

Material Safety Data Sheet

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Version 1.5

According to 91/155/EEC

1 - Product and Company Information

Product Name 2-BUTOXYETHANOL, FOR HPLC-GC
Product Number 20398

Company Sigma-Aldrich Pte Ltd
#08-01 Citilink Warehouse
Singapore 118529
Singapore

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2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
2-BUTOXYETHANOL	111-76-2	203-905-0	603-014-00-0

Formula C6H14O2

Molecular Weight 118.18 AMU

Synonyms

BUCS * Butoksyetylowy alkohol (Polish) *
2-Butossi-etanol (Italian) * 2-Butoxy-aethanol
(German) * Butoxyethanol * n-Butoxyethanol *
2-Butoxyethanol * 2-Butoxy-1-ethanol *
2-Butoxyethanol (ACGIH:OSHA) * Butyl cellosolve
(OSHA) * Butylcelosolv (Czech) * O-Butyl
ethylene glycol * Butylglycol (French,German) *
Butyl oxitol * Dowanol EB * Ektasolve EB *
Ethylene glycol n-butyl ether * Ethylene glycol,
monobutyl ether * Gafcol EB * Glycol butyl ether
* Glycol ether EB * Glycol monobutyl ether *
Jeffersol EB * Monobutyl ether of ethylene
glycol * Monobutyl glycol ether *
3-Oxa-1-heptanol * Poly-Solv EB

3 - Hazards Identification

SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

Harmful by inhalation, in contact with skin and if swallowed.
Irritating to eyes and skin.

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 skin contact, flush with copious amounts of water for
at least 15 minutes. Remove contaminated clothing and shoes.
Call a physician.

AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

AFTER INGESTION

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

5 - Fire Fighting Measures

EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

SPECIAL RISKS

Specific Hazard(s): Combustible liquid. Emits toxic fumes under fire conditions.

Explosion Hazards: May form peroxides of unknown stability.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

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

6 - Accidental Release Measures

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

Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

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

METHODS FOR CLEANING UP

Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

7 - Handling and Storage

HANDLING

Directions for Safe Handling: Do not breathe vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE

Conditions of Storage: Keep tightly closed.

Unsuitable: Minimize exposure to air. If peroxide formation is suspected, do not open or move container.

8 - Exposure Controls / Personal Protection

ENGINEERING CONTROLS

Safety shower and eye bath. Mechanical exhaust required.

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	98

Poland NDSCh 200
Poland NDSP -

EXPOSURE LIMITS - EUROPEAN UNION
Source Type Value
OEL OEL 98 mg/m3
20 ppm

Remarks: Skin

EXPOSURE LIMITS - DENMARK
Source Type Value
OEL TWA 98 mg/m3
20 ppm

Remarks: H

EXPOSURE LIMITS - GERMANY
Source Type Value
TRGS 900 OEL 100 mg/m3
20 ppm

Remarks: 4
Remarks: H,Y

EXPOSURE LIMITS - NORWAY
Source Type Value
OEL 50 mg/m3
10 ppm

Remarks: H

EXPOSURE LIMITS - SWEDEN
Source Type Value
LLV (Level 50 mg/m3
10 ppm

Remarks: H

EXPOSURE LIMITS - SWITZERLAND
Source Type Value
OEL OEL 100 mg/m3
20 ppm

Remarks: H M

EXPOSURE LIMITS - UNITED KINGDOM
Source Type Value
OEL OEL 123 mg/m3
25 ppm

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator.

Hand Protection: Compatible chemical-resistant gloves.

Eye Protection: Chemical safety goggles.

9 - Physical and Chemical Properties

Appearance Physical State: Clear liquid
Color: Colorless

Property	Value	At Temperature or Pressure
pH	9.5	
BP/BP Range	171 °C	743 mmHg
MP/MP Range	-75 °C	
Flash Point	67 °C	Method: closed cup
Flammability	N/A	

Autoignition Temp	245 °C	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	Lower: 1.1 % Upper: 10.6 %	
Vapor Pressure	< 1 mmHg	20 °C
SG/Density	0.9 g/cm ³	
Partition Coefficient	Log Kow: 0.83	
Viscosity	N/A	
Vapor Density	4.1 g/l	
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	27.4 mN/m	25 °C
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	Other Solvents: MOSTORGANIC SOLVENTS, MINERAL OIL	

10 - Stability and Reactivity

STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

11 - Toxicological Information

RTECS NUMBER: KJ8575000

ACUTE TOXICITY

LD50

Oral

Rat

> 5,000 mg/kg

LD50

Skin

Rabbit

2,000 mg/kg

LD50

Oral

Rat

470 mg/kg

LC50

Inhalation

Rat

450 ppm

4H

Remarks: Behavioral:Ataxia. Nutritional and Gross
Metabolic:Weight loss or decreased weight gain.

LD50

Intraperitoneal
Rat
220 MG/KG

LD50
Intravenous
Rat
307 MG/KG

LD50
Oral
Mouse
1230 mg/kg
Remarks: Behavioral:Altered sleep time (including change in righting reflex). Behavioral:Somnolence (general depressed activity). Skin and Appendages: Other: Hair.

LC50
Inhalation
Mouse
700 ppm
7H
Remarks: Behavioral:Analgesia. Lungs, Thorax, or Respiration:Dyspnea. Kidney, Ureter, Bladder:Hematuria.

