

Material Safety Data Sheet

1,4-BUTANEDIOL

Section 1 - Chemical Product and Company Identification

MSDS Name: 1,4-Butanediol

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	EC no	EINECS/ELINCS
110-63-4	1,4-Butanediol	203-786-5	NA

Section 3 - Hazards Identification

3.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Acute toxicity, Category 4, Oral, H302

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

3.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Hazard pictograms



Signal word

Warning

Hazard statement(s)

H302

Harmful if swallowed.

3.3 Other hazards

None

Section 4 - First Aid Measures

4.1 Description of first aid measures

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Take off immediately all contaminated clothing. Rinse skin with water/ shower.

In case of eye contact

Rinse out with plenty of water. Remove contact lenses.

If swallowed

Immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

Dizziness, Unconsciousness, Nausea, Vomiting, Headache, Convulsions, CNS disorders, paralysis symptoms

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4.3 Indication of any immediate medical attention and special treatment needed

No data available

Section 5 - Fire Fighting Measures

5.1 Extinguishing media**Suitable extinguishing media**

Water, Foam, Carbon dioxide (CO₂), Dry powder

Unsuitable extinguishing media

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

5.2 Special hazards arising from the substance or mixture

Combustible.

Vapours are heavier than air and may spread along floors. Forms explosive mixtures with air on intense heating.

Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters**Special protective equipment for firefighters**

In the event of fire, wear self-contained breathing apparatus.

5.4 Further information

Prevent fire extinguishing water from contaminating surface water or the ground water system.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non- emergency personnel: Do not breathe vapours, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet- brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

Indications about waste treatment see section 13.

Section 7 - Handling and Storage

7.1 Precautions for safe handling**Advice on safe handling**

Observe label precautions.

Hygiene measures

Change contaminated clothing. Preventive skin protection recommended. Wash hands after working with substance.

7.2 Conditions for safe storage, including any incompatibilities**Storage conditions**

Tightly closed.

Recommended storage temperature see product label.

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7.3 Specific end use(s)

Apart from the uses mentioned in the section 1.2 no other specific uses are stipulated.

Section 8 - Exposure Controls, Personal Protection

8.1 Control parameters

Contains no substances with occupational exposure limit values.

8.2 Exposure controls

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

See section 7.1.

Individual protection measures

Protective clothing needs to be selected specifically for the workplace, depending on concentrations and quantities of the hazardous substances handled. The chemical resistance of the protective equipment should be enquired at the respective supplier.

Eye/face protection

Safety glasses

Hand protection

full contact:	Glove material:	Nitrile rubber
	Glove thickness:	0.11 mm
	Break through time:	> 480 min

splash contact:	Glove material:	Nitrile rubber
	Glove thickness:	0.11 mm
	Break through time:	>480 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 741 Dermatrill® L (full contact), KCL 741 Dermatrill® L (splash contact).

The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types. This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please

Other protective equipment

protective clothing

Respiratory protection

Required when vapours/aerosols are generated.

Recommended Filter type: Filter A (acc. to DIN 3181) for vapours of organic compounds

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

8.3 Environmental exposure controls

Do not let product enter drains.

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Section 9 - Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

a) Appearance	Form: liquid Colour: colourless
b) Odour	Odourless
c) Odour Threshold	Not applicable
d) pH	7-8 at 500 g/l at 20 °C
e) Melting point/freezing point	19.5 – 20.0 °C
f) Initial boiling point and boiling range	230°C at 1,013 hPa
g) Flash point	115°C Method: DIN 51758
h) Evaporation rate	No data available
i) Flammability (solid, gas)	No data available.
j) Upper/lower flammability or explosive limits	Upper explosion limit: 18.3%(V) Lower explosion limits: 1.95%(V)
k) Vapour pressure	< 0.1 hPa at 20°C
l) Vapour density	3.1
m) Relative density	No data available
n) Water solubility	at 20°C soluble
o) Partition coefficient: n-octanol water	log Pow: -0.88 (25°C) OECD Test Guideline 107 Bioaccumulation is not expected .
p) Auto-ignition temperature	No data available
q) Decomposition temperature	No data available
r) Viscosity,dynamic	84.9 mPa.s at 20°C
s) Explosive properties	Not classified as explosives
t) Oxidizing properties	none

9.2 Other safety information

Ignition temperature	385 °C Method: DIN 5179
Viscosity, kinematic	83.2 mm ² /s at 20 °C

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Section 10 - Stability and Reactivity

10.1 Reactivity

Forms explosive mixtures with air on intense heating.
A range from approx. 15 Kelvin below the flash point is to be rated as critical.

