LEMON CALIFORNIA OIL

Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

Issue date: 10/24/2018 Revision date: 09/27/2023 Supersedes: 09/13/2022 Version: 1.5

SECTION 1: Identification

1.1. Product identifier

Product form : Mixture

Product name : LEMON CALIFORNIA OIL

CAS-No. : N/A

Product code : 50-6160-01

Product group : Trade product

1.2. Recommended use and restrictions on use

1.3. Supplier

The Lebermuth Company
4004 Technology Drive
46628 South Bend, IN - United States
T 574-259-7000 - F 574-258-7450
info@lebermuth.com - www.lebermuth.com

1.4. Emergency telephone number

Emergency number : CHEMTREC - USA: 800-424-9300 International: +1 703-527-3887 / 1-800-424-9300
CCN 13010

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

Classification (GHS CA)

Flammable liquids Category 3	H226
Skin corrosion/irritation Category 2	H315
Skin sensitization, Category 1	H317
Reproductive toxicity Category 2	H361
Specific target organ toxicity (repeated exposure) Category 2	H373
Aspiration hazard Category 1	H304

Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements

GHS CA labeling

Hazard pictograms (GHS CA) :

Signal word (GHS CA) : Danger

Hazard statements (GHS CA) : H226 - Flammable liquid and vapor
H304 - May be fatal if swallowed and enters airways
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H361 - Suspected of damaging fertility or the unborn child
H373 - May cause damage to organs through prolonged or repeated exposure

Precautionary statements (GHS CA) : P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 - Keep container tightly closed.
P240 - Ground/bond container and receiving equipment.
P241 - Use explosion-proof electrical/ventilating/lighting equipment.
P242 - Use only non-sparking tools.

P243 - Take action to prevent static discharges.
P260 - Do not breathe dust/fume/gas/mist/vapors/spray.
P261 - Avoid breathing dust/fume/gas/mist/vapors/spray.
P264 - Wash hands, forearms and face thoroughly after handling.
P272 - Contaminated work clothing should not be allowed out of the workplace.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor.
P302+P352 - IF ON SKIN: Wash with plenty of water.
P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water .
P308+P313 - IF exposed or concerned: Get medical advice/attention.
P314 - Get medical advice/attention if you feel unwell.
P321 - Specific treatment (see supplemental first aid instruction on this label).
P331 - Do NOT induce vomiting.
P332+P313 - If skin irritation occurs: Get medical advice/attention.
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
P362+P364 - Take off contaminated clothing and wash it before reuse.
P370+P378 - In case of fire: Use media other than water to extinguish.
P403+P235 - Store in a well-ventilated place. Keep cool
P405 - Store locked up.
P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS CA)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Chemical name / Synonyms	Product identifier	%	Classification (GHS CA)
LIMONENE	(+)-1-methyl-4-isopropenyl-1-cyclohexene / (+)-4-isopropenyl-1-methylcyclohexene / (+)-cajeputene / (+)-carvene / (+)-citrene / (+)-para-mentha-1,8-diene / (+)-p-mentha-1,8-diene / (+)-R-limonene / (R)-(+)-4-isopropenyl-1-methyl-1-cyclohexene / (R)-(+)-limonene / (R)-1-methyl-4-(1-methylethenyl)cyclohexene / (R)-4-isopropenyl-1-methyl-1-cyclohexene / (R)-p-mentha-1,8-diene / 1,8-menthadiene, D- / 1-methyl-4-(1-methylethenyl)cyclohexene, (R)- / cyclohexene, 1-methyl-4-(1-methylethenyl)-, (R)- / cyclohexene, 1-methyl-4-(1-methylethenyl)-, (theta)- / cyclohexene, 4-isopropenyl-1-methyl- / D-(+)-limonene / dextro-limonene / dextro-para-mentha-1,8-diene / d-limonene / D-para-mentha-1,8-diene / D-p-mentha-1,8-diene / limonene, (R)-(+)- / limonene, D-(+)- / limonene, dextro- / para-mentha-1,8-diene, (R)-(+)- / p-mentha-1,8-diene, (R)-(+)- / p-mentha-1,8-diene, D- / R-(+)-limonen / refchole	(CAS-No.) 5989-27-5	≥ 50	Flam. Liq. 3, H226 Skin Irrit. 2, H315 Skin Sens. 1B, H317 Asp. Tox. 1, H304
BETA-PINENE*	2(10)-pinene / 6,6-dimethyl-2-methylenebicyclo(3.1.1)heptane / beta-pinene(FCC) / bicyclo[3.1.1]heptane, 6,6-dimethyl-2-methylene- / FEMA No 2903 / nopinen / nopinene / PC 600 / pin-2(10)-ene / pseudopinen / pseudo-pinen / pseudopinene / pseudo-pinene / terebenthene(=beta-pinene)	(CAS-No.) 127-91-3	10 – 25	Flam. Liq. 3, H226 Skin Irrit. 2, H315 Skin Sens. 1B, H317 Asp. Tox. 1, H304
GAMMA-TERPINENE		(CAS-No.) 99-85-4	5 – 10	Flam. Liq. 3, H226 Repr. 2, H361 Asp. Tox. 1, H304
CITRAL		(CAS-No.) 5392-40-5	1 – 5	Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Skin Sens. 1, H317 STOT RE 2, H373

