Section 1 - Chemical Product and Company Identification

MSDS Name: L(-)-Borneol, 98%

Catalog Numbers: AC160650000, AC160650250, AC160651000, AC160655000

Synonyms: endo-(1S)-1,7,7-Trimethylbicyclo[2.2.1]heptan-2-ol; (-)-Borneol; (1S-Endo)-1,7,7-trimethylbicyclo[2.2.1]heptan-2-ol; 1-Bornyl alcohol; Bicyclo(2.2.1)heptan-2-ol, 1,7,7-trimethyl-, (1S-endo)-; Bicyclo[2.2.1]heptan-2-ol, 1,7,7-trimethyl-, (1-endo)-; Bicyclo[2.2.1]heptan-2-ol, 1,7,7-trimethyl-, (1S,2R,4S)-; Borneol, (1S,2R,4S)-(-)-; l-2-Bornanol; l-2-Camphanol

Company Identification: Acros Organics BVBA

Janssen Pharmaceuticaal 3a
2440 Geel, Belgium

Company Identification: (USA)

Acros Organics
One Reagent Lane
Fair Lawn, NJ 07410

For information in the US, call: 800-ACROS-01

For information in Europe, call: +32 14 57 52 11

Emergency Number, Europe: +32 14 57 52 99

Emergency Number US: 201-796-7100

CHEMTREC Phone Number, US: 800-424-9300

CHEMTREC Phone Number, Europe: 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#: 464-45-9

Chemical Name: L(-)-Borneol

%: 98

EINECS#: 207-353-1

Hazard Symbols: None listed

Risk Phrases: None listed

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Warning! Flammable solid. May cause allergic skin reaction. May cause central nervous system effects. May cause eye, skin, and respiratory tract irritation. Target Organs: Central nervous system, skin.

Potential Health Effects

Eye: May cause eye irritation. May cause chemical conjunctivitis and corneal damage.

Skin: May cause mild skin irritation.

Ingestion: May cause central nervous system depression. May cause nausea, vomiting, abdominal pain, and increased salivation.

Inhalation: May cause respiratory tract irritation. Olfactory fatigue may occur. Can produce delayed pulmonary edema.

Chronic: No information found.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get
medical aid.

Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion: Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation: Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:

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. Will burn if involved in a fire. Dust can be an explosion hazard when exposed to heat or flame. Flammable solid. May burn rapidly with flare burning effect. May re-ignite after fire is extinguished.

Extinguishing Media: For large fires, use water spray, fog or regular foam. Contact professional fire-fighters immediately. For small fires, use dry chemical, carbon dioxide, sand, earth, water spray or regular foam. Cool containers with flooding quantities of water until well after fire is out.

Autoignition Temperature: Not applicable.
Flash Point: 65 deg C (149.00 deg F)

Explosion Limits: Lower:

Explosion Limits: Upper:

NFPA Rating: health: 1; flammability: 2; instability: 0;

Section 6 - Accidental Release Measures

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

Spills/Leaks: Vacuum or sweep up material and place into a suitable disposal container. Scoop up with a nonsparking tool, then place into a suitable container for disposal. Avoid generating dusty conditions. Remove all sources of ignition.

Section 7 - Handling and Storage

Handling: Minimize dust generation and accumulation. Avoid contact with skin and eyes. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep away from heat, sparks and flame. Use only in a chemical fume hood. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a tightly closed container. Flammables-area. Store in a cool, dry area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>OSHA - Final PELs</th>
</tr>
</thead>
<tbody>
<tr>
<td>L(-)-Borneol</td>
<td>none listed</td>
<td>none listed</td>
<td>none listed</td>
</tr>
</tbody>
</table>

OSHA Vacated PELs: L(-)-Borneol: None listed

Engineering Controls: Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local explosion-proof ventilation to keep airborne levels to acceptable levels.

Exposure Limits

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

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 respirator use.

Section 9 - Physical and Chemical Properties

Physical State: Crystalline powder
Color: white
Odor: none reported
pH: Not available
Vapor Pressure: 33.5 mm Hg @ 25 deg C
Vapor Density: 5.31
Evaporation Rate: Not available
Viscosity: Not available
Boiling Point: 210 deg C (410.00°F)
Freezing/Melting Point: 207 - 208 deg C
Decomposition Temperature: Not available
Solubility in water: insoluble
Specific Gravity/Density: Not available.
Molecular Formula: C_{10}H_{18}O
Molecular Weight: 154.25

Section 10 - Stability and Reactivity

Chemical Stability: Stable at room temperature in closed containers under normal storage and handling conditions.
Conditions to Avoid: Incompatible materials, ignition sources, dust generation, excess heat.
Incompatibilities with Other Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Carbon monoxide, carbon monoxide, carbon dioxide.
Hazardous Polymerization: Has not been reported.

Section 11 - Toxicological Information

RTECS#: CAS# 464-45-9: DT5095000
RTECS: 
LD50/LC50: 
LD50/LEC50: Draize test, rabbit, skin: 500 mg/24H Mild;
Oral, rat: LD50 = 5800 mg/kg;
Carcinogenicity: L(-)-Borneol - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Other: Standard Draize Test: Administration onto the skin (rabbit) = 500 mg/24H (Mild).

Section 12 - Ecological Information

Not available

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

US DOT
Shipping Name: BORNEOL
Hazard Class: 4.1
UN Number: UN1312
Packing Group: III
Canada TDG
Shipping Name: Not available
Hazard Class: 
UN Number: 
Packing Group:
Section 15 - Regulatory Information

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: Not available
Risk Phrases:
Safety Phrases:
  S 24/25 Avoid contact with skin and eyes.

WGK (Water Danger/Protection)

CAS# 464-45-9: Not available

Canada

CAS# 464-45-9 is listed on Canada's DSL List
Canadian WHMIS Classifications: B4, D2B
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.
CAS# 464-45-9 is not listed on Canada's Ingredient Disclosure List.

US Federal

TSCA

CAS# 464-45-9 is listed on the TSCA Inventory.

Section 16 - Other Information

MSDS Creation Date: 9/02/1997
Revision #7 Date 7/20/2009

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantibility or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.