

Se-Jin Yook 9-24-04

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Material Safety Data Sheet 1-Butanol

ACC# 15400

Section 1 - Chemical Product and Company Identification

MSDS Name: 1-Butanol

Catalog Numbers: AC107690000, AC107690010, AC107690025, AC107690200, AC167690000, AC167691000, AC167695000, AC232080000, AC232080010, AC232080025, AC423490000, AC423490010, AC423490040, AC423492000, AC423495000, AC610020040, AC610251000, S75058, S79930, S79930-1, S799302, S79932HPLC, A383-1, A383-4, A383J4, A383SK-1, A383SK-4, A398-4, A399-1, A399-20, A399-4, A399-4LC, A399-500, A399J4, A399J500, A399S-4, A400-4, BP2603-100, BP505-25, BP505-500, NC9025368, NC9926765, S79930-2MF*, S79932SPEC

Synonyms: n-Butanol; 1-Butanol; n-Butyl alcohol; 1-Butyl alcohol; Butyl hydroxide; 1-Hydroxybutane; Methylolpropane; n-Propylcarbinol; Propylmethanol; Butyric alcohol.

Company Identification:

Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410

For information, call: 201-796-7100

Emergency Number: 201-796-7100

For CHEMTREC assistance, call: 800-424-9300

For International CHEMTREC assistance, call: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
71-36-3	n-Butyl alcohol	> 99	200-751-6

Hazard Symbols: XN

Risk Phrases: 10 22 37/38 41

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless liquid. Flash Point: 35 deg C. **Warning! Flammable liquid and vapor.** May be harmful if swallowed. May cause central nervous system depression. Aspiration hazard if swallowed. Can enter lungs and cause damage. Breathing vapors may cause drowsiness and dizziness. Causes skin and respiratory tract irritation. Causes severe eye irritation and possible eye injury.

Target Organs: Central nervous system, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes severe eye irritation. May cause corneal edema and inflammation. May cause lacrimation (tearing), blurred vision, and photophobia. Vapors appear to cause a special vacuolar keratopathy in humans.

Skin: Causes skin irritation. Skin absorption is slight. Repeated or prolonged exposure may cause drying and cracking of the skin. Although n-butanol can enter the circulation after topical application, the absorbed dose is insignificant compared to that from other routes.

Ingestion: May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. May be harmful if swallowed.

Inhalation: Causes respiratory tract irritation. May cause cardiovascular disturbances, hearing abnormalities, central nervous system depression, muscle weakness, and possible death due to respiratory failure. May be absorbed through the lungs.

Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis. May cause damage to the auditory nerve (some hearing loss) and vestibular injury. Animal evidence suggests that fetotoxicity and teratogenicity may be observed at doses that also cause harmful effects in the mothers. The systemic toxicity of n-butanol is low, although it may potentiate the hepatic (liver) toxicity of other inhaled compounds, such as carbon tetrachloride.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: Potential for aspiration if swallowed. Get medical aid immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Alcoholic beverage consumption may enhance the toxic effects of this substance. Persons with liver, kidney, or central nervous system diseases may be at increased risk from exposure to this product. Butanol is especially toxic if aspirated. Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Flammable liquid and vapor. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Flash Point: 35 deg C (95.00 deg F)

Autoignition Temperature: 343 deg C (649.40 deg F)

Explosion Limits, Lower: 1.4 vol %

Upper: 11.2 vol %

NFPA Rating: (estimated) Health: 2; Flammability: 3; Instability: 0

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Provide ventilation. Use only non-sparking tools and equipment.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Do not ingest or inhale. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
n-Butyl alcohol	20 ppm TWA	1400 ppm IDLH	100 ppm TWA; 300 mg/m ³ TWA

OSHA Vacated PELs: n-Butyl alcohol: No OSHA Vacated PELs are listed for this chemical.

Personal Protective Equipment

Eyes: Wear chemical goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: colorless

Odor: vinous or wine-like

pH: Not available.

Vapor Pressure: 6.7 mm Hg @ 25 deg C

Vapor Density: 2.6 (Air=1)

Evaporation Rate: 0.46 (Butyl acetate=1)

Viscosity: 2.94 cP at 20 deg C

Boiling Point: 116 deg C

Freezing/Melting Point: -89.5 deg C

Decomposition Temperature: Not available.

Solubility: Slightly soluble.

Specific Gravity/Density: 0.8100 (Water=1)

Molecular Formula: C4H10O

Molecular Weight: 74.12

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Ignition sources, excess heat, confined spaces.

Incompatibilities with Other Materials: Strong oxidizing agents, strong acids, alkali metals, halogens.

Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:

CAS# 71-36-3: EO1400000

LD50/LC50:

CAS# 71-36-3:

Draize test, rabbit, eye: 2 mg Severe;

Draize test, rabbit, eye: 2 mg/24H Severe;

Draize test, rabbit, skin: 405 mg/24H Moderate;

Draize test, rabbit, skin: 20 mg/24H Moderate;

Inhalation, rat: LC50 = 8000 ppm/4H;

Inhalation, rat: LC50 = 24000 mg/m³/4H;

Oral, mouse: LD50 = 100 mg/kg;

Oral, rabbit: LD50 = 3484 mg/kg;

Oral, rabbit: LD50 = 3400 mg/kg;

Oral, rat: LD50 = 790 mg/kg;

Oral, rat: LD50 = 800 mg/kg;

Skin, rabbit: LD50 = 3400 mg/kg;

Carcinogenicity:

CAS# 71-36-3: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA.

Epidemiology: No data available.

Teratogenicity: See actual entry in RTECS for complete information.

Reproductive Effects: See actual entry in RTECS for complete information.

Neurotoxicity: No information available.

Mutagenicity: See actual entry in RTECS for complete information.

Other Studies: No data available.

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: LC50 = 1510-1730 mg/L; 96 Hr; Static bioassay at 24.7? (pH 7.64) Water flea Daphnia: EC50 = 1980-1983 mg/L; 48 Hr; Unspecified Bacteria: Phytobacterium phosphoreum: EC50 = 2817-3710 mg/L; 5,30 min; Microtox test Release of n-butanol to soil may result in volatilization from the soil surface and biodegradation is expected to be significant. n-

Butanol should not bind strongly to soil and so is expected to leach into groundwater. Release of n-butanol to water is expected to result in biodegradation and in volatilization from the water surface. Photooxidation by hydroxyl radicals is expected to be slow.

Environmental: When released to soil, substance is expected to biodegrade, leach to ground water or volatilize. In water, substance is expected to biodegrade or volatilize. Bioconcentration potential is predicted to be low. Soil Mobility: Substance is moderately to highly mobile (log octanol/ water partition coefficient=0.88).

Physical: Substance reacts in air with hydroxyl radicals (half-life=2.3 days).

Other: None.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: CAS# 71-36-3: waste number U031 (Ignitable waste).

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	BUTANOLS				BUTANOLS
Hazard Class:	3				3
UN Number:	UN1120				UN1120
Packing Group:	III				III
Additional Info:					FLASHPOINT 29 C

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 71-36-3 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

CAS# 71-36-3: 5000 lb final RQ; 2270 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 71-36-3: acute, flammable.

Section 313

This material contains n-Butyl alcohol (CAS# 71-36-3, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 71-36-3 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations**European Labeling in Accordance with EC Directives****Hazard Symbols:**

XN

Risk Phrases:

R 10 Flammable.

R 22 Harmful if swallowed.

R 37/38 Irritating to respiratory system and skin.

R 41 Risk of serious damage to eyes.

R 67 Vapours may cause drowsiness and dizziness.

Safety Phrases:

S 13 Keep away from food, drink and animal feeding stuffs.

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 37/39 Wear suitable gloves and eye/face protection.

S 46 If swallowed, seek medical advice immediately and show this container or label.

S 7/9 Keep container tightly closed and in a well-ventilated place.

WGK (Water Danger/Protection)

CAS# 71-36-3: 1

Canada - DSL/NDSL

CAS# 71-36-3 is listed on Canada's DSL List.

Canada - WHMIS

This product does not have a WHMIS classification.

Canadian Ingredient Disclosure List

CAS# 71-36-3 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 71-36-3: OEL-AUSTRALIA:TWA 50 ppm (150 mg/m³);Skin OEL-AUSTRIA

:TWA 100 ppm (300 mg/m³) OEL-BELGIUM:STEL 50 ppm (152 mg/m³);Skin OE

L-CZECHOSLOVAKIA:TWA 100 mg/m³;STEL 200 mg/m³ OEL-DENMARK:STEL 50 ppm

(150 mg/m³);Skin OEL-FINLAND:TWA 50 ppm (150 mg/m³);STEL 75 ppm (225

mg/m₃);Skin OEL-FRANCE:STEL 50 ppm (150 mg/m₃) OEL-GERMANY:TWA 100 ppm (300 mg/m₃) OEL-HUNGARY:TWA 100 mg/m₃;STEL 200 mg/m₃;Skin OEL-IN DIA:TWA 50 ppm (150 mg/m₃);Skin OEL-JAPAN:STEL 50 ppm (150 mg/m₃);Skin OEL-THE NETHERLANDS:TWA 50 ppm (150 mg/m₃);Skin OEL-THE PHILIPPINE S:TWA 100 ppm (300 mg/m₃) OEL-RUSSIA:STEL 50 ppm (10 mg/m₃) OEL-SWED EN:TWA 15 ppm (45 mg/m₃);STEL 30 ppm (90 mg/m₃);Skin OEL-SWITZERLAND: TWA 50 ppm (150 mg/m₃);STEL 100 ppm;Skin OEL-TURKEY:TWA 100 ppm (300 mg/m₃) OEL-UNITED KINGDOM:TWA 50 ppm (150 mg/m₃);STEL 50 ppm;Skin OEL IN BULGARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNAM check ACGI TLV

Section 16 - Additional Information

MSDS Creation Date: 6/10/1999

Revision #8 Date: 4/07/2004

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