Material Safety Data Sheet

According to OSHA and ANSI

Printing date 03/07/2011 Reviewed on 03/04/2011

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

Product identifier

Product name: cis-1,4-Dichloro-2-butene

Stock number: A18956
CAS Number:
1476-11-5
EINECS Number:
216-021-5
Index number:
602-073-00-X
Relevant identified uses of the substance or mixture and uses advised against.
Sector of Use SU24 Scientific research and development

Details of the supplier of the safety data sheet
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 telephone number:
During normal hours the Health, Safety and Environmental Department. After normal hours call Chemtrec at (800) 424-9300.

2 Hazards identification

Classification of the substance or mixture

GHS02 Flame

H226 Flammable liquid and vapour.

GHS06 Skull and crossbones

H300 Fatal if swallowed.
H310 Fatal in contact with skin.
H330 Fatal if inhaled.

GHS08 Health hazard

H350 May cause cancer.

GHS05 Corrosion

H314 Causes severe skin burns and eye damage.
H318 Causes serious eye damage.

GHS09 Environment

H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

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

T+; Very toxic

R26: Very toxic by inhalation.

T; Toxic

R45-24/25: May cause cancer. Toxic in contact with skin and if swallowed.

C; Corrosive

R34: Causes burns.

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N; Dangerous for the environment

R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R10: Flammable.

Information concerning particular hazards for human and environment: Not applicable

Label elements

Labelling according to EU guidelines:

Code letter and hazard designation of product:
T+ Very toxic
N Dangerous for the environment

Risk phrases:
45 May cause cancer.
10 Flammable.
24/25 Also toxic in contact with skin and if swallowed.
26 Also very toxic by inhalation.
34 Causes burns.
50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Safety phrases:
53 Avoid exposure - obtain special instructions before use.
45 In case of accident or if you feel unwell, seek medical advice immediately.
60 This material and its container must be disposed of as hazardous waste.
61 Avoid release to the environment. Refer to special instructions/Safety data sheets
Hazard description:
WHMIS classification
B3 - Combustible liquid
D1A - Very toxic material causing immediate and serious toxic effects
D2A - Very toxic material causing other toxic effects
E - Corrosive material

Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

HEALTH	4
FIRE	2
REACTIVITY	1

Health (acute effects) = 4
Flammability = 2
Reactivity = 1

Other hazards
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Substances
(CAS#) Description:
1476-11-5 cis-1,4-Dichloro-2-butene
Identification number(s):
EINECS Number: 216-021-5
Index number: 602-073-00-X

4 First aid measures

Description of 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.
After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.

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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.
Information for doctor
Most important symptoms and effects, both acute and delayed
No further relevant information available.
Indication of any immediate medical attention and special treatment needed
No further relevant information available.

5 Firefighting measures

Extinguishing media
Suitable extinguishing agents
Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Special hazards arising from the substance or mixture
In case of fire, the following can be released:
Carbon monoxide and carbon dioxide
Hydrogen chloride (HCl)
Advice for firefighters
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Environmental precautions:
Do not allow material to be released to the environment without proper governmental permits.
Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Use neutralizing agent.
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
Reference to other sections
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
Precautions for safe handling
Keep container tightly sealed.
Ensure good ventilation at the workplace.
Open and handle container with care.
Information about protection against explosions and fires: Keep ignition sources away.

Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and receptacles: Refrigerate
Information about storage in one common storage facility:
Store in the dark.
Protect from heat.
Store away from oxidizing agents.
Further information about storage conditions:
Keep container tightly sealed.
Protect from exposure to light.
Refrigerate
Specific end use(s) No further relevant information available.

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8 Exposure controls/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:

1,4-Dichloro-2-butene

	ppm
ACGIH TLV	0.005 (skin); Suspected human carcinogen
Austria	Carcinogen
Russia TWA	0.1 mg/m3-STEL (skin)
United Kingdom	Carcinogen

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

Exposure controls
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.
Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
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
Tightly sealed goggles
Full face protection
Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties	
General Information	
Appearance:	
Form:	Liquid
Color:	Not determined.
Odor:	Not determined
Odour threshold:	Not determined.
pH-value:	Not determined.
Change in condition	
Melting point/Melting range:	-48°C (-54 °F)
Boiling point/Boiling range:	152.5°C (307 °F)
Sublimation temperature / start:	Not determined
Flash point:	55°C (131 °F)
Flammability (solid, gaseous)	Not applicable.
Ignition temperature:	Not determined
Decomposition temperature:	Not determined
Auto igniting:	Not determined.
Explosion limits:	
Lower:	Not determined
Upper:	Not determined
Vapor pressure at 20°C (68 °F):	3.5 hPa (3 mm Hg)
Density at 20°C (68 °F):	1.188 g/cm³ (9.914 lbs/gal)
Relative density	Not determined.
Vapour density	Not determined.

