Safety data sheet

acc. to Regulation (EC) No. 1907/2006 (REACH)

Oil of citronella , natural

article number: **6502**
Version: **2.0 en**
Replaces version of: 2020-03-05
Version: (1)

date of compilation: 2020-03-05
Revision: 2022-08-15

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

1.1 Product identifier

Identification of the substance	**Oil of citronella** , natural
Article number	6502
EC number	294-954-7
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).

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
National Poisons Information Service City Hospital	Dudley Rd	B187QH Birmingham	844 892 0111	

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
3.1O	Acute toxicity (oral)	4	Acute Tox. 4	H302
3.3	Serious eye damage/eye irritation	1	Eye Dam. 1	H318
3.4S	Skin sensitisation	1	Skin Sens. 1	H317
3.10	Aspiration hazard	1	Asp. Tox. 1	H304
4.1C	Hazardous to the aquatic environment - chronic hazard	2	Aquatic Chronic 2	H411

For full text of abbreviations: see SECTION 16

The most important adverse physicochemical, human health and environmental effects

Spillage and fire water can cause pollution of watercourses.

2.2 Label elements

Labelling

Signal word **Danger**

Pictograms

GHS05, GHS07, GHS08, GHS09

Hazard statements

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
H411	Toxic to aquatic life with long lasting effects

Precautionary statements

Precautionary statements - prevention

P273	Avoid release to the environment
P280	Wear protective gloves/eye protection

Precautionary statements - response

P301+P330+P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting
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
P310	Immediately call a POISON CENTER/doctor

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.

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
EC No	294-954-7

Impurities/additives/constituents:

Name of substance	Identifier	Wt%
Citronellal	CAS No 106-23-0 EC No 203-376-6	25 – < 50
(±)-ß-Citronellol	CAS No 106-22-9 EC No 203-375-0	10 – < 25
Geraniol	CAS No 106-24-1 EC No 203-377-1	10 – < 25
Geranyl formate	CAS No 105-86-2 EC No 203-339-4	1 – < 5
Geranyl acetate	CAS No 105-87-3 EC No 203-341-5	1 – < 5
Citronellyl acetate	CAS No 150-84-5 EC No 205-775-0	1 – < 5
D-(+)-Limonene	CAS No 5989-27-5 EC No 227-813-5	1 – < 5
Eugenol	CAS No 97-53-0 EC No 202-589-1	1 – < 5
Geranial	CAS No 141-27-5 EC No 205-476-5	< 1

Name of substance	Identifier	Wt%
Neral	CAS No 106-26-3 EC No 203-379-2	< 1
Linalool	CAS No 78-70-6 EC No 201-134-4	< 1

Substance, Specific Conc. Limits, M-factors, ATE

Specific Conc. Limits	M-Factors	ATE	Exposure route
-	-	>300 $^{mg}/_{kg}$	oral

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.

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_2)

Unsuitable extinguishing media

water jet

5.2 Special hazards arising from the substance or mixture

Combustible.

Hazardous combustion products

Carbon monoxide (CO), Carbon dioxide (CO_2), 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. Do not allow firefighting water to enter drains or water courses. 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

Use personal protective equipment as required. Avoid contact with skin, eyes and clothes. Do not breathe vapour/spray.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

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.

Measures to protect the environment

Avoid release to the environment.

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:

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/m³	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 of the mixture

Name of sub-stance	CAS No	End-point	Threshol d level	Protection goal, route of exposure	Used in	Exposure time
Citronellal	106-23-0	DNEL	9 mg/m³	human, inhalat-ory	worker (industry)	chronic - systemic effects

Relevant DNELs of components of the mixture

Name of substance	CAS No	End-point	Threshold level	Protection goal, route of exposure	Used in	Exposure time
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/cm²	human, dermal	worker (industry)	chronic - local effects
Geraniol	106-24-1	DNEL	161,6 mg/m³	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/cm²	human, dermal	worker (industry)	chronic - local effects
(±)-ß-Citronellol	106-22-9	DNEL	161,6 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
(±)-ß-Citronellol	106-22-9	DNEL	10 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
(±)-ß-Citronellol	106-22-9	DNEL	10 mg/m³	human, inhalatory	worker (industry)	acute - local effects
(±)-ß-Citronellol	106-22-9	DNEL	327,4 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects
(±)-ß-Citronellol	106-22-9	DNEL	2.950 µg/cm²	human, dermal	worker (industry)	acute - local effects
D-(+)-Limonene	5989-27-5	DNEL	66,7 mg/m³	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/m³	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/m³	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/m³	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/m³	human, inhalatory	worker (industry)	chronic - systemic effects
Linalool	78-70-6	DNEL	16,5 mg/m³	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

Relevant DNELs of components of the mixture

Name of substance	CAS No	End-point	Threshold level	Protection goal, route of exposure	Used in	Exposure time
Neral	106-26-3	DNEL	9 mg/m³	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/cm²	human, dermal	worker (industry)	chronic - local effects

Relevant PNECs of components of the mixture

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)
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)
(±)-ß-Citronellol	106-22-9	PNEC	0,002 mg/l	aquatic organisms	freshwater	short-term (single instance)
(±)-ß-Citronellol	106-22-9	PNEC	0 mg/l	aquatic organisms	marine water	short-term (single instance)
(±)-ß-Citronellol	106-22-9	PNEC	580 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)
(±)-ß-Citronellol	106-22-9	PNEC	0,026 mg/kg	aquatic organisms	freshwater sediment	short-term (single instance)
(±)-ß-Citronellol	106-22-9	PNEC	0,003 mg/kg	aquatic organisms	marine sediment	short-term (single instance)

