



SIGMA-ALDRICH

Material Safety Data Sheet

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Version 1.50

Section 1 - Product and Company Information

Product Name: (-)-BORNEOL
Product Number: 15599
Brand: Fluka Chemical
Company: Sigma-Aldrich
Address: 3050 Spruce Street, SAINT LOUIS, MO 63103 US
Technical Phone: 800-325-5832
Fax: 800-325-5052
Emergency Phone: 314-776-6555

Section 2 - Composition/Information on Ingredient

Table with 5 columns: Substance Name, CAS #, SARA 313, EC no, Annex I Index Number. Row 1: (-)-BORNEOL, 464-45-9, No, 207-353-1.

Section 3 - Hazards Identification

Emergency Overview: Flammable (USA) Highly Flammable (EU). Irritant. May cause sensitization by skin contact.

HMIS Rating: Health: 3, Flammability: 3, Reactivity: 0

NFPA Rating: Health: 3, Flammability: 3, Reactivity: 0

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

Oral Exposure: If swallowed, wash out mouth with water provided person is conscious. Call a physician.

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

Dermal Exposure: In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

Eye Exposure: In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

Flammable Hazards: Yes

Explosion Data: Dust Potential: This material, like most materials in powder form, is capable of creating a dust explosion.

Flash Point: 149 °F, 65 °C

Autoignition Temp: N/A, Flammability: Yes

Extinguishing Media: Suitable. For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible.

Firefighting: Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s): Flammable solid. Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

Procedure to be Followed in Case of Leak or Spill: Evacuate area. Shut off all sources of ignition. Use nonsparking tools.

Procedure(s) of Personal Precaution(s): Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

Methods for Cleaning Up: Avoid raising dust. Sweep up, place in a bag and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

Handling: User Exposure: Avoid contact with eyes, skin, and clothing. Avoid breathing dust. Avoid prolonged or repeated exposure.

Storage: Suitable. Keep container closed. Keep away from heat, sparks, and open flame.

Section 8 - Exposure Controls / PPE

Engineering Controls: Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

Personal Protective Equipment: Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a fullface particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls.

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full-face supplied air respirator.  
**Hand**  
Compatible chemical-resistant gloves.  
**Eye**  
Chemical safety goggles.

**General Hygiene Measures**  
Wash thoroughly after handling.

## Section 9 - Physical/Chemical Properties

| Appearance               | Physical State                             | Color                             | Form                |
|--------------------------|--|-----------------------------------|---------------------|
|                          | Solid                                      | Colorless                         | Fine crystals       |
| <b>Molecular Weight</b>  | 154.25 AMU                                 |                                   |                     |
| <b>Property</b>          | <b>Value</b>                               | <b>At Temperature or Pressure</b> |                     |
| pH                       | N/A  |                                   |                     |
| BP/BP Range              | 210 °C                                     | 760 mmHg                          |                     |
| MP/MP Range              | 206 °C                                     |                                   |                     |
| Freezing Point           | N/A  |                                   |                     |
| Vapor Pressure           | 33.5 mmHg                                  | 25 °C                             |                     |
| Vapor Density            | 5.31 g/l                                   |                                   |                     |
| Saturated Vapor Conc.    | N/A  |                                   |                     |
| SG/Density               | N/A  |                                   |                     |
| Bulk Density             | N/A  |                                   |                     |
| Odor Threshold           | N/A  |                                   |                     |
| Volatile%                | N/A  |                                   |                     |
| VOC Content              | N/A  |                                   |                     |
| Water Content            | N/A  |                                   |                     |
| Solvent Content          | N/A  |                                   |                     |
| Evaporation Rate         | N/A  |                                   |                     |
| Viscosity                | N/A  |                                   |                     |
| Partition Coefficient    | N/A  |                                   |                     |
| Decomposition Temp.      | N/A  |                                   |                     |
| Flash Point °F           | 149 °F                                     |                                   | Method: closed cup  |
| Flash Point °C           | 65 °C                                      |                                   | Method: closed cup  |
| <b>Explosion Limits</b>  | N/A  |                                   |                     |
| <b>Flammability</b>      | N/A  |                                   |                     |
| <b>Autoignition Temp</b> | N/A  |                                   |                     |
| <b>Optical Rotation</b>  | Degree of Rotation<br>-44.0 - -37.0 (+/-1) |                                   | Solvent: EtOH50 g/l |
| <b>Solubility</b>        | N/A  |                                   |                     |

N/A = not available

## Section 10 - Stability and Reactivity

**Stability**  
**Stable**  
Stable.  
**Materials to Avoid**  
Strong oxidizing agents

**Hazardous Decomposition Products**  
**Hazardous Decomposition Products**  
Carbon monoxide, Carbon dioxide

**Hazardous Polymerization**  
**Hazardous Polymerization**  
Will not occur.

## Section 11 - Toxicological Information

**Route of Exposure**  
**Skin Contact**  
May cause skin irritation.  
**Skin Absorption**  
May be harmful if absorbed through the skin.  
**Eye Contact**  
May cause eye irritation.  
**Inhalation**  
May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.  
**Ingestion**  
May be harmful if swallowed.

**Sensitization**  
**Skin**  
May cause allergic skin reaction.

**Signs and Symptoms of Exposure**  
Exposure can cause: Nausea, headache, and vomiting. Convulsions. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

**RTECS Number:** DT5095000

**Toxicity Data**  
Oral - Rat: 5800 mg/kg (LD50)

**Irritation Data**  
Skin - Rabbit: 500 mg 24H  
Remarks: Mild irritation effect

## Section 12 - Ecological Information

No data available.

## Section 13 - Disposal Considerations

**Appropriate Method of Disposal of Substance or Preparation**  
Contact a licensed professional waste disposal service to dispose of this material.  
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable.  
Observe all federal, state, and local environmental regulations.

## Section 14 - Transport Information

**DOT**  
**Proper Shipping Name:** Borneol  
**UN#:** 1312  
**Class:** 4.1  
**Packing Group:** Packing Group III  
**Hazard Label:** Flammable solid  
**PIH:** Not PIH

**IATA**  
**Proper Shipping Name:** Borneol  
**IATA UN Number:** 1312

Hazard Class: 4.1  
Packing Group: III

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### Section 15 - Regulatory Information

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#### EU Additional Classification

Symbol of Danger: F Xi

#### Indication of Danger

Highly Flammable, Irritant.

**Risk Statements** R: 11 43

Highly flammable. May cause sensitization by skin contact.

**Safety Statements** S: 16 36/37

Keep away from sources of ignition - no smoking. Wear suitable protective clothing and gloves.

#### US Classification and Label Text

#### Indication of Danger

Flammable (USA) Highly Flammable (EU) Irritant.

#### Risk Statements

May cause sensitization by skin contact.

#### Safety Statements

Keep away from sources of ignition - no smoking. Wear suitable protective clothing and gloves.

#### United States Regulatory Information

SARA Listed: No

TSCA Inventory Item: Yes

#### Canada Regulatory Information

#### WHMIS Classification

This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: Yes

NDSL: No

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### Section 16 - Other Information

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#### Disclaimer

For R&D use only. Not for drug, household or other uses.

#### Warranty

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. SigmaAldrich Inc., shall not be held liable for any damage resulting from handling or contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2008 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

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