10.2 Chemical stability

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

10.3 Possibility of hazardous reactions

Violent reactions possible with:
Strong oxidizing agents, Reducing agents, Acid anhydrides, Acid chlorides

10.4 Conditions to avoid

Strong heating.

10.5 Incompatible materials

No data available

10.6 Hazardous decomposition products

No data available

Section 11 - Toxicological Information

11.1. Information on toxicological effects

Acute oral toxicity

LD50 Rat: 1,500 mg/kg
OECD Test Guideline 401
Symptoms: Nausea, Vomiting
absorption

Acute inhalation toxicity

LC50 Rat: > 5.1 mg/l; 4 h ; dust/mist
OECD Test Guideline 403

Acute dermal toxicity

LD50 Rat: > 2,000 mg/kg
(ECHA)

Skin irritation

Rabbit
Result: No skin irritation
Draize Test

Eye irritation

Rabbit
Result: No eye irritation

Draize Test

Sensitisation
Patch test: human
Result: negative
(IUCLID)

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Maximisation Test Guinea pig
Result: negative
(ECHA)

Germ cell

mutagenicity

Genotoxicity in vitro

Ames test

Escherichia coli/Salmonella typhimurium

Result: negative

Method: OECD Test Guideline 471

In vitro mammalian cell gene mutation test

Chinese hamster ovary cells

Result: negative

Method: OECD Test Guideline 476

Mutagenicity (mammal cell test): chromosome aberration. Chinese hamster lung cells

Result: negative

Method: OECD Test Guideline 473

Carcinogenicity

This information is not available.

Reproductive toxicity

This information is not available.

Teratogenicity

This information is not available.

Specific target organ toxicity - single exposure

This information is not available.

Specific target organ toxicity - repeated exposure

This information is not available.

Aspiration hazard

This information is not available.

11.2 Further information

Systemic effects:

CNS disorders, Headache, Dizziness, Convulsions, paralysis symptoms, Unconsciousness, change in weight damage to: Liver, Kidney .Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

Section 12 - Ecological Information

12.1 Toxicity

Toxicity to fish

static test LC50 Pimephales promelas (fathead minnow): > 30,000 mg/l; 96 h

OECD Test Guideline 203

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Toxicity to daphnia and other aquatic invertebrates

static test EC50 Daphnia magna (Water flea): 813 mg/l; 48 h

Analytical monitoring: yes

OECD Test Guideline 202

Toxicity to algae

static test ErC50 Desmodesmus subspicatus (green algae): > 500 mg/l; 72 h

DIN 38412

Toxicity to bacteria

EC20 activated sludge: > 400 mg/l; 30 min

OECD Test Guideline 209

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) static test

NOEC Daphnia magna (Water flea): > 85 mg/l; 21 d Analytical monitoring: yes

OECD Test Guideline 211

12.2 Persistence and degradability

Biodegradability

96 %; 14 d; aerobic

OECD Test Guideline

301C Readily

biodegradable

12.3 Bioaccumulative potential

Partition coefficient:

n-octanol/water

log Pow: -0.88 (25 °C)

OECD Test Guideline 107

Bioaccumulation is not expected.

12.4 Mobility in soil

No information available.

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted.

12.6. Other adverse effects

Additional ecological information

Formation of health-hazardous mixtures possible with water. Discharge into the environment must be avoided.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Waste material must be disposed of in accordance with the national and local regulations.

Leave chemicals in original containers. No mixing with other waste.

Handle uncleaned containers like the product itself.

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Section 14 - Transport Information

Land transport (ADR/RID)

14.1 - 14.6 Not classified as dangerous in the meaning of transport regulations.

Inland waterway transport (ADN)

Not relevant

Air transport (IATA)

14.1 - 14.6 Not classified as dangerous in the meaning of transport regulations.

Sea transport (IMDG)

14.1 - 14.6 Not classified as dangerous in the meaning of transport regulations.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not relevant

Section 15 - Regulatory Information

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

National legislation

Storage class 10 – 13

5.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out.

Section 16 - Other Information

Full text of H-Statements referred to under sections 2 and 3.

H302 Harmful if swallowed.

Further information

The above information is believed to be correct but does not support 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.

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