Name	Chemical name / Synonyms	Product identifier	%	Classification (GHS CA)
PINENE	2,6,6-trimethylbicyclo-(3,1,1)-2-heptene / 2,6,6-trimethylbicyclo(3.1.1)-2-hept-2-ene / 2,6,6-trimethylbicyclo(3.1.1)-2-heptene / 2,6,6-trimethylbicyclo(3.1.1)hept-2-ene / 2,6,6-trimethyldicyclo(3.1.1)-2-heptene / 2-pinene / acintene A / alpha-pinene (FCC) / australene / bicyclo[3.1.1]hept-2-ene, 2,6,6-trimethyl- / FEMA No 2902 / pin-2(3)-ene / pinen alpha / pinene (=alpha-pinene) / pinene, pract. (=alpha-pinene)	(CAS-No.) 80-56-8	1 – 5	Flam. Liq. 3, H226 Acute Tox. 4 (Oral), H302 Skin Irrit. 2, H315 Skin Sens. 1B, H317 Asp. Tox. 1, H304
MYRCENE	1,6-Octadiene, 7-methyl-3-methylene- / 2-methyl-6-methylene-2,7-octadiene / 3-methylene-7-methyl-1,6-octadiene / beta-myrcene / FEMA no 2762 / myrcene	(CAS-No.) 123-35-3	1 – 5	Flam. Liq. 3, H226 Skin Irrit. 2, H315 Eye Irrit. 2A, H319 Asp. Tox. 1, H304
P-CYMENE	1-isopropyl-4-methylbenzene / 1-methyl-4-(1-methylethyl)benzene / 1-methyl-4-isopropylbenzene / 2-para-tolylpropane / 2-p-tolylpropane / 4-cymene / 4-isopropyl-1-methylbenzene / 4-isopropyltoluene / 4-methylisopropylbenzene / benzene, 1-isopropyl-4-methyl- / benzene, 1-methyl-4-(1-methylethyl)- / camphogen / cumene, para-methyl- / cumene, p-methyl- / cymene / cymol / dolcymene / HERCULES para-cymene / isopropylmethylbenzene / isopropyltoluene / isopropyltoluol / methylisopropylbenzene / paracymene / para-cymene / paracymol / para-cymol / para-isopropylmethylbenzene / para-isopropyltoluene / para-methylcumene / para-methylisopropyl benzene / para-methylisopropylbenzene / p-cymene / p-cymol / p-isopropylmethylbenzene / p-isopropyltoluene / p-methylcumene / p-methylisopropyl benzene / p-methylisopropylbenzene	(CAS-No.) 99-87-6	0.1 – 1	Flam. Liq. 3, H226 Acute Tox. 3 (Inhalation), H331 Acute Tox. 3 (Inhalation:vapor), H331 Repr. 2, H361 Asp. Tox. 1, H304

Full text of hazard classes and H-statements : see section 16

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove person to fresh air and keep comfortable for breathing.

