

SIGMA-ALDRICH**Material Safety Data Sheet**Version 3.2
Revision Date 01/11/2008
Print Date 12/02/2008**1. PRODUCT AND COMPANY IDENTIFICATION**

Product name : 1-Butanol
 Product Number : B7906
 Brand : Sigma
 Company : Sigma-Aldrich
 3050 Spruce Street
 SAINT LOUIS MO 63103
 USA
 Telephone : +1 800-325-5832
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 Emergency Phone # : (314) 776-6555

2. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms : n-Butanol
 Butyl alcohol
 Formula : C₄H₁₀O
 Molecular Weight : 74.12 g/mol

CAS-No.	EC-No.	Index-No.	Concentration
n-Butanol 71-36-3	200-751-6	603-004-00-6	-

3. HAZARDS IDENTIFICATION**Emergency Overview****OSHA Hazards**

Flammable Liquid
 Target Organ Effect
 Harmful by ingestion.
 Irritant

Target Organs

Central nervous system, ears, Liver, Kidney, Blood

HMIS Classification

Health Hazard: 2
 Chronic Health Hazard: *
 Flammability: 3
 Physical hazards: 1

NFPA Rating

Health Hazard: 2
 Fire : 3

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Reactivity Hazard: 1**Potential Health Effects**

Inhalation Vapours may cause drowsiness and dizziness. May be harmful if inhaled. May cause respiratory tract irritation.
Skin May be harmful if absorbed through skin. May cause skin irritation.
Eyes May cause eye irritation.
Ingestion Harmful if swallowed.

4. FIRST AID MEASURES**General advice**

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

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

In case of skin contact

Wash off with soap and plenty of water. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES**Flammable properties**

Flash point 35 °C (95 °F) - closed cup

Ignition temperature 343 °C (649 °F)

Suitable extinguishing media

For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

Specific hazards

Flash back possible over considerable distance.

Special protective equipment for fire-fighters

Wear self contained breathing apparatus for fire fighting if necessary.

Further information

Use water spray to cool unopened containers. In case of fire: Evacuate area and fight fire remotely due to the risk of explosion.

6. ACCIDENTAL RELEASE MEASURES**Personal precautions**

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions

Do not let product enter drains.

Methods for cleaning up

Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13). Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

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Handling

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Storage

Keep container tightly closed in a dry and well-ventilated place. Store in cool place.

Handle and store under inert gas. hygroscopic

8. EXPOSURE CONTROLS / PERSONAL PROTECTION**Components with workplace control parameters**

Components	CAS-No.	Value	Control parameters	Update	Basis
n-Butanol	71-36-3	TWA	20 ppm	2002-01-01	US. American Conference of Governmental and Industrial Hygienists Threshold Limit Values for Chemical Substances in the Work Environment; Annual Reports for the Year 2004; Committees on Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs)
Remarks	2002 Adoption.				
		CEIL	50 ppm 150 mg/m ³	1989-03-01	US. Department of Labor - Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1000 Z-1-A
		TWA	100 ppm 300 mg/m ³	1993-06-30	US. Department of Labor - Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PEL) 29 CFR 1910.1000 Air Contaminants.

Personal protective equipment**Respiratory protection**

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection

Handle with gloves.

Eye protection

Safety glasses

Skin and body protection

Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES**Appearance**

Form liquid, clear
Colour colourless

Safety data

pH no data available
Melting point -90 °C (-130 °F)
Boiling point 117.7 °C (243.9 °F) at 1,013 hPa (760 mmHg)
Flash point 35 °C (95 °F) - closed cup
Ignition temperature 343 °C (649 °F)
Lower explosion limit 1.4 %(V)
Upper explosion limit 11.2 %(V)
Vapour pressure 5 hPa (4 mmHg) at 20 °C (68 °F)
Density 0.811 g/cm³
Water solubility soluble
Relative vapour density 2.56
- (Air = 1.0)

10. STABILITY AND REACTIVITY**Storage stability**

Stable under recommended storage conditions.

Conditions to avoid

Heat, flames and sparks.
Exposure to moisture.

Materials to avoid

Oxidizing agents, Alkali metals, Bases, Strong acids, Halogens

Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides

Hazardous reactions

Vapours may form explosive mixture with air.

11. TOXICOLOGICAL INFORMATION**Acute toxicity**

LD50 Oral - rat - 790 mg/kg

Remarks: Liver:Fatty liver degeneration. Kidney, Ureter, Bladder:Other changes. Blood:Other changes.

LC50 Inhalation - rat - 4 h - 8000 ppm

LD50 Dermal - rabbit - 3,400 mg/kg

Irritation and corrosion

Skin - rabbit - Skin irritation - 24 h

Eyes - rabbit - Eye irritation

Sensitisation

no data available

Chronic exposure

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Signs and Symptoms of Exposure

drying, cracking of the skin, Skin irritation

Potential Health Effects

Inhalation Vapours may cause drowsiness and dizziness. May be harmful if inhaled. May cause respiratory tract irritation.

Skin May be harmful if absorbed through skin. May cause skin irritation.

Eyes May cause eye irritation.

Ingestion Harmful if swallowed.

Target Organs Central nervous system, ears, Liver, Kidney, Blood,

12. ECOLOGICAL INFORMATION

Elimination information (persistence and degradability)

Bioaccumulation Oncorhynchus mykiss (rainbow trout) - 24 h
Bioconcentration factor (BCF): 0.38

Ecotoxicity effects

Toxicity to fish LC50 - Pimephales promelas (fathead minnow) - 1,840 mg/l - 96 h

Toxicity to daphnia and other aquatic invertebrates. EC50 - Daphnia magna (Water flea) - 1,983 mg/l - 48 h

Further information on ecology

no data available

13. DISPOSAL CONSIDERATIONS

Product

Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations.

Contaminated packaging

Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)

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UN-Number: 1120 Class: 3 Packing group: III
Proper shipping name: Butanols

IMDG

UN-Number: 1120 Class: 3 Packing group: III EMS-No: F-E, S-D
Proper shipping name: BUTANOLS
Marine pollutant: No

IATA

UN-Number: 1120 Class: 3 Packing group: III
Proper shipping name: Butanols

15. REGULATORY INFORMATION

OSHA Hazards

Flammable Liquid, Target Organ Effect, Harmful by ingestion,, Irritant

TSCA Status

On TSCA Inventory

DSL Status

All components of this product are on the Canadian DSL list.

SARA 302 Components

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

	CAS-No.	Revision Date
n-Butanol	71-36-3	1987-01-01

SARA 311/312 Hazards

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

	CAS-No.	Revision Date
n-Butanol	71-36-3	1987-01-01

Pennsylvania Right To Know Components

	CAS-No.	Revision Date
n-Butanol	71-36-3	1987-01-01

New Jersey Right To Know Components

	CAS-No.	Revision Date
n-Butanol	71-36-3	1987-01-01

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.

16. OTHER INFORMATION

Further information

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