MATERIAL SAFETY DATA SHEET

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

Revision Date 08/23/2013 Version 1.1

SECTION 1.Identification

Product identifier

Product number	820159
Product name	Bis(2-chloroethyl)ammonium chloride for synthesis

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

Identified uses	Chemical for synthesis

Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation | 290 Concord Road, Billerica, MA 01821, United States of America | SDS Phone Support: +1-978-715-1335 | General Inquiries: +1-978-715-4321 | Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5)
Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2. Hazards identification

GHS Classification

Acute toxicity, Category 4, Oral, H302
Skin corrosion, Category 1B, H314
Corrosive to Metals, Category 1, H290

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

GHS-Labeling

Hazard pictograms

Signal Word
Danger

Hazard Statements
H290 May be corrosive to metals.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.

Precautionary Statements

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P309 + P310 IF exposed or if you feel unwell: Immediately call a POISON CENTER or doctor/physician.

OSHA Hazards
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Other hazards
None known.

SECTION 3. Composition/information on ingredients

Formula	$(ClCH_2CH_2)_2NH_2Cl$	$C_4H_{10}Cl_3N$ (Hill)
CAS-No.	821-48-7	
Molar mass	178.48 g/mol	

Hazardous ingredients
Chemical Name (Concentration)
CAS-No.
Bis(2-chloroethyl)amine hydrochloride (>= 90 % - <= 100 %)
821-48-7

SECTION 4. First aid measures

Description of first-aid measures
Inhalation
After inhalation: fresh air. Call in physician.

Skin contact
After skin contact: wash off with plenty of water. Immediately remove contaminated clothing. If available swab with polyethylene glycol 400. Call a physician immediately.

Eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist.

Ingestion
After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation!). Call a physician immediately. Do not attempt to neutralize.

Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed
Irritation and corrosion, Cough, Shortness of breath, Nausea, Vomiting, Headache
Risk of blindness!

Indication of any immediate medical attention and special treatment needed
No information available.

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media

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

Special hazards arising from the substance or mixture

Not combustible.
Ambient fire may liberate hazardous vapors.
Fire may cause evolution of:
nitrogen oxides, Hydrogen chloride gas

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.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Avoid substance contact. Avoid generation of dusts; do not inhale dusts. Ensure adequate ventilation. 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.

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 dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

SECTION 7. Handling and storage

Precautions for safe handling

Observe label precautions.

Conditions for safe storage, including any incompatibilities

Tightly closed. Dry.

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

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
Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

Eye/face protection
Tightly fitting safety goggles

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:
protective clothing

Respiratory protection
required when dusts 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	powder, finecrystalline
Color	beige
Odor	slight
Odor Threshold	No information available.
pH	No information available.
Melting point	212 - 215 °C (decomposition)
Boiling point	No information available.
Flash point	not applicable
Evaporation rate	No information available.

Flammability (solid, gas)	No information available.
Lower explosion limit	No information available.
Upper explosion limit	No information available.
Vapor pressure	No information available.
Relative vapor density	No information available.
Relative density	No information available.
Water solubility	> 100 g/l at 68 °F (20 °C)
Partition coefficient: n-octanol/water	log Pow: -1.75 (calculated) (Lit.) Bioaccumulation is not expected (log Pow <1).
Autoignition temperature	No information available.
Decomposition temperature	> 412 °F (> 211 °C)
Viscosity, dynamic	No information available.
Explosive properties	No information available.
Corrosion	May be corrosive to metals.

SECTION 10. Stability and reactivity

Reactivity
See below

Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

Possibility of hazardous reactions
Violent reactions possible with:

Strong oxidizing agents, strong alkalis

Conditions to avoid
Strong heating (decomposition).

Incompatible materials
no information available

Hazardous decomposition products
in the event of fire: See section 5.

SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure
Eye contact, Skin contact, Ingestion

Acute oral toxicity
LD50 rat: 1,150 mg/kg (External MSDS)
Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.

Acute inhalation toxicity

Symptoms: burns of mucous membranes, Cough, Shortness of breath, Inhalation may lead to the formation of oedemas in the respiratory tract., Possible damages:, damage of respiratory tract

Corrosive to respiratory system

Skin irritation
Causes skin burns.

Causes burns.

Eye irritation
Causes serious eye damage.
Risk of blindness!

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

Systemic effects:

Possible symptoms:
Nausea, Vomiting, Headache
Further data:
Other dangerous properties can not be excluded.
Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

Ecotoxicity

No information available.

Persistence and degradability

No information available.

Bioaccumulative potential

Partition coefficient: n-octanol/water
log Pow: -1.75
(calculated)
(Lit.) Bioaccumulation is not expected (log Pow <1).

Mobility in soil

No information available.

Additional ecological information
We have no quantitative data concerning the ecological effects of this product.
Further information on ecology
Discharge into the environment must be avoided.

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.

SECTION 14. Transport information

Land transport (DOT)

UN number	UN 1759
Proper shipping name	CORROSIVE SOLID, N.O.S. (BIS(2-CHLOROETHYL)AMMONIUM CHLORIDE)
Class	8
Packing group	II
Environmentally hazardous	--

Air transport (IATA)

UN number	UN 1759
Proper shipping name	CORROSIVE SOLID, N.O.S. (BIS(2-CHLOROETHYL)AMMONIUM CHLORIDE)
Class	8
Packing group	II
Environmentally hazardous	--
Special precautions for user	no

Sea transport (IMDG)

UN number	UN 1759
Proper shipping name	CORROSIVE SOLID, N.O.S. (BIS(2-CHLOROETHYL)AMMONIUM CHLORIDE)
Class	8
Packing group	II
Environmentally hazardous	--
Special precautions for user	yes
EmS	F-A S-B

SECTION 15. Regulatory information

United States of America

OSHA Hazards

Harmful if swallowed.
Corrosive to skin
Corrosive to eyes
Corrosive by inhalation.

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

Acute Health 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

Massachusetts Right To Know
Remarks
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know
Ingredients
Bis(2-chloroethyl)amine hydrochloride

New Jersey Right To Know
Ingredients
Bis(2-chloroethyl)amine hydrochloride

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:	This product contains one or several components listed in the Canadian NDSL. *Ingredients* Bis(2-chloroethyl)amine hydrochloride

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.

H290	May be corrosive to metals.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.

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.

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