

Safety data sheet

acc. to Safe Work Australia - Code of Practice



Geranium oil , natural

article number: **7054**
Version: **GHS 2.0 en**
Replaces version of: 2022-10-17
Version: (GHS 1)

date of compilation: 2022-10-17
Revision: 2024-03-04

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Identification of the substance **Geranium oil , natural**
Article number 7054
CAS number 90082-51-2

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: Laboratory chemical
Laboratory and analytical use
Uses advised against: Do not use for private purposes (household).
Food, drink and animal feedingstuffs.

1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co. KG
Schoemperlenstr. 3-5
D-76185 Karlsruhe
Germany

Telephone:+49 (0) 721 - 56 06 0
Telefax: +49 (0) 721 - 56 06 149
e-mail: sicherheit@carlroth.de
Website: www.carlroth.de

Competent person responsible for the safety data sheet: Department Health, Safety and Environment

e-mail (competent person): **sicherheit@carlroth.de**

1.4 Emergency telephone number

Name	Street	Postal code/city	Telephone	Website
NSW Poisons Information Centre Childrens Hospital	Hawkesbury Road	2145 Westmead, NSW	131126	

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification acc. to GHS

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
2.6	Flammable liquid	4	Flam. Liq. 4	H227
3.2	Skin corrosion/irritation	2	Skin Irrit. 2	H315
3.3	Serious eye damage/eye irritation	1	Eye Dam. 1	H318
3.4S	Skin sensitisation	1	Skin Sens. 1	H317

For full text of abbreviations: see SECTION 16

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The most important adverse physicochemical, human health and environmental effects

The product is combustible and can be ignited by potential ignition sources.

2.2 Label elements

Labelling

Signal word

Danger

Pictograms

GHS05, GHS07



Hazard statements

H227	Combustible liquid
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H318	Causes serious eye damage

Precautionary statements

Precautionary statements - prevention

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P261	Avoid breathing dust/fume/gas/mist/vapours/spray
P280	Wear protective gloves

Precautionary statements - response

P302+P352	IF ON SKIN: Wash with plenty of soap and water
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P370+P378	In case of fire: Use sand, carbon dioxide or powder extinguisher for extinction

Precautionary statements - disposal

P501	Dispose of contents/container to industrial combustion plant
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Hazardous ingredients for labelling:

Linalool, Geraniol, DL- α -Pinene, (\pm)-S-Citronellol, Acetic acid linalyl ester, Citronellyl formate, Terpinolene, Isomenthone, β -Caryophyllene, Geranyl acetate, Geranyl formate, Menthone, Geranial, Nerol, Myrcene, DL-Limonene, Neral, L-(-)-Limonene

2.3 Other hazards

This material is combustible, but will not ignite readily.

Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) at a concentration of $\geq 0,1\%$.

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SECTION 3: Composition/information on ingredients

3.1 Substances

Name of substance Geranium oil

CAS No 90082-51-2

Impurities/additives/constituents:

Name of substance	Identifier	Wt%
Linalool	CAS No 78-70-6	25 – 50
Geraniol	CAS No 106-24-1	10 – 25
α -Terpineol	CAS No 98-55-5	10 – 25
(\pm)- β -Citronellol	CAS No 106-22-9	5 – 10
Acetic acid linalyl ester	CAS No 115-95-7	5 – 10
Citronellyl formate	CAS No 105-85-1	1 – 5
Isomenthone	CAS No 491-07-6	1 – 5
Terpinolene	CAS No 586-62-9	1 – 5
β -Caryophyllene	CAS No 87-44-5	1 – 5
Geranial	CAS No 141-27-5	0.99 – < 1
Neral	CAS No 106-26-3	0.99 – < 1
Geranyl formate	CAS No 105-86-2	0.99 – < 1
Geranyl acetate	CAS No 105-87-3	0.99 – < 1
Menthone	CAS No 10458-14-7	0.99 – < 1
Nerol	CAS No 106-25-2	0.99 – < 1
Myrcene	CAS No 123-35-3	0.99 – < 1
DL-Limonene	CAS No 138-86-3	0.99 – < 1
L(-)-Limonene	CAS No 5989-54-8	0.99 – < 1
DL- α -Pinene	CAS No 80-56-8	0.99 – < 1

Remarks

For full text of abbreviations: see SECTION 16

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SECTION 4: First aid measures

4.1 Description of first aid measures



General notes

Take off contaminated clothing.

Following inhalation

Provide fresh air.

Following skin contact

Rinse skin with water/shower. After contact with skin, wash immediately with plenty of water. In case of skin reactions, consult a physician.

Following eye contact

In case of contact with eyes flush immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart and consult an ophthalmologist.

Following ingestion

Rinse mouth. Call a doctor if you feel unwell.

