

Material Safety Data Sheet

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Version 1.4

According to 91/155/EEC

1 - Product and Company Information

Product Name	1,3-BUTADIENE, STAB., CYL. WITH 14 L
Product Number	17932
Company	Sigma-Aldrich Pte Ltd #08-01 Citilink Warehouse Singapore 118529 Singapore
Technical Phone #	65 271 1089
Fax	65 271 1571

2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
1,3-BUTADIENE	106-99-0	203-450-8	601-013-00-X
Formula	C4H6		
Molecular Weight	54.09 AMU		
Synonyms	Biethylene * Bivinyll * Butadien (Dutch) * Buta-1,3-dien (Dutch) * Butadien (Polish) * Buta-1,3-dien (German) * Buta-1,3-diene * 1,3-Butadiene (ACGIH:OSHA) * alpha,gamma-Butadiene * Butadiene (OSHA) * Butadiene-1,3 * Divinyl * Erythrene * NCI-C50602 * Pyrrolylene * Vinyethylene		

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

May cause cancer. May cause heritable genetic damage. Extremely flammable.

Carc. Cat.1 Muta. Cat.2

4 - First Aid Measures

AFTER INHALATION

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

AFTER SKIN CONTACT

In case of contact, immediately wash skin with soap and copious amounts of water.

AFTER EYE CONTACT

Contamination of the eyes should be treated by immediate and prolonged irrigation with copious amounts of water. Assure adequate flushing of the eyes by separating the eyelids with fingers.

AFTER INGESTION

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

5 - Fire Fighting Measures

EXTINGUISHING MEDIA

Suitable: Use water spray or fog nozzle to keep cylinder cool. Move cylinder away from fire if there is no risk.

SPECIAL RISKS

Specific Hazard(s): Extremely flammable. Vapor may travel considerable distance to source of ignition and flash back.

Emits toxic fumes under fire conditions.

Explosion Hazards: May form explosive mixtures with air Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

SPECIFIC METHOD(S) OF FIRE FIGHTING

Do not extinguish burning gas if flow cannot be shut off immediately. Use water spray or fog nozzle to keep cylinder cool. Move cylinder away from fire if there is no risk.

6 - Accidental Release Measures

PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area and keep personnel upwind. Shut off all sources of ignition. Shut off leak if there is no risk.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Do not breathe gas. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Conditions of Storage: Keep tightly closed. Keep away from heat, sparks, and open flame. Use with equipment rated for cylinder pressure, and of compatible materials of construction. Close valve when not in use and when empty. Make sure cylinder is properly secured when in use or stored Cylinder temperature should not exceed 125°F (52°C).

Unsuitable: Store away from heat and direct sunlight

SPECIAL REQUIREMENTS: Contents under pressure. Air sensitive.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Warning: suck-back into cylinder may cause rupture. Use back-flow-preventive device in piping.

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	10 MG/M3
Poland		NDSCh	40 MG/M3
Poland		NDSP	-
USA	OSHA.	STEL	5 ppm
Remarks: 15 MIN.			

EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	22 mg/m3
		10 ppm
Remarks: K		

EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	34 mg/m3
		15 ppm
Remarks: 4		
Remarks: TRK, TRGS 901-18		

EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	2.2 mg/m3
		1 ppm
Remarks: K		

EXPOSURE LIMITS - SWEDEN

Source	Type	Value
	LLV (Level)	11 mg/m3
		0.5 ppm
Remarks: K		

EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	11 mg/m3
		5 ppm
Remarks: K		

EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	22 mg/m3
		10 ppm

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator in nonventilated areas and/or for exposure above the TLV or PEL.
Hand Protection: Compatible chemical-resistant gloves.
Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance	Physical State: Gas	
Property	Value	At Temperature or Pressure
pH	N/A	

BP/BP Range	-4.5 °C	760 mmHg
MP/MP Range	-109 °C	
Flash Point	-76 °C	Method: closed cup
Flammability	N/A	
Autoignition Temp	420 °C	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	Lower: 2 % Upper: 12 %	
Vapor Pressure	3102 mmHg	37.7 °C
SG/Density	N/A	
Partition Coefficient	N/A	
Viscosity	N/A	
Vapor Density	1.9 g/l	15 °C
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents, Oxygen Copper, Copper alloys.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

11 - Toxicological Information

RTECS NUMBER: EI9275000

ACUTE TOXICITY

LD50

Oral

Rat

5480 mg/kg

LC50

Inhalation

Rat

285,000 mg/m3

4H

Remarks: Behavioral:General anesthetic. Lungs, Thorax, or
Respiration:Respiratory depression.

LD50

Oral

Mouse

3210 mg/kg

LC50

Inhalation

Mouse

270,000 mg/m3

2H

SIGNS AND SYMPTOMS OF EXPOSURE

Cholinesterase inhibitors can cause heavy salivation and secretion in the lungs, lachrymation, blurred vision, involuntary defecation, diarrhea, tremor, ataxia, sweating, hypothermia, lowered heart rate, and/or a fall in blood pressure as a result of their action at cholinergic nerve sites. Exposure can cause: Narcotic effect. Headache. Nausea. Vomiting. Dizziness. Drowsiness. Confusion. Weakness. Muscle cramps/spasms. Change in pupil size. Tremors. Seizures. Incoordination. Convulsions. Coma.

ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: May cause eye irritation.
Inhalation: May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract. Can cause rapid suffocation.
Ingestion: May be harmful if swallowed.

TARGET ORGAN INFORMATION

Blood. Heart. Eyes. Central nervous system.

CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

Rat

Route of Application: Inhalation

Result: Tumorigenic: Carcinogenic by RTECS criteria.

Cardiac: Tumors. Lungs, Thorax, or Respiration: Tumors.

Mouse

Route of Application: Inhalation

Exposure Time: 6H/13W

Result: Tumorigenic: Carcinogenic by RTECS criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and Taste): Olfaction: Tumors.

Cardiac: Tumors.

Rat

Route of Application: Inhalation

Exposure Time: 6H/2Y

Result: Tumorigenic: Carcinogenic by RTECS criteria. Skin and Appendages: Other: Tumors.

Rat

Route of Application: Inhalation

Exposure Time: 6H/2Y

Result: Tumorigenic: Neoplastic by RTECS criteria.

Gastrointestinal: Tumors. Endocrine: Thyroid tumors.

Rat

Route of Application: Inhalation

Exposure Time: 6H/15W

Result: Tumorigenic: Carcinogenic by RTECS criteria.

Endocrine: Tumors.

Mouse

Route of Application: Inhalation
Exposure Time: 40W
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS
criteria. Gastrointestinal:Tumors.

Rat

Route of Application: Inhalation
Exposure Time: 6H/2Y
Result: Tumorigenic:Carcinogenic by RTECS criteria.
Endocrine:Thyroid tumors. Skin and Appendages: Other: Tumors.

Mouse

Route of Application: Inhalation
Exposure Time: 6H/65W
Result: Tumorigenic:Equivocal tumorigenic agent by RTECS
criteria. Sense Organs and Special Senses (Nose, Eye, Ear, and
Taste):Eye:Tumors. Cardiac:Tumors.

Mouse

Route of Application: Inhalation
Exposure Time: 6H/2Y
Result: Tumorigenic:Carcinogenic by RTECS criteria.
Vascular:Tumors. Liver:Tumors.

IARC CARCINOGEN LIST

Rating: Group 2A

CHRONIC EXPOSURE - MUTAGEN

Result: May alter genetic material.

Human

500 UMOL/L
Cell Type: lymphocyte
Sister chromatid exchange

Mouse

6250 PPB/6H/13W-I
Inhalation
Micronucleus test

Mouse

500 PPM
Inhalation
6H/5D
specific locus test

Mouse

125 PPM
Inhalation
6H
DNA damage

Mouse

200 PPM
Inhalation
5D/6H
DNA

Mouse

625 PPM
Inhalation

6H/10D
Cytogenetic analysis

Mouse
6250 PPB/6H/10D-I
Inhalation
Sister chromatid exchange

Mouse
1250 PPM
Inhalation
6H/10W
Dominant lethal test

Mouse
20 PPH
Cell Type: lymphocyte
Mutation in mammalian somatic cells.

Mouse
625 PPM
Inhalation
6H/2W
Mutation in mammalian somatic cells.

Mouse
130 PPM
Inhalation
5D/6H
sperm

Mouse
500 PPM
Inhalation
6H/5D
Heritable translocation test

Hamster
25 UMOL/L
Cell Type: ovary
Sister chromatid exchange

CHRONIC EXPOSURE - TERATOGEN

Result: Laboratory experiments have shown teratogenic effects.

Species: Rat
Dose: 8000 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Result: Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

Species: Mouse
Dose: 500 PPM/6H
Route of Application: Inhalation
Exposure Time: (5D MALE)
Result: Paternal Effects: Testes, epididymis, sperm duct.
Effects on Embryo or Fetus: Cytological changes (including

somatic cell genetic material).

Species: Mouse

Dose: 1000 PPM/6H

Route of Application: Inhalation

Exposure Time: (6-15D PREG)

Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Effects on Embryo or Fetus: Extra embryonic structures (e.g., placenta, umbilical cord). Effects on Embryo or Fetus:

Fetotoxicity (except death, e.g., stunted fetus).

Species: Mouse

Dose: 1000 PPM/6H

Route of Application: Inhalation

Exposure Time: (6-15D PREG)

Result: Maternal Effects: Uterus, cervix, vagina.

CMR CAT.: Carc. Cat.2

12 - Ecological Information

No data available.

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations.

CONTAMINATED CONTAINER DISPOSAL

Caution: no-return cylinder. Do not reuse. Empty cylinder will contain hazardous residue. Follow proper disposal techniques.

14 - Transport Information

RID/ADR

UN#: 1010

Class: 2

Proper Shipping Name: 1,3-Butadiene, inhibited

IMDG

UN#: 1010

Class: 2.1

Proper Shipping Name: BUTADIENES, STABILIZED

Marine Pollutant: No

Severe Marine Pollutant: No

IATA

UN#: 1010

Class: 2.1

Proper Shipping Name: BUTADIENES, STABILIZED

Inhalation Packing Group I: No

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 601-013-00-X

NOTA: D

INDICATION OF DANGER: F+ T

Extremely Flammable. Toxic.

R-PHRASES: 45 46 12

May cause cancer. May cause heritable genetic damage. Extremely

flammable.

S-PHRASES: 53 45

Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 2

SWITZERLAND

SWISS POISON CLASS: 1*

16 - Other Information

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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