Material Safety Data Sheet

acc. to OSHA and ANSI

Printing date 11/10/2008 *Reviewed on 11/10/2008*

1 Identification of substance:

Product details:

Product name: Bis(2-chloroethyl) ether

Stock number: L16920

Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com

Information Department: Health, Safety and Environmental Department
Emergency information:
During normal hours the Health, Safety and Environmental Department.
After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:

Chemical characterization:
Description: (CAS#)
Bis(2-chloroethyl) ether (CAS# 111-44-4): 100%
Identification number(s):
EINECS Number: 203-870-1
Index number: 603-029-00-2

3 Hazards identification

Hazard description:

T+ Very toxic

Information pertaining to particular dangers for man and environment
R 10 Flammable.
R 26/27/28 Very toxic by inhalation, in contact with skin and if swallowed.
R 40 Limited evidence of a carcinogenic effect.
Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

HEALTH	3
FIRE	2
REACTIVITY	1

Health (acute effects) = 3
Flammability = 2
Reactivity = 1

4 First aid measures

General information
Immediately remove any clothing soiled by the product.
Remove breathing apparatus only after contaminated clothing has been completely removed.
In case of irregular breathing or respiratory arrest provide artificial respiration.

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After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.
After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.
After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.
After swallowing
Do not induce vomiting; immediately call for medical help.
Seek immediate medical advice.

5 Fire fighting measures

Suitable extinguishing agents
Use carbon dioxide, extinguishing powder or foam. Water may be ineffective but may be used for cooling exposed containers.
Special hazards caused by the material, its products of combustion or resulting gases:
In case of fire, the following can be released:
Carbon monoxide and carbon dioxide
Hydrogen chloride (HCl)
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Person-related safety precautions:
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Keep away from ignition sources
Measures for environmental protection:
Do not allow material to be released to the environment without proper governmental permits.
Measures for cleaning/collecting:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Keep away from ignition sources.
Additional information:
See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling
Information for safe handling:
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.

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Open and handle container with care.
Information about protection against explosions and fires:
Keep ignition sources away.
Protect against electrostatic charges.
Fumes can combine with air to form an explosive mixture.

Storage
Requirements to be met by storerooms and receptacles:
No special requirements.
Information about storage in one common storage facility:
Store away from oxidizing agents.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

8 Exposure controls and personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace:

Bis(2-chloroethyl) ether

	ppm
ACGIH TLV	5; 10-STEL (skin) Not classifiable as a human carcinogen
Austria MAK	5 (skin)
Belgium TWA	5; 10-STEL (skin)
Finland TWA	5; 10-STEL (skin)
France VME	5 (skin)
Germany MAK	10 (skin)
Japan OEL	15 (skin)
Korea TLV	5; 10-STEL (skin)
Netherlands MAC-TGG	5 (skin)
Norway TWA	5
Poland TWA	10 mg/m3; 60 mg/m3-STEL
Russia	15; 2 mg/m3-STEL (skin)
Sweden	Carcinogen
Switzerland MAK-W	5; 25-KZG-W (skin)
USA PEL	5; 15-Ceiling (skin)

Components with limit values that require monitoring at the workplace:
Additional information: No data

Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
Breathing equipment:
Use suitable respirator when high concentrations are present.

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Protection of hands:
Check protective gloves prior to each use for their proper condition.
Impervious gloves
Material of gloves
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties:

General Information	
Form:	Liquid
Color:	Colorless
Odor:	Not determined
Change in condition	
Melting point/Melting range:	Not determined
Boiling point/Boiling range:	65-67°C (149-153°F) (15mm Hg)
Sublimation temperature / start:	Not determined
Flash point:	55°C (131°F)
Ignition temperature:	Not determined
Decomposition temperature:	Not determined
Explosion limits:	
Lower:	Not determined
Upper:	Not determined
Vapor pressure:	Not determined
Density:	Not determined
Solubility in / Miscibility with	
Water:	Not miscible or difficult to mix

10 Stability and reactivity

Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.
Materials to be avoided: Oxidizing agents
Dangerous reactions No dangerous reactions known
Dangerous products of decomposition:
Carbon monoxide and carbon dioxide
Hydrogen chloride (HCl)

