Read the entire SDS for a complete hazard assessment.

Section 1. Product and Company Identification

1.1 Product Identifiers:

Product Names: Camphor Synthetic (technical grade)
Synonyms: (+-)-Camphor; 2-Bornanone; 2-Camphonone;Bicyclo(2,2,1)heptan-2-one, 1,7,7-trimethyl-; Gum Camphor
Chemical Name: 1,7,7-Trimethylbicyclo[2,2,1]heptan-2-one
Chemical Formula: C10H16O
Export Tariff # 2914.29.3100
CAS Number 76-22-2 **EINECS Number:** 200-945-0

Recommended use: Industrial uses such as manufacture of cellulose nitrate, polyvinyl chloride and plastics. May Function as plasticizer.
Restrictions on use: For manufacturing/industrial use only

1.2 Manufacturer and Supplier/Distributor:

Manufacturer
Wuzhou Huangpu Chemical Pharmaceutical Co
No. 1, Wusong Roag
Wanxiu District, Wuzhou 543000, China
Telephone no.: 0086-774-2063281
Fax no.: 0086-774-3811538

Distributor
R.E. Carroll, Inc. 1570 North Olden Avenue
Trenton, NJ 08638-3204 USA
Phone: 609-695-6211 Fax: 609-695-0102
Responsible Party:
John Boruta, Quality Assurance / Compliance Manager
Email: johnb@recarroll.com

1.4 Emergency telephone number:

In China: Emergency telephone number: 0086-774-2063281
In the US: For a transport accident or leak, fire or major spill, call CHEMTREC, (800) 424-9300.
For International CHEMTREC assistance, call 1-703-527-3887 (collect calls accepted).

Section 2. Hazards Identification

2.1 Globally Harmonized System (GHS) Hazard Classification:

OSHA Classification in accordance with 29 CFR 1910 (OSHA HCS): Hazardous, May form combustible dust clouds in air.
This SDS meets the requirements of GHS Revision 3, HCS 2012 (29 CFR 1910.1200).
GHS Classifications: Hazardous

Flammable solid	(Category 2)	H228
Eye irritation	(Category 2)	H319
Skin Corrosion/irritation	(Category 2)	H315
Specific Target Organ Toxicity	(Category 3)	H335
Acute Oral Toxicity	(Category 4)	H302
Acute Inhalation Toxicity	(Category 4)	H332

2.2 GHS Label elements including precautionary statements:

Hazard pictograms:

GHS Signal Word: **Warning**

Hazard Statements:

H228	**Flammable solid**
H302+ H332	**Harmful if swallowed or inhaled**
H315	**Causes skin irritation**
H319	**Causes serious eye irritation**
H335	**May cause respiratory irritation** **Target Organ Respiratory System**

Hazardous, May form combustible dust clouds in air.

Precautionary Statements:

Prevention
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink, or smoke when using this product
Wear protective gloves/protective clothing/eye protection/face protection
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area
Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Ground/bond container and receiving equipment
Use explosion-proof electrical/ventilating/lighting/equipment

Response:
IF SWALLOWED: Call a POISON CENTER or doctor/physician. Do NOT induce vomiting.
If exposed or concerned, get medical advice/attention.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell.
IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. If skin irritation occurs, get medical attention.
IF IN EYES Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation occurs: Get medical advice/ attention.
IN CASE OF FIRE: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

STORAGE: Store in a well-ventilated place. Keep cool. Store in accordance with local/regional/national/international regulations.

DISPOSAL: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal. See section 13 of this SDS for disposal instructions.

2.3 **Other hazards which are not included in the classification criteria:** May cause loss of sense of smell**.** Rubefacient (produces redness of the skin caused by dilation of the capillaries.)

Section 3. Composition/Information on Ingredients

Chemical Name	CAS No.	EINECS No.	Weight percent
Camphor	76-22-2	200-945-0	94-100

Section 4. First-Aid Measures

General advice: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area. Remove contaminated clothing.

4.1 Inhalation:

Move to fresh air. If breathing is difficult, give oxygen and continue to monitor. If not breathing, give artificial respiration. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. Call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt, or waistband.

4.2 Skin contact:

Wash skin with plenty of soap and water. Remove contaminated clothing and shoes. If symptoms persist, seek medical attention. Wash contaminated clothing before use.

4.3 Eye contact:

Immediately flush eyes thoroughly with water for several minutes. Remove contact lenses after one to two minutes and continue flushing for several more minutes. If redness, itching or burning sensation develops, seek medical attention.

