



# SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Revision Date 04/03/2014

Version 1.2

## SECTION 1. Identification

### Product identifier

Product number	801640
Product name	1-Chlorobutane for synthesis
CAS-No.	109-69-3

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

Identified uses	Chemical for synthesis
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### Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation   290 Concord Road, Billerica, MA 01821, United States of America   General Inquiries: +1-978-751-4321   Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5)
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Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week
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## SECTION 2. Hazards identification

### GHS Classification

Flammable liquid, Category 2, H225

For the full text of the H-Statements mentioned in this Section, see Section 16.

### GHS-Labeling

*Hazard pictograms*



*Signal Word*

Danger

*Hazard Statements*

H225 Highly flammable liquid and vapor.

*Precautionary Statements*

P210 Keep away from heat.

### OSHA Hazards

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This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS and may deviate from the GHS information.

## Other hazards

None known.

## SECTION 3. Composition/information on ingredients

Formula	CH <sub>3</sub> (CH <sub>2</sub> ) <sub>3</sub> Cl	C <sub>4</sub> H <sub>9</sub> Cl (Hill)
Molar mass	92.57 g/mol	

### Hazardous ingredients

*Chemical Name (Concentration)*

CAS-No.

1-chlorobutane (>= 90 % - <= 100 % )

109-69-3

Exact percentages are being withheld as a trade secret.

## SECTION 4. First aid measures

### Description of first-aid measures

#### *Inhalation*

After inhalation: fresh air.

#### *Skin contact*

After skin contact: wash off with plenty of water. Remove contaminated clothing.

#### *Eye contact*

After eye contact: rinse out with plenty of water.

#### *Ingestion*

After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Pulmonary failure possible after aspiration of vomit. Call a physician immediately. Do not give milk, alcoholic beverages or castor oil.

Never give anything by mouth to an unconscious person.

### Most important symptoms and effects, both acute and delayed

irritant effects, Dermatitis, Dizziness, Unconsciousness, narcosis, inebriation, Vomiting, Headache

Drying-out effect resulting in rough and chapped skin.

### Indication of any immediate medical attention and special treatment needed

Subsequently administer: Sodium sulfate (1 tablespoon/1/4 l water).

## SECTION 5. Fire-fighting measures

### Extinguishing media

#### *Suitable extinguishing media*

Carbon dioxide (CO<sub>2</sub>), Foam, Dry powder

#### *Unsuitable extinguishing media*

For this substance/mixture no limitations of extinguishing agents are given.

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## Special hazards arising from the substance or mixture

Combustible.

Vapors are heavier than air and may spread along floors.

Forms explosive mixtures with air at ambient temperatures.

Pay attention to flashback.

Development of hazardous combustion gases or vapors possible in the event of fire.

Fire may cause evolution of:

Hydrogen chloride gas, Phosgene

## Advice for firefighters

*Special protective equipment for fire-fighters*

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

*Further information*

Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system. Cool closed containers exposed to fire with water spray.

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## SECTION 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

### Environmental precautions

Do not empty into drains. Risk of explosion.

### Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.

Observe possible material restrictions (see sections 7 and 10).

Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

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## SECTION 7. Handling and storage

### Precautions for safe handling

Observe label precautions.

*Advice on protection against fire and explosion*

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

### Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place. Protected from light. Keep away from heat and sources of ignition.

Store at +15°C to +25°C (+59°F to +77°F).

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## SECTION 8. Exposure controls/personal protection

### Exposure limit(s)

Contains no substances with occupational exposure limit values.

### Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

### Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

### Hygiene measures

Change contaminated clothing. Application of skin- protective barrier cream recommended.

Wash hands after working with substance.

### Eye/face protection

Safety glasses

### Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

### Other protective equipment:

Flame retardant antistatic protective clothing

### Respiratory protection

required when vapors/aerosols are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	stinging
Odor Threshold	No information available.
pH	No information available.
Melting point	-123 °C
Boiling point/boiling range	ca. 174 °F (79 °C) at 1,013 hPa
Flash point	ca. 1 °F (-17 °C) Method: DIN 51755 Part 1

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Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	1.8 %(V)
Upper explosion limit	10.1 %(V)
Vapor pressure	ca.110 hPa at 68 °F (20 °C)
Relative vapor density	3.2
Density	0.886 g/cm <sup>3</sup> at 68 °F (20 °C)
Relative density	No information available.
Water solubility	ca.0.5 g/l at 68 °F (20 °C)
Partition coefficient: n-octanol/water	log Pow: 2.66 OECD Test Guideline 107 Bioaccumulation is not expected.
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	0.45 mPa.s at 68 °F (20 °C)
Explosive properties	Not classified as explosive.
Oxidizing properties	none
Ignition temperature	ca. 536 °F (280 °C)

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### SECTION 10. Stability and reactivity

#### Reactivity

Vapors may form explosive mixture with air.

#### Chemical stability

Sensitivity to light

Sensitive to air.

Decomposes on exposure to light.

#### Possibility of hazardous reactions

Risk of explosion with:

Alkali metals, Alkaline earth metals, sodium amide

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Risk of ignition or formation of inflammable gases or vapors with:

Oxidizing agents, Powdered light metals

### Conditions to avoid

Warming.