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Evaporation rate	Not determined.
Solubility in / Miscibility with	
Water:	Not miscible or difficult to mix
Segregation coefficient (n-octonol/water):	Not determined.
Viscosity:	
dynamic:	Not determined.
kinematic:	Not determined.
Other information	No further relevant information available.

10 Stability and reactivity

Reactivity
Chemical stability
Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.
Possibility of hazardous reactions No dangerous reactions known
Incompatible materials:
Heat
Light
Oxidizing agents
Hazardous decomposition products:
Carbon monoxide and carbon dioxide
Hydrogen chloride (HCl)

11 Toxicological information

Information on toxicological effects
Acute toxicity:
Primary irritant effect:
on the skin: Corrosive effect on skin and mucous membranes.
on the eye: Strong corrosive effect.
Sensitization: No sensitizing effects known.
Subacute to chronic toxicity:
Corrosive materials are acutely destructive to the respiratory tract, eyes, skin and digestive tract. Eye contact may result in permanent damage and complete vision loss. Inhalation may result in respiratory effects such as inflammation, edema, and chemical pneumonitis. May cause coughing, wheezing, laryngitis, shortness of breath, headache, nausea and vomiting. Ingestion may cause damage to the mouth, throat and esophagus. May cause skin burns or irritation depending on the severity of the exposure.
Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
Danger through skin absorption.
Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.
ACGIH A2: Suspected human carcinogen: Agent is carcinogenic in experimental animals at dose levels, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) considered relevant to worker exposure. Available epidemiologic studies are conflicting or insufficient to confirm an increased risk of cancer in exposed humans.

12 Ecological information

Toxicity
Acquatic toxicity: No further relevant information available.
Persistence and degradability No further relevant information available.
Behavior in environmental systems:
Bioaccumulative potential No further relevant information available.
Mobility in soil No further relevant information available.
Ecotoxical effects:
Remark: Very toxic for aquatic organisms
Additional ecological information:
General notes:
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Danger to drinking water if even extremely small quantities leak into the ground.
Also poisonous for fish and plankton in water bodies.
Do not allow material to be released to the environment without proper governmental permits.
Very toxic for aquatic organisms

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Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects No further relevant information available.

13 Disposal considerations

Waste treatment methods
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:	UN3390
Packing group:	I
Proper shipping name (technical name):	TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. (cis-1,4-Dichloro-2-butene)
Label	6.1+8

Land transport ADR/RID (cross-border)

ADR/RID class:	6.1 (TC1) Toxic substances
Danger code (Kemler):	668
UN-Number:	3390
Packaging group:	I
Special marking:	Symbol (fish and tree)
UN proper shipping name:	3390 TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. (cis-1,4-Dichloro-2-butene)

Maritime transport IMDG:

IMDG Class:	6.1
UN Number:	3390
Label	6.1+8
Packaging group:	I
Marine pollutant:	No
Proper shipping name:	TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S. (cis-1,4-Dichloro-2-butene)

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class:	6.1
UN/ID Number:	3390
Label	6.1+8
Packaging group:	I
Proper shipping name:	TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S.

UN "Model Regulation": UN3390, TOXIC BY INHALATION LIQUID, CORROSIVE, N.O.S., 6.1 (8), I
Environmental hazards: Environmentally hazardous substance, liquid; Marine Pollutant
Special precautions for user Warning: Toxic substances

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Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

Product related hazard informations:

Hazard symbols:
T+ Very toxic
N Dangerous for the environment

Risk phrases:
45 May cause cancer.
10 Flammable.
24/25 Also toxic in contact with skin and if swallowed.
26 Also very toxic by inhalation.
34 Causes burns.
50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Safety phrases:
53 Avoid exposure - obtain special instructions before use.
45 In case of accident or if you feel unwell, seek medical advice immediately.
60 This material and its container must be disposed of as hazardous waste.
61 Avoid release to the environment. Refer to special instructions/Safety data sheets

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.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

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 process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.
Contact:
Zachariah C. Holt
Global EHS Manager
Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)