4.4 Ingestion:

Give nothing by mouth. Call a poison center or physician. DO NOT INDUCE VOMITING. Never give anything by mouth to an unconscious person. Gently wipe or rinse the inside of the mouth with water. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt, or waistband.

4.5 Most important acute and delayed symptoms/effects:

Eye Contact: May cause eye irritation.
Skin Contact: May cause redness and/or skin irritation.
Ingestion: May cause gastric disturbance.

Inhalation: May cause irritation.
Chronic health effects: kidney effects.
Relevant routes of exposure: Eye, skin, inhalation, ingestion.

4.6 Indication of immediate medical attention and notes for physicians:

Persons with pre-existing skin, eye, or respiratory conditions may be at an increased risk from the irritant properties of this material. Certain medical conditions may be aggravated by exposure: kidney disorders, liver disorders, heart disorders, epilepsy. Attending physician should treat exposed patients symptomatically

Protection of First Aiders: No action should be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Section 5. Fire-Fighting Measures

5.1 Flammable Properties:

Flash point: CLOSED CUP: 65.6°C (150.1°F). OPEN CUP: 93°C (199.4°F).

Flammable Limits: LOWER: 0.6% UPPER: 3.5%

Auto ignition temperature 467°C (872.6°F)

Thermal decomposition: When heated, hazardous gases may be released.

Fire and Explosion Hazard: Flammable solid. When heated near flashpoint, combustible vapors may be produced.

Sensitivity to Mechanical Impact: No information available

Sensitivity to Static Discharge: No information available

5.2 Extinguishing media:

Suitable extinguishing media: Combustible material. Use CO2, dry chemical, or foam. Water can be used to cool and protect product.

Unsuitable extinguishing media: Forceful application of fire extinguishing agents or water spray may spread burning material.

5.3 Special hazards arising from the chemical:

Unusual fire and explosion hazards: Explosion hazard: This product may form explosive dust clouds in air. Dust explosion hazard may result from forceful application of fire extinguishing agents.

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition, which may be toxic and/or irritating.

5.4 Special protective equipment and precautions for firefighters:

Fire Fighting Procedures: Keep personnel away. Isolate fire and deny unnecessary entry. Do not apply direct water stream. Use fine water spray or foam. Cool surroundings with water to localize fire zone.

Special Protective Equipment for Firefighters: No special protective equipment required. Wear positive-pressure self-contained breathing apparatus (SCBA) and protective firefighting clothing (includes firefighting helmet, coat, trousers, boots, and gloves) to protect against other burning material. If protective equipment is not available or not used, fight fire from a protected location or safe distance.

Section 6. Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:

Use personal protective equipment. Avoid breathing mists. Avoid skin and eye contact. Evacuate personnel to safe areas. Spilled material may cause a slipping hazard. Use appropriate safety equipment. See Section 8 for information on personal protection equipment.

6.2 Environmental precautions and protective procedures:

Prevent further leakage or spillage if safe to do so. Do not let product enter drains, sewers, waterways, and/or groundwater. In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

6.3 Methods and material for containment and cleaning up:

Contain spilled material if possible. Eliminate all ignition sources including smoking, flares, sparks or flames in immediate area. All equipment used when handling the product must be grounded. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

Section 7. Handling and Storage

7.1 Precautions for safe handling:

Avoid breathing process mists. Avoid contact with eyes, skin and clothing. Use with adequate ventilation. Good housekeeping and controlling of dusts are necessary for safe handling of product. Follow procedures specified in the National Fire Protection Association Codes and Standards for handling combustible dusts. To reduce the potential for dust explosions, electrically bond and ground equipment. Dust can be ignited by static discharge. Pneumatic conveying and other mechanical handling operations can generate combustible dust. Ground all equipment containing material. Use only non-sparking tools. Avoid formation of dust and aerosols. Do not eat, drink and/or smoke in work areas. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas.

7.2 Conditions for safe storage (including any incompatibilities):

Store in a cool place. Keep container tightly closed in a dry and well-ventilated place. Store in accordance with good manufacturing practices. Keep away from heat and sources of ignition in flammables storage area.
Fixed storage containers, transfer containers and associated equipment should be grounded and bonded to prevent accumulation of static charge.

Section 8. Exposure Controls and Personal Protection

Consult with a Health and Safety Professional for specific selections.