First-aid measures after skin contact : Rinse skin with water/shower. Remove/Take off immediately all contaminated clothing. If skin irritation or rash occurs: Get medical advice/attention.

First-aid measures after eye contact : Rinse eyes with water as a precaution.

First-aid measures after ingestion : Do not induce vomiting. Call a physician immediately.

First-aid measures general : Call a physician immediately.

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects after skin contact : Irritation. May cause an allergic skin reaction.

Symptoms/effects after ingestion : Risk of lung edema.

4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment : Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

Suitable extinguishing media : Water spray. Dry powder. Foam. Carbon dioxide.

5.2. Unsuitable extinguishing media

5.3. Specific hazards arising from the hazardous product

Fire hazard : Flammable liquid and vapor.

5.4. Special protective equipment and precautions for fire-fighters

Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

No additional information available

6.2. Methods and materials for containment and cleaning up

Methods for cleaning up : Take up liquid spill into absorbent material. Notify authorities if product enters sewers or public waters.

Other information : Dispose of materials or solid residues at an authorized site.

6.3. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection"

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Ensure good ventilation of the work station. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Flammable vapors may accumulate in the container. Use explosion-proof equipment. Wear personal protective equipment. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapors/spray. Avoid contact with skin and eyes.

Hygiene measures : Wash contaminated clothing before reuse. Contaminated work clothing should not be allowed out of the workplace. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Ground/bond container and receiving equipment.

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

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

CITRAL (5392-40-5)		
USA - ACGIH	ACGIH OEL TWA [ppm]	5 ppm (IFV - Inhalable fraction and vapor)
USA - ACGIH	Remark (ACGIH)	TLV® Basis: Body weight eff; URT irr; eye dam. Notations: Skin; DSEN; A4 (Not classifiable as a Human Carcinogen)
USA - ACGIH	Regulatory reference	ACGIH 2023

PINENE (80-56-8)		
USA - ACGIH	ACGIH OEL TWA [ppm]	20 ppm
USA - ACGIH	Remark (ACGIH)	TLV® Basis: Lung irr. Notations: DSEN; A4 (Not classifiable as a Human Carcinogen)
USA - ACGIH	Regulatory reference	ACGIH 2023

BETA-PINENE* (127-91-3)		
USA - ACGIH	ACGIH OEL TWA [ppm]	20 ppm
USA - ACGIH	Remark (ACGIH)	TLV® Basis: Lung irr. Notations: DSEN; A4 (Not classifiable as a Human Carcinogen)
USA - ACGIH	Regulatory reference	ACGIH 2023

8.2. Appropriate engineering controls

Appropriate engineering controls : Ensure good ventilation of the work station.

Environmental exposure controls : Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment

Hand protection:

Protective gloves

Eye protection:

Safety glasses

Skin and body protection:

Wear suitable protective clothing

Respiratory protection:

[In case of inadequate ventilation] wear respiratory protection.

Personal protective equipment symbol(s):

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid
Appearance	:	No data available
Color	:	YELLOW TO GREENISH-YELLOW LIQUID
Odor	:	CHARACTERISTIC LEMON PEEL ODOR
Odor threshold	:	No data available
pH	:	No data available
Relative evaporation rate (butyl acetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	No data available
Melting point	:	Not applicable
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	48 °C
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Flammability (solid, gas)	:	Not applicable
Vapor pressure	:	No data available
Vapor pressure at 50°C	:	No data available
Relative density	:	0.848 (0.84 – 0.857)
Solubility	:	Insoluble.
Partition coefficient n-octanol/water (Log Pow)	:	No data available
Explosion limits	:	No data available

