

3-Methoxy-3-methyl-1-butanol

sc-238576

Material Safety Data Sheet



The Power is Question

Hazard Alert Code Key:

EXTREME

HIGH

MODERATE

LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

3-Methoxy-3-methyl-1-butanol

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER

Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800

EMERGENCY:

ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS

C6-H14-O2, CH3OC(CH3)2CH2CH2OH, "Nissho Iwai MMB", "Kuraray MMB", "glycol ether", "alcohol ether solvent", methylmethoxybutanol, "methylmethoxybutyl alcohol", methoxymethylbutanol, "methoxymethylbutyl alcohol", 3-methyl-3-methoxybutanol, "3-methyl-3-methoxybutyl alcohol", 3-methoxy-3-methylbutanol, "3-methoxy-3-methylbutyl alcohol", "3-methoxy-3-methyl butanol", 3-methoxy-isopentanol, "3-methoxy-isopentyl alcohol", "3-methoxy-isoamyl alcohol", "methoxyamyl alcohol", Solfit

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability:	1		
Toxicity:	2		
Body Contact:	0		
Reactivity:	2		
Chronic:	2		

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4



CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW

RISK

HARMFUL - May cause lung damage if swallowed.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Swallowing of the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis; serious consequences may result. (ICSC13733).

■ Accidental ingestion of the material may be damaging to the health of the individual.

EYE

■ Although the liquid is not thought to be an irritant, direct contact with the eye may produce transient discomfort characterized by tearing or conjunctival redness (as with windburn).

SKIN

■ The material is not thought to produce adverse health effects or skin irritation following contact (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

■ Repeated exposure may cause skin cracking, flaking or drying following normal handling and use.

■ Open cuts, abraded or irritated skin should not be exposed to this material.

■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

■ The material is not thought to produce respiratory irritation (as classified using animal models). Nevertheless inhalation of vapors, fumes or aerosols, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.

■ Inhalation of vapours may cause drowsiness and dizziness. This may be accompanied by narcosis, reduced alertness, loss of reflexes, lack of coordination and vertigo.

■ Inhalation of vapors or aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.

■ Inhalation hazard is increased at higher temperatures.

CHRONIC HEALTH EFFECTS

■ Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

Some glycol esters and their ethers cause wasting of the testicles, reproductive changes, infertility and changes to kidney function. Shorter chain compounds are more dangerous.

<p>.

The material is considered to have low toxicity, however excessive exposure may cause health problems.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
3-methyl-3-methoxy butanol	56539-66-3	> 98

Section 4 - FIRST AID MEASURES

SWALLOWED

· If swallowed do NOT induce vomiting. · If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. · If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

EYE

■ If this product comes in contact with the eyes: · Wash out immediately with fresh running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

SKIN

■ If skin or hair contact occurs: · Flush skin and hair with running water (and soap if available). · Seek medical attention in event of irritation.

INHALED

· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested.

NOTES TO PHYSICIAN

■ Any material aspirated during vomiting may produce lung injury. Therefore emesis should not be induced mechanically or pharmacologically.

<\p>.

Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

Vapor Pressure (mmHg):	0.503 @ 20 C
Upper Explosive Limit (%):	13.1
Specific Gravity (water=1):	0.927 @ 20 C
Lower Explosive Limit (%):	1.2

EXTINGUISHING MEDIA

- Alcohol stable foam.
- Dry chemical powder.

FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Combustible.
 - Slight fire hazard when exposed to heat or flame.
- Combustion products include: carbon dioxide (CO₂), other pyrolysis products typical of burning organic material.
May emit poisonous fumes.

FIRE INCOMPATIBILITY

- Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

PERSONAL PROTECTION

Glasses:
Chemical goggles.
Gloves:
Respirator:
Type A Filter of sufficient capacity

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.

MAJOR SPILLS

- Moderate hazard.
- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- DO NOT allow clothing wet with material to stay in contact with skin.
- The tendency of many ethers to form explosive peroxides is well documented. Ethers lacking non-methyl hydrogen atoms adjacent to the ether link are thought to be relatively safe
- DO NOT concentrate by evaporation, or evaporate extracts to dryness, as residues may contain explosive peroxides with DETONATION potential.
 - Any static discharge is also a source of hazard.
 - Before any distillation process remove trace peroxides by shaking with excess 5% aqueous ferrous sulfate solution or by percolation through a column of activated alumina.
 - Distillation results in uninhibited ether distillate with considerably increased hazard because of risk of peroxide formation on storage.
 - Add inhibitor to any distillate as required.
 - When solvents have been freed from peroxides by percolation through columns of activated alumina, the absorbed peroxides must promptly be desorbed by treatment with polar solvents such as methanol or water, which should then be disposed of safely.
- The substance accumulates peroxides which may become hazardous only if it evaporates or is distilled or otherwise treated to concentrate the peroxides. The substance may concentrate around the container opening for example.
- Purchases of peroxidisable chemicals should be restricted to ensure that the chemical is used completely before it can become peroxidised.
- A responsible person should maintain an inventory of peroxidisable chemicals or annotate the general chemical inventory to indicate which chemicals are subject to peroxidation. An expiration date should be determined. The chemical should either be treated to remove peroxides or disposed of before this date.
 - The person or laboratory receiving the chemical should record a receipt date on the bottle. The individual opening the container should add an opening date.
 - Unopened containers received from the supplier should be safe to store for 18 months.
 - Opened containers should not be stored for more than 12 months.
 - Avoid all personal contact, including inhalation.

