

***n*-Butanol**

Version 1.01

Revision Date 02.10.2007

Material Safety Data Sheet

SECTION 1 Identification of the substance/preparation and of the company/undertaking

Trade name	n-Butanol	
Synonyms	n-Butanol, Propylcarbinol, 1-Buranol, Hydroxybutane, Butyl alcohol, Butyric alcohol, n-Butan-1-ol, Propyl methanol	
Company	Sasol Chemicals North America LCC 900 Threadneedle, Suite 100 Houston, Texas 77079-2990 USA	
Telephone	CHEMTREC North America Transport Emergency (24-hr)	(800) 424-9300
	CHEMTREC World Wide Transport Emergency (24-hr)	(703) 527-3887
	MSDS and Product Information (8:00am-4:30pm CST)	(281) 588-3315
	Sasol LCCC Main Gate Guard	(337) 494-5142

SECTION 2 Hazards identification

Emergency Overview

Danger	Highly flammable.
State of matter	liquid clear, colourless
Odour	alcoholic

Potential environmental effects

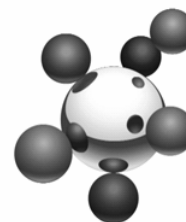
Environmental precautions	Should not be released into the environment. Prevent further leakage or spillage if safe to do so.
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Ecological information: See chapter 12

Potential health effects

Acute effects

Eyes	Causes eye irritation.
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Skin Prolonged or repeated skin contact with liquid may cause defatting resulting in drying, redness and possible blistering.

Inhalation May cause respiratory tract irritation.

Ingestion Aspiration hazard if swallowed - can enter lungs and cause damage.

Toxicological information: See chapter 11

SECTION 3 Composition/information on ingredients

<u>Components</u>	<u>CAS-No.</u>	<u>Weight %</u>
butan-1-ol; n-butanol	71-36-3	99.85

Exposure limit(s): See chapter 8

Classification and hazard labelling: See chapter 15

SECTION 4 First aid measures

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

Skin contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash contaminated clothing before re-use. If skin irritation persists, call a physician.

Inhalation Move to fresh air in case of accidental inhalation of vapours. If breathing is irregular or stopped, administer artificial respiration. Call a physician immediately.

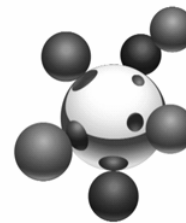
Ingestion If swallowed, seek medical advice immediately and show this container or label. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.

SECTION 5 Fire-fighting measures

Flammability

Flash point 37 °C closed cup 98.6 °C open cup

Autoignition temperature 343 °C



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Explosion limits	Lower explosion limit: 1.4 %(V) Upper explosion limit: 11.2 %(V)
Fire/explosion	Flash back possible over considerable distance.
Hazardous combustion products	Carbon oxides
Suitable extinguishing media	Water spray Alcohol-resistant foam Dry chemical Carbon dioxide (CO ₂)
Protection measures and instructions	Wear self-contained breathing apparatus and protective suit.
Further information	Cool containers / tanks with water spray.

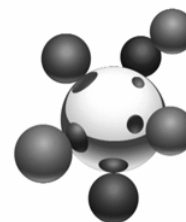
SECTION 6 Accidental release measures

Personal precautions	Keep people away from and upwind of spill/leak. Remove all sources of ignition. Do not breathe vapours or spray mist. Material can create slippery conditions.
Environmental precautions	Should not be released into the environment. Prevent further leakage or spillage if safe to do so.
Methods for cleaning up	Soak up with inert absorbent material and dispose of as hazardous waste.

Exposure controls / personal protection: See chapter 8

SECTION 7 Handling and storage

Safe handling advice	Provide sufficient air exchange and/or exhaust in work rooms. Wear personal protective equipment. Ensure all equipment is electrically grounded before beginning transfer operations. Take precautionary measures against static discharges.
Advice on protection against fire and explosion	Use explosion-proof equipment.
Storage	Keep containers tightly closed in a dry, cool and well-ventilated place.



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SECTION 8 Exposure controls / personal protection

Engineering measures

Provide sufficient air exchange and/or exhaust in work rooms.

Personal protective equipment

Eyes Safety glasses with side-shields

Skin Protective suit Safety shoes

Inhalation In case of insufficient ventilation, wear suitable respiratory equipment.

Hand protection

Hygiene measures Wash hands before breaks and immediately after handling the product.

Protective measures Wear suitable protective equipment.

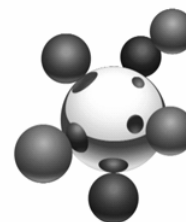
Exposure Guidelines

<u>Components</u>	<u>Exposure limit(s)</u>
N-BUTYL ALCOHOL	US. ACGIH Threshold Limit Values time weighted average 20 ppm US. NIOSH: Pocket Guide to Chemical Hazards Ceiling Limit Value and Time Period (if specified): 50 ppm (150 mg/m ³) US. NIOSH: Pocket Guide to Chemical Hazards Skin designation: US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) Permissible exposure limit 100 ppm (300 mg/m ³)
N-BUTYL ALCOHOL; 1-BUTANOL	US. OSHA Table Z-1-A (29 CFR 1910.1000) Ceiling Limit Value: 50 ppm (150 mg/m ³) US. OSHA Table Z-1-A (29 CFR 1910.1000) Skin designation (Final Rule Limit applies): US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants Ceiling Limit Value: 50 ppm (150 mg/m ³) US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants Skin designation: Can be absorbed through the skin. Can be absorbed through the skin. Can be absorbed through the skin.

