

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: **6502**  
Version: **GHS 3.0 en**  
Replaces version of: 2022-08-15  
Version: (GHS 2)

date of compilation: 2020-03-05  
Revision: 2024-03-04

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

### 1.1 Product identifier

Identification of the substance	<b>Oil of citronella , natural</b>
Article number	6502
CAS number	91771-61-8
Alternative name(s)	Oleum Citronellae

### 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 products which come into contact with foodstuffs. Do not use for private purposes (household). Food, drink and animal feeding-stuffs.

### 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](mailto:sicherheit@carlroth.de)  
**Website:** [www.carlroth.de](http://www.carlroth.de)

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

**e-mail (competent person):** [sicherheit@carlroth.de](mailto: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
3.10	Acute toxicity (oral)	4	Acute Tox. 4	H302
3.3	Serious eye damage/eye irritation	1	Eye Dam. 1	H318

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

Section	Hazard class	Cat-egory	Hazard class and category	Hazard statement
3.4S	Skin sensitisation	1	Skin Sens. 1	H317
3.10	Aspiration hazard	1	Asp. Tox. 1	H304

For full text of abbreviations: see SECTION 16

### 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,  
GHS08



#### Hazard statements

H227 Combustible liquid  
H302 Harmful if swallowed  
H304 May be fatal if swallowed and enters airways  
H317 May cause an allergic skin reaction  
H318 Causes serious eye damage

#### Precautionary statements

##### **Precautionary statements - prevention**

P280 Wear eye protection/face protection

##### **Precautionary statements - response**

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician  
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  
P331 Do NOT induce vomiting  
P370+P378 In case of fire: Use sand, carbon dioxide or powder extinguisher for extinction

## 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  $\geq 0,1\%$ .

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

### SECTION 3: Composition/information on ingredients

#### 3.1 Substances

"UVCB substance" (substance of unknown or variable composition).

Name of substance Oil of citronella

CAS No 91771-61-8

#### Impurities/additives/constituents:

Name of substance	Identifier	Wt%
Citronellal	CAS No 106-23-0	25 - < 50
(±)-β-Citronellol	CAS No 106-22-9	10 - < 25
Geraniol	CAS No 106-24-1	10 - < 25
Geranyl formate	CAS No 105-86-2	1 - < 5
Geranyl acetate	CAS No 105-87-3	1 - < 5
Citronellyl acetate	CAS No 150-84-5	1 - < 5
D-(+)-Limonene	CAS No 5989-27-5	1 - < 5
Eugenol	CAS No 97-53-0	1 - < 5
Geranial	CAS No 141-27-5	< 1
Neral	CAS No 106-26-3	< 1
Linalool	CAS No 78-70-6	< 1

#### Remarks

For full text of abbreviations: see SECTION 16

### SECTION 4: First aid measures

#### 4.1 Description of first aid measures



#### General notes

Take off contaminated clothing.

#### Following inhalation

Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice.

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

### Following skin contact

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 with water (only if the person is conscious). Call a physician immediately. Call a doctor. Observe aspiration hazard if vomiting occurs.

### 4.2 Most important symptoms and effects, both acute and delayed

Aspiration hazard, Vomiting, Risk of blindness, Risk of serious damage to eyes, 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, alcohol resistant foam, dry extinguishing powder, BC-powder, carbon dioxide (CO<sub>2</sub>)

#### 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 (CO<sub>2</sub>), May produce toxic fumes of carbon monoxide if burning.

### 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.

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



Oil of citronella , natural

article number: 6502

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures



#### For non-emergency personnel

Use personal protective equipment as required. 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.

#### Consideration of other advice:

#### Ventilation requirements

Use local and general ventilation.

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

### 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.

#### Human health values

Relevant DNELs and other threshold levels				
Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
DNEL	2.73 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	chronic - systemic effects
DNEL	9.69 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects

Relevant DNELs of components						
Name of substance	CAS No	Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
Citronellal	106-23-0	DNEL	9 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	chronic - systemic effects
Citronellal	106-23-0	DNEL	1.7 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Citronellal	106-23-0	DNEL	140 µg/cm <sup>2</sup>	human, dermal	worker (industry)	chronic - local effects
Geraniol	106-24-1	DNEL	161.6 mg/m <sup>3</sup>	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 <sup>2</sup>	human, dermal	worker (industry)	chronic - local effects
(±)-β-Citronellol	106-22-9	DNEL	161.6 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	chronic - systemic effects
(±)-β-Citronellol	106-22-9	DNEL	10 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	chronic - local effects
(±)-β-Citronellol	106-22-9	DNEL	10 mg/m <sup>3</sup>	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 <sup>2</sup>	human, dermal	worker (industry)	acute - local effects