4.2 Most important symptoms and effects, both acute and delayed

Vomiting, Risk of blindness, Risk of serious damage to eyes, Irritation, Allergic reactions

4.3 Indication of any immediate medical attention and special treatment needed

none

SECTION 5: Firefighting measures

5.1 Extinguishing media



Suitable extinguishing media

co-ordinate firefighting measures to the fire surroundings!
water spray, dry extinguishing powder, BC-powder, carbon dioxide (CO₂)

Unsuitable extinguishing media

water jet

5.2 Special hazards arising from the substance or mixture

Combustible. In case of insufficient ventilation and/or in use, may form flammable/explosive vapour-air mixture. Solvent vapours are heavier than air and may spread along floors. Places which are not ventilated, e.g. unventilated below ground level areas such as trenches, conduits and shafts, are particularly prone to the presence of flammable substances or mixtures. Vapours may form explosive mixtures with air.

Hazardous combustion products

Carbon monoxide (CO), Carbon dioxide (CO₂), May produce toxic fumes of carbon monoxide if burning.

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5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures



For non-emergency personnel

Avoid contact with skin, eyes and clothes. Do not breathe vapour/spray. Avoidance of ignition sources.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it. If substance has entered a water course or sewer, inform the responsible authority.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains.

Advice on how to clean up a spill

Absorb with liquid-binding material (sand, diatomaceous earth, acid- or universal binding agents).

Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Provision of sufficient ventilation.

Measures to prevent fire as well as aerosol and dust generation



Keep away from sources of ignition - No smoking.

Take precautionary measures against static discharge.

Advice on general occupational hygiene

Wash hands before breaks and after work. Keep away from food, drink and animal feedingstuffs.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed.

Incompatible substances or mixtures

Observe hints for combined storage.

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Consideration of other advice:

Ventilation requirements

Use local and general ventilation.

Specific designs for storage rooms or vessels

Recommended storage temperature: 15 – 25 °C

7.3 Specific end use(s)

No information available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

National limit values

Occupational exposure limit values (Workplace Exposure Limits)

This information is not available.

Relevant DNELs of components						
Name of substance	CAS No	End-point	Threshold level	Protection goal, route of exposure	Used in	Exposure time
Linalool	78-70-6	DNEL	2.8 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
Linalool	78-70-6	DNEL	16.5 mg/m ³	human, inhalatory	worker (industry)	acute - systemic effects
Linalool	78-70-6	DNEL	2.5 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Linalool	78-70-6	DNEL	5 mg/kg bw/day	human, dermal	worker (industry)	acute - systemic effects
Geraniol	106-24-1	DNEL	161.6 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
Geraniol	106-24-1	DNEL	12.5 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Geraniol	106-24-1	DNEL	11,800 µg/cm ²	human, dermal	worker (industry)	chronic - local effects
(±)-β-Citronellol	106-22-9	DNEL	161.6 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
(±)-β-Citronellol	106-22-9	DNEL	10 mg/m ³	human, inhalatory	worker (industry)	chronic - local effects
(±)-β-Citronellol	106-22-9	DNEL	10 mg/m ³	human, inhalatory	worker (industry)	acute - local effects
(±)-β-Citronellol	106-22-9	DNEL	327.4 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
(±)-β-Citronellol	106-22-9	DNEL	2,950 µg/cm ²	human, dermal	worker (industry)	acute - local effects
Acetic acid linalyl ester	115-95-7	DNEL	2.75 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
Acetic acid linalyl ester	115-95-7	DNEL	2.5 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects

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Relevant DNELs of components						
Name of substance	CAS No	End-point	Threshold level	Protection goal, route of exposure	Used in	Exposure time
Acetic acid linalyl ester	115-95-7	DNEL	236.2 µg/cm ²	human, dermal	worker (industry)	chronic - local effects
Acetic acid linalyl ester	115-95-7	DNEL	236.2 µg/cm ²	human, dermal	worker (industry)	acute - local effects
Citronellyl formate	105-85-1	DNEL	4.94 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
Citronellyl formate	105-85-1	DNEL	1.4 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Geranyl acetate	105-87-3	DNEL	62.59 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
Geranyl acetate	105-87-3	DNEL	35.5 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Nerol	106-25-2	DNEL	4.4 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
Nerol	106-25-2	DNEL	1.25 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Neral	106-26-3	DNEL	9 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
Neral	106-26-3	DNEL	1.7 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Neral	106-26-3	DNEL	140 µg/cm ²	human, dermal	worker (industry)	chronic - local effects
DL-α-Pinene	80-56-8	DNEL	3.8 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
DL-α-Pinene	80-56-8	DNEL	0.542 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
L-(-)-Limonene	5989-54-8	DNEL	33.3 mg/m ³	human, inhalatory	worker (industry)	chronic - systemic effects
L-(-)-Limonene	5989-54-8	DNEL	222 µg/cm ²	human, dermal	worker (industry)	acute - local effects

