



N-BUTANE (D10, 98%)

Safety Data Sheet

according to Regulation (EC) No. 453/2010 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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Version: 4.0

DLM-1610

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

1.1. Product identifier

| | |
|-------------------------------|--|
| Product form | : Substance |
| Substance name | : N-BUTANE (D10, 98%) |
| EC index no | : 601-004-00-0 (Unlabeled) |
| EC no | : 203-448-7 (Unlabeled) |
| CAS No | : 7582-04-9 |
| Product code | : DLM-1610 |
| Formula | : CD3(CD2)2CD3 |
| Other means of identification | : Also applicable to: DLM-1610-1-LB (D10, 98%) - Lecture Bottle |

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

1.2.1. Relevant identified uses

| | |
|----------------------------------|------------------------------|
| Main use category | : Professional use |
| Industrial/Professional use spec | : For professional use only. |

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

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

USA: 1-800-322-1174 Int: 1-978-749-8000
cilsales@isotope.com www.isotope.com

Emergency telephone number

Emergency numbers:

Chemtrec: 1-800-424-9300 (24 hours)
International: 1-703-741-5970 (24 hours)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flam. Gas 1 H220
Press. Gas
Compressed gas H280

Full text of H-phrases: see section 16

Classification according to Directive 67/548/EEC or 1999/45/EC

F+; R12
R5

Full text of R-phrases: see section 16

Classification (GHS-US)

Simple Asphy H380
Flam. Gas 1 H220
Compressed gas H280
Press. Gas Not classified

Adverse physicochemical, human health and environmental effects

No additional information available

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2.2. Label elements

Labeling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



GHS02

GHS04

Signal word (CLP) :

Danger

Hazard statements (CLP) :

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

Precautionary statements (CLP) :

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely
P381 - In case of leaking gas fire, eliminate all ignition sources if safe to do so
P403 - Store in a well-ventilated place
P410+P403 - Protect from sunlight. Store in a well-ventilated place

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS02

GHS04

Signal word (GHS-US) :

Danger

Hazard statements (GHS-US) :

H220 - Extremely flammable gas
H280 - Contains gas under pressure; may explode if heated
H380 - May displace oxygen and cause rapid suffocation

Precautionary statements (GHS-US) :

P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely
P381 - In case of leaking gas fire, eliminate all ignition sources if safe to do so
P403 - Store in a well-ventilated place
P410+P403 - Protect from sunlight. Store in a well-ventilated place

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

| Name | Product identifier | % | Classification according to Directive 67/548/EEC |
|---|---|-----|--|
| N-BUTANE (D10, 98%) (Main constituent) | (CAS No) 7582-04-9 (EC no) 203-448-7 (Unlabeled) (EC index no) 601-004-00-0 (Unlabeled) | 100 | F+; R12 R5 |

| Name | Product identifier | % | Classification according to Regulation (EC) No. 1272/2008 [CLP] |
|---|---|-----|---|
| N-BUTANE (D10, 98%) (Main constituent) | (CAS No) 7582-04-9 (EC no) 203-448-7 (Unlabeled) (EC index no) 601-004-00-0 (Unlabeled) | 100 | Flam. Gas 1, H220 Press. Gas Compressed gas, H280 |

Full text of R-, H- and EUH-phrases: see section 16

| Name | Product identifier | % | Classification (GHS-US) |
|---|--------------------|-----|--|
| N-BUTANE (D10, 98%) (Main constituent) | (CAS No) 7582-04-9 | 100 | Simple Asphy, H380 Flam. Gas 1, H220 Compressed gas, H280 Press. Gas Not classified |

Full text of H-phrases: see section 16

3.2. Mixtures

Not applicable

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SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures general : Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.
- First-aid measures after inhalation : If breathed in, move person to fresh air. If not breathing, give artificial respiration. Consult a physician.
- First-aid measures after skin contact : Wash with soap and plenty of water. Consult a physician.
- First-aid measures after eye contact : Flush eyes with water as a precaution.
- First-aid measures after ingestion : Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries after inhalation : May be harmful if inhaled. May cause respiratory tract irritation.
- Symptoms/injuries after skin contact : May be harmful if absorbed through skin. May cause skin irritation.
- Symptoms/injuries after eye contact : May cause eye irritation.
- Symptoms/injuries after ingestion : May be harmful if swallowed.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

- suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide.

5.2. Special hazards arising from the substance or mixture

- Reactivity : Not available.