9.2. Other information

VOC content	:	87.3 %
Refractive index	:	1.474 (1.462 – 1.479)

SECTION 10: Stability and reactivity

10.1. Reactivity

Reactivity	:	Flammable liquid and vapor.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No dangerous reactions known under normal conditions of use.
Conditions to avoid	:	Avoid contact with hot surfaces. Heat. No flames, no sparks. Eliminate all sources of ignition.
Hazardous decomposition products	:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	:	Not classified
Acute toxicity (dermal)	:	Not classified
Acute toxicity (inhalation)	:	Not classified

citral (5392-40-5)	
LD50 oral rat	≈ 6800 mg/kg body weight Animal: rat
LD50 dermal rat	> 2000 mg/kg body weight Animal: rat, Remarks on results: other:

d-Limonene (5989-27-5)	
LD50 oral rat	> 2000 mg/kg body weight (OECD 423: Acute Oral Toxicity – Acute Toxic Class Method, Rat, Female, Experimental value, Oral, 14 day(s))
LD50 dermal rabbit	> 5000 mg/kg body weight (Equivalent or similar to OECD 402, 24 h, Rabbit, Read-across, Dermal, 7 day(s))

Myrcene (123-35-3)	
LD50 oral rat	> 11390 mg/kg body weight Animal: rat
LD50 oral	> 3380 mg/kg body weight Animal: mouse
LD50 dermal rabbit	> 5000 mg/kg body weight Animal: rabbit, Guideline: OECD Guideline 402 (Acute Dermal Toxicity)

alpha-Pinene (80-56-8)	
LD50 oral rat	> 500 mg/kg body weight (OECD 423: Acute Oral Toxicity – Acute Toxic Class Method, Rat, Female, Experimental value, Oral, 01 day(s))
LD50 oral	500 mg/kg body weight
LD50 dermal rat	> 2000 mg/kg body weight (OECD 402: Acute Dermal Toxicity, 24 h, Rat, Male / female, Experimental value, Skin, 14 day(s))
ATE CA (oral)	500 mg/kg body weight

beta-Pinene (127-91-3)	
LD50 oral rat	4700 mg/kg (Rat, Oral)
ATE CA (oral)	4700 mg/kg body weight

p-Mentha-1,4-diene (99-85-4)	
LD50 oral	3650 mg/kg body weight
ATE CA (oral)	3650 mg/kg body weight

p-Cymene (99-87-6)	
LD50 oral rat	4750 mg/kg (Rat, Male / female, Experimental value, Oral, 14 day(s))
LD50 oral	4750 mg/kg body weight
LD50 dermal rabbit	> 5000 mg/kg (Rabbit, Experimental value, Dermal, 14 day(s))
LC50 Inhalation - Rat	> 9.7 mg/l (5 h, Rat, Experimental value, Inhalation)
LC50 Inhalation - Rat (Vapours)	9.7 mg/l/4h
ATE CA (oral)	4750 mg/kg body weight
ATE CA (Gases)	700 ppmV/4h
ATE CA (vapors)	9.7 mg/l/4h
ATE CA (dust,mist)	0.5 mg/l/4h

Skin corrosion/irritation : Causes skin irritation.

Serious eye damage/irritation : Not classified

Respiratory or skin sensitization : May cause an allergic skin reaction.

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

citral (5392-40-5)	
NOAEL (chronic,oral,animal/male,2 years)	60 mg/kg body weight Animal: mouse, Animal sex: male, Guideline: OECD Guideline 453 (Combined Chronic Toxicity / Carcinogenicity Studies), Remarks on results: other:

Reproductive toxicity : Suspected of damaging fertility or the unborn child.

