SAFETY DATA SHEET

1. Identification

Product identifier **Camphor**

Other means of identification

Catalog number 1087508

Chemical name Bicyclo[2.2.1]heptane-2-one, 1,7,7-trimethyl

Synonym(s) (1R,4R)-(+)-Camphor * d-Camphor

Recommended use Specified quality tests and assay use only.

Recommended restrictions Not for use as a drug. Not for administration to humans or animals.

Manufacturer/Importer/Supplier/Distributor information

Company name U. S. Pharmacopeia

Address 12601 Twinbrook Parkway
Rockville
MD
20852-1790
US

Telephone RS Technical Services 301-816-8129

Website www.usp.org

E-mail RSTECH@usp.org

Emergency phone number CHEMTREC within US & Canada 1-800-424-9300
CHEMTREC outside US & Canada +1 703-527-3887

2. Hazard(s) identification

Note This product is supplied in a small quantity which does not constitute a combustible dust hazard. The physical properties of this material indicate that in large quantities accumulated dust may be hazardous.

Physical hazards	Flammable solids	Category 2
Health hazards	Acute toxicity, oral	Category 2
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2A
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation

OSHA hazard(s) Not classified.

Label elements

Signal word Danger

Hazard statement Flammable solid. Fatal if swallowed. Causes skin irritation. Causes serious eye irritation. May cause respiratory irritation.

Precautionary statement

Prevention Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Avoid breathing vapors. Use only outdoors or in a well-ventilated area. Wash thoroughly after handling. Wear protective gloves/eye protection/face protection.

Response If swallowed: Immediately call a poison center/doctor. Rinse mouth. If on skin: Wash with plenty of water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. In case of fire: Use appropriate media for extinction.

Storage Store in a well-ventilated place. Keep container tightly closed. Store locked up.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC)	Not classified.

3. Composition/information on ingredients

Substance

Hazardous components

Chemical name	Common name and synonyms	CAS number	%
Camphor	(1R,4R)-(+)-Camphor d-Camphor	464-49-3	100

4. First-aid measures

Inhalation	Move to fresh air. Call a POISON CENTER or doctor/physician if you feel unwell.
Skin contact	Remove contaminated clothing. Wash off with soap and plenty of water. If skin irritation occurs: Get medical advice/attention.
Eye contact	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
Ingestion	Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
Most important symptoms/effects, acute and delayed	Irritation of eyes, skin, and mucous membranes. Central nervous system effects. Respiratory depression. Convulsions.
Indication of immediate medical attention and special treatment needed	Treatment of overdose should be symptomatic and supportive and may include the following: 1. Administer activated charcoal as a slurry, unless contraindicated. This is most effective when administered within one hour of ingestion. Protect airway. 2. Consider gastric lavage if it can be performed soon after ingestion, unless contraindicated. Control seizures prior to initiation and protect airway. 3. For seizures: Administer intravenous benzodiazepines. Consider phenobarbital if seizures are uncontrollable or recur. 4. For apnea, treat with endotracheal intubation and ventilatory assistance. 5. Charcoal hemoperfusion, amberlite hemoperfusion, and lipid dialysis may remove camphor from serum. 6. Monitor liver and renal function and hydration. [Hazardtext 2008 and UK PID 2005]
General information	Remove from exposure. Remove contaminated clothing. For treatment advice, seek guidance from an occupational health physician or other licensed health-care provider familiar with workplace chemical exposures. In the United States, the national poison control center phone number is 1-800-222-1222. If person is not breathing, give artificial respiration. If breathing is difficult, give oxygen if available. Persons developing serious hypersensitivity (anaphylactic) reactions must receive immediate medical attention.

5. Fire-fighting measures

Suitable extinguishing media	Use fire-extinguishing media appropriate for surrounding materials. Water. Foam. Dry chemical or CO2.
Unsuitable extinguishing media	None known.
Specific hazards arising from the chemical	Explosion hazard: Avoid generating dust; fine dust dispersed in air in sufficient concentrations and in the presence of an ignition source is a potential dust explosion hazard.
Special protective equipment and precautions for firefighters	Wear suitable protective equipment.
Fire-fighting equipment/instructions	Use water spray to cool unopened containers. As with all fires, evacuate personnel to a safe area. Firefighters should use self-contained breathing equipment and protective clothing.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration. Keep unnecessary personnel away. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Avoid inhalation of dust from the spilled material. Wear appropriate personal protective equipment.
Methods and materials for containment and cleaning up	Sweep up or vacuum up spillage and collect in suitable container for disposal. Avoid the generation of dusts during clean-up. For waste disposal, see section 13 of the SDS. Clean surface thoroughly to remove residual contamination.