5.3. Advice for firefighters

- Firefighting instructions : Wear self contained breathing apparatus for fire fighting if necessary.
- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.
- Other information : Use water spray to cool unopened containers.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

- Emergency procedures : 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.

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3. Methods and material for containment and cleaning up

- For containment : Sweep up and shovel. Keep in suitable, closed containers for disposal.
- Methods for cleaning up : Clean up promptly by sweeping or vacuum.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Additional hazards when processed : Avoid inhalation of vapor or mist.
- Precautions for safe handling : Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take precautionary measures against static discharge.
- Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Keep container tightly closed in a cool, dry and well-ventilated place.
- Storage conditions : Store at room temperature away from light and moisture.

7.3. Specific end use(s)

No additional information available

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

| N-BUTANE (D10, 98%) (7582-04-9) | | |
|---------------------------------|-------------------------|---|
| Italy - Portugal - USA ACGIH | ACGIH TWA (ppm) | 1000 ppm Central Nervous System impairment. Cardiac sensitization. Varies |
| Italy - Portugal - USA ACGIH | ACGIH STEL (ppm) | 1000 ppm Central Nervous System impairment. 2015 Adoption |
| USA NIOSH | NIOSH REL (TWA) (mg/m3) | 1900 mg/m ³ Also see specific listing for Isobutane. |
| USA NIOSH | NIOSH REL (TWA) (ppm) | 800 ppm Also see specific listing for Isobutane. |

8.2. Exposure controls

Personal protective equipment : Gloves. Protective clothing. Protective goggles. Self-contained breathing apparatus.



Hand protection : Wear suitable protective clothing and gloves.

Eye protection : Wear safety glasses with side shields (or goggles) and a face shield.

Skin and body protection : Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Respiratory protection : When appropriate, use NIOSH/CEN approved respirator.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

| | |
|---|---|
| Physical state | : Gas |
| Appearance | : Gaseous. |
| Molecular mass | : 68.18 g/mol (Labeled) |
| Color | : Colorless. |
| Odor | : odorless. |
| Odor threshold | : No data available |
| pH | : No data available |
| Relative evaporation rate (butyl acetate=1) | : No data available |
| Melting point | : -138 °C (-216 °F) - lit. |
| Freezing point | : No data available |
| Boiling point | : -0.5 °C (31.1 °F) - lit. |
| Flash point | : -60 °C (76 °F) |
| Self ignition temperature | : 288 °C (550 °F) |
| Decomposition temperature | : No data available |
| Flammability (solid, gas) | : No data available |
| Vapor pressure | : 2426 hPa (1,820 mmHg) at 25 °C (77 °F); 3,556.67 hPa (2,667.72 mmHg) at 37.7 °C (99.9 °F) |
| Relative vapor density at 20 °C | : 2.33 |
| Relative density | : No data available |
| Relative gas density | : 2.48 kg/m ³ at 15 °C (59 °F) |
| Solubility | : No data available |
| Log Pow | : 2.89 |
| Log Kow | : No data available |
| Viscosity, kinematic | : No data available |
| Viscosity, dynamic | : No data available |
| Explosive properties | : No data available |
| Oxidizing properties | : No data available |
| Explosive limits | : 1.8 - 8.4 vol % |

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

Not available.

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10.2. Chemical stability

Stable if stored under recommended conditions.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

Heat, flames and sparks.

10.5. Incompatible materials

Strong oxidizing agent.

10.6. Hazardous decomposition products

carbon oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

| N-BUTANE (D10, 98%) (7582-04-9) | |
|---------------------------------|--------------------------------|
| LC50 inhalation rat (mg/l) | 658000 mg/m ³ - 4 h |
| ATE (vapors) | 658000.000 mg/l/4h |
| ATE (dust, mist) | 658000.000 mg/l/4h |

Skin corrosion/irritation : Not classified

Serious eye damage/irritation : Not classified

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

Potential Adverse human health effects and symptoms : Central nervous system depression. Giddiness. Shortness of breath. Narcosis. Dermal contact with rapidly evaporating liquid could result in freezing of the tissues and frostbite. Exposure can cause numbness, tingling and weakness in extremities. Cyanosis. Pulmonary edema. Effects may be delayed. Abdominal pain. Nausea. Vomiting. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Stomach - Irregularities - Based on Human Evidence.

Symptoms/injuries after inhalation : May be harmful if inhaled. May cause respiratory tract irritation.

Symptoms/injuries after skin contact : May be harmful if absorbed through skin. May cause skin irritation.

Symptoms/injuries after eye contact : May cause eye irritation.