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: **6502**

Relevant DNELs of components						
Name of substance	CAS No	End-point	Threshold level	Protection goal, route of exposure	Used in	Exposure time
D-(+)-Limonene	5989-27-5	DNEL	66.7 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	chronic - systemic effects
D-(+)-Limonene	5989-27-5	DNEL	9.5 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Citronellyl acetate	150-84-5	DNEL	17 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	chronic - systemic effects
Citronellyl acetate	150-84-5	DNEL	4.8 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Eugenol	97-53-0	DNEL	21.2 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	chronic - systemic effects
Eugenol	97-53-0	DNEL	6 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
Geranyl acetate	105-87-3	DNEL	62.59 mg/m <sup>3</sup>	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
Linalool	78-70-6	DNEL	2.8 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	chronic - systemic effects
Linalool	78-70-6	DNEL	16.5 mg/m <sup>3</sup>	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
Neral	106-26-3	DNEL	9 mg/m <sup>3</sup>	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 <sup>2</sup>	human, dermal	worker (industry)	chronic - local effects

Relevant PNECs of components						
Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
Citronellal	106-23-0	PNEC	0.009 mg/l	aquatic organisms	freshwater	short-term (single instance)
Citronellal	106-23-0	PNEC	0.001 mg/l	aquatic organisms	marine water	short-term (single instance)
Citronellal	106-23-0	PNEC	4 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
Citronellal	106-23-0	PNEC	0.159 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Citronellal	106-23-0	PNEC	0.016 mg/kg	aquatic organisms	marine sediment	short-term (single instance)

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: **6502**

Relevant PNECs of components						
Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
Citronellal	106-23-0	PNEC	0.027 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)
D-(+)-Limonene	5989-27-5	PNEC	14 µg/l	aquatic organisms	freshwater	short-term (single instance)
D-(+)-Limonene	5989-27-5	PNEC	1.4 µg/l	aquatic organisms	marine water	short-term (single instance)
D-(+)-Limonene	5989-27-5	PNEC	1.8 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
D-(+)-Limonene	5989-27-5	PNEC	3.85 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
D-(+)-Limonene	5989-27-5	PNEC	0.385 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
D-(+)-Limonene	5989-27-5	PNEC	0.763 mg/kg	terrestrial organisms	soil	short-term (single instance)
Citronellyl acetate	150-84-5	PNEC	0.003 mg/l	aquatic organisms	freshwater	short-term (single instance)
Citronellyl acetate	150-84-5	PNEC	0 mg/l	aquatic organisms	marine water	short-term (single instance)
Citronellyl acetate	150-84-5	PNEC	10 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)



# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

Relevant PNECs of components						
Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
Citronellyl acetate	150-84-5	PNEC	0.851 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Citronellyl acetate	150-84-5	PNEC	0.085 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Citronellyl acetate	150-84-5	PNEC	0.168 mg/kg	terrestrial organisms	soil	short-term (single instance)
Eugenol	97-53-0	PNEC	1.13 µg/l	aquatic organisms	freshwater	short-term (single instance)
Eugenol	97-53-0	PNEC	0.113 µg/l	aquatic organisms	marine water	short-term (single instance)
Eugenol	97-53-0	PNEC	0.081 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
Eugenol	97-53-0	PNEC	0.008 mg/kg	aquatic organisms	marine sediment	short-term (single instance)
Eugenol	97-53-0	PNEC	0.015 mg/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)
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)
Linalool	78-70-6	PNEC	0.327 mg/kg	terrestrial organisms	soil	short-term (single instance)
Neral	106-26-3	PNEC	0.007 mg/l	aquatic organisms	freshwater	short-term (single instance)
Neral	106-26-3	PNEC	0.001 mg/l	aquatic organisms	marine water	short-term (single instance)

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

Relevant PNECs of components						
Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
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)

### 8.2 Exposure controls

#### Individual protection measures (personal protective equipment)

##### Eye/face protection



Use safety goggle with side protection.

##### 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

NBR (Nitrile rubber)

##### • material thickness

0,4 mm

##### • breakthrough times of the glove material

>480 minutes (permeation: level 6)

##### • Splash protection - Protective gloves

• type of material: NBR (Nitrile rubber)

• material thickness: >0,11 mm

• breakthrough times of the glove material: >30 minutes (permeation: level 2)

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



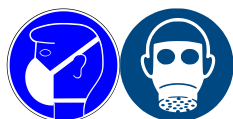
## Oil of citronella , natural

article number: 6502

### • 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	clear - colourless - yellowish brown
Odour	characteristic
Melting point/freezing point	<-20 °C (ECHA)
Boiling point or initial boiling point and boiling range	92 °C at 1,013 hPa (ECHA)
Flammability	flammable liquid in accordance with GHS criteria
Lower and upper explosion limit	not determined
Flash point	78 °C (ECHA)
Auto-ignition temperature	240 °C at 1,004 hPa (ECHA)
Decomposition temperature	not relevant
pH (value)	not determined
Kinematic viscosity	not determined
<u>Solubility(ies)</u>	
Water solubility	1.767 g/l at 25 °C (ECHA)
<u>Partition coefficient</u>	
Partition coefficient n-octanol/water (log value):	≥2.73 – ≤7.04 (pH value: 7, 25 °C) (ECHA)
Soil organic carbon/water (log KOC)	≥1.69 – ≤4.3 (ECHA)
Vapour pressure	22.14 Pa at 25 °C
<u>Density and/or relative density</u>	
Density	0.89 g/cm <sup>3</sup>
Relative vapour density	Information on this property is not available.