11 Toxicological information

Acute toxicity:

LD/LC50 values that are relevant for classification:		
Oral	LD50	112 mg/kg (mam) 209 mg/kg (mouse)

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		75 mg/kg (rat)
		126 mg/kg (rabbit)
Dermal	LD50	300 mg/kg (guinea pig)
		90 mg/kg (rabbit)
Inhalative	LC50/1H	500 ppm/1H (guinea pig)
	LC50/2H	650 mg/m3/2H (mouse)
	LC50/4H	330 mg/m3/4H (rat)
Irritation of skin	mild	500 mg (rabbit)
Irritation of eyes	severe	100 mg (rabbit)

Primary irritant effect:
on the skin: Irritant to skin and mucous membranes.
on the eye: Irritating effect.
Sensitization: Sensitization possible through skin contact.
Other information (about experimental toxicology):
Tumorigenic effects have been observed on tests with laboratory animals.
Mutagenic effects have been observed on tests with bacteria.
Mutagenic effects have been observed on tests with insects.
Subacute to chronic toxicity:
Subacute to chronic toxicity:
Sense Organs and Special Senses (Eye) - ptosis.
Gastrointestinal - changes in structure or function of salivary glands.
Gastrointestinal - hypermotility, diarrhea.
Related to Chronic Data - death.
Brain and Coverings - other degenerative changes.
Cardiac - other changes.
Liver - liver function tests impaired.
Liver - multiple effects.
Liver - tumors.
Blood - lymphoma, including Hodgkin's disease.
Kidney, Ureter, Bladder - other changes.
Tumorigenic - carcinogenic by RTECS criteria.
Tumorigenic - equivocal tumorigenic agent by RTECS criteria.
Tumorigenic - tumors at site of application.
Additional toxicological information:
Danger through skin absorption.
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
EPA-B2: Probable human carcinogen, sufficient evidence from animal studies; inadequate evidence or no data from epidemiologic studies.
IARC-3: Not classifiable as to carcinogenicity to humans.
ACGIH A4: Not classifiable as a human carcinogen: Inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.

12 Ecological information:

General notes:
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.

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Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations

Product:
Recommendation
Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: *Disposal must be made according to official regulations.*

14 Transport information

DOT regulations:

Hazard class:	*6.1*
Identification number:	*UN2929*
Packing group:	*II*
Proper shipping name (technical name):	*TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S. (Bis(2-chloroethyl) ether)*
Label	*6.1+3*

Land transport ADR/RID (cross-border)

ADR/RID class:	*6.1 (TF1) Toxic substances*
Danger code (Kemler):	*63*
UN-Number:	*2929*
Packaging group:	*II*
Description of goods:	*2929 TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S. (Bis(2-chloroethyl) ether)*

Maritime transport IMDG:

IMDG Class:	*6.1*
UN Number:	*2929*
Label	*6.1+3*
Packaging group:	*II*

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Proper shipping name:	TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S. (Bis(2-chloroethyl) ether)

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class:	6.1
UN/ID Number:	2929
Label	6.1+3
Packaging group:	II
Proper shipping name:	TOXIC LIQUID, FLAMMABLE, ORGANIC, N.O.S. (Bis(2-chloroethyl) ether)

15 Regulations

Product related hazard informations:

Hazard symbols:
T+ Very toxic

Risk phrases:
10 Flammable.
26/27/28 Very toxic by inhalation, in contact with skin and if swallowed.
40 Limited evidence of a carcinogenic effect.

Safety phrases:
7/9 Keep container tightly closed and in a well-ventilated place.
27/28 After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of water.
36/37 Wear suitable protective clothing and gloves.
45 In case of accident or if you feel unwell, seek medical advice immediately.

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
This product contains a chemical known to the state of California to cause cancer or reproductive toxicity.
All components of this product are listed on the Canadian Non-Domestic Substances List (NDSL).

Information about limitation of use:
For use only by technically qualified individuals.
This product is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

16 Other information:

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or

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process, is the responsibility of the user.

Department issuing MSDS: *Health, Safety and Environmental Department.*
Contact: *Paul V. Connolly*