Symptoms/injuries after ingestion : May be harmful if swallowed.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

| N-BUTANE (D10, 98%) (7582-04-9) | |
|---------------------------------|------|
| Log Pow | 2.89 |

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

No additional information available

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SECTION 13: Disposal considerations

13.1. Waste treatment methods

- Regional legislation (waste) : Waste materials should be disposed of under conditions which meet Federal, State, and Local environmental control regulations.
- Waste disposal recommendations : Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.
- Ecology - waste materials : Dispose of as unused product.

SECTION 14: Transport information

In accordance with ADR / RID / ADNR / IMDG / ICAO / IATA

14.1. UN number

- UN-No.(DOT) : 1011
- DOT NA no. UN1011

14.2. UN proper shipping name

- DOT Proper Shipping Name : Butane
see also Petroleum gases, liquefied
- Department of Transportation (DOT) Hazard Classes : 2.1 - Class 2.1 - Flammable gas 49 CFR 173.115
- Hazard labels (DOT) : 2.1 - Flammable gas



- DOT Special Provisions (49 CFR 172.102) : 19 - For domestic transportation only, the identification number UN1075 may be used in place of the identification number specified in column (4) of the 172.101 table. The identification number used must be consistent on package markings, shipping papers and emergency response information.
T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter.
- DOT Packaging Exceptions (49 CFR 173.xxx) : 306
- DOT Packaging Non Bulk (49 CFR 173.xxx) : 304
- DOT Packaging Bulk (49 CFR 173.xxx) : 314;315

14.3. Additional information

- Other information : No supplementary information available.
- Special transport precautions : Not dangerous goods.

Overland transport

- Class (ADR) : 2 - Gases
- Hazard identification number (Kemler No.) : 23
- Classification code (ADR) : 2F
- Danger labels (ADR) : 2.1 - Flammable gases



- Orange plates : An orange rectangular plate with a black border. The number '23' is printed in black in the top half, and the number '1011' is printed in black in the bottom half.

- Tunnel restriction code : B/D
- Limited quantities (ADR) : 0
- EAC : 2YE
- Excepted quantities (ADR) : E0

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Transport by sea

DOT Vessel Stowage Location : E - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length, but is prohibited from carriage on passenger vessels in which the limiting number of passengers is exceeded.

DOT Vessel Stowage Other : 40 - Stow "clear of living quarters"

MFAG-No : 115

Air transport

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : Forbidden

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 150 kg

Civil Aeronautics Law : Gases under pressure/Gases flammable under pressure

14.4. Environmental hazards

Other information : No supplementary information available.

14.5. Special precautions for user

Special transport precautions : Not dangerous goods.

14.6. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

N-BUTANE (D10, 98%) (7582-04-9)

| | |
|-------------------------------------|--|
| SARA Section 311/312 Hazard Classes | Fire hazard Delayed (chronic) health hazard |
|-------------------------------------|--|

15.2. International regulations

CANADA

N-BUTANE (D10, 98%) (7582-04-9)

Listed on the Canadian DSL (Domestic Substances List) inventory.

15.2.1. National regulations

No additional information available

15.3. US State regulations

N-BUTANE (D10, 98%)(7582-04-9)

| | |
|----------------------------|---|
| State or local regulations | U.S. - Massachusetts - Right To Know List U.S. - Pennsylvania - RTK (Right to Know) List U.S. - New Jersey - Right to Know Hazardous Substance List This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm. |
|----------------------------|---|

SECTION 16: Other information

Other 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.

Full text of R-, H- and EUH-phrases::

| | |
|----------------|-------------------------------------|
| Compressed gas | Gases under pressure Compressed gas |
| Flam. Gas 1 | Flammable gases Category 1 |
| Press. Gas | Gases under pressure |
| H220 | Extremely flammable gas |

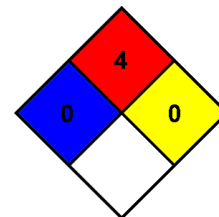
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| | |
|------|--|
| H280 | Contains gas under pressure; may explode if heated |
| R12 | Extremely flammable |
| R5 | Heating may cause an explosion |
| F+ | Extremely flammable |

- NFPA health hazard : 0 - Exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials.
- NFPA fire hazard : 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.
- NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

- Health : 0 Minimal Hazard - No significant risk to health
- Flammability : 4 Severe Hazard
- Physical : 3 Serious Hazard

CIL Multi-Solvent Mixture SDS

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product