STOT-single exposure : Not classified

STOT-repeated exposure : May cause damage to organs through prolonged or repeated exposure.

citral (5392-40-5)	
LOAEC (inhalation,rat,gas,90 days)	68 ppm Animal: rat, Animal sex: female
NOAEL (oral,rat,90 days)	100 mg/kg body weight Animal: rat, Guideline: OECD Guideline 453 (Combined Chronic Toxicity / Carcinogenicity Studies)
NOAEC (inhalation,rat,gas,90 days)	34 ppm Animal: rat, Animal sex: female
NOAEL (subchronic,oral,animal/male,90 days)	60 mg/kg body weight Animal: mouse, Animal sex: male, Guideline: OECD Guideline 453 (Combined Chronic Toxicity / Carcinogenicity Studies)
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.

Myrcene (123-35-3)	
LOAEL (oral,rat,90 days)	250 mg/kg body weight Animal: rat, Guideline: OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity Study in Rodents)
NOAEL (subchronic,oral,animal/male,90 days)	500 mg/kg body weight Animal: mouse, Animal sex: male, Guideline: OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity Study in Rodents)
NOAEL (subchronic,oral,animal/female,90 days)	250 mg/kg body weight Animal: mouse, Animal sex: female, Guideline: OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity Study in Rodents)

Aspiration hazard : May be fatal if swallowed and enters airways.

Symptoms/effects after skin contact : Irritation. May cause an allergic skin reaction.

Symptoms/effects after ingestion : Risk of lung edema.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.

Hazardous to the aquatic environment, short–term (acute) : Not classified

Hazardous to the aquatic environment, long–term (chronic) : Not classified

citral (5392-40-5)	
LC50 - Fish [1]	6.78 mg/l Test organisms (species): Leuciscus idus
EC50 - Crustacea [1]	6.8 mg/l Test organisms (species): Daphnia magna
EC50 72h - Algae [1]	103.8 mg/l Test organisms (species): Desmodesmus subspicatus (previous name: Scenedesmus subspicatus)

d-Limonene (5989-27-5)	
LC50 - Fish [1]	720 µg/l (Equivalent or similar to OECD 203, 96 h, Pimephales promelas, Flow-through system, Fresh water, Experimental value)
LC50 - Fish [2]	702 µg/l Test organisms (species): Pimephales promelas
EC50 - Crustacea [1]	0.307 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Daphnia magna, Semi-static system, Fresh water, Experimental value, GLP)
EC50 - Crustacea [2]	0.51 mg/l Test organisms (species): Daphnia magna
EC50 72h - Algae [1]	0.32 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)
EC50 72h - Algae [2]	0.214 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)
BCF - Fish [1]	864.8 l/kg (BCFBAF v3.01, Pisces, QSAR, Fresh weight)
Partition coefficient n-octanol/water (Log Pow)	4.38 (Experimental value, Equivalent or similar to OECD 117, 37 °C)
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	3.049 – 3.801 (log Koc, SRC PCKOCWIN v2.0, Calculated value)

Myrcene (123-35-3)	
EC50 - Crustacea [1]	1.47 mg/l Test organisms (species): Daphnia magna
EC50 72h - Algae [1]	0.342 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)
EC50 72h - Algae [2]	0.31 mg/l Test organisms (species): Pseudokirchneriella subcapitata (previous names: Raphidocelis subcapitata, Selenastrum capricornutum)
Partition coefficient n-octanol/water (Log Pow)	5.285 (Literature, 25 °C)

alpha-Pinene (80-56-8)	
LC50 - Fish [1]	0.303 mg/l (OECD 203: Fish, Acute Toxicity Test, 96 h, Danio rerio, Semi-static system, Fresh water, Experimental value, GLP)
EC50 - Crustacea [1]	0.475 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Daphnia magna, Semi-static system, Fresh water, Experimental value, Locomotor effect)
BCF - Other aquatic organisms [1]	1233.1 – 1248 l/kg (BCFBAF v3.01, Read-across, Fresh weight)
Partition coefficient n-octanol/water (Log Pow)	4.487 (Experimental value, Equivalent or similar to OECD 107, 25 °C)
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	3.009 – 3.853 (log Koc, SRC PCKOCWIN v2.0, Calculated value)

