

Material Safety Data Sheet

10420
n-Butanol

Revision Date
Revision Number

24-Sep-2010
1.00

1. PRODUCT AND COMPANY IDENTIFICATION

Identification of the substance/preparation	n-Butanol
CAS-No	71-36-3
Use of the Substance /Preparation	Intermediate, solvent.
Supplier	OXEA Corporation 1505 West LBJ Freeway, Suite 400 Dallas, TX 75234 USA
Product Information	Product Stewardship FAX: +49 (0)208 693 2053 email: psq@oxea-chemicals.com
Emergency telephone number	in USA, call 800 424 9300 outside USA, call 703 527 3887, collect calls accepted

2. HAZARDS IDENTIFICATION

Emergency Overview

Product Description	
Physical state	liquid
Colour	colourless
Odour	alcoholic
Statements of hazard	Warning Flammable liquid and vapour Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback Vapours may form explosive mixture with air Causes skin irritation Causes eye irritation Causes severe respiratory tract irritation Vapours may cause drowsiness and dizziness
OSHA Regulatory Status	This material is hazardous as defined by the American OSHA Hazard Communication Standard (29CFR 1910.1200).

Potential Health Effects

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Principle Routes of Exposure	Inhalation, Eye contact, Skin contact, Ingestion.
Inhalation	Causes severe respiratory tract irritation. Components of the product may be absorbed into the body by inhalation. Vapours may cause drowsiness and dizziness.
Eye contact	Causes eye irritation.
Skin contact	Causes skin irritation. Components of the product may be absorbed into the body through the skin.
Ingestion	Components of the product may be absorbed into the body by ingestion.
Main symptoms	cough, headache, dizziness, drowsiness, nausea, vomiting, abdominal pain, unconsciousness, diarrhea.
Target Organ Effects	Lung irritation Pneumonia

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No	Concentration (%)	OSHA status
Butan-1-ol	71-36-3	> 99,80	hazardous

4. FIRST AID MEASURES

General advice

Remove contaminated, soaked clothing immediately and dispose of safely. If unconscious place in recovery position and seek medical advice. First aider needs to protect himself.

Inhalation

Keep at rest. Aerate with fresh air. When symptoms persist or in all cases of doubt seek medical advice.

Eyes

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. Immediate medical attention is required.

Skin

Wash off immediately with soap and plenty of water. When symptoms persist or in all cases of doubt seek medical advice.

Ingestion

Rinse mouth. Call a physician immediately. If conscious, drink plenty of water. Do not induce vomiting without medical advice.

Main symptoms

cough, headache, dizziness, drowsiness, nausea, vomiting, abdominal pain, unconsciousness, diarrhea.

Special hazard

Lung irritation, Pneumonia.

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Notes to physician

Treat symptomatically. If ingested, irrigate the stomach using activated charcoal. Chemical pneumonitis could follow respiratory exposure.

5. FIRE-FIGHTING MEASURES

OSHA Flammability classification

Flammable liquids Class I C

Suitable extinguishing media

dry chemical. carbon dioxide (CO₂). water spray. alcohol-resistant foam.

Extinguishing media which must not be used for safety reasons

Do not use a solid water stream as it may scatter and spread fire.

Special exposure hazards arising from the substance or preparation itself, its combustion products, or released gases

Under conditions giving incomplete combustion, hazardous gases produced may consist of:

carbon monoxide (CO)

carbon dioxide (CO₂)

Combustion gases of organic materials must in principle be graded as inhalation poisons

Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback

Vapours may form explosive mixtures with air

Special protective equipment for fire-fighters

Fire fighter protection should include a self-contained breathing apparatus (NIOSH-approved or EN 133) and full fire-fighting turn out gear.

Precautions for fire-fighting

Cool containers / tanks with water spray. Dike and collect water used to fight fire. Keep people away from and upwind of fire. Do not allow run-off from fire fighting to enter drains or water courses. Foam should be applied in large quantities as it is broken down to some extent by the product.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Avoid contact with skin and eyes. Avoid breathing vapors or mists. Keep people away from and upwind of spill/leak.

Ensure adequate ventilation, especially in confined areas. Keep away from heat and sources of ignition.

For emergency responders: Personal protection see section 8.

Environmental precautions

Prevent further leakage or spillage. Do not discharge product into the aquatic environment without pretreatment (biological treatment plant).

Methods for containment

Stop the flow of material, if possible without risk. Dike spilled material, where this is possible.