- Wear protective clothing when risk of exposure occurs.

RECOMMENDED STORAGE METHODS

- Metal can or drum
- Packing as recommended by manufacturer.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- No smoking, naked lights or ignition sources.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

The following materials had no OELs on our records

- 3-methyl-3-methoxy butanol: CAS:56539-66-3

PERSONAL PROTECTION



RESPIRATOR

Type A Filter of sufficient capacity

Consult your EHS staff for recommendations

EYE

- Safety glasses with side shields
- Chemical goggles.

HANDS/FEET

■ Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

- Neoprene gloves.

Wear chemical protective gloves, eg. PVC.

OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

ENGINEERING CONTROLS

■ Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator.

<p>.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Liquid.

Mixes with water.

State	Liquid	Molecular Weight	118
Melting Range (°F)	< -58	Viscosity	Not Available
Boiling Range (°F)	345.2	Solubility in water (g/L)	Miscible
Flash Point (°F)	159.8 [CC]	pH (1% solution)	Not available.
Decomposition Temp (°F)	Not available.	pH (as supplied)	Not applicable
Autoignition Temp (°F)	743	Vapor Pressure (mmHg)	0.503 @ 20 C
Upper Explosive Limit (%)	13.1	Specific Gravity (water=1)	0.927 @ 20 C
Lower Explosive Limit (%)	1.2	Relative Vapor Density (air=1)	Not available.
Volatile Component (%vol)	100	Evaporation Rate	0.07 (BuAc=1)

APPEARANCE

Clear, colourless liquid with a light, inoffensive odour; mixes with water. Compatible with a large range of organic solvents and synthetic resins.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

STORAGE INCOMPATIBILITY

- Glycol ethers may form peroxides under certain conditions; the potential for peroxide formation is enhanced when these substances are used in processes such as distillation where they are concentrated or even evaporated to near-dryness or dryness; storage under a nitrogen atmosphere is recommended to minimise the possible formation of highly reactive peroxides
 - Nitrogen blanketing is recommended if transported in containers at temperatures within 15 deg C of the flash-point and at or above the flash-point - large containers may first need to be purged and inerted with nitrogen prior to loading
 - In the presence of strong bases or the salts of strong bases, at elevated temperatures, the potential exists for runaway reactions.
 - Contact with aluminium should be avoided; release of hydrogen gas may result- glycol ethers will corrode scratched aluminium surfaces.
 - May discolour in mild steel/ copper; lined containers, glass or stainless steel is preferred
 - Glycols and their ethers undergo violent decomposition in contact with 70% perchloric acid. This seems likely to involve formation of the glycol perchlorate esters (after scission of ethers) which are explosive, those of ethylene glycol and 3-chloro-1,2-propanediol being more powerful than glyceryl nitrate, and the former so sensitive that it explodes on addition of water . Investigation of the hazards associated with use of 2-butoxyethanol for alloy electropolishing showed that mixtures with 50-95% of acid at 20 deg C, or 40-90% at 75 C, were explosive and initiable by sparks. Sparking caused mixtures with 40-50% of acid to become explosive, but 30% solutions appeared safe under static conditions of temperature and concentration.
- Avoid reaction with oxidizing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

3-METHYL-3-METHOXY BUTANOL

TOXICITY AND IRRITATION

3-METHYL-3-METHOXY BUTANOL:

- unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY	IRRITATION
Oral (Mouse) LD50: 5830 mg/kg *	Nil Reported
Oral (Rat) LD50: 4380 mg/kg * [Manufacturer]	

■ For 3-methyl-3-methoxy butanol (MMB):

Acute toxicity: In an acute dermal toxicity study with 3-methoxy-3-methyl-1-butanol (MMB) at 2000 mg/kg bw, there was no death, clinical sign or abnormality at necropsy in SD rats. The acute dermal LD50 was considered to be more than 2000 mg/kg bw. In an acute oral toxicity study [OECD TG 401], Crj:CD SD rats (5 animals/sex/dose) were given MMB by gavage at 0, 2000, 3200, 4000 or 5000 mg/kg bw for males and females. Deaths were found in males and females at 4000 mg/kg and higher. No changes in body weight were recorded for rats that died. The LD50 values were estimated to be 4500 and 4300 mg/kg bw in males and females, respectively. There is no available information on acute inhalation toxicity.