7. Handling and storage

Precautions for safe handling
As a general rule, when handling USP Reference Standards, avoid all contact and inhalation of dust, mists, and/or vapors associated with the material. Clean equipment and work surfaces with suitable detergent or solvent after use. After removing gloves, wash hands and other exposed skin thoroughly. Combustible dust clouds may be created where operations produce fine material (dust). Avoid significant deposits of material, especially on horizontal surfaces, which may become airborne and form combustible dust clouds and may contribute to secondary explosions.

Conditions for safe storage, including any incompatibilities
Store in tight container as defined in the USP-NF. This material should be handled and stored per label instructions to ensure product integrity.

8. Exposure controls/personal protection

Occupational exposure limits

U.S. - OSHA

Material	Type	Value	Form
Camphor (CAS 464-49-3)	TWA	2 mg/m3	(camphor, synthetic)

ACGIH

Material	Type	Value	Form
Camphor (CAS 464-49-3)	TWA	2 ppm	(camphor, synthetic)

Biological limit values
No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls
Airborne exposure should be controlled primarily by engineering controls such as general dilution ventilation, local exhaust ventilation, or process enclosure. Local exhaust ventilation is generally preferred to general exhaust because it can control the contaminant at its source, preventing dispersion into the work area. An industrial hygiene survey involving air monitoring may be used to determine the effectiveness of engineering controls. Effectiveness of engineering controls intended for use with highly potent materials should be assessed by use of nontoxic surrogate materials. Local exhaust ventilation such as a laboratory fume hood or other vented enclosure is recommended, particularly for grinding, crushing, weighing, or other dust-generating procedures.

Individual protection measures, such as personal protective equipment

Eye/face protection
Safety glasses with sideshields are recommended. Face shields or goggles may be required if splash potential exists or if corrosive materials are present. Approved eye protection (e.g., bearing the ANSI Z87 or CSA stamp) is preferred. Maintain eyewash facilities in the work area.

Skin protection

Hand protection
Chemically compatible gloves. For handling solutions, ensure that the glove material is protective against the solvent being used. Use handling practices that minimize direct hand contact. Employees who are sensitive to natural rubber (latex) should use nitrile or other synthetic nonlatex gloves. Use of powdered latex gloves should be avoided due to the risk of latex allergy.

Other
For handling of laboratory scale quantities, a cloth lab coat is recommended. Where significant quantities are handled, work clothing may be necessary to prevent take-home contamination.

Respiratory protection
Where respirators are deemed necessary to reduce or control occupational exposures, use NIOSH-approved respiratory protection and have an effective respirator program in place (applicable U.S. regulation OSHA 29 CFR 1910.134).

Thermal hazards
Not available.

General hygiene considerations
Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Appearance
Colorless or white crystals.

Physical state
Solid.

Form
Crystals.

Odor
Pungent odor.

Odor threshold
1.3 ppm

pH
Not available.

Melting point/freezing point
352.4 - 356 °F (178 - 180 °C)

Initial boiling point and boiling range
399.2 - 405.32 °F (204 - 207.4 °C)

Flash point
149.00 °F (65.00 °C) Closed Cup
199.40 °F (93.00 °C) Open Cup

Evaporation rate
Not available.

Flammability (solid, gas)
Flammable solid.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)	0.6 %
Flammability limit - upper (%)	3.5 %
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	0.009599 kPa at 25 °C
Vapor density	5.24 (Air = 1)
Relative density	Not available.
Solubility in water	Slightly soluble.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	870.8 °F (466 °C)
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Chemical family	Cyclic terpene.
Molecular formula	C10H16O
Molecular weight	152.23
Solubility (other)	Very soluble in alcohol, in ether, in chloroform; freely soluble in hexane, in carbon disulfide, in fixed and volatile oils; soluble in benzene, in acetone, in oil of terpentine, in glacial acetic acid, in petroleum ether.
Specific gravity	0.992 at 25 °C

10. Stability and reactivity

Reactivity	No reactivity hazards known.
Chemical stability	Risk of ignition.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Heat, flames, and sparks. Avoid temperatures exceeding the flash point.
Incompatible materials	Alkaline metals. Strong oxidizing agents. Peroxides. Strong reducing agents. Strong bases. Chlorinated solvents. Chromic anhydride. Chlorates. Naphthalene. Potassium permanganate. Salts of any kind should not be added to camphor water.
Hazardous decomposition products	Irritating and/or toxic fumes or gases. Emits toxic fumes under fire conditions.