8.1 Control parameter: Occupational exposure limits:

TWA 8 Hr.:	12(mg/m3)	STEL: 19 (mg/m3)	[Canada]
TWA:10 Hr.	2 (mg/m3)		from NIOSH REL
TWA 8 Hr.	2 (mg/m3)		from OSHA (PEL) [United States]

TWA 8 Hr.:	2 ppm	STEL: 3 (ppm)	from ACGIH (TLV) [United States] [1999]
TWA:	2 (ppm)	STEL: 3 (ppm)	[United Kingdom (UK)]
TWA:	13(mg/m3)	STEL: 19 (mg/m3)	[United Kingdom (UK)]
TWA:	2 ppm	STEL: 3 ppm	Mexico OEL
MAK:	2 ppm, 13 mg/m³		
IDLH:	200 mg/m3		NIOSH

Consult local authorities for acceptable exposure limits.

8.2 Appropriate engineering controls: Use adequate general or local exhaust ventilation to control airborne concentrations. Use explosion-proof electrical/ventilating/lighting/equipment. Ensure that eyewash stations and safety showers are close to the workstation location.

8.3 Personal protective equipment:

Eye protection: Use safety glasses with side shields.

Body protection: Use protective clothing as needed.

Hand protection: Contact should be minimized. Protective gloves are recommended.

Respiratory protection: Concentration in air determines the level of respiratory protection needed. Wear respiratory protection if ventilation is inadequate. Use NIOSH certified respiratory equipment (NIOSH certified organic vapor/particulate respirator) as needed. Consult OSHA regulations for proper respiratory use (29 CFR 1910.134).

Other: Remove contaminated clothing and wash before reuse. For non-fire emergencies, respiratory protection may be necessary and wear appropriate protective clothing to avoid contact with material. Have eyewash station, safety showers, and water supply in work area. Do not consume or store food in the work area. Wash hands before smoking or eating.

Section 9. Physical and Chemical Properties

Appearance:	
Physical state	Solid – crystals/powder
Color	Clear White
Odor	Fragrant, Penetrating
Odor threshold	1.3 ppm
pH	NA
Melting/freezing point	170°C
Initial boiling point and range	205°C (401°F)
Flash point	CLOSED CUP: 65.6°C (150.1°F). OPEN CUP: 93°C (199.4°F).

Evaporation rate	ND
Flammability (solid, gas)	Flammable solid (Flammable vapor at elevated temperatures)
Upper/lower flammability or explosive limits	LOWER: 0.6% UPPER: 3.5%
Vapor pressure	0.27 mbar @ 20 deg C
Vapor density	5.24 (Air = 1)
Relative density/Specific gravity	0.992
Solubility(water)	Slightly soluble
Bulk density	800kg/m3 (approximately)
Partition coefficient n-octanol/water	log Kow = 2.38 /measured
Auto-ignition temperature	467°C (872.6°F)
Decomposition temperature	ND
Viscosity	ND
Taste:	Slightly bitter, cooling

NA = Not applicable
ND = No data

Section 10. Stability and Reactivity

10.1 Chemical stability: Stable under normal temperature conditions and recommended use.

10.2 Possibility of hazardous reactions: No hazardous reactions if stored and handled as prescribed.

10.3 Conditions to avoid: Avoid heat, sparks, open flames, and other ignition sources.

10.4 Incompatible materials: Strong oxidizers, acids, bases. Reacts violently with strong reducing agents and chlorinated solvents, causing fire and explosion hazard.

10.5 Hazardous decomposition products:

Decomposition products depend upon temperature, air supply and the presence of other materials. They are smoke, carbon monoxide, and carbon dioxide. Processing may release fumes and other decomposition products. Fumes can be irritating.

10.6 Hazardous Polymerization: Will not polymerize.

Section 11 Toxicological Information

11.1 Information on the likely routes of exposure: Inhalation, ingestion, skin and eye contact.

11.2 Information on toxicological effects:

Acute toxicity

LD50: Mouse oral 1310 mg/kg

Skin corrosion/irritation:	Classification: classified as a skin irritant, Category 2
Serious eye damage/irritation:	Classification: Category 2 irritant
Inhalation:	Classification: Classified category 3
Respiratory sensitization:	Classification: Does not cause respiratory sensitization
Skin sensitization:	Classification: Does not cause skin sensitization
Ingestion	May cause gastric disturbances Classification: Acute oral Category 4.

Repeated dose toxicity

Inhalation :	May cause respiratory irritation
Mutagenicity:	Tests on bacterial or mammalian cell cultures did not show mutagenic effects
Reproductive Toxicity:	See Human Experience.
Teratogenicity:	No known significant effects or critical hazards. Camphor is not mutagenic with the Ames test but sister chromatid exchange has been reported in mice given 80 mg/kg doses of **camphor** ip, demonstrating possible genotoxicity.