beta-Pinene (127-91-3)	
LC50 - Fish [1]	0.557 mg/l (OECD 203: Fish, Acute Toxicity Test, 96 h, Cyprinus carpio, Semi-static system, Fresh water, Weight of evidence, Other isomer)
ErC50 algae	0.826 mg/l (OECD 201: Alga, Growth Inhibition Test, 48 h, Pseudokirchneriella subcapitata, Static system, Fresh water, Weight of evidence, Other isomer)
BCF - Fish [1]	1125 l/kg (BCFBAF v3.01, Pisces, Fresh water, QSAR, Other isomer)

beta-Pinene (127-91-3)	
Partition coefficient n-octanol/water (Log Pow)	4.425 (Similar product, Read-across, Equivalent or similar to OECD 107, 25 °C)
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	3.009 – 3.836 (log Koc, Calculated value, Other isomer)

p-Cymene (99-87-6)	
LC50 - Fish [1]	48 mg/l (EPA OPPTS 850.1075, 96 h, Cyprinodon variegatus, Static system, Salt water, Experimental value)
EC50 - Crustacea [1]	3.7 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Daphnia magna, Semi-static system, Fresh water, Experimental value, GLP)
EC50 72h - Algae [1]	4.03 mg/l (OECD 201: Alga, Growth Inhibition Test, Selenastrum capricornutum, Static system, Fresh water, Experimental value, GLP)
Partition coefficient n-octanol/water (Log Pow)	4.8 (Experimental value, OECD 117: Partition Coefficient (n-octanol/water), HPLC method, 20 °C)
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	4.17 (log Koc, SRC PCKOCWIN v2.0, QSAR)

12.2. Persistence and degradability

d-Limonene (5989-27-5)	
Persistence and degradability	Readily biodegradable in water.
ThOD	3.29 g O_2/g substance

Myrcene (123-35-3)	
Persistence and degradability	Readily biodegradable in water.

alpha-Pinene (80-56-8)	
Persistence and degradability	Readily biodegradable in water.

beta-Pinene (127-91-3)	
Persistence and degradability	Readily biodegradable in water.

p-Cymene (99-87-6)	
Persistence and degradability	Readily biodegradable in water.

12.3. Bioaccumulative potential

d-Limonene (5989-27-5)	
Bioaccumulative potential	Potential for bioaccumulation (4 ≤ Log Kow ≤ 5).
BCF - Fish [1]	864.8 l/kg (BCFBAF v3.01, Pisces, QSAR, Fresh weight)
Partition coefficient n-octanol/water (Log Pow)	4.38 (Experimental value, Equivalent or similar to OECD 117, 37 °C)
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	3.049 – 3.801 (log Koc, SRC PCKOCWIN v2.0, Calculated value)

Myrcene (123-35-3)	
Bioaccumulative potential	High potential for bioaccumulation (Log Kow > 5).
Partition coefficient n-octanol/water (Log Pow)	5.285 (Literature, 25 °C)

alpha-Pinene (80-56-8)	
Bioaccumulative potential	Potential for bioaccumulation (500 ≤ BCF ≤ 5000).
BCF - Other aquatic organisms [1]	1233.1 – 1248 l/kg (BCFBAF v3.01, Read-across, Fresh weight)
Partition coefficient n-octanol/water (Log Pow)	4.487 (Experimental value, Equivalent or similar to OECD 107, 25 °C)
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	3.009 – 3.853 (log Koc, SRC PCKOCWIN v2.0, Calculated value)