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

Particle characteristics not relevant (liquid)

### Other safety parameters

Oxidising properties none

## 9.2 Other information

Information with regard to physical hazard classes: There is no additional information.

Other safety characteristics:

Refractive index 1.463 – 1.475 (20 °C)

## 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.

### 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

Harmful if swallowed.

GHS of the United Nations, annex 4. May be harmful in contact with skin.

Acute toxicity					
Exposure route	Endpoint	Value	Species	Method	Source
oral	LD50	>300 – <2,000 mg/kg	rat		ECHA
dermal	LD50	>2,000 mg/kg	rat		ECHA

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

Acute toxicity of components					
Name of substance	CAS No	Exposure route	Endpoint	Value	Species
Citronellal	106-23-0	oral	LD50	2,150 mg/kg	rat
Citronellal	106-23-0	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
(±)-β-Citronellol	106-22-9	oral	LD50	3,450 mg/kg	rat
(±)-β-Citronellol	106-22-9	dermal	LD50	2,650 mg/kg	rabbit
D-(+)-Limonene	5989-27-5	oral	LD50	>2,000 mg/kg	rat
Citronellyl acetate	150-84-5	oral	LD50	6,800 mg/kg	rat
Citronellyl acetate	150-84-5	dermal	LD50	>2,000 mg/kg	rabbit
Eugenol	97-53-0	oral	LD50	>2,000 mg/kg	rat
Geranyl acetate	105-87-3	oral	LD50	6,330 mg/kg	rat
Linalool	78-70-6	oral	LD50	2,790 mg/kg	rat
Linalool	78-70-6	dermal	LD50	5,610 mg/kg	rabbit
Geranial	141-27-5	oral	LD50	6,800 mg/kg	rat
Geranial	141-27-5	dermal	LD50	>2,000 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

### Skin corrosion/irritation

Shall not be classified as corrosive/irritant to skin.

### 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).

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

### Aspiration hazard

May be fatal if swallowed and enters airways.

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

#### • If swallowed

aspiration hazard

#### • If in eyes

Causes serious eye damage, risk of blindness

#### • If inhaled

Data are not available.

#### • If on skin

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
Citronellal	106-23-0	LC50	22 mg/l	fish	96 h
Citronellal	106-23-0	ErC50	13.33 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
(±)-β-Citronellol	106-22-9	LC50	14.66 mg/l	fish	96 h
(±)-β-Citronellol	106-22-9	EC50	17.48 mg/l	aquatic invertebrates	48 h
D-(+)-Limonene	5989-27-5	LC50	0.46 mg/l	fish	96 h
D-(+)-Limonene	5989-27-5	EC50	0.307 mg/l	aquatic invertebrates	48 h
D-(+)-Limonene	5989-27-5	ErC50	0.32 mg/l	algae	72 h
Citronellyl acetate	150-84-5	LC50	6.1 mg/l	fish	96 h
Citronellyl acetate	150-84-5	EC50	3.48 mg/l	aquatic invertebrates	48 h
Citronellyl acetate	150-84-5	ErC50	>7.2 mg/l	algae	72 h
Eugenol	97-53-0	LC50	13 mg/l	fish	96 h

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

Aquatic toxicity (acute) of components					
Name of substance	CAS No	Endpoint	Value	Species	Exposure time
Eugenol	97-53-0	EC50	1.05 mg/l	aquatic invertebrates	48 h
Eugenol	97-53-0	ErC50	24 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
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
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
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

Aquatic toxicity (chronic) of components					
Name of substance	CAS No	Endpoint	Value	Species	Exposure time
Geraniol	106-24-1	EC50	70 mg/l	microorganisms	30 min
(±)-β-Citronellol	106-22-9	EC50	>10,000 mg/l	microorganisms	30 min
D-(+)-Limonene	5989-27-5	EC50	<0.67 mg/l	fish	8 d
D-(+)-Limonene	5989-27-5	EC50	188 µg/l	aquatic invertebrates	21 d
Linalool	78-70-6	EC50	>100 mg/l	microorganisms	30 min
Geranial	141-27-5	EC50	160 mg/l	microorganisms	30 min
Neral	106-26-3	EC50	160 mg/l	microorganisms	30 min

## 12.2 Persistence and degradability

### Biodegradation

The substance is readily biodegradable.

