

# Borneol

sc-255003



The Power is Question

## Material Safety Data Sheet

Hazard Alert Code Key: **EXTREME** **HIGH** **MODERATE** **LOW**

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

Borneol

### 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

C10-H18-O, "bicyclo(2.2.1)heptan-2-ol, 1, 7, 7-trimethyl-, endo-", (d-form), "bicyclo(2.2.1)heptan-2-ol, 1, 7, 7-trimethyl-, (1S-endo)-(l-form)", endo-2-bornanol, endo-2-camphanol, endo-2-hydroxycamphane, "bornyl alcohol", "camphane, 2-hydroxy-", 2-camphanol, camphol, 2-hydroxycamphane, "1, 7, 7-trimethyl-(bicyclo(2.2.1)heptan-2-ol, endo-", "(l-form synonyms)", l-2-borneol, (-)-borneol, l-borneol, "(1S, 2R, 4S)-(-)-borneol", "1-bornyl alcohol", l-2-camphanol, linderol, "Ngai camphor", "Baros camphor", "Sumatra camphor", "Borneo camphor", "Dryobalanops camphor", "Bhimsaim camphor", "Malayan camphor"

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

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

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



### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

Harmful if swallowed.  
Flammable.

## POTENTIAL HEALTH EFFECTS

### ACUTE HEALTH EFFECTS

#### SWALLOWED

- Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.
- Small oral doses of camphor or camphor containing oils may produce a sensation of warmth in the stomach; larger doses may induce nausea and vomiting.  
Camphor is a central nervous system stimulant.

#### EYE

- There is some evidence to suggest that this material can cause eye irritation and damage in some persons.
- Direct contact with camphor or camphor-containing oils may produce keratitis (inflammation of the cornea).

#### SKIN

- Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.
- There is some evidence to suggest that this material can cause inflammation of the skin on contact in some persons.
- Camphor is mainly a local irritant.  
Symptoms might include reddening and warming of the skin.
- 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 dusts, or fume, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
- Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.
- Inhalation overexposure to camphor or camphor-containing oils may produce irritation of the eyes and nose, with a risk of loss of smell.  
Acute exposures affect the central nervous system, resulting in nausea, vomiting, dizziness, agitation and confusion.
- 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.

### CHRONIC HEALTH EFFECTS

- Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.  
Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.  
Person with pre-existing convulsive disorders, eye and skin diseases, chronic respiratory disease, kidney and liver disease may be more susceptible to symptoms of exposure at potentially hazardous levels.  
When the cancer promoter, croton oil, was applied concurrently with camphor to the skin of mice, twice weekly, two carcinomas, one invasive, developed in 2 of 110 animals.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
borneol	507-70-0	>98

## Section 4 - FIRST AID MEASURES

### SWALLOWED

· IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY. · Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:

### 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 contact occurs: · Immediately remove all contaminated clothing, including footwear · Flush skin and hair with running water (and soap if available).

## **INHALED**

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

## **NOTES TO PHYSICIAN**

■ Treat symptomatically.

For camphor intoxications:

· Treatment is aimed at preventing convulsions. Intravenous sodium thiopental, pentobarbital or amobarbital (Amytal) is effective. The drug should be injected slowly until the desired condition is reached, namely a degree of depression sufficient to prevent or stop convulsions and to keep the patient asleep, but not deep enough to depress respirations or blood pressure. Intramuscular sodium phenobarbital may also be helpful. These drugs as well as diazepam, can be used to terminate camphor convulsions.

· The patient should be kept under careful observation for many hours and protected from all possible stimuli. Wakefulness, muscular twitchings and increased reflex excitability are signs that warn for the need of additional barbiturate.

## **Section 5 - FIRE FIGHTING MEASURES**

Vapor Pressure (mmHg):	33.753 (25 C)
Upper Explosive Limit (%):	Not available
Specific Gravity (water=1):	1.011
Lower Explosive Limit (%):	Not available

## **EXTINGUISHING MEDIA**

■ For SMALL FIRES:

Dry chemical, CO<sub>2</sub>, water spray or foam.

For LARGE FIRES:

Water-spray, fog or foam.

## **FIRE FIGHTING**

· Alert Emergency Responders and tell them location and nature of hazard.

· Wear breathing apparatus plus protective gloves.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 1000 metres in all directions.

## **GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS**

· Flammable solid which burns and propagates flame easily, even when partly wetted with water.

· Any source of ignition, i.e. friction, heat, sparks or flame, may cause fire or explosion.

Combustion products include: carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), other pyrolysis products typical of burning organic material.