beta-Pinene (127-91-3)	
Bioaccumulative potential	Potential for bioaccumulation (4 ≤ Log Kow ≤ 5).
BCF - Fish [1]	1125 l/kg (BCFBAF v3.01, Pisces, Fresh water, QSAR, Other isomer)
Partition coefficient n-octanol/water (Log Pow)	4.425 (Similar product, Read-across, Equivalent or similar to OECD 107, 25 °C)
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	3.009 – 3.836 (log Koc, Calculated value, Other isomer)

p-Cymene (99-87-6)	
Bioaccumulative potential	Potential for bioaccumulation (4 ≤ Log Kow ≤ 5).
Partition coefficient n-octanol/water (Log Pow)	4.8 (Experimental value, OECD 117: Partition Coefficient (n-octanol/water), HPLC method, 20 °C)
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	4.17 (log Koc, SRC PCKOCWIN v2.0, QSAR)

12.4. Mobility in soil

d-Limonene (5989-27-5)	
Surface tension	No data available in the literature

d-Limonene (5989-27-5)	
Ecology - soil	Low potential for mobility in soil.
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	3.049 – 3.801 (log Koc, SRC PCKOCWIN v2.0, Calculated value)
Partition coefficient n-octanol/water (Log Pow)	4.38 (Experimental value, Equivalent or similar to OECD 117, 37 °C)

Myrcene (123-35-3)	
Ecology - soil	No (test)data on mobility of the substance available.
Partition coefficient n-octanol/water (Log Pow)	5.285 (Literature, 25 °C)

alpha-Pinene (80-56-8)	
Ecology - soil	Low potential for mobility in soil. May be harmful to plant growth, blooming and fruit formation.
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	3.009 – 3.853 (log Koc, SRC PCKOCWIN v2.0, Calculated value)
Partition coefficient n-octanol/water (Log Pow)	4.487 (Experimental value, Equivalent or similar to OECD 107, 25 °C)

beta-Pinene (127-91-3)	
Ecology - soil	Low potential for mobility in soil.
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	3.009 – 3.836 (log Koc, Calculated value, Other isomer)
Partition coefficient n-octanol/water (Log Pow)	4.425 (Similar product, Read-across, Equivalent or similar to OECD 107, 25 °C)

p-Cymene (99-87-6)	
Surface tension	No data available in the literature
Ecology - soil	Low potential for mobility in soil.
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	4.17 (log Koc, SRC PCKOCWIN v2.0, QSAR)
Partition coefficient n-octanol/water (Log Pow)	4.8 (Experimental value, OECD 117: Partition Coefficient (n-octanol/water), HPLC method, 20 °C)

12.5. Other adverse effects

Ozone : Not classified

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.

Additional information : Flammable vapors may accumulate in the container.

SECTION 14: Transport information

14.1. Basic shipping description

In accordance with TDG

Transportation of Dangerous Goods

UN-No. (TDG) : UN1197

Packing group (TDG) : III - Minor Danger

TDG Primary Hazard Classes : 3 - Class 3 - Flammable Liquids

Transport document description (TDG) : UN1197 EXTRACTS, FLAVOURING, LIQUID (Regulated for Bulk only), 3, III

Proper Shipping Name (TDG) : EXTRACTS, FLAVOURING, LIQUID
(Regulated for Bulk only)

Hazard labels (TDG) : 3 - Flammable liquids

Explosive Limit and Limited Quantity Index : 5 L

Excepted quantities (TDG) : E1

Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : 60 L

14.2. Transport information/DOT

Department of Transport

DOT NA No	:	UN1197
UN-No.(DOT)	:	1197
Packing group (DOT)	:	III - Minor Danger
Transport document description (DOT)	:	UN1197 Extracts, flavoring, liquid (Regulated for Bulk only), 3, III
Proper Shipping Name (DOT)	:	Extracts, flavoring, liquid (Regulated for Bulk only)
Contains Statement Field Selection (DOT)	:	
Class (DOT)	:	3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120
Division (DOT)	:	3
Hazard labels (DOT)	:	3 - Flammable liquid