Specific target organ toxicity (STOT):

STOT-single exposure:	Classification: Category 3 May cause respiratory irritation
STOT-repeated exposure:	Classification: Not classified
Aspiration Hazard:	Classification criteria not fulfilled.
Chronic effects**:**	Prolonged inhalation may be harmful

Symptoms related to the physical, chemical, and toxicological characteristics:

Eye contact: Pain or irritation, watering, redness.
Inhalation: irritation of respiratory tract, coughing, and difficulty breathing.
Skin contact: Irritation, redness.
Ingestion: gastric irritation, colic, nausea, vomiting, diarrhea, anxiety, excitement
Anosmia (loss of smell)

Human Experience:

Adults have survived ingestions of up to 42 g/kg, but usually doses in excess of 2 g/kg produce dangerous effects. Fatal doses in adults is 4 gm/kg, in children, fatal doses have ranged from 0.7-1.0 g/kg, in infants 70 mg/kg. The main target organs of camphor exposure are CNS and kidneys. Convulsions, depression, apnea, asystole, gastric irritation, colic, nausea, vomiting, diarrhea, anxiety, excitement, delirium, and severe post-convulsive coma may occur after intake of camphor. Large camphor ingestion may lead to abortion and/or a death of the fetus. Certain medical conditions may be aggravated by exposure: kidney disorders, liver disorders, heart disorders, epilepsy. With chronic dermal exposure, systemic effects and contact dermatitis can occur as well as significant allergic response.

11.3 Carcinogenicity: Not considered a carcinogen by IARC, NTP, OSHA, **or** ACGIH.

Section 12 Ecological Information

TOX DATA

Toxicity to fish
LC50; Species: Pimephales promelas (Fathead minnow); Conditions: static bioassay; Concentration: 145 mg/L for 1 hr; 112 mg/L/24 hr; 111 mg/L/48 hr; 110 mg/L/72 hr; 110 mg/L/96 hr.

Chronic toxicity: No Data

12.1 Mobility: Large volumes may penetrate soil and could contaminate groundwater. Camphor is expected to volatilize from wet soil surfaces based upon its estimated Henry's Law constant. Dry soil surfaces will volatilize camphor based upon its vapor pressure.

12.2 Aquatic and terrestrial ecotoxicity: No data on aquatic toxicity long-term. No data terrestrial toxicity data.

12.3 Persistence and degradability:
Vapor-phase Camphor will be degraded in the atmosphere by photochemical reaction with sunlight; the half-life for this reaction in air is estimated to be 3.5 days.

12.4 Bioaccumulative potential: Expected to be low (log Pow< 1).

12.5 Other adverse effects: none

Section 13 Disposal Considerations

13.1 Disposal methods:

Uncontaminated discarded product is not a hazardous waste under RCRA. Do not dump into any sewers, on the ground or into any body of water. All disposal practices must comply with all federal, state, and local laws and regulations. Offer surplus and non-recyclable material to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this.

13.2 Container disposal:

Empty container retains product residue. Observe all hazard precautions. Do not distribute, make available, furnish or reuse empty container except for storage and shipment of original product. Remove all product residue. Puncture or otherwise destroy empty container and dispose of in a facility permitted for nonhazardous waste.

Section 14 Transport Information

14.1 US DOT

Flammable solid
NA number: 2717
UN proper shipping name: Camphor, Synthetic UNNA: 2717 PG: Ill
Reportable Quantity (RQ): No
Poison Inhalation Hazard: No
Transport hazard class: 4.1

Packing group (if applicable): III

14.2 IMDG: **Proper shipping name:** Camphor, Synthetic
Flammable solid
UN number: 2717
Class: 4.1
Packing group: III **EMS-No** (Emergency schedule information): F-A, S-I
Marine Pollutant (Yes/No): No

14.3 IATA **Proper shipping name:** Camphor, Synthetic
Flammable solid
UN number: 2717
Class: 4.1
Packing group: III

Section 15. Regulatory Information

U.S. Regulations

15.1 USA TSCA: Listed on the TSCA Inventory.

15.2 SARA Section 311/312 Hazard Categories:

Acute Hazard: Yes
Chronic Hazard: No
Fire Hazard: Yes
Reactive Hazard: No
Sudden Pressure Release: No

Clean Water Act This product does not contain any hazardous substances listed under the US Clean Water Act Section 311.