## **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:

Particulate

## **Section 6 - ACCIDENTAL RELEASE MEASURES**

### **MINOR SPILLS**

· Remove all ignition sources.

· DO NOT touch or walk through spilled material.

### **MAJOR SPILLS**

· 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**

· Avoid all personal contact, including inhalation.

· Wear protective clothing when risk of overexposure occurs.

Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.

· Do NOT cut, drill, grind or weld such containers.

· In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

### **RECOMMENDED STORAGE METHODS**

■ For low viscosity materials and solids: Drums and jerricans must be of the non-removable head type. Where a can is to be used as an inner package, the can must have a screwed enclosure.

### **STORAGE REQUIREMENTS**

■ FOR MINOR QUANTITIES:

- Store in an indoor fireproof cabinet or in a room of noncombustible construction
- Provide adequate portable fire-extinguishers in or near the storage area.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

The following materials had no OELs on our records

- borneol: CAS:507-70-0 CAS:464-45-9

### PERSONAL PROTECTION



### RESPIRATOR

Particulate

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.

Wear physical protective gloves, eg. leather.

### OTHER

- Overalls.
- Eyewash unit.
- Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.
- For large scale or continuous use wear tight-weave non-static clothing (no metallic fasteners, cuffs or pockets), non sparking safety footwear.

### ENGINEERING CONTROLS

■ For large scale or continuous use:

- Spark-free, earthed ventilation system, venting directly to the outside and separate from usual ventilation systems
- Provide dust collectors with explosion vents.
- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
- Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Solid.

Does not mix with water.

Sinks in water.

State	Divided solid	Molecular Weight	154.24
Melting Range (°F)	402.8- 406.4	Viscosity	Not Applicable
Boiling Range (°F)	413.6 (d-form)	Solubility in water (g/L)	Immiscible
Flash Point (°F)	150.008	pH (1% solution)	Not applicable
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not applicable

Autoignition Temp (°F)	Not available	Vapor Pressure (mmHg)	33.753 (25 C)
Upper Explosive Limit (%)	Not available	Specific Gravity (water=1)	1.011
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	5.31
Volatile Component (%vol)	Not available	Evaporation Rate	Not available

### APPEARANCE

White crystalline powder with peppery odour and burning taste resembling mint; does not mix with water. Soluble in alcohol (176:100), ether, petroleum ether (1:6), benzene(1:5), toluene, acetone, decalin tetralin. Sublimes, but is less volatile than camphor.

log Kow 2.94

Material	Value
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## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

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

### STORAGE INCOMPATIBILITY

#### ■ Camphor:

- reacts violently with strong oxidisers, chromic anhydride, potassium permanganate
- is incompatible with chlorates, naphthalene, 2-naphthol, dichlorobenzene
- may generate static charges due to low conductivity.

Avoid reaction with oxidizing agents.

Segregate from chromic anhydride, potassium permanganate, chlorates, oxidising agents, naphthalene, dichlorobenzene and organic solvents. Contact with chromic anhydride, may form explosive mixtures

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

## Section 11 - TOXICOLOGICAL INFORMATION

borneol

### TOXICITY AND IRRITATION

BORNEOL:

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

TOXICITY	IRRITATION
Oral (rat) LD50: 500 mg/kg	Nil Reported
Oral (mouse) LD50: 1059 mg/kg	Skin (rabbit): 500 mg/24h - Mild
Oral (rat) LD50: 5800 mg/kg	

■ Camphor appears to have moderate acute oral toxicity, with an LD50 of 1310 mg/kg in mice. It demonstrated moderate to high toxicity in acute inhalation studies(450 mg/m<sup>3</sup> (72 ppm) in mice and 500 mg/m<sup>3</sup> (80 ppm) in rats). In subchronic studies,inhaled camphor resulted in emphysema in mice at 210 mg/m<sup>3</sup> (33 ppm) and rabbits at 33 mg/m<sup>3</sup> (5 ppm). In 13-week subchronic dermal studies, camphor had NOAELs of 1000 mg/kg bw/day in mice and 250 mg/kg bw/day in rats. IPCS reported negative results in carcinogenicity tests for camphor. In addition, camphor was negative for genotoxicity in a microsome mutagenesis test, and a peripheral blood micronucleus assay. Reproductive toxicity studies were not available for camphor, however, in developmental toxicity studies, camphor demonstrated no foetal toxicity (with NOAELs 800 mg/kg bw/day in rats) at dose levels that resulted in maternal toxicity.

d-borneol [RTECS No.: ED 7000000]

l-borneol [RTECS No.: DT 5095000]

### CARCINOGEN

VPVB_(VERY~	US - Maine Chemicals of High Concern List	Carcinogen	CA Prop 65; IARC; NTP 11th ROC
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## Section 12 - ECOLOGICAL INFORMATION

This material and its container must be disposed of as hazardous waste.

### Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
borneol	HIGH		LOW	HIGH

### GESAMP/EHS COMPOSITE LIST - GESAMP Hazard Profiles

Name / EHS TRN A1a A1b A1 A2 B1 B2 C1 C2 C3 D1 D2 D3 E1 E2 E3 Cas No / RTECS No \_\_\_\_\_  
 \_\_\_\_\_ [Heavy 226 282 5 2 (2) NR 1 NI 0 0 (1) 1 1 FE 2 Oxo 6 5 Fraction] / CAS:507- 70- 0 /

Legend: EHS=EHS Number (EHS=GESAMP Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships)  
 NRT=Net Register Tonnage, A1a=Bioaccumulation log Pow, A1b=Bioaccumulation BCF, A1=Bioaccumulation, A2=Biodegradation,

B1=Acuteaquatic toxicity LC/ECIC50 (mg/l), B2=Chronic aquatic toxicity NOEC (mg/l), C1=Acute mammalian oral toxicity LD50 (mg/kg), C2=Acute mammalian dermal toxicity LD50 (mg/kg), C3=Acute mammalian inhalation toxicity LC50 (mg/kg), D1=Skin irritation & corrosion, D2=Eye irritation& corrosion, D3=Long-term health effects, E1=Tainting, E2=Physical effects on wildlife & benthic habitats, E3=Interference with coastal amenities, For column A2: R=Readily biodegradable, NR=Not readily biodegradable. For column D3: C=Carcinogen, M=Mutagenic, R=Reprotoxic, S=Sensitising, A=Aspiration hazard, T=Target organ systemic toxicity, L=Lunginjury, N=Neurotoxic, I=Immunotoxic. For column E1: NT=Not tainting (tested), T=Tainting test positive. For column E2: Fp=Persistent floater, F=Floater, S=Sinking substances. The numerical scales start from 0 (no hazard), while higher numbers reflect increasing hazard. (GESAMP/EHS Composite List of Hazard Profiles - Hazard evaluation of substances transported by ships)

## Section 13 - DISPOSAL CONSIDERATIONS

### US EPA Waste Number & Descriptions

A. General Product Information

Ignitability characteristic: use EPA hazardous waste number D001 (waste code I)

#### Disposal Instructions

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

! Puncture containers to prevent re-use and bury at an authorized landfill.

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. 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.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

## Section 14 - TRANSPORTATION INFORMATION

DOT:

Symbols: None Hazard class or Division: 4.1

Identification Numbers: UN1312 PG: III

Label Codes: 4.1 Special provisions: A1, IB8,

IP3, T1,

TP33

Packaging: Exceptions: None Packaging: Non- bulk: 213

Packaging: Exceptions: None Quantity limitations: 25 kg

Passenger aircraft/rail:

Quantity Limitations: Cargo 100 kg Vessel stowage: Location: A aircraft only:

Vessel stowage: Other: None

Hazardous materials descriptions and proper shipping names:

Borneol

#### Air Transport IATA:

ICAO/IATA Class: 4.1 ICAO/IATA Subrisk: None

UN/ID Number: 1312 Packing Group: III

Special provisions: None

Cargo Only

Packing Instructions: 100 kg Maximum Qty/Pack: 25 kg

Passenger and Cargo Passenger and Cargo

Packing Instructions: 420 Maximum Qty/Pack: 419

Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity

Packing Instructions: 10 kg Maximum Qty/Pack: Y419

Shipping Name: BORNEOL

#### Maritime Transport IMDG:

IMDG Class: 4.1 IMDG Subrisk: None

UN Number: 1312 Packing Group: III

EMS Number: F-A , S-I Special provisions: None

Limited Quantities: 5 kg

Shipping Name: BORNEOL

## Section 15 - REGULATORY INFORMATION

**borneol (CAS: 507-70-0,464-45-9) is found on the following regulatory lists;**

"Canada Domestic Substances List (DSL)", "International Fragrance Association (IFRA) Survey: Transparency List", "US - New Jersey Right

## Section 16 - OTHER INFORMATION

### ND

Substance CAS Suggested codes borneol 507- 70- 0 AUTOID~ borneol 464- 45- 9 AUTOID~

### Ingredients with multiple CAS Nos

Ingredient Name CAS borneol 507-70-0, 464-45-9

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■ 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](http://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.

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