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, Hyroxybutane, 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

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.

Ecological information: See chapter 12

Potential health effects

Acute effects

Eyes Causes eye irritation.
n-Butanol

Revised Date 02.10.2007

Skin contact: 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

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>butan-1-ol; n-butanol</td>
<td>71-36-3</td>
<td>99.85</td>
</tr>
</tbody>
</table>

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
n-Butanol

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 (CO2)

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.
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

<table>
<thead>
<tr>
<th>Components</th>
<th>Exposure limit(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-BUTYL ALCOHOL</td>
<td>US. ACGIH Threshold Limit Values time weighted average 20 ppm</td>
</tr>
<tr>
<td></td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards Ceiling Limit Value and Time Period (if specified): 50 ppm (150 mg/m3)</td>
</tr>
<tr>
<td></td>
<td>US. NIOSH: Pocket Guide to Chemical Hazards Skin designation:</td>
</tr>
<tr>
<td></td>
<td>US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) Permissible exposure limit 100 ppm (300 mg/m3)</td>
</tr>
<tr>
<td>N-BUTYL ALCOHOL; 1-BUTANOL</td>
<td>US. OSHA Table Z-1-A (29 CFR 1910.1000) Ceiling Limit Value: 50 ppm (150 mg/m3)</td>
</tr>
<tr>
<td></td>
<td>US. OSHA Table Z-1-A (29 CFR 1910.1000) Skin designation (Final Rule Limit applies):</td>
</tr>
<tr>
<td></td>
<td>US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants Ceiling Limit Value: 50 ppm (150 mg/m3)</td>
</tr>
<tr>
<td></td>
<td>US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants Skin designation:</td>
</tr>
<tr>
<td></td>
<td>Can be absorbed through the skin. Can be absorbed through the skin. Can be absorbed through the skin.</td>
</tr>
</tbody>
</table>

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
**n-Butanol**

**State of matter**  liquid

**Colour**  clear, colourless

**Odour**  alcoholic

**Form**  liquid

**Boiling point/boiling range**  117 °C

**Flash point**  37 °C closed cup98.6 °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 mm²/s

**Viscosity, dynamic**  36.1 mPa.s

**Melting point/range**  -89.5 °C

**Density**  0.81 g/cm³

### 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
**n-Butanol**

**Version 1.01**

**Revision Date 02.10.2007**

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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.

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**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

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**SECTION 13   Disposal considerations**

**Waste Classification**  

**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

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**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
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  CAS-No.
Butan-1-ol  71-36-3

US. Massachusetts Commonwealth’s Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)
Components  CAS-No.
Butan-1-ol  71-36-3

US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)
Components  CAS-No.
Butan-1-ol  71-36-3

US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)
Components  CAS-No.
Butan-1-ol  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  CAS-No.
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  71-36-3  Reportable Quantity
5,000 lbs  1,000 lbs  10 mg/L  10,000 mg/kg  1,000 mg/kg  100 mg/L  1,000 lbs

Health
US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)
Components  CAS-No.
Not listed
Inventories

Other international regulations

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

SECTION 16 Other information

Hazard Ratings

<table>
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<tr>
<th></th>
<th>Health</th>
<th>Flammability</th>
<th>Reactivity Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMIS</td>
<td>2</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>NFPA</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

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The MSDS was created by: Motlatsi(MS)
The MSDS was approved by: Glen Telge