Relevant PNECs of components						
Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
Linalool	78-70-6	PNEC	0.2 mg/l	aquatic organisms	freshwater	short-term (single instance)
Linalool	78-70-6	PNEC	0.02 mg/l	aquatic organisms	marine water	short-term (single instance)
Linalool	78-70-6	PNEC	10 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Linalool	78-70-6	PNEC	2.22 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Linalool	78-70-6	PNEC	0.222 mg/kg	aquatic organisms	marine sediment	short-term (single instance)

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Relevant PNECs of components						
Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
Linalool	78-70-6	PNEC	0.327 mg/kg	terrestrial organisms	soil	short-term (single instance)
α-Terpineol	98-55-5	PNEC	68 µg/l	aquatic organisms	freshwater	short-term (single instance)
α-Terpineol	98-55-5	PNEC	6.8 µg/l	aquatic organisms	marine water	short-term (single instance)
α-Terpineol	98-55-5	PNEC	2.6 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
α-Terpineol	98-55-5	PNEC	1.85 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
α-Terpineol	98-55-5	PNEC	0.185 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
α-Terpineol	98-55-5	PNEC	0.329 mg/kg	terrestrial organisms	soil	short-term (single instance)
Geraniol	106-24-1	PNEC	0.011 mg/l	aquatic organisms	freshwater	short-term (single instance)
Geraniol	106-24-1	PNEC	0.001 mg/l	aquatic organisms	marine water	short-term (single instance)
Geraniol	106-24-1	PNEC	0.7 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Geraniol	106-24-1	PNEC	0.115 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Geraniol	106-24-1	PNEC	0.011 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Geraniol	106-24-1	PNEC	0.017 mg/kg	terrestrial organisms	soil	short-term (single instance)
(±)-β-Citronellol	106-22-9	PNEC	0.002 mg/l	aquatic organisms	freshwater	short-term (single instance)
(±)-β-Citronellol	106-22-9	PNEC	0 mg/l	aquatic organisms	marine water	short-term (single instance)
(±)-β-Citronellol	106-22-9	PNEC	580 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
(±)-β-Citronellol	106-22-9	PNEC	0.026 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
(±)-β-Citronellol	106-22-9	PNEC	0.003 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
(±)-β-Citronellol	106-22-9	PNEC	0.004 mg/kg	terrestrial organisms	soil	short-term (single instance)
Acetic acid linalyl ester	115-95-7	PNEC	0.011 mg/l	aquatic organisms	freshwater	short-term (single instance)
Acetic acid linalyl ester	115-95-7	PNEC	0.001 mg/l	aquatic organisms	marine water	short-term (single instance)
Acetic acid linalyl ester	115-95-7	PNEC	1 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)

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Relevant PNECs of components						
Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
Acetic acid linalyl ester	115-95-7	PNEC	0.609 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Acetic acid linalyl ester	115-95-7	PNEC	0.061 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Acetic acid linalyl ester	115-95-7	PNEC	0.115 mg/kg	terrestrial organisms	soil	short-term (single instance)
Citronellyl formate	105-85-1	PNEC	1.3 µg/l	aquatic organisms	freshwater	short-term (single instance)
Citronellyl formate	105-85-1	PNEC	0.13 µg/l	aquatic organisms	marine water	short-term (single instance)
Citronellyl formate	105-85-1	PNEC	2.24 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Citronellyl formate	105-85-1	PNEC	93.55 µg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Citronellyl formate	105-85-1	PNEC	9.35 µg/kg	aquatic organisms	marine sediment	short-term (single instance)
Citronellyl formate	105-85-1	PNEC	17.89 µg/kg	terrestrial organisms	soil	short-term (single instance)
Geranyl acetate	105-87-3	PNEC	3.72 µg/l	aquatic organisms	freshwater	short-term (single instance)
Geranyl acetate	105-87-3	PNEC	0.372 µg/l	aquatic organisms	marine water	short-term (single instance)
Geranyl acetate	105-87-3	PNEC	8 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Geranyl acetate	105-87-3	PNEC	0.442 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Geranyl acetate	105-87-3	PNEC	0.044 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Geranyl acetate	105-87-3	PNEC	0.086 mg/kg	terrestrial organisms	soil	short-term (single instance)
Nerol	106-25-2	PNEC	7.45 µg/l	aquatic organisms	freshwater	short-term (single instance)
Nerol	106-25-2	PNEC	0.745 µg/l	aquatic organisms	marine water	short-term (single instance)
Nerol	106-25-2	PNEC	12.9 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Nerol	106-25-2	PNEC	133 µg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Nerol	106-25-2	PNEC	13.3 µg/kg	aquatic organisms	marine sediment	short-term (single instance)
Nerol	106-25-2	PNEC	22.3 µg/kg	terrestrial organisms	soil	short-term (single instance)
Neral	106-26-3	PNEC	0.007 mg/l	aquatic organisms	freshwater	short-term (single instance)