A range from approx. 15 Kelvin below the flash point is to be rated as critical.

### Incompatible materials

various plastics, Light metals

### Hazardous decomposition products

in the event of fire: See section 5.

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## SECTION 11. Toxicological information

### Information on toxicological effects

#### *Likely route of exposure*

Inhalation, Eye contact, Skin contact

#### *Acute oral toxicity*

LD50 rat: 2,200 mg/kg (IUCLID)

Symptoms: Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract.

#### *Acute inhalation toxicity*

LC50 rat: > 30.8 mg/l; 4 h (IUCLID)

Symptoms: slight mucosal irritations

#### *Acute dermal toxicity*

LDLO rabbit: 20 g/kg

(RTECS)

#### *Skin irritation*

rabbit

Result: No irritation

(IUCLID)

Drying-out effect resulting in rough and chapped skin. Dermatitis

#### *Eye irritation*

rabbit

Result: No eye irritation

(IUCLID)

slight irritation

#### *Sensitization*

Sensitization test: guinea pig

Result: negative

Method: OECD Test Guideline 406

#### *Genotoxicity in vitro*

Mutagenicity (mammal cell test): chromosome aberration.

Result: negative

(National Toxicology Program)

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Ames test  
Salmonella typhimurium  
Result: negative  
(National Toxicology Program)

*Specific target organ systemic toxicity - single exposure*

The substance or mixture is not classified as specific target organ toxicant, single exposure.

*Specific target organ systemic toxicity - repeated exposure*

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

*Aspiration hazard*

Regarding the available data the classification criteria are not fulfilled.

### Carcinogenicity

IARC	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
ACGIH	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

### Further information

After absorption of toxic quantities:

narcosis

Possible symptoms:

Headache, Vomiting, inebriation, Dizziness, Unconsciousness

Chronic intoxication:

Damage to:

Liver

Further data:

Handle in accordance with good industrial hygiene and safety practice.

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## SECTION 12. Ecological information

### Ecotoxicity

*Toxicity to fish*

LC50 Leuciscus idus (Golden orfe): 600 mg/l; 48 h

DIN 38412 part 15

*Toxicity to daphnia and other aquatic invertebrates*

EC50 Daphnia magna (Water flea): 452 mg/l; 48 h

OECD Test Guideline 202

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### *Toxicity to algae*

IC50 *Desmodesmus subspicatus* (green algae): > 450 mg/l; 72 h (IUCLID)

NOEC *Desmodesmus subspicatus* (green algae): 90 mg/l; 72 h (External MSDS)

### *Toxicity to bacteria*

BRINGMANN-KÜHN-TEST EC10 *Pseudomonas putida*: 332 mg/l; 18 h (IUCLID)

## **Persistence and degradability**

### *Biodegradability*

47 %; 28 d

ISO 10708

Not readily biodegradable.

## **Bioaccumulative potential**

*Partition coefficient: n-octanol/water*

log Pow: 2.66

OECD Test Guideline 107

Bioaccumulation is not expected.

## **Mobility in soil**

No information available.

## **Other adverse effects**

### *Henry constant*

1690 Pa·m<sup>3</sup>/mol

Method: (experimental)

(Lit.) Distribution preferentially in air.

### *Additional ecological information*

Discharge into the environment must be avoided.

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## **SECTION 13. Disposal considerations**

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

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## **SECTION 14. Transport information**

### **Land transport (DOT)**

UN number	UN 1127
Proper shipping name	CHLOROBUTANES
Class	3
Packing group	II
Environmentally hazardous	--

### **Air transport (IATA)**



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UN number UN 1127  
Proper shipping name CHLOROBUTANES  
Class 3  
Packing group II  
Environmentally hazardous --  
Special precautions for user no

## Sea transport (IMDG)

UN number UN 1127  
Proper shipping name CHLOROBUTANES  
Class 3  
Packing group II  
Environmentally hazardous --  
Special precautions for user yes  
EmS F-E S-D

## SECTION 15. Regulatory information

### United States of America

#### OSHA Hazards

Flammable Liquid

This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS, and may deviate from the GHS information on the label and in section 2.

#### SARA 311/312 Hazards

Fire Hazard

#### SARA 313

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

#### SARA 302

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

#### Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

#### DEA List I

Not listed

#### DEA List II

Not listed

### US State Regulations

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### Massachusetts Right To Know

#### *Ingredients*

1-chlorobutane

### Pennsylvania Right To Know

#### *Ingredients*

1-chlorobutane

### New Jersey Right To Know

#### *Ingredients*

1-chlorobutane

### California Prop 65 Components

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

### Notification status

TSCA: All components of the product are listed in the TSCA-inventory.

DSL: All components of this product are on the Canadian DSL.

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## SECTION 16. Other information

### Training advice

Provide adequate information, instruction and training for operators.

### Full text of H-Statements referred to under sections 2 and 3.

H225 Highly flammable liquid and vapor.

### Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at [www.wikipedia.org](http://www.wikipedia.org).

Revision Date 04/03/2014

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The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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