

## MATERIAL SAFETY DATA SHEET

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Version 1.5

## Section 1 - Product and Company Information

Product Name (1R)-(+)-CAMPHOR  
Product Number C9380  
Brand SIGMA

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

Substance Name	CAS #	SARA 313 No
(+)-CAMPHOR	464-49-3	No

Formula C10H16O  
Synonyms (-)-Alcanfor \* Bicyclo(2.2.1)heptan-2-one, 1,7,7-trimethyl-, (1S)- (9CI) \* 1-Camphor \* Alcanfor \* Bicyclo(2.2.1)heptan-2-one, 1,7,7-trimethyl-, (1R)- \* (+)-2-Bornanone \* d-2-Bornanone \* d-2-Camphanone \* Camphor, (+)- \* d-Camphor \* Camphor USP \* Japanese camphor

RTECS Number: EX1250000

## Section 3 - Hazards Identification

## EMERGENCY OVERVIEW

Flammable (USA) Highly Flammable (EU). Harmful.  
Irritating to eyes, respiratory system and skin. Harmful if swallowed.  
Readily absorbed through skin. Rubefacient. Target organ(s): Liver. Nerves.

## HMIS RATING

HEALTH: 2  
FLAMMABILITY: 3  
REACTIVITY: 1

## NFPA RATING

HEALTH: 2  
FLAMMABILITY: 3  
REACTIVITY: 1

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.

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### Section 5 - Fire Fighting Measures

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#### FLAMMABLE HAZARDS

Flammable Hazards: Yes

#### FLASH POINT

148 °F 64 °C Method: closed cup

#### EXPLOSION LIMITS

Lower: 0.6 % Upper: 3.5 %

#### AUTOIGNITION TEMP

466 °C

#### FLAMMABILITY

N/A

#### 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. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

#### 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.

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### Section 6 - Accidental Release Measures

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#### 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.

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### Section 7 - Handling and Storage

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## 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. Store in a cool dry place.

Incompatible Materials: Avoid mixing with and storage near: chlorates, naphthalene, p-dichlorobenzene, organic solvents, potassium permanganate. Salts of any kind should not be added to camphor water

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## Section 8 - Exposure Controls / PPE

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### ENGINEERING CONTROLS

Safety shower and eye bath. Use nonsparking tools. Use only in a chemical fume hood.

### 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 full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.

Hand: Compatible chemical-resistant gloves.

Eye: Chemical safety goggles.

### GENERAL HYGIENE MEASURES

Wash thoroughly after handling. Remove and wash contaminated clothing promptly.

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## Section 9 - Physical/Chemical Properties

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### Appearance

Physical State: Solid  
Color: White  
Form: Powder

Property	Value	At Temperature or Pressure
Molecular Weight	152.24 AMU	
pH	N/A	
BP/BP Range	204 °C	760 mmHg
MP/MP Range	179.0 - 181.0 °C	
Freezing Point	N/A	
Vapor Pressure	4 mmHg	70 °C
Vapor Density	5.24 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	
Surface Tension	N/A	
Partition Coefficient	Log Kow: 3.04	
Decomposition Temp.	N/A	

Flash Point	148 °F 64 °C	Method: closed cup
Explosion Limits	Lower: 0.6 % Upper: 3.5 %	
Flammability	N/A	
Autoignition Temp	466 °C	
Refractive Index	N/A	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

N/A = not available

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## Section 10 - Stability and Reactivity

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### STABILITY

Stable: Stable.

Materials to Avoid: Strong oxidizing agents, Strong reducing agents, Chlorinated solvents.

### HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

### HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

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## Section 11 - Toxicological Information

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### ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes eye irritation.

Inhalation: May be harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.

Ingestion: Harmful if swallowed.

### TARGET ORGAN(S) OR SYSTEM(S)

Central nervous system. Damage to the liver. Damage to the kidneys.

### SIGNS AND SYMPTOMS OF EXPOSURE

Nausea, dizziness, and headache. Exposure can cause: Human toxicity: ingestion or injection may cause vertigo, mental confusion, delirium, clonic convulsions, coma, respiratory failure, and death.

### TOXICITY DATA

Oral

Mouse

1310 mg/kg

LD50

### IRRITATION DATA

Eyes

Remarks: Moderate irritation effect

Inhalation

Remarks: Moderate irritation effect

Skin

Rabbit

500 mg

24H

Remarks: Moderate irritation effect

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat  
Dose: 4 GM/KG  
Route of Application: Oral  
Exposure Time: (6-15D PREG)  
Result: Maternal Effects: Other effects.

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Section 12 - Ecological Information

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ACUTE ECOTOXICITY TESTS

Test Type: LC50 Fish  
Species: Brachydanio rerio  
Time: 96 h  
Value: 36 mg/l

Test Type: LC50 Fish  
Species: Pimephales promelas (Fathead minnow)  
Time: 96 h  
Value: 110 mg/l

ELIMINATION

Elimination: > 70 %

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Section 13 - Disposal Considerations

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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.

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Section 14 - Transport Information

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DOT

Proper Shipping Name: Camphor, [synthetic]  
UN#: 2717  
Class: 4.1  
Packing Group: Packing Group III  
Hazard Label: Flammable solid  
PIH: Not PIH

IATA

Proper Shipping Name: Camphor  
IATA UN Number: 2717  
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-Xn  
Indication of Danger: Highly Flammable. Harmful.  
R: 11-22-36/37/38  
Risk Statements: Highly flammable. Harmful if swallowed.  
Irritating to eyes, respiratory system and skin.  
S: 16-26

Safety Statements: Keep away from sources of ignition - no smoking. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Flammable (USA) Highly Flammable (EU). Harmful.

Risk Statements: Harmful if swallowed. Irritating to eyes, respiratory system and skin.

Safety Statements: Keep away from sources of ignition - no smoking. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing.

US Statements: Readily absorbed through skin. Rubefacient.

Target organ(s): Liver. Nerves.

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. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2007 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.