Marine pollutant	:	NO
Dangerous for the environment	:	No
DOT Special Provisions (49 CFR 172.102)	:	B1 - If the material has a flash point at or above 38 C (100 F) and below 93 C (200 F), then the bulk packaging requirements of 173.241 of this subchapter are applicable. If the material has a flash point of less than 38 C (100 F), then the bulk packaging requirements of 173.242 of this subchapter are applicable. IB3 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized, except for UN2672 (also see Special Provision IP8 in Table 2 for UN2672). T2 - 1.5 178.274(d)(2) Normal..... 178.275(d)(3) TP1 - The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = 97 / 1 + a (tr - tf) Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees celsius of the liquid during filling.
DOT Packaging Exceptions (49 CFR 173.xxx)	:	150
DOT Packaging Non Bulk (49 CFR 173.xxx)	:	203
DOT Packaging Bulk (49 CFR 173.xxx)	:	242
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	:	60 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	:	220 L
DOT Vessel Stowage Location	:	A - The material may be stowed ‘‘on deck’’ or ‘‘under deck’’ on a cargo vessel and on a passenger vessel.
Emergency Response Guide (ERG) Number	:	127
Other information	:	No supplementary information available.

14.3. Air and sea transport

IMDG

UN-No. (IMDG)	:	1197
Proper Shipping Name (IMDG)	:	EXTRACTS, FLAVOURING, LIQUID
Transport document description (IMDG)	:	UN 1197 EXTRACTS, FLAVOURING, LIQUID, 3, III, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS
Class (IMDG)	:	3 - Flammable liquids
Packing group (IMDG)	:	III - substances presenting low danger

IATA

UN-No. (IATA)	:	1197
Proper Shipping Name (IATA)	:	Extracts, liquid
Transport document description (IATA)	:	UN 1197 Extracts, liquid, 3, III, ENVIRONMENTALLY HAZARDOUS
Class (IATA)	:	3 - Flammable Liquids
Packing group (IATA)	:	III - Low danger

SECTION 15: Regulatory information

15.1. National regulations

LEMON CALIFORNIA OIL (N/A)
Listed on the Canadian DSL (Domestic Substances List)

citral (5392-40-5)
Listed on the Canadian DSL (Domestic Substances List)

Myrcene (123-35-3)
Listed on the Canadian DSL (Domestic Substances List)

alpha-Pinene (80-56-8)
Listed on the Canadian DSL (Domestic Substances List)

beta-Pinene (127-91-3)
Listed on the Canadian DSL (Domestic Substances List)

p-Mentha-1,4-diene (99-85-4)
Listed on the Canadian DSL (Domestic Substances List)

p-Cymene (99-87-6)
Listed on the Canadian DSL (Domestic Substances List)

15.2. International regulations

LEMON CALIFORNIA OIL (N/A)
Not listed on the United States TSCA (Toxic Substances Control Act) inventory

citral (5392-40-5)
Listed on INSQ (Mexican National Inventory of Chemical Substances)

Myrcene (123-35-3)
Listed on INSQ (Mexican National Inventory of Chemical Substances)

alpha-Pinene (80-56-8)
Listed on INSQ (Mexican National Inventory of Chemical Substances)

beta-Pinene (127-91-3)
Listed on INSQ (Mexican National Inventory of Chemical Substances)

p-Mentha-1,4-diene (99-85-4)
Listed on INSQ (Mexican National Inventory of Chemical Substances)

p-Cymene (99-87-6)
Listed on INSQ (Mexican National Inventory of Chemical Substances)

SECTION 16: Other information

SDS Major/Minor	:	None
Issue date	:	10/24/2018
Revision date	:	09/27/2023
Supersedes	:	09/13/2022

Full text of H-phrases:

H226	Flammable liquid and vapor
H302	Harmful if swallowed
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H331	Toxic if inhaled
H361	Suspected of damaging fertility or the unborn child
H373	May cause damage to organs through prolonged or repeated exposure

SDS Canada (GHS) - Lebermuth

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.