

## SAFETY DATA SHEET

Creation Date 26-Sep-2009

Revision Date 14-Feb-2020

Revision Number 3

### 1. Identification

**Product Name** 2-Chlorobutane

**Cat No. :** B21586

**CAS-No** 78-86-4  
**Synonyms** sec-Butyl chloride

**Recommended Use** Laboratory chemicals.  
**Uses advised against** Food, drug, pesticide or biocidal product use.  
**Details of the supplier of the safety data sheet**

**Company**

Alfa Aesar  
Thermo Fisher Scientific Chemicals, Inc.  
30 Bond Street  
Ward Hill, MA 01835-8099  
Tel: 800-343-0660  
Fax: 800-322-4757  
**Email:** tech@alfa.com  
www.alfa.com

**Emergency Telephone Number**

During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660.  
After normal business hours, call Carechem 24 at (866) 928-0789.

### 2. Hazard(s) identification

**Classification**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

|                     |            |
|---------------------|------------|
| Flammable liquids   | Category 2 |
| Corrosive to metals | Category 1 |

**Label Elements**

**Signal Word**

Danger

**Hazard Statements**

Highly flammable liquid and vapor  
May be corrosive to metals

**Precautionary Statements****Prevention**

Keep away from heat/sparks/open flames/hot surfaces. - No smoking  
 Keep container tightly closed  
 Ground/bond container and receiving equipment  
 Use explosion-proof electrical/ventilating/lighting/equipment  
 Use only non-sparking tools  
 Take precautionary measures against static discharge  
 Wear protective gloves/protective clothing/eye protection/face protection  
 Keep only in original container

**Skin**

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower

**Fire**

In case of fire: Use CO<sub>2</sub>, dry chemical, or foam for extinction

**Spills**

Absorb spillage to prevent material damage

**Storage**

Store in a well-ventilated place. Keep cool  
 Store in corrosive resistant polypropylene container with a resistant inliner

**Disposal**

Dispose of contents/container to an approved waste disposal plant

**Hazards not otherwise classified (HNOC)**

Harmful to aquatic life with long lasting effects

### 3. Composition/Information on Ingredients

| Component         | CAS-No  | Weight % |
|-------------------|---------|----------|
| Butane, 2-chloro- | 78-86-4 | 99       |

### 4. First-aid measures

**General Advice**

If symptoms persist, call a physician.

**Eye Contact**

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

**Skin Contact**

Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

**Inhalation**

Remove to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.

**Ingestion**

Clean mouth with water and drink afterwards plenty of water.

**Most important symptoms and effects**

No information available. Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

**Notes to Physician**

Treat symptomatically

## 5. Fire-fighting measures

|                                         |                                                                                                                                |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Suitable Extinguishing Media</b>     | Water spray. Carbon dioxide (CO <sub>2</sub> ). Dry chemical. Chemical foam. Water mist may be used to cool closed containers. |
| <b>Unsuitable Extinguishing Media</b>   | No information available                                                                                                       |
| <b>Flash Point</b>                      | -15 °C / 5 °F                                                                                                                  |
| <b>Method -</b>                         | No information available                                                                                                       |
| <b>Autoignition Temperature</b>         | 460 °C / 860 °F                                                                                                                |
| <b>Explosion Limits</b>                 |                                                                                                                                |
| <b>Upper</b>                            | 8.8%                                                                                                                           |
| <b>Lower</b>                            | 1.7%                                                                                                                           |
| <b>Sensitivity to Mechanical Impact</b> | No information available                                                                                                       |
| <b>Sensitivity to Static Discharge</b>  | No information available                                                                                                       |

### Specific Hazards Arising from the Chemical

Flammable. Vapors may form explosive mixtures with air. Containers may explode when heated. Vapors may travel to source of ignition and flash back.

### Hazardous Combustion Products

Carbon monoxide (CO). Carbon dioxide (CO<sub>2</sub>). Hydrogen chloride gas.

### Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

### NFPA

**Health**  
0

**Flammability**  
3

**Instability**  
0

**Physical hazards**  
N/A

## 6. Accidental release measures

|                                             |                                                                                                                                                                               |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Personal Precautions</b>                 | Ensure adequate ventilation. Use personal protective equipment as required. Remove all sources of ignition. Take precautionary measures against static discharges.            |
| <b>Environmental Precautions</b>            | Should not be released into the environment. Do not flush into surface water or sanitary sewer system.                                                                        |
| <b>Methods for Containment and Clean Up</b> | Keep in suitable, closed containers for disposal. Soak up with inert absorbent material. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. |

## 7. Handling and storage

|                 |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Handling</b> | Ensure adequate ventilation. Wear personal protective equipment/face protection. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Take precautionary measures against static discharges. |
| <b>Storage</b>  | Flammables area. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed in a dry and well-ventilated place. Keep away from heat, sparks and flame. Keep under nitrogen.                                                                                                                                                                                                                   |

## 8. Exposure controls / personal protection

|                            |                                                                                                                                               |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Exposure Guidelines</b> | This product does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies. |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|

**Engineering Measures** Use explosion-proof electrical/ventilating/lighting/equipment. Ensure adequate ventilation, especially in confined areas.

### Personal Protective Equipment

**Eye/face Protection** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin and body protection** Wear appropriate protective gloves and clothing to prevent skin exposure.

**Respiratory Protection** No protective equipment is needed under normal use conditions.

**Hygiene Measures** Handle in accordance with good industrial hygiene and safety practice.

## 9. Physical and chemical properties

|                                               |                                        |
|-----------------------------------------------|----------------------------------------|
| <b>Physical State</b>                         | Liquid                                 |
| <b>Appearance</b>                             | Clear                                  |
| <b>Odor</b>                                   | Characteristic                         |
| <b>Odor Threshold</b>                         | No information available               |
| <b>pH</b>                                     | No information available               |
| <b>Melting Point/Range</b>                    | -140 °C / -220 °F                      |
| <b>Boiling Point/Range</b>                    | 68 - 70 °C / 154.4 - 158 °F @ 760 mmHg |
| <b>Flash Point</b>                            | -15 °C / 5 °F                          |
| <b>Evaporation Rate</b>                       | No information available               |
| <b>Flammability (solid,gas)</b>               | Not applicable                         |
| <b>Flammability or explosive limits</b>       |                                        |
| <b>Upper</b>                                  | 8.8%                                   |
| <b>Lower</b>                                  | 1.7%                                   |
| <b>Vapor Pressure</b>                         | 145 mbar @ 20 °C                       |
| <b>Vapor Density</b>                          | 3.2 (Air = 1.0)                        |
| <b>Specific Gravity</b>                       | 0.870                                  |
| <b>Solubility</b>                             | Soluble in water                       |
| <b>Partition coefficient; n-octanol/water</b> | No data available                      |
| <b>Autoignition Temperature</b>               | 460 °C / 860 °F                        |
| <b>Decomposition Temperature</b>              | No information available               |
| <b>Viscosity</b>                              | No information available               |
| <b>Molecular Formula</b>                      | C4 H9 Cl                               |
| <b>Molecular Weight</b>                       | 92.57                                  |

## 10. Stability and reactivity

**Reactive Hazard** None known, based on information available

**Stability** Stable under recommended storage conditions.

**Conditions to Avoid** Incompatible products. Keep away from open flames, hot surfaces and sources of ignition.

**Incompatible Materials** Strong oxidizing agents, Strong bases, Metals, copper, Strong acids

**Hazardous Decomposition Products** Carbon monoxide (CO), Carbon dioxide (CO<sub>2</sub>), Hydrogen chloride gas

**Hazardous Polymerization** No information available.

**Hazardous Reactions** None under normal processing.

## 11. Toxicological information

### Acute Toxicity

#### Product Information

#### Component Information

| Component         | LD50 Oral               | LD50 Dermal                | LC50 Inhalation |
|-------------------|-------------------------|----------------------------|-----------------|
| Butane, 2-chloro- | LD50 = 20 mL/kg ( Rat ) | LD50 = 20 mL/kg ( Rabbit ) | Not listed      |

**Toxicologically Synergistic Products** No information available

### Delayed and immediate effects as well as chronic effects from short and long-term exposure

**Irritation** No information available

**Sensitization** No information available

**Carcinogenicity** The table below indicates whether each agency has listed any ingredient as a carcinogen.

| Component         | CAS-No  | IARC       | NTP        | ACGIH      | OSHA       | Mexico     |
|-------------------|---------|------------|------------|------------|------------|------------|
| Butane, 2-chloro- | 78-86-4 | Not listed | Not listed | Not listed | Not listed | Not listed |