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Relevant PNECs of components						
Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
Neral	106-26-3	PNEC	0.001 mg/l	aquatic organisms	marine water	short-term (single instance)
Neral	106-26-3	PNEC	1.6 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Neral	106-26-3	PNEC	0.125 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Neral	106-26-3	PNEC	0.013 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Neral	106-26-3	PNEC	0.021 mg/kg	terrestrial organisms	soil	short-term (single instance)
DL- α -Pinene	80-56-8	PNEC	0.606 μ g/l	aquatic organisms	freshwater	short-term (single instance)
DL- α -Pinene	80-56-8	PNEC	0.061 μ g/l	aquatic organisms	marine water	short-term (single instance)
DL- α -Pinene	80-56-8	PNEC	0.2 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
DL- α -Pinene	80-56-8	PNEC	157 μ g/kg	aquatic organisms	freshwater sediment	short-term (single instance)
DL- α -Pinene	80-56-8	PNEC	15.7 μ g/kg	aquatic organisms	marine sediment	short-term (single instance)
DL- α -Pinene	80-56-8	PNEC	31.7 μ g/kg	terrestrial organisms	soil	short-term (single instance)
L-(-)-Limonene	5989-54-8	PNEC	5.4 μ g/l	aquatic organisms	freshwater	short-term (single instance)
L-(-)-Limonene	5989-54-8	PNEC	0.54 μ g/l	aquatic organisms	marine water	short-term (single instance)
L-(-)-Limonene	5989-54-8	PNEC	0.2 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
L-(-)-Limonene	5989-54-8	PNEC	1.322 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
L-(-)-Limonene	5989-54-8	PNEC	0.132 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
L-(-)-Limonene	5989-54-8	PNEC	0.262 mg/kg	terrestrial organisms	soil	short-term (single instance)

8.2 Exposure controls

Individual protection measures (personal protective equipment)

Eye/face protection



Use safety goggle with side protection.

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Skin protection



• hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. The times are approximate values from measurements at 22 °C and permanent contact. Increased temperatures due to heated substances, body heat etc. and a reduction of the effective layer thickness by stretching can lead to a considerable reduction of the breakthrough time. If in doubt, contact manufacturer. At an approx. 1.5 times larger / smaller layer thickness, the respective breakthrough time is doubled / halved. The data apply only to the pure substance. When transferred to substance mixtures, they may only be considered as a guide.

• type of material

Butyl caoutchouc (butyl rubber)

• material thickness

0,7mm

• breakthrough times of the glove material

>480 minutes (permeation: level 6)

• other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

Respiratory protection



Respiratory protection necessary at: Aerosol or mist formation. Type: A (against organic gases and vapours with a boiling point of > 65 °C , colour code: Brown).

Environmental exposure controls

Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	liquid
Colour	light brown
Odour	characteristic
Melting point/freezing point	<-20 °C at 101,325 Pa (ECHA)
Boiling point or initial boiling point and boiling range	224.1 °C at 101,325 Pa (ECHA)
Flammability	flammable liquid in accordance with GHS criteria
Lower and upper explosion limit	0.9 vol% (LEL) - 5.2 vol% (UEL)
Flash point	91 °C at 101,300 Pa (ECHA)

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Auto-ignition temperature	240 °C at 1,015 hPa (ECHA) (auto-ignition temperature (liquids and gases))
Decomposition temperature	not relevant
pH (value)	not determined
Kinematic viscosity	not determined
<u>Solubility(ies)</u>	
Water solubility	(poorly soluble)
<u>Partition coefficient</u>	
Partition coefficient n-octanol/water (log value):	3.5 (25 °C) (ECHA)
Vapour pressure	39.3 Pa at 24 °C
<u>Density and/or relative density</u>	
Density	~ 0.9 g/cm ³ at 20 °C
Relative vapour density	Information on this property is not available.
Particle characteristics	not relevant (liquid)
<u>Other safety parameters</u>	
Oxidising properties	none
9.2 Other information	
Information with regard to physical hazard classes:	There is no additional information.
Other safety characteristics:	
Refractive index	1.465

SECTION 10: Stability and reactivity

10.1 Reactivity

It's a reactive substance. Risk of ignition.

If heated

Risk of ignition. Vapours may form explosive mixtures with air.

10.2 Chemical stability

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

10.3 Possibility of hazardous reactions

Violent reaction with: strong oxidiser

10.4 Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

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10.5 Incompatible materials

There is no additional information.

10.6 Hazardous decomposition products

Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Classification acc. to GHS

Acute toxicity

Shall not be classified as acutely toxic.