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

Degradability of components						
Name of substance	CAS No	Process	Degradation rate	Time	Method	Source
Citronellal	106-23-0	biotic/abiotic	60 %	d		
Citronellal	106-23-0	carbon dioxide generation	83 %	28 d		ECHA
Geraniol	106-24-1	DOC removal	90 – 100 %	3 d		ECHA
(±)-β-Citronellol	106-22-9	biotic/abiotic	>60 %	d	modifizierter OECD Screening Test	
(±)-β-Citronellol	106-22-9	oxygen depletion	80 – 90 %	28 d		ECHA
D-(+)-Limonene	5989-27-5	carbon dioxide generation	58.8 %	14 d		ECHA
D-(+)-Limonene	5989-27-5	oxygen depletion	80 %	28 d		ECHA
Citronellyl acetate	150-84-5	carbon dioxide generation	93 %	28 d		ECHA
Eugenol	97-53-0	biotic/abiotic	82 %	28 d		
Eugenol	97-53-0	oxygen depletion	50 %	7 d		ECHA
Geranyl acetate	105-87-3	oxygen depletion	>70 %	28 d		ECHA
Geranyl formate	105-86-2	oxygen depletion	79 %	28 d		ECHA
Linalool	78-70-6	oxygen depletion	40.9 %	5 d		ECHA
Geranial	141-27-5	oxygen depletion	>90 %	28 d		ECHA
Neral	106-26-3	oxygen depletion	>90 %	28 d		ECHA

### 12.3 Bioaccumulative potential

The substance fulfils the very bioaccumulative criterion.

n-octanol/water (log KOW)	≥2.73 – ≤7.04 (pH value: 7, 25 °C) (ECHA)
---------------------------	---

Bioaccumulative potential of components				
Name of substance	CAS No	BCF	Log KOW	BOD5/COD
Citronellal	106-23-0	113.6	3.62 (25 °C)	
Geraniol	106-24-1		2.6 (25 °C)	
(±)-β-Citronellol	106-22-9	82.59	3.41 (25 °C)	
D-(+)-Limonene	5989-27-5		4.38 (pH value: 7.2, 37 °C)	
Citronellyl acetate	150-84-5		4.9 (pH value: 4.23, 25 °C)	
Eugenol	97-53-0		1.83 (pH value: 5.5, 30 °C)	



# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

Bioaccumulative potential of components				
Name of substance	CAS No	BCF	Log KOW	BOD5/COD
Geranyl acetate	105-87-3		4.04	
Geranyl formate	105-86-2		4.1 (pH value: 7.42, 20 °C)	
Linalool	78-70-6		2.9 (pH value: 7, 20 °C)	
Neral	106-26-3	89.72		

### 12.4 Mobility in soil

The Organic Carbon normalised adsorption coefficient	$\geq 1.69 - \leq 4.3$ (ECHA)
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### 12.5 Results of PBT and vPvB assessment

Data are not available.

### 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.

#### Relevant provisions relating to waste(Basel Convention)

#### Properties of waste which render it hazardous

H11 Toxic (Delayed or chronic)

### 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.

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

### 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	Oil of citronella

#### 14.3 Transport hazard class(es)

UN RTDG	9
IMDG-Code	9
ICAO-TI	9

#### 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



# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

**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., (Oil of citronella), 9, III

Marine pollutant YES (hazardous to the aquatic environment), (Oil of citronella)

Danger label(s) 9, "Fish and tree"



Special provisions (SP) 274, 335, 969

Excepted quantities (EQ) E1

Limited quantities (LQ) 5 L

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., (Oil of citronella), 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

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

### SECTION 15: Regulatory information

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

There is no additional information.

##### National regulations(Australia)

##### Australian Inventory of Chemical Substances(AICS)

Substance is listed.

##### 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	substance is listed
CN	IECSC	substance is listed
EU	ECSI	substance is listed
EU	REACH Reg.	substance is listed
NZ	NZIoC	substance is listed
TR	CICR	substance is listed
TW	TCSI	substance is listed
VN	NCI	substance is listed

##### Legend

AIIC	Australian Inventory of Industrial Chemicals
CICR	Chemical Inventory and Control Regulation
ECSI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
NCI	National Chemical Inventory
NZIoC	New Zealand Inventory of Chemicals
REACH Reg.	REACH registered substances
TCSI	Taiwan Chemical Substance Inventory

#### 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
2.3		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

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: 6502

### Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
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
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
log KOW	n-Octanol/water
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
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).

# Safety data sheet

acc. to Safe Work Australia - Code of Practice



## Oil of citronella , natural

article number: **6502**

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

Code	Text
H227	Combustible liquid.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.

### Disclaimer

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