**Mutagenic Effects** No information available

**Reproductive Effects** No information available.

**Developmental Effects** No information available.

**Teratogenicity** No information available.

**STOT - single exposure** None known

**STOT - repeated exposure** None known

**Aspiration hazard** No information available

**Symptoms / effects, both acute and delayed** Inhalation of high vapor concentrations may cause symptoms like headache, dizziness, tiredness, nausea and vomiting

**Endocrine Disruptor Information** No information available

**Other Adverse Effects** The toxicological properties have not been fully investigated.

## 12. Ecological information

### Ecotoxicity

Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

| Component         | Freshwater Algae | Freshwater Fish                                  | Microtox   | Water Flea |
|-------------------|------------------|--------------------------------------------------|------------|------------|
| Butane, 2-chloro- | Not listed       | LC50: = 75.5 mg/L, 96h semi-static (Danio rerio) | Not listed | Not listed |

**Persistence and Degradability** Persistence is unlikely based on information available.

**Bioaccumulation/ Accumulation** No information available.

**Mobility** Will likely be mobile in the environment due to its volatility.

## 13. Disposal considerations

**Waste Disposal Methods** Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

## 14. Transport information

**DOT**

UN-No UN1127  
 Proper Shipping Name CHLOROBUTANES  
 Technical Name 2-Chlorobutane  
 Hazard Class 3  
 Packing Group II

**TDG**

UN-No UN1127  
 Proper Shipping Name CHLOROBUTANES  
 Hazard Class 3  
 Packing Group II

**IATA**

UN-No UN1127  
 Proper Shipping Name CHLOROBUTANES  
 Hazard Class 3  
 Packing Group II

**IMDG/IMO**

UN-No UN1127  
 Proper Shipping Name CHLOROBUTANES  
 Hazard Class 3  
 Packing Group II

## 15. Regulatory information

**United States of America Inventory**

| Component         | CAS-No  | TSCA | TSCA Inventory notification - Active/Inactive | TSCA - EPA Regulatory Flags |
|-------------------|---------|------|-----------------------------------------------|-----------------------------|
| Butane, 2-chloro- | 78-86-4 | X    | ACTIVE                                        | -                           |

**Legend:**

TSCA - Toxic Substances Control Act, (40 CFR Part 710)

X - Listed

-' - Not Listed

TSCA 12(b) - Notices of Export Not applicable

**International Inventories**

Canada (DSL/NDL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Australia (AICS), China (IECSC), Korea (ECL).

| Component         | CAS-No  | DSL | NDL | EINECS    | PICCS | ENCS | AICS | IECSC | KECL        |
|-------------------|---------|-----|-----|-----------|-------|------|------|-------|-------------|
| Butane, 2-chloro- | 78-86-4 | X   | -   | 201-151-7 | X     | X    | X    | X     | 2014-3-6146 |

**U.S. Federal Regulations**

SARA 313 Not applicable

SARA 311/312 Hazard Categories See section 2 for more information

CWA (Clean Water Act) Not applicable

Clean Air Act Not applicable

OSHA - Occupational Safety and Health Administration Not applicable

CERCLA Not applicable

**California Proposition 65**

This product does not contain any Proposition 65 chemicals.

**U.S. State Right-to-Know Regulations**

| Component         | Massachusetts | New Jersey | Pennsylvania | Illinois | Rhode Island |
|-------------------|---------------|------------|--------------|----------|--------------|
| Butane, 2-chloro- | X             | X          | X            | -        | -            |

**U.S. Department of Transportation**

Reportable Quantity (RQ): N  
DOT Marine Pollutant N  
DOT Severe Marine Pollutant N

**U.S. Department of Homeland Security**

This product does not contain any DHS chemicals.

**Other International Regulations****Mexico - Grade**

No information available

**16. Other information****Prepared By**

Health, Safety and Environmental Department  
Email: tech@alfa.com  
www.alfa.com

**Creation Date**

26-Sep-2009

**Revision Date**

14-Feb-2020

**Print Date**

14-Feb-2020

**Revision Summary**

SDS authoring systems update, replaces ChemGes SDS No. 78-86-4/3.

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

**End of SDS**