11. Toxicological information

Information on likely routes of exposure

Ingestion	Fatal if swallowed.
Inhalation	May cause irritation to the respiratory system.
Skin contact	Causes skin irritation.
Eye contact	Causes serious eye irritation.
Symptoms related to the physical, chemical, and toxicological characteristics	Headache. Loss of smell. Dizziness. Confusion. Excitement. Hallucinations. Delirium. Tremor. Seizures. Convulsions. Temporary absence or cessation of breathing. Nausea. Vomiting. Diarrhea. Urinary retention.
Delayed and immediate effects of exposure	Central nervous system stimulation. Central nervous system depression. Gastrointestinal irritation. Kidney damage. Respiratory failure.
Acute toxicity	Fatal if swallowed.

Product	Species	Test Results
Camphor (CAS 464-49-3)		
Acute		
Oral		
LD50	Mouse	1310 mg/kg
	Rat	> 5 g/kg

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/eye irritation Causes serious eye irritation.

Local effects

Skin irritancy test
Result: Moderately irritating.
Species: Rabbit

Respiratory sensitization Due to lack of data the classification is not possible.

Skin sensitization Due to lack of data the classification is not possible.

Germ cell mutagenicity Due to lack of data the classification is not possible.
Data from germ cell mutagenicity tests were not found.

Mutagenicity

Chromasomal aberration assay in Chinese hamster ovary cells
Result: Negative.
In vivo sister chromatid exchange assay in mice
Result: Positive.
Mouse peripheral blood micronucleus test
Result: Negative.
Salmonella microsome assay
Result: Negative.

Carcinogenicity Due to lack of data the classification is not possible.
This material is not considered to be a carcinogen by IARC, NTP, or OSHA.

Reproductive toxicity Based on available data, the classification criteria are not met.
A review of limited human pregnancy data has not demonstrated an increase in developmental effects.

Reproductivity

0 - 400 mg/kg/day Reproductivity and development study, administered by gavage.
Result: Maternal toxicity. No adverse effects on offspring development.
Species: Rabbit
100 - 800 mg/kg Reproductivity and development study, administered by gavage.
Result: Maternal toxicity. No adverse effects on offspring development.
Species: Rat
147 - 681 mg/kg/day Reproductivity and development study, administered orally during organogenesis.
Result: Maternal toxicity. No evidence of teratogenicity.
Species: Rabbit
216 - 1000 mg/kg/day Reproductivity and development study, administered orally during organogenesis.
Result: Maternal toxicity. No evidence of teratogenicity.
Species: Rat

Specific target organ toxicity - single exposure Respiratory tract irritation.

Specific target organ toxicity - repeated exposure Based on available data, the classification criteria are not met.

Aspiration hazard Based on available data, the classification criteria are not met.

12. Ecological information

Ecotoxicity

Product		Species	Test Results
Camphor (CAS 464-49-3)			
Aquatic			
Fish	LC50	Fathead minnow (Pimephales promelas)	110 mg/l, 96 hours, Static

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential Not available.

Mobility in soil Not available.

Other adverse effects Not available.

13. Disposal considerations

Disposal instructions Dispose in accordance with all applicable regulations. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.

Local disposal regulations	Not available.
Hazardous waste code	Not available.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number	UN2717
UN proper shipping name	Camphor
Transport hazard class(es)	4.1
Subsidiary class(es)	Not available.
Packing group	III

IATA

UN number	UN2717
UN proper shipping name	Camphor
Transport hazard class(es)	4.1
Subsidiary class(es)	-
Packaging group	III

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code No information available.

DOT

IATA

15. Regulatory information

US federal regulations CERCLA/SARA Hazardous Substances - Not applicable.

All components are on the U.S. EPA TSCA Inventory List.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - Yes Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No
SARA 302 Extremely hazardous substance	No
SARA 311/312 Hazardous chemical	No

Other federal regulations

Safe Drinking Water Act (SDWA)	Not regulated.

Food and Drug Administration (FDA)	Not regulated.
US state regulations	California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	No
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

16. Other information, including date of preparation or last revision

Issue date	09-11-2008
Revision date	06-12-2014
Version #	02
Further information	Refer to NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids, for safe handling.
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Revision Information	This document has undergone significant changes and should be reviewed in its entirety.