LD50
Intraperitoneal
Mouse
536 MG/KG

LD50
Intravenous
Mouse
1130 MG/KG

LD50
Oral
Rabbit
300 mg/kg

LD50
Skin
Rabbit
220 mg/kg

LD50
Intraperitoneal
Rabbit
220 MG/KG

LD50
Intravenous
Rabbit
252 MG/KG

LD50
Oral
Guinea pig
1200 mg/kg
Remarks: Behavioral:General anesthetic. Gastrointestinal:Other changes. Kidney, Ureter, Bladder:Other changes.

LD50
Skin
Guinea pig
230 UL/KG

IRRITATION DATA

Skin
Rabbit
72 H
Remarks: Mild irritation effect
Eyes
Rabbit
24 H
Remarks: Mild irritation effect

Skin
Rabbit
500 mg
Remarks: Open irritation test

Eyes
Rabbit
100 mg
Remarks: Severe irritation effect

Eyes
Rabbit
100 mg
24H
Remarks: Moderate irritation effect

SIGNS AND SYMPTOMS OF EXPOSURE

Human exposure above 200 ppm can be expected to cause narcosis, damage to the kidney and liver and present an abnormal blood picture showing erythropenia, reticulocytosis, granulocytosis, leukocytosis, and would be likely to cause fragility of erythrocytes and hematuria. Swallowing of 2-butoxyethanol results in a sour taste that turns to a burning sensation and is followed by numbness of the tongue which indicates paralysis of the sensory nerve endings. Causes central nervous system (CNS) depression, loss of taste, numbness of the tongue, headaches, and stupor. Narcotic effect.

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.
Skin Absorption: Toxic if absorbed through skin. Readily absorbed through skin.
Eye Contact: Causes severe eye irritation.
Inhalation: Harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.
Ingestion: Harmful if swallowed.

TARGET ORGAN INFORMATION

Blood. Kidneys. Liver. Central nervous system. Testes.

CHRONIC EXPOSURE - CARCINOGEN

Rat
Route of Application: Inhalation
Exposure Time: 6H/2Y
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Endocrine: Tumors.

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

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 25 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system.

Species: Rabbit
Dose: 100 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-18D PREG)
Result: Specific Developmental Abnormalities: Cardiovascular (circulatory) system.

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

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

Species: Rat
Dose: 6279 MG/KG
Route of Application: Oral
Exposure Time: (13W MALE)
Result: Paternal Effects: Spermatogenesis (including genetic material, sperm morphology, motility, and count).

Species: Rat
Dose: 200 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Maternal Effects: Uterus, cervix, vagina. Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).

Species: Rat
Dose: 12 MG/KG/4H
Route of Application: Inhalation
Exposure Time: (1-19D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Rat
Dose: 200 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-15D PREG)
Result: Maternal Effects: Other effects. Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse
Dose: 9440 MG/KG
Route of Application: Oral

Exposure Time: (7-14D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mouse
Dose: 7 GM/KG
Route of Application: Oral
Exposure Time: (8-14D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Species: Mouse
Dose: 9440 MG/KG
Route of Application: Oral
Exposure Time: (6-13D PREG)
Result: Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).

Species: Rabbit
Dose: 200 PPM/6H
Route of Application: Inhalation
Exposure Time: (6-18D PREG)
Result: Maternal Effects: Uterus, cervix, vagina. Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea).

12 - Ecological Information

ECOTOXICOLOGICAL EFFECTS

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 24 h
Value: 1,815 mg/l

Test Type: LC50 Fish
Species: Lepomis macrochirus (Bluegill)
Time: 96 h
Value: 1,490 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 48 h
Value: 1,690 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 48 h
Value: 210 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 96 h
Value: 1,574 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 96 h
Value: 210 mg/l

Test Type: LC50 Fish

Species: other fish
Time: 48 h
Value: 610 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 48 h
Value: 270 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 48 h
Value: 220 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 48 h
Value: 410 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 96 h
Value: 399 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 96 h
Value: 220 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 96 h
Value: 220 mg/l

Test Type: LC50 Fish
Species: other fish
Time: 96 h
Value: 350 mg/l

ADDITIONAL ECOLOGICAL INFORMATION

BOD: 88 %

13 - Disposal Considerations

SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose of this material. This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

14 - Transport Information

RID/ADR

Non-hazardous for road transport.

IMDG

Non-hazardous for sea transport.

IATA

Non-hazardous for air transport.

15 - Regulatory Information

CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 603-014-00-0

INDICATION OF DANGER: Xn

Harmful.

R-PHRASES: 20/21/22 36/38

Harmful by inhalation, in contact with skin and if swallowed.
Irritating to eyes and skin.

S-PHRASES: 36/37 46

Wear suitable protective clothing and gloves. If swallowed,
seek medical advice immediately and show this container or
label.

COUNTRY SPECIFIC INFORMATION

Germany

WGK: 1

SWITZERLAND

SWISS POISON CLASS: 4

NORWAY

Labelling for organic solvents where the package is 1 liter or
more.

YL-tall m3/l: 5400

YL-group: 5

Safety phrases: 38 42 210

In case of insufficient ventilation, wear suitable respiratory
equipment. During fumigation/spraying wear suitable respiratory
equipment. Use compressed air- or fresh air line breathing
apparatus in confined spaces.

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
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