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Methods for cleaning up

Soak up with inert absorbent material (e.g. universal binder). Keep in suitable, closed containers for disposal. If liquid has been spilled in large quantities clean up promptly by scoop or vacuum. Dispose of in accordance with local regulations. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).

Authority Notification

Within the United States, call the National Response Center (800-424-8802) and appropriate state and local authorities if the quantity released over 24 hours is equal to or greater than the reportable quantity listed below:

Reportable Quantity (RQ) 5000 lb/ 2270 kg (1-Butanol)

7. HANDLING AND STORAGE

Handling

Advice on safe handling

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. Provide sufficient air exchange and/or exhaust in work rooms.

Advice on protection against fire and explosion

Keep away from sources of ignition - No smoking. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). In case of fire, emergency cooling with water spray should be available. Ground and bond containers when transferring material. Vapour is heavier than air and can travel considerable distance to a source of ignition and flashback. Vapours may form explosive mixture with air.

Storage

Technical measures/Storage conditions

Keep containers tightly closed in a cool, well-ventilated place. Handle and open container with care.

Suitable material stainless steel, mild steel
Unsuitable material Attacks some forms of plastic and rubber, Natural Rubber

Advice on common storage

Incompatible products:
strong oxidizing agents
acids
acid chlorides
reducing agents

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits United States of America

US ACGIH

Component	TWA (mg/m ³)	TWA (ppm)	STEL (mg/m ³)	STEL (ppm)	Ceiling (mg/m ³)	Ceiling (ppm)
Butan-1-ol 71-36-3		20				

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US OSHA Z-1

Component	Ceiling (mg/m ³)	Ceiling (ppm)	PEL (mg/m ³)	PEL (ppm)	Skin Designation
Butan-1-ol 71-36-3			300	100	

US OSHA Z-1A Revoked (1993)

Component	TWA (mg/m ³)	TWA (ppm)	STEL (mg/m ³)	STEL (ppm)	Ceiling (mg/m ³)	Ceiling (ppm)	Skin Designation
Butan-1-ol 71-36-3					150	50	Yes

US NIOSH Pocket Guide

Component	Ceiling (mg/m ³)	Ceiling (ppm)	Ceiling Time Period	Skin Designation
Butan-1-ol 71-36-3	150	50		Yes

US NIOSH IDHL

Component	Potential cancer hazard	Concentration (mg/m ³)	Concentration (ppm)	Listed w/o limits
Butan-1-ol 71-36-3			1400	

Note

For details and further information please refer to the original regulation.

Occupational exposure controls

Engineering measures

General or dilution ventilation is frequently insufficient as the sole means of controlling employee exposure. Local ventilation is usually preferred. Explosion-proof equipment (for example fans, switches, and grounded ducts) should be used in mechanical ventilation systems.

Personal protective equipment

General industrial hygiene practice

Avoid contact with skin, eyes and clothing. Do not breathe vapours or spray mist. Ensure that eyewash stations and safety showers are close to the workstation location.

Hygiene measures

When using, do not eat, drink or smoke. Take off all contaminated clothing immediately. Wash hands before breaks and immediately after handling the product.

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Respiratory protection

Respirator with filter for organic vapour. Use the indicated respiratory protection if the occupational exposure limit is exceeded and/or in case of product release (dust). Equipment should conform to NIOSH.

Hand protection

Wear protective gloves. Recommendations are listed below. Other protective material may be used, depending on the situation, if adequate degradation and permeation data is available. If other chemicals are used in conjunction with this chemical, material selection should be based on protection for all chemicals present.

Suitable material butyl-rubber

Suitable material nitrile rubber

Eye protection

Tightly fitting safety goggles. In addition to goggles, wear a face shield if there is a reasonable chance for splash to the face.

Skin and body protection

Impervious clothing. Wear face-shield and protective suit for abnormal processing problems.