The undiluted MMB showed slight irritation to the skin after prolonged exposure in rabbits. MMB was moderately irritant to rabbit eyes.

There was no evidence of sensitisation of MMB in guinea pigs.

Repeated dose toxicity: In a repeated dose toxicity study, Crj:CD(SD)IGS rats (5 animals/sex/dose) were given MMB by gavage at 0 (vehicle: distilled water), 15, 60, 250 or 1000 mg/kg bw/day. The administration period was 28 days and the recovery period was 14 days after administration. There were no MMB-induced changes in general condition, body weight gain, food consumption, haematological findings, necropsy findings and histopathological findings. A decrease in chloride in males and females at 1000 mg/kg bw/day and increases in A/G ratio and inorganic phosphorus in males at 1000 mg/kg bw/day were detected. An increase in relative weight of the kidneys in males at 250 (11%) and 1000 mg/kg bw/day (15%) and in females at 1000 mg/kg bw/day (16%), and an increase in relative weight of the liver in males (10%) and females (13%) at 1000 mg/kg bw/day after the administration period and in males at 1000 mg/kg bw/day (7%) after the recovery period were detected. The NOAELs for repeated dose toxicity were considered to be 60 mg/kg bw/day for males and 250 mg/kg bw/day for females.

females.

Genotoxicity: In a reverse gene mutation assay [OECD TG 471], MMB was not mutagenic in *Salmonella typhimurium* TA100, TA1535, TA98, TA1537, and TA 1538 or in *Escherichia coli* WP2 uvrA either with or without an exogenous metabolic activation. In a chromosomal aberration test [OECD TG 473], MMB did not induce structural chromosomal aberrations or polyploidy either with or without an exogenous metabolic activation. There is no available information on carcinogenicity.

Reproductive toxicity: In the reproduction/developmental toxicity screening test [OECD TG 421], Crj:CD(SD)IGS rats (12 animals/sex/dose) were given MMB by gavage at 0 (vehicle: distilled water), 8, 40, 200 or 1000 mg/kg bw/day.

Males were dosed for 47 days and females were dosed from day 14 before mating to day 4 of lactation throughout the mating and pregnancy period. Increases in absolute and relative weights of the kidney in males at 200 mg/kg bw/day and higher and relative weight of the liver and kidney in females at 1000 mg/kg bw/day were detected. No effects of MMB on reproductive and developmental parameters were observed. No external or internal malformation was found in pups at any dose. The NOAELs were considered to be 40 mg/kg bw/day in males and 200 mg/kg bw/day in females for general toxicity and 1000 mg/kg bw/day for reproductive and developmental toxicity in rats.

Developmental toxicity: In a developmental toxicity study, Crj:CD(SD) female rats (25 animals/dose) were given MMB by gavage at 0 (vehicle: deionized water), 250, 500 or 2000 mg/kg bw/day on days 6-15 of gestation. Decreased motor activity, excess salivation, ataxia, muscle flaccidity and loss of righting reflex at 2000 mg/kg bw/day and decreases in body weight gains and food consumption at 250 mg/kg bw/day and higher were observed in dams. Foetal body weights were decreased at 2000 mg/kg bw/day. No increases in embryonic/ foetal deaths and fetal malformations were detected after administration of MMB. Increases in skeletal variations and delayed ossification were found at 2000 mg/kg bw/day. The NOAELs were considered to be less than 250 mg/kg bw/day for maternal toxicity and 500 mg/kg bw/day for developmental toxicity in rats.

Section 12 - ECOLOGICAL INFORMATION

No data

Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
3-methyl-3-methoxy butanol	LOW		LOW	HIGH

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

! Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult Waste Management Authority for disposal.

Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: DOT, IATA, IMDG

Section 15 - REGULATORY INFORMATION

3-methyl-3-methoxy butanol (CAS: 56539-66-3) is found on the following regulatory lists;

"IMO IBC Code Chapter 17: Summary of minimum requirements", "IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances", "International Fragrance Association (IFRA) Survey: Transparency List", "OECD Representative List of High Production Volume (HPV) Chemicals", "US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes", "US Toxic Substances Control Act (TSCA) - Inventory"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

- Potentially explosive peroxides may form on standing.*.

- Inhalation and/or ingestion may produce health damage*.
 - Cumulative effects may result following exposure*.
 - Repeated exposure potentially causes skin dryness and cracking*.
 - Vapours potentially cause drowsiness and dizziness*.
- * (limited evidence).

ND

Substance CAS Suggested codes 3- methyl- 3- methoxy butanol 56539- 66- 3

Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.

- Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

- The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

This document is copyright. Apart from any fair dealing for the purposes of private study, research, review or criticism, as permitted under the Copyright Act, no part may be reproduced by any process without written permission from CHEMWATCH. TEL (+61 3) 9572 4700.

Issue Date: Oct-25-2009

Print Date:Dec-1-2010