Containers may explode when heated. Ruptured cylinders may rocket. (ERG, 2016)

Advice for firefighters

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.

NFPA 704



■ HEALTH 1 Exposure would cause irritation with only minor residual injury (e.g. [acetone](#), sodium bromate, potassium chloride)

Will rapidly or completely vaporize at normal atmospheric pressure and temperature, or is readily dispersed in air and will

■ FIRE 4 burn readily. Includes pyrophoric substances. Flash point below room temperature at 22.8 °C (73 °F). (e.g. acetylene, propane, [hydrogen gas](#))

■ REACT 0 Normally stable, even under fire exposure conditions, and is not reactive with water (e.g. helium, [N2](#))

□ SPEC.

□ HAZ.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Ventilation. Remove all ignition sources. NEVER direct water jet on liquid.

Environmental precautions

Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Ventilation. Remove all ignition sources. NEVER direct water jet on liquid.

Methods and materials for containment and cleaning up

Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Ventilation. Remove all ignition sources. NEVER direct water jet on liquid.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding) if in liquid state. Use non-sparking handtools. 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.

Conditions for safe storage, including any incompatibilities

Fireproof. Cool. Butane in liquid form may be stored both above and below ground. Besides storage in liquefied form under its vapor pressure at normal atmospheric temperatures, refrigerated liquid storage at atmospheric pressure may be used. Such systems are closed and insulated, and the liquid petroleum gas vapor is circulated through pumps and compressors to serve as the refrigerant for the system. Butane may be stored in pits in the earth capped by metal domes and in underground chambers.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 1000 ppm as STEL. MAK: 2400 mg/m³, 1000 ppm; peak limitation category: II(4); pregnancy risk group: D

Biological limit values

no data available

Exposure controls

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

Individual protection measures

Eye/face protection

Wear face shield.

Skin protection

Cold-insulating gloves. Protective clothing.

Respiratory protection

Use closed system or ventilation.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties

Information on basic physicochemical properties

Physical state	gas
Colour	Colorless gas [Note: Shipped as a liquefied compressed gas. A liquid below 31 degrees F]
Odour	Faint, disagreeable odor
Melting point/freezing point	-138.35°C
Boiling point or initial boiling point and boiling range	?0.5°C(lit.)
Flammability	Flammable Gas
Lower and upper explosion limit/flammability limit	Lower flammable limit: 1.9% by volume; Upper flammable limit: 8.5% by volume.
Flash point	45
Auto-ignition temperature	550° F (USCG, 1999)
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	7.5 at 300 K; 9.9 at 400 K; 12.2 at 500 K; 14.5 at 600 K (all in uPa.s) (gas)
Solubility	61 mg/L at 68° F (NTP, 1992)
Partition coefficient n-octanol/water	log Kow = 2.89
Vapour pressure	3.21, 1.26, and 0.66 mM at 4, 25, and 50 °C, respectively (Kresheck et al., 1965)
Density and/or relative density	0.579g/mL at 20°C(lit.)
Relative vapour density	2.11 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

Reactivity

no data available

Chemical stability

no data available

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 gas is heavier than air and may accumulate in lowered spaces causing a deficiency of oxygen. As a result of flow, agitation, etc., electrostatic charges can be generated. BUTANE can explode when exposed to flame or when mixed with (nickel carbonyl + oxygen). It can also react with oxidizers. Strong acids and alkalis should be avoided. (NTP, 1992).

Conditions to avoid

no data available

Incompatible materials

Very dangerous fire hazard when exposed to ... oxidizers.

Hazardous decomposition products

When heated to decomposition it emits acrid smoke and fumes.

SECTION 11: Toxicological information

Acute toxicity

- Oral: no data available
- Inhalation: LC50 Rat inhalation 658 mg//4 hr
- 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. The substance may cause effects on the central nervous system.

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

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

Persistence and degradability

AEROBIC: A mean half-life of 5.9 days was reported for all detectable hydrocarbons in an aerobic biodegradation study of gasoline in water from a domestic sewage treatment plant(1). Among the last compounds to be degraded was butane, for which a degradation half-life was calculated as 15 days(1). Within 24 hrs, n-butane was oxidized to its corresponding methyl ketone, 2-butanone(2,3), and the corresponding alcohol, 2-butanol(3,4), by cell suspensions of over 20 methyltrophic organisms isolated from lake water and soil samples(1-3). After 192 hrs, the concentration of n-butane contained in gasoline was reduced from 0.63 to 0.37 uL/L for both a sterile control and a mixed culture sample collected from ground water contaminated with gasoline; these data indicate that n-butane was not biodegraded over the study period(5). The biodegradation of n-butane in a Columbia River soil was measured over 50 days; a degradation rate of 1.8 mgC/day/kg dry soil was reported without the addition of nitrogen(6). When nitrogen at 0.15 mg per bottle was added, the degradation rate increased to 11.4 mg C/day/kg dry soil(6). 100% of the initially added n-butane (32.9 mg/L) was biodegraded over 34 days in a screening study using an activated sludge inoculum(7).

Bioaccumulative potential

An estimated BCF of 33 was calculated for n-butane(SRC), using a log Kow of 2.89(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is moderate(SRC).

Mobility in soil

The Koc of n-butane is estimated as 900(SRC), using a measured log Kow of 2.89(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that n-butane is expected to have low mobility in soil.

Other adverse effects

no data available

SECTION 13: Disposal considerations

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

UN Number

ADR/RID: UN1011 (For reference only, please check.)

IMDG: UN1011 (For reference only, please check.)

IATA: UN1011 (For reference only, please check.)

UN Proper Shipping Name

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

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

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

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.)

Packing group, if applicable

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

IMDG: (For reference only, please check.)

IATA: (For reference only, please check.)

Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

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

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.

PICCS

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

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

Check oxygen content before entering area. Turn leaking cylinder with the leak up to prevent escape of gas in liquid state. Information except physical properties also apply for Isobutane (CAS 75-28-5). High concentrations in the air cause a deficiency of oxygen with the risk of unconsciousness or death.

Disclaimer:

The information in this MSDS is only applicable to the specified product, unless otherwise specified, it is not applicable to the mixture of this product and other substances. This MSDS only provides information on the safety of the product for those who have received the appropriate professional training for the user of the product. Users of this MSDS must make independent judgments on the applicability of this SDS. The authors of this MSDS will not be held responsible for any harm caused by the use of this MSDS.