Acute toxicity					
Exposure route	Endpoint	Value	Species	Method	Source
oral	LD50	>5,000 mg/kg	rat		ECHA

Acute toxicity estimate (ATE) of components			
Name of substance	CAS No	Exposure route	ATE
Menthone	10458-14-7	oral	500 mg/kg
DL- α -Pinene	80-56-8	oral	1,000 mg/kg

Acute toxicity of components					
Name of substance	CAS No	Exposure route	Endpoint	Value	Species
Linalool	78-70-6	oral	LD50	2,790 mg/kg	rat
Linalool	78-70-6	dermal	LD50	5,610 mg/kg	rabbit
α -Terpineol	98-55-5	oral	LD50	4,300 mg/kg	rat
α -Terpineol	98-55-5	dermal	LD50	>2,000 mg/kg	rat
Geraniol	106-24-1	oral	LD50	3,600 mg/kg	rat
Geraniol	106-24-1	dermal	LD50	>5,000 mg/kg	rabbit
(\pm)- β -Citronellol	106-22-9	oral	LD50	3,450 mg/kg	rat
(\pm)- β -Citronellol	106-22-9	dermal	LD50	2,650 mg/kg	rabbit
Acetic acid linalyl ester	115-95-7	oral	LD50	>9,000 mg/kg	rat
Acetic acid linalyl ester	115-95-7	dermal	LD50	>5,000 mg/kg	rabbit
Citronellyl formate	105-85-1	oral	LD50	>6,800 mg/kg	rat
Citronellyl formate	105-85-1	dermal	LD50	>2,000 mg/kg	rabbit
Terpinolene	586-62-9	oral	LD50	>2,000 mg/kg	rat
Terpinolene	586-62-9	dermal	LD50	>2,000 mg/kg	rat
β -Caryophyllene	87-44-5	oral	LD50	>5,000 mg/kg	mouse

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Acute toxicity of components					
Name of substance	CAS No	Exposure route	Endpoint	Value	Species
Geranyl acetate	105-87-3	oral	LD50	6,330 mg/kg	rat
Geranial	141-27-5	oral	LD50	6,800 mg/kg	rat
Geranial	141-27-5	dermal	LD50	>2,000 mg/kg	rat
Nerol	106-25-2	oral	LD50	4,500 mg/kg	rat
Nerol	106-25-2	dermal	LD50	>5,000 mg/kg	rabbit
Myrcene	123-35-3	oral	LD50	>3,380 mg/kg	mouse
Myrcene	123-35-3	dermal	LD50	>5,000 mg/kg	rabbit
DL-Limonene	138-86-3	oral	LD50	5,300 mg/kg	rat
Neral	106-26-3	oral	LD50	6,800 mg/kg	rat
Neral	106-26-3	dermal	LD50	>2,000 mg/kg	rat
DL- α -Pinene	80-56-8	dermal	LD50	>2,000 mg/kg	rat
DL- α -Pinene	80-56-8	oral	LD50	3,700 mg/kg	rat

Skin corrosion/irritation

Causes skin irritation.

Serious eye damage/eye irritation

Causes serious eye damage.

Respiratory or skin sensitisation

May cause an allergic skin reaction.

Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

Carcinogenicity

Shall not be classified as carcinogenic.

Reproductive toxicity

Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure

Shall not be classified as a specific target organ toxicant (single exposure).

Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

Symptoms related to the physical, chemical and toxicological characteristics

• If swallowed

Data are not available.

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- **If in eyes**

Causes serious eye damage, risk of blindness

- **If inhaled**

Data are not available.

- **If on skin**

causes skin irritation, May produce an allergic reaction, pruritis, localised redness

- **Other information**

none

11.2 Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) at a concentration of $\geq 0,1\%$.

SECTION 12: Ecological information

12.1 Toxicity

Toxic to aquatic life with long lasting effects.