Environmental exposure controls

If possible use in closed systems. If leakage can not be prevented, the substance needs to be suck off at the emission point, if possible without danger. Observe the exposure limits, clean exhaust air if needed. If recycling is not practicable, dispose of in compliance with local regulations. Inform the responsible authorities in case of leakage into the atmosphere, or of entry into waterways, soil or drains.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	liquid
Colour	colourless
Odour	alcoholic
Molecular weight	74,12
Molecular formula	C ₄ H ₁₀ O
Flash point	95 °F (35 °C)
Method	ISO 2719
Autoignition temperature	671 °F (355 °C)
Method	DIN 51794
Lower explosion limit	1,4 Vol %
Upper explosion limit	11,3 Vol %
Melting point/range	< -130 °F (< -90 °C) (Pour point)
Boiling point/range	246 °F (119 °C) @ 1013 hPa

Vapour pressure

Values [hPa]	@ °C	@ °F
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9. PHYSICAL AND CHEMICAL PROPERTIES

	10	20	68	
	53	50	122	
Density				
Values [g/cm ³]	@ °C	@ °F		Method
0,81	20	68		DIN 51757
Refractive Index			1,399 @ 68 °F (20 °C)	
Viscosity			2,947 mPa*s @ 68 °F (20 °C)	
Method			dynamic DIN 51562	
pH			neutral	
Water solubility			66 g/l @ 68 °F (20 °C) OECD 105	
log Pow			1 (measured) OECD 117	
Vapour density			2,6 (Air = 1) @ 20 °C (68 °F)	
Surface tension			69,9 mN/m (1 g/l @ 20°C), OECD 115	

10. STABILITY AND REACTIVITY

Stability

Stable under recommended storage conditions.

Hazardous reactions

Vapours may form explosive mixture with air.

Conditions to avoid

Avoid contact with heat, sparks, open flame, and static discharge. Avoid any source of ignition.

Materials to avoid

strong oxidizing agents, acids, acid chlorides, reducing agents.

Hazardous decomposition products

No decomposition if stored and applied as directed.

11. TOXICOLOGICAL INFORMATION

Principle Routes of Exposure Inhalation, Eye contact, Skin contact, Ingestion

Acute toxicity				
Routes of Exposure	Endpoint	Values	Species	Method
Butan-1-ol (71-36-3)				
Oral	LD50	2292 mg/kg	rat, female	OECD 401
Inhalative	LC0	> 17,76 mg/l (4h)	rat, male/female	OECD 403
Dermal	LD50	3430 mg/kg	rabbit	OECD 402

Irritation and corrosion				
Target Organ Effects	Species	Result	Method	

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Butan-1-ol (71-36-3)				
Skin	rabbit	irritating	Draize Test	
Eyes	rabbit	severe irritation	OECD 405	

Sensitization				
Target Organ Effects	Species	Evaluation	Method	
Butan-1-ol (71-36-3)				
Skin	guinea pig	not sensitizing	OECD 406	read across

Subacute, subchronic and prolonged toxicity				
Type	Dose	Species	Method	
Butan-1-ol (71-36-3)				
Subchronic toxicity	NOAEL: 125 mg/kg/d	rat, male/female		Oral
Subchronic toxicity	LOAEL: 500 mg/kg/d	rat, male/female		Oral
Subchronic toxicity	NOAEL: ~ 2,35 mg/l/d (90d)	rat, male/female	EPA OTS 798.2450	Inhalation

Carcinogenicity, Mutagenicity, Reproductive toxicity					
Type	Dose	Species	Evaluation	Method	
Butan-1-ol (71-36-3)					
Mutagenicity		V79 cells, Chinese hamster	negative	OECD 476 (Mammalian Gene Mutation)	
Mutagenicity		V79 cells, Chinese hamster	negative	Chromosomal Aberration	
Mutagenicity		Salmonella typhimurium	negative	Ames test	
Mutagenicity		mouse	negative	OECD 474	Oral
Reproductive toxicity	NOAEL 18,5 mg/l	rat, parental			Inhalation
Reproductive toxicity	NOAEL 18,5 mg/l	Rat, 1. Generation, male/female			Inhalation
Mutagenicity	NOAEL 5000 mg/kg/d	rat, female		Oral	
Developmental Toxicity	NOAEL 1454 mg/kg/d	rat		Oral	Maternal toxicity, Fetal toxicity
Developmental Toxicity	NOAEL 5654 mg/kg/d	rat		Oral	Teratogenicity
Developmental Toxicity	NOAEL 10,8 mg/l	rat		Inhalation	Maternal toxicity, Fetal toxicity
Developmental Toxicity	NOAEL 24,7 mg/l	rat		Inhalation	Teratogenicity

Butan-1-ol, CAS 71-36-3**Main symptoms**

cough, headache, dizziness, drowsiness, nausea, vomiting, abdominal pain, unconsciousness, diarrhoea.