15.3 CERCLA Hazardous Substance SARA Section 304 Release Reporting:

Component(s)	Reportable Quantity
None	

15.4 SARA Section 302 Extremely Hazardous Substances:

Component(s)/ CAS Number	Concentration	Min	Max
None			

15.5 SARA Section 313 Toxic Chemicals:

Component(s)/ CAS Number	Reporting Threshold	Concentration Min	Max
None			

15.6 California Proposition 65: This product is not known to contain chemical(s) known to the State of California to cause cancer or reproductive harm.
California Director's List of Hazardous Substances (8 CCR 339): Camphor (DL)

15.7 Pennsylvania Worker and Community Right To Know Act:
Camphor CAS = 76-22-2

15.8 New Jersey Worker and Community Right To Know Act
Camphor CAS = 76-22-2
Camphor is listed in the RTK Lists of Rode Island, Florida, Minnesota, and Tennessee.

15.9 **State Drinking Water Guidelines:** (NH) NEW HAMPSHIRE 50 ug/L

15.10 International Regulations:

Canadian Regulations: WHMIS Statement: This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*. This product is classified as controlled in accordance with the Canadian Controlled Products Regulations.

This product complies with RoHS (Restriction on Hazardous Substances).

Other requirements: Inventory Listing

TSCA - *United States Toxic Substances Control Act Section 8(b) Inventory*	*LISTED*
DSL - *Canadian Domestic Substances List*	*LISTED*
NDSL - *Non-Domestic Substances List*	*NOT LISTED*
EINECS - *European Inventory of Existing Chemical Substances/European*	*LISTED*
ELINCS - *List of Notified Chemical Substances*	*NOT LISTED*
ENCS - *Japan Existing and New Chemical Substances*	*LISTED*
KECI - *Korean Existing and Evaluated Chemical Substances*	*LISTED*
AICS Australia - *Australian Inventory of Chemical Substances*	*LISTED*
PICCS - *Philippine Inventory*	*LISTED*
IECSC - *Inventory of Existing Chemical Substances Produced or Imported in China*	*LISTED*
NLP - *No Longer Polymers List*	*LISTED*

Section 16. Other Information

16.1 NFPA and HMIS Hazard Ratings:

We assigned NFPA and HMIS ratings to this product based on the hazards of its ingredient(s). Because the customer is most aware of the application of the product, the customer must ensure that the proper personal protective equipment (PPE) is provided consistent with information contained in the product SDS. This information is intended solely for the use of individuals trained in the particular hazard rating system.

Key: 0 = least, 1 = slight, 2 = moderate, 3 = high, 4 = extreme

NFPA (National Fire Protection Association) - Classification

Health	*2 = moderate*
Flammability	*2 = moderate*

Instability or Reactivity	0 minimal

HMIS® [Hazardous Materials Identification System (Paint & Coating)] - Classification

Health	*2 = moderate*
Flammability	*2 = moderate*
Reactivity	0 minimal

NFPA, HMIS® rating involves data interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this SDS must be considered. This information is supplied solely for the use of individuals trained in the particular hazard rating system.

16.2 Revision information:

Previous version:	none – initial release
Date of this revision:	02/01/2019 (Version 0)
Revision summary:	GHS/OSHA compliant SDS

16.3 Training advice: Provide adequate information, instruction and training for operators. Additional references static charges include American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practice on Static Electricity) or CENELEC CLC/TR 50404 (Electrostatics - Code of practice for the avoidance of hazards due to static electricity).

16.4 Key or legend to abbreviations and acronyms used in the safety data sheet:

ACGIH	American Conference of Governmental Industrial Hygienists
BEI	Biological Exposure Index
LC50	Median Lethal Concentration
LD50	Median Lethal Dose
NOAEL	No observed adverse effect level
NOEC	No Observed Effect Concentration
NOEL	No Observed Effect Level
OECD	Organization for Economic Co-operation and Development
OPPTS	Office of Prevention, Pesticides, and Toxic Substances
OEL	Occupational Exposure Limit
PEL	Permissible Exposure Limit
ppm	parts per million
STEL	Short Term Exposure Limit
TLV	Threshold Limit Value
TWA	Time Weighted Average
Action Level	An exposure value set by OSHA that is lower than the PEL that will trigger the need for activities such as exposure monitoring and medical surveillance.
DNEL	*The **derived no-effect level*** is the level of exposure to a substance above which humans should not be exposed. According to REACH
OSHA -	Occupational Safety and Health Administration
NIOSH IDLH**:**	The National Institute for Occupational Safety and Health Immediately Dangerous to Life or Health

Declare to reader:

The opinions expressed herein are those of qualified experts within R.E. Carroll, Inc. The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The

information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

END OF SDS