Aquatic toxicity (acute) of components					
Name of substance	CAS No	Endpoint	Value	Species	Exposure time
Linalool	78-70-6	LC50	27.8 mg/l	fish	96 h
Linalool	78-70-6	EC50	59 mg/l	aquatic invertebrates	48 h
Linalool	78-70-6	ErC50	156.7 mg/l	algae	96 h
α -Terpineol	98-55-5	LC50	70 mg/l	fish	96 h
α -Terpineol	98-55-5	EC50	73 mg/l	aquatic invertebrates	48 h
α -Terpineol	98-55-5	ErC50	68 mg/l	algae	72 h
Geraniol	106-24-1	LC50	22 mg/l	fish	96 h
Geraniol	106-24-1	EC50	10.8 mg/l	aquatic invertebrates	48 h
Geraniol	106-24-1	ErC50	13.1 mg/l	algae	72 h
(\pm)- β -Citronellol	106-22-9	LC50	14.66 mg/l	fish	96 h
(\pm)- β -Citronellol	106-22-9	EC50	17.48 mg/l	aquatic invertebrates	48 h
Acetic acid linalyl ester	115-95-7	ErC50	62 mg/l	algae	72 h
Acetic acid linalyl ester	115-95-7	LC50	11 mg/l	fish	96 h
Acetic acid linalyl ester	115-95-7	EC50	59 mg/l	aquatic invertebrates	48 h
Citronellyl formate	105-85-1	LC50	1.3 mg/l	fish	96 h
Citronellyl formate	105-85-1	EC50	7.6 mg/l	aquatic invertebrates	48 h
Citronellyl formate	105-85-1	ErC50	3.1 mg/l	algae	72 h
Terpinolene	586-62-9	LC50	0.805 mg/l	fish	96 h
Terpinolene	586-62-9	EC50	0.634 mg/l	aquatic invertebrates	48 h

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Aquatic toxicity (acute) of components					
Name of substance	CAS No	Endpoint	Value	Species	Exposure time
Terpinolene	586-62-9	ErC50	0.692 mg/l	algae	72 h
β -Caryophyllene	87-44-5	EC50	>0.17 mg/l	daphnia magna	48 h
β -Caryophyllene	87-44-5	ErC50	>0.033 mg/l	algae	72 h
Geranyl acetate	105-87-3	LC50	68.12 mg/l	fish	96 h
Geranyl acetate	105-87-3	EC50	14.1 mg/l	aquatic invertebrates	48 h
Geranyl acetate	105-87-3	ErC50	3.72 mg/l	algae	72 h
Geranyl formate	105-86-2	EC50	2.3 mg/l	aquatic invertebrates	48 h
Geranyl formate	105-86-2	ErC50	0.23 mg/l	algae	72 h
Geranial	141-27-5	LC50	6.78 mg/l	fish	96 h
Geranial	141-27-5	EC50	6.8 mg/l	aquatic invertebrates	48 h
Geranial	141-27-5	ErC50	103.8 mg/l	algae	72 h
Nerol	106-25-2	LC50	20.3 mg/l	fish	96 h
Nerol	106-25-2	EC50	32.4 mg/l	aquatic invertebrates	48 h
Nerol	106-25-2	ErC50	9.54 mg/l	algae	72 h
Myrcene	123-35-3	EC50	1.47 mg/l	aquatic invertebrates	48 h
Myrcene	123-35-3	EC50	0.31 mg/l	algae	72 h
Myrcene	123-35-3	ErC50	0.342 mg/l	algae	72 h
DL-Limonene	138-86-3	EC50	17 mg/l	daphnia magna	48 h
DL-Limonene	138-86-3	LC50	80 mg/l	rainbow trout (Oncorhynchus mykiss)	96 h
Neral	106-26-3	LC50	6.78 mg/l	fish	96 h
Neral	106-26-3	EC50	6.8 mg/l	aquatic invertebrates	48 h
Neral	106-26-3	ErC50	103.8 mg/l	algae	72 h
DL- α -Pinene	80-56-8	LC50	0.303 mg/l	fish	96 h
DL- α -Pinene	80-56-8	EC50	0.475 mg/l	aquatic invertebrates	48 h

Aquatic toxicity (chronic) of components					
Name of substance	CAS No	Endpoint	Value	Species	Exposure time
Linalool	78-70-6	EC50	>100 mg/l	microorganisms	30 min
Geraniol	106-24-1	EC50	70 mg/l	microorganisms	30 min
(\pm)- β -Citronellol	106-22-9	EC50	>10,000 mg/l	microorganisms	30 min
Acetic acid linalyl ester	115-95-7	LC50	11.14 mg/l	fish	20 h

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Aquatic toxicity (chronic) of components

Name of substance	CAS No	Endpoint	Value	Species	Exposure time
Terpinolene	586-62-9	EC50	69 mg/l	microorganisms	3 h
Geranial	141-27-5	EC50	160 mg/l	microorganisms	30 min
Nerol	106-25-2	EC50	241 mg/l	microorganisms	3 h
Neral	106-26-3	EC50	160 mg/l	microorganisms	30 min

12.2 Persistence and degradability

2.91 mg/mg

Biodegradation

The substance is readily biodegradable.