PEL= Permissible Exposure Limits
TLV= Threshold Limit Value
EL= Excursion Limit

TWA= Time Weighted Average (8 hr.)
STEL= Short Term Exposure Limit (15 min.)
WEEL= Workplace Environmental Exposure Level

SECTION 9 Physical and chemical properties



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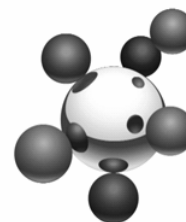
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State of matter	liquid
Colour	clear, colourless
Odour	alcoholic
Form	liquid
Boiling point/boiling range	117 °C
Flash point	37 °C closed cup 98.6 °C open cup
Lower explosion limit	1.4 %(V)
Upper explosion limit	11.2 %(V)
Vapour pressure	9.333 hPa at 25 °C
Solubility	partly soluble
Viscosity	44.568 mm ² /s
Viscosity, dynamic	36.1 mPa.s
Melting point/range	-89.5 °C
Density	0.81 g/cm ³

SECTION 10 Stability and reactivity

Conditions to avoid	Heat, flames and sparks.
Hazardous decomposition products	Carbon oxides
Incompatible products	Strong oxidizing agents Incompatible with acids. Halogenated compounds
Hazardous reactions	Hazardous polymerisation does not occur.

SECTION 11 Toxicological information



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Acute oral toxicity LD50 rat: 790 mg/kg; literature value

Acute inhalation toxicity LC50 rat: 8,000 mg/l; ; 4 h; literature value

Acute dermal toxicity LD50 rabbit: 3,400 mg/kg; literature value

Skin irritation rabbit: moderately irritating; literature value; Irritating to skin.

Eye irritation rabbit: highly irritating; literature value; Risk of serious damage to eyes.

SECTION 12 Ecological information

Ecotoxicity effects

Toxicity to fish LC50 Pimephales promelas: 1,730 mg/l; 96 h; literature value

Toxicity to daphnia EC50 Daphnia magna: 1,983 mg/l; 48 h; literature value

SECTION 13 Disposal considerations

Waste Classification US. EPA Resource Conservation and Recovery Act: (RCRA) D List of Characteristic Hazardous Wastes (40 CFR 261.21-24): D001

Waste from residues / unused products In accordance with local and national regulations. Do not contaminate ponds, waterways or ditches with chemical or used container. The product should not be allowed to enter drains, water courses or the soil.

Uncleaned empty packaging Do not burn, or use a cutting torch on, the empty drum., Triple rinse containers., Can be offered for recycling, re-conditioning or puncture.

Handling and storage: See chapter 7

Exposure controls / personal protection: See chapter 8

SECTION 14 Transport information

DOT/49CFR UN 1120 Butanols (n-butanol), 3, III

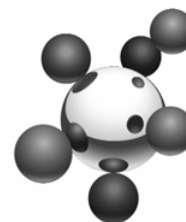
ADR UN 1120 Butanols (n-butanol), 3, III

RID UN 1120 BUTANOLS (n-butanol), 3, III

ADNR UN 1120 BUTANOLS (n-butanol), 3, III

IMDG UN 1120 BUTANOLS (n-butanol), 3, III; EmS F-E, S-D

ICAO/IATA UN 1120 Butanols (n-butanol), 3, III



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SECTION 15 Regulatory information

U.S. Federal Classifications:

OSHA Hazards Flammable Liquid, Mild eye irritant, Mild skin irritant

SARA 311/312 Fire Hazard, Acute Health Hazard

U.S. Regulated Ingredients:

Hazard information reporting

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

Components

Butan-1-ol

CAS-No.

71-36-3

US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

Components

Butan-1-ol

CAS-No.

71-36-3

US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

Components

Butan-1-ol

CAS-No.

71-36-3

US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

Components

Butan-1-ol

CAS-No.

71-36-3

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A)

Components

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

Spill reporting

US. EPA CERCLA Hazardous Substances (40 CFR 302)

Components

Butan-1-ol

CAS-No.

71-36-3

Reportable Quantity

5,000 lbs 5,000 lbs 1,000

lbs 10 mg/L 10,000

mg/kg 1,000 mg/kg 100

mg/L 100 lbs 5,000 lbs 1

lbs

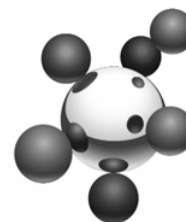
Health

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

Components

Not listed

CAS-No.



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Inventories

Other international regulations

WHMIS Classification B2: Flammable Liquid
D2B: Toxic Material Causing Other Toxic Effects

SECTION 16 Other information

Hazard Ratings

	<u>Health</u>	<u>Flammability</u>	<u>Reactivity Hazard</u>
HMIS	2	3	0
NFPA	1	3	0

All reasonable efforts were exercised to compile this MSDS in accordance with ISO 11014 and ANSIZ400.1.1993. The MSDS provides information regarding the health, safety and environmental hazards, at the date of issue, to facilitate the safe receipt, use and handling of the product in the workplace. Since Sasol and its subsidiaries cannot anticipate or control all conditions under which the product may be handled, used and received in the workplace, it remains the obligation of each user, receiver or handler to, prior to usage, review this MSDS in the context within which the product will be received, handled or used in the workplace. The user, handler or receiver must ensure that the necessary mitigating measures are in place as regards health and safety. This does not substitute the need or requirement for any relevant risk assessments to be conducted. It further remains the responsibility of the receiver, handler or user to communicate such information to all relevant parties that may be involved in the receipt, use or handling of the product. Although all reasonable efforts were exercised in the compilation of this MSDS, Sasol does not expressly warrant the accuracy or assume any liability for the incompleteness of the information contained herein or any advice given. The product is sold and risk passes in accordance with the specific terms and conditions of sale.

The MSDS was created by: Motlatsi(MS)

The MSDS was approved by: Glen Telge