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Butan-1-ol, CAS 71-36-3

Aspiration toxicity

Based on the viscosity a potential aspiration hazard cannot be excluded

Other adverse effects

Components of the product may be absorbed into the body by inhalation, ingestion and through the skin.

Note

Handle in accordance with good industrial hygiene and safety practice.

12. ECOLOGICAL INFORMATION

Acute aquatic toxicity

Species	Exposure time	Dose	Method
Butan-1-ol (71-36-3)			
Pimephales promelas (fathead minnow)	96h	LC50: 1376 mg/l	OECD 203
Daphnia magna (Water flea)	48h	EC50: 1328 mg/l	OECD 202
Pseudomonas putida	17 h	EC50: 4390 mg/l (Growth inhibition)	DIN 38412, part 8
Pseudokirchneriella subcapitata	96h	EC50: 225 mg/l (Growth rate)	OECD 201

Long term toxicity

Type	Species	Dose	Method
Butan-1-ol (71-36-3)			
Reproductive toxicity	Daphnia magna (Water flea)	NOEC: 4,1 mg/l/21d	OECD 211
Reproductive toxicity	Daphnia magna (Water flea)	EC50: 18 mg/l/21d	OECD 211

Butan-1-ol, CAS 71-36-3

Biodegradation

92 % (15 d), Sewage, aerobic, domestic, non-adapted, BOD.

Note

Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

Product Information

Disposal required in compliance with all waste management related state and local regulations. The choice of the appropriate method of disposal depends on the product composition by the time of disposal as well as the local statutes and possibilities for disposal.

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Uncleaned empty packaging

Contaminated packaging should be emptied as far as possible and after appropriate cleansing may be taken for reuse.

14. TRANSPORT INFORMATION

ICAO/IATA

UN/ID No UN 1120
Proper shipping name Butanols
Class 3
Packing group III

IMDG

UN/ID No UN 1120
Proper shipping name Butanols
Class 3
Packing group III
EmS F-E, S-D

IBC-Code

Product name n-Butyl alcohol
Pollution category Z

D.O.T. (49CFR)

UN/ID No UN 1120
Proper shipping name Butanols
Class 3
Packing group III
Reportable Quantity (RQ) 5000 lb/ 2270 kg (1-Butanol)
Emergency Response Guide 129

TDG (Transport of Dangerous Goods) Canada

UN/ID No UN 1120
Proper shipping name Butanols
Class 3
Packing group III

15. REGULATORY INFORMATION

OSHA Regulatory Status

This material is hazardous as defined by the American OSHA Hazard Communication Standard (29CFR 1910.1200).

Federal and State Regulations

Components of the product are listed in the quoted regulations. For details please refer to the regulations directly. This list is not exhaustive, please check for other applicable regulations.

Federal Regulations

This product is listed on the TSCA inventory

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Butan-1-ol (CAS #: 71-36-3)
CERCLA Hazardous Substance
CERCLA RQ 5000 LBS
EPCRA SARA Title III 313
de minimis concentration 1.0 %

State Regulations

Butan-1-ol (CAS #: 71-36-3)
CA Hazardous Substances (Director's) List
IL Chemical Safety Act
MA Hazardous Substances List
NJ RTK List
PA RTK List
RI RTK List

International Inventories

Butan-1-ol (CAS #: 71-36-3)
AICS (AU)
DSL (CA)
G-1321 (CH)
IECSC (CN)
EC-No. 2007516 (EU)
ENCS (2)-3049 (JP)
ISHL (2)-3049 (JP)
ISHL 2-(8)-299 (JP)
KECI KE-03867 (KR)
PICCS (PH)
TSCA (US)
NZIoC (NZ)

16. OTHER INFORMATION

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Training advice
For effective first-aid, special training / education is needed.

Hazard Rating Systems

NFPA (National Fire Protection Association)
Health Hazard 2

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Fire Hazard	3
Reactivity	0
HMIS (Hazardous Material Information System)	
Health Hazard	2
Flammability	3
Physical Hazard	0

Sources of key data used to compile the datasheet

Information contained in this safety data sheet is based on Oxea owned data and public sources deemed valid or acceptable. The absence of data elements required by ANSI or 2001/58/EC indicates, that no data meeting these requirements is available.

Further information for the safety data sheet

Changes against the previous version are marked by ***. Observe national and local legal requirements. For more information, other material safety data sheets or technical data sheets please consult the Oxea homepage (www.oxea-chemicals.com).

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