Process of degradability

Process	Degradation rate	Time
oxygen depletion	67 %	28 d

Degradability of components

Name of substance	CAS No	Process	Degradation rate	Time	Method	Source
Linalool	78-70-6	oxygen depletion	40.9 %	5 d		ECHA
α -Terpineol	98-55-5	carbon dioxide generation	80 %	28 d	OECD Guideline 310	
Geraniol	106-24-1	DOC removal	90 - 100 %	3 d		ECHA
(\pm)- β -Citronellol	106-22-9	biotic/abiotic	>60 %	d	modifizierter OECD Screening Test	
(\pm)- β -Citronellol	106-22-9	oxygen depletion	80 - 90 %	28 d		ECHA
Acetic acid linalyl ester	115-95-7	oxygen depletion	$\geq 0 - \leq 10$ %	1 d		ECHA
Citronellyl formate	105-85-1	carbon dioxide generation	88 %	28 d		ECHA
Terpinolene	586-62-9	oxygen depletion	81 %	28 d		ECHA
β -Caryophyllene	87-44-5	oxygen depletion	10 %	28 d		ECHA
Geranyl acetate	105-87-3	oxygen depletion	>70 %	28 d		ECHA
Geranyl formate	105-86-2	oxygen depletion	79 %	28 d		ECHA
Geranial	141-27-5	oxygen depletion	>90 %	28 d		ECHA

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Degradability of components						
Name of substance	CAS No	Process	Degradation rate	Time	Method	Source
Nerol	106-25-2	oxygen depletion	90 %	28 d		ECHA
Myrcene	123-35-3	oxygen depletion	76 %	28 d		ECHA
Neral	106-26-3	oxygen depletion	>90 %	28 d		ECHA
DL- α -Pinene	80-56-8	oxygen depletion	68 %	28 d		ECHA
L-(-)-Limonene	5989-54-8	oxygen depletion	85 %	28 d		ECHA

12.3 Bioaccumulative potential

Does not significantly accumulate in organisms.

n-octanol/water (log KOW)	3.5 (25 °C) (ECHA)
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Bioaccumulative potential of components				
Name of substance	CAS No	BCF	Log KOW	BOD5/COD
Linalool	78-70-6		2.9 (pH value: 7, 20 °C)	
α -Terpineol	98-55-5		2.98	
Geraniol	106-24-1		2.6 (25 °C)	
(\pm)- β -Citronellol	106-22-9	82.59	3.41 (25 °C)	
Acetic acid linalyl ester	115-95-7	174	3.9 (25 °C)	
Citronellyl formate	105-85-1		3.9 (pH value: 7, 20 °C)	
Terpinolene	586-62-9		4.47	
β -Caryophyllene	87-44-5		6.23 (pH value: 7, 25 °C)	
Geranyl acetate	105-87-3		4.04	
Geranyl formate	105-86-2		4.1 (pH value: 7.42, 20 °C)	
Menthone	10458-14-7		3.05	
Nerol	106-25-2		2.76 (pH value: ~6.5, 30 °C)	
Myrcene	123-35-3		4.82 (pH value: ~6.5, 30 °C)	
DL-Limonene	138-86-3		4.57	
Neral	106-26-3	89.72		
DL- α -Pinene	80-56-8		4.83	
L-(-)-Limonene	5989-54-8	864.8	4.38 (pH value: 7.2, 37 °C)	

12.4 Mobility in soil

Data are not available.

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12.5 Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

12.6 Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) at a concentration of $\geq 0,1\%$.

12.7 Other adverse effects

Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods



This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

Sewage disposal-relevant information

Do not empty into drains.

Waste treatment of containers/packagings

Only packagings which are approved (e.g. acc. to the Dangerous Goods Regulations) may be used. Handle contaminated packages in the same way as the substance itself. Completely emptied packages can be recycled.

13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions. Non-contaminated packages may be recycled.

SECTION 14: Transport information

14.1 UN number

UN RTDG	UN 3082
IMDG-Code	UN 3082
ICAO-TI	UN 3082

14.2 UN proper shipping name

UN RTDG	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
IMDG-Code	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
ICAO-TI	Environmentally hazardous substance, liquid, n.o.s.
Technical name	Geranyl formate, Terpinolene

14.3 Transport hazard class(es)

UN RTDG	9
IMDG-Code	9
ICAO-TI	9

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14.4 Packing group

UN RTDG	III
IMDG-Code	III
ICAO-TI	III

14.5 Environmental hazards hazardous to the aquatic environment

14.6 Special precautions for user

There is no additional information.

14.7 Transport in bulk according to IMO instruments

The cargo is not intended to be carried in bulk.

14.8 Information for each of the UN Model Regulations

Transport information National regulations Additional information (UN RTDG)

UN number	3082
Class	9
Environmental hazards	Yes Hazardous to the aquatic environment
Packing group	III
Danger label(s)	9 Fish and tree



Special provisions (SP)	274, 331, 335, 375 UN RTDG
Excepted quantities (EQ)	E1 UN RTDG
Limited quantities (LQ)	5 L UN RTDG
Emergency Action Code	3Z

International Maritime Dangerous Goods Code (IMDG) - Additional information

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Particulars in the shipper's declaration	UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (Geranyl formate, Terpinolene, solution), 9, III
Marine pollutant	YES (hazardous to the aquatic environment), (Terpinolene)
Danger label(s)	9, "Fish and tree"



Special provisions (SP)	274, 335, 969
Excepted quantities (EQ)	E1
Limited quantities (LQ)	5 L



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EmS	F-A, S-F
Stowage category	A
International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information	
Proper shipping name	Environmentally hazardous substance, liquid, n.o.s.
Particulars in the shipper's declaration	UN3082, Environmentally hazardous substance, liquid, n.o.s., (Geranyl formate, Terpinolene, solution), 9, III
Environmental hazards	yes (hazardous to the aquatic environment)
Danger label(s)	9, "Fish and tree"
 	
Special provisions (SP)	A97, A158, A197, A215
Excepted quantities (EQ)	E1
Limited quantities (LQ)	30 kg

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

There is no additional information.

Other information

Directive 94/33/EC on the protection of young people at work. Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

National inventories

Country	Inventory	Status
AU	AIIC	not all ingredients are listed
CA	DSL	not all ingredients are listed
CN	IECSC	not all ingredients are listed
EU	ECSI	all ingredients are listed
EU	REACH Reg.	not all ingredients are listed
JP	CSCL-ENCS	all ingredients are listed
JP	ISHA-ENCS	not all ingredients are listed
KR	KECI	not all ingredients are listed
MX	INSQ	not all ingredients are listed
NZ	NZIoC	all ingredients are listed
PH	PICCS	not all ingredients are listed
TR	CICR	not all ingredients are listed
TW	TCSI	not all ingredients are listed
US	TSCA	not all ingredients are listed

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Country	Inventory	Status
VN	NCI	all ingredients are listed

Legend

AIIC	Australian Inventory of Industrial Chemicals
CICR	Chemical Inventory and Control Regulation
CSCL-ENCS	List of Existing and New Chemical Substances (CSCL-ENCS)
DSL	Domestic Substances List (DSL)
ECSI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
INSQ	National Inventory of Chemical Substances
ISHA-ENCS	Inventory of Existing and New Chemical Substances (ISHA-ENCS)
KECI	Korea Existing Chemicals Inventory
NCI	National Chemical Inventory
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances (PICCS)
REACH Reg.	REACH registered substances
TCSI	Taiwan Chemical Substance Inventory
TSCA	Toxic Substance Control Act

15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Indication of changes (revised safety data sheet)

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
2.2	Hazardous ingredients for labelling: Linalool, Geraniol, DL- α -Pinene, (\pm)-S-Citronellol, Acetic acid linalyl ester, Citronellyl formate, Terpinolene, Isomenthone, β -Caryophyllene, Geranyl acetate, Geranyl formate, Geranial, Nerol, Myrcene, DL-Limonene, Neral, L(-)-Limonene	Hazardous ingredients for labelling: Linalool, Geraniol, DL- α -Pinene, (\pm)-S-Citronellol, Acetic acid linalyl ester, Citronellyl formate, Terpinolene, Isomenthone, β -Caryophyllene, Geranyl acetate, Geranyl formate, Menthone, Geranial, Nerol, Myrcene, DL-Limonene, Neral, L(-)-Limonene	yes
2.3		Endocrine disrupting properties: Does not contain an endocrine disruptor (ED) at a concentration of $\geq 0,1\%$.	yes
14.8		Emergency Action Code: 3Z	yes
15.1		National inventories: change in the listing (table)	yes

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
BOD	Biochemical Oxygen Demand
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
COD	Chemical oxygen demand
DGR	Dangerous Goods Regulations (see IATA/DGR)
DNEL	Derived No-Effect Level
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval

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Abbr.	Descriptions of used abbreviations
ED	Endocrine disruptor
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
ErC50	≡ EC50: in this method, that concentration of test substance which results in a 50 % reduction in either growth (EbC50) or growth rate (ErC50) relative to the control
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
ICAO-TI	Technical instructions for the safe transport of dangerous goods by air
IMDG	International Maritime Dangerous Goods Code
IMDG-Code	International Maritime Dangerous Goods Code
LC50	Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval
LD50	Lethal Dose 50 %: the LD50 corresponds to the dose of a tested substance causing 50 % lethality during a specified time interval
LEL	Lower explosion limit (LEL)
log KOW	n-Octanol/water
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
UEL	Upper explosion limit (UEL)
UN RTDG	UN Recommendations on the Transport of Dangerous Good
vPvB	Very Persistent and very Bioaccumulative

Key literature references and sources for data

Safe Work Australia's Code of Practice for Labelling of Workplace Hazardous Chemicals (under WHS Regulations).

UN Recommendations on the Transport of Dangerous Good. International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

List of relevant phrases (code and full text as stated in section 2 and 3)

Code	Text
H227	Combustible liquid.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.

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Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.