Relevant PNECs of components of the mixture

Name of substance	CAS No	End-point	Threshold level	Organism	Environmental compartment	Exposure time
(±)-ß-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)
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)

Relevant PNECs of components of the mixture

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

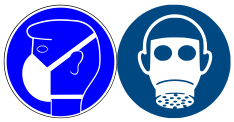
• Splash protection - Protective gloves

• type of material: NBR (Nitrile rubber)
• material thickness: >0,11 mm
• breakthrough times of the glove material: >30 minutes (permeation: level 2)

• 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	this material is combustible, but will not ignite readily
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
Solubility(ies)	
Water solubility	1,767 $^{g}/_{l}$ at 25 °C (ECHA)
Partition coefficient	
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
Density and/or relative density	
Density	0,89 $^{g}/_{cm^3}$
Relative vapour density	information on this property is not available
Particle characteristics	not relevant (liquid)
Other safety parameters	
Oxidising properties	none

9.2 Other information

Information with regard to physical hazard classes:	hazard classes acc. to GHS (physical hazards): not relevant
Other safety characteristics:	
Refractive index	1,463 – 1,475 (20 °C)

SECTION 10: Stability and reactivity

10.1 Reactivity

This material is not reactive under normal ambient conditions.

If heated

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

There are no specific conditions known which have to be avoided.

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.

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

Acute toxicity of components of the mixture

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
(±)-ß-Citronellol	106-22-9	oral	LD50	3.450 mg/kg	rat
(±)-ß-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	1.930 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

Acute toxicity of components of the mixture					
Name of substance	**CAS No**	**Exposure route**	**Endpoint**	**Value**	**Species**
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).

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

Not listed.

11.3 Information on other hazards

There is no additional information.

SECTION 12: Ecological information

12.1 Toxicity

Toxic to aquatic life with long lasting effects.

Aquatic toxicity (acute) of components of the mixture

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
(±)-ß-Citronellol	106-22-9	LC50	14,66 mg/l	fish	96 h
(±)-ß-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	EC50	1,05 mg/l	daphnia magna	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

Aquatic toxicity (acute) of components of the mixture

Name of substance	CAS No	Endpoint	Value	Species	Exposure time
Neral	106-26-3	ErC50	103,8 mg/l	algae	72 h

Aquatic toxicity (chronic) of components of the mixture

Name of substance	CAS No	Endpoint	Value	Species	Exposure time
Geraniol	106-24-1	EC50	70 mg/l	microorganisms	30 min
(±)-ß-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

Biodegradation

The substance is readily biodegradable.

12.2 Process of degradability

Degradability of components of the mixture

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
(±)-ß-Citronellol	106-22-9	biotic/abiotic	>60 %	d	modifizierter OECD Screening Test	
(±)-ß-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

Degradability of components of the mixture						
Name of substance	**CAS No**	**Process**	**Degradation rate**	**Time**	**Method**	**Source**
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 of the mixture				
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)	
(±)-ß-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)	
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	≥1,69 – ≤4,3 (ECHA)

12.5 Results of PBT and vPvB assessment

Data are not available.

12.6 Endocrine disrupting properties

Not listed.

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. Avoid release to the environment. Refer to special instructions/safety data sheets.

Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used.

13.2 Relevant provisions relating to waste

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process. Waste catalogue ordinance (Germany).

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.

SECTION 14: Transport information

14.1 UN number or ID number

ADRRID	UN 3082
IMDG-Code	UN 3082
ICAO-TI	UN 3082

14.2 UN proper shipping name

ADRRID	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)

ADRRID	9
IMDG-Code	9
ICAO-TI	9

14.4 Packing group

ADRRID	III
IMDG-Code	III
ICAO-TI	III

14.5	**Environmental hazards**	hazardous to the aquatic environment

14.6 Special precautions for user

Provisions for dangerous goods (ADR) should be complied within the premises.

14.7 Maritime 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 of dangerous goods by road, rail and inland waterway (ADR/RID/ADN) - Additional information

Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
Particulars in the transport document	UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., (Oil of citronella), 9, III, (-)
Classification code	M6
Danger label(s)	9, "Fish and tree"

Environmental hazards	yes (hazardous to the aquatic environment)
Special provisions (SP)	274, 335, 375, 601
Excepted quantities (EQ)	E1
Limited quantities (LQ)	5 L
Transport category (TC)	3
Tunnel restriction code (TRC)	-
Hazard identification No	90
Emergency Action Code	3Z

Regulations concerning the International Carriage of Dangerous Goods by Rail (RID)Additional information

Classification code	M6
Danger label(s)	9 Fish and tree

Environmental hazards	Yes Hazardous to water
Special provisions (SP)	274, 335, 375, 601
Excepted quantities (EQ)	E1
Limited quantities (LQ)	5 L
Transport category (TC)	3
Hazard identification No	90

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

SECTION 15: Regulatory information

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

Relevant provisions of the European Union (EU)

Seveso Directive

2012/18/EU (Seveso III)

No	Dangerous substance/hazard categories	Qualifying quantity (tonnes) for the application of lower and upper-tier requirements		Notes
E2	environmental hazards (hazardous to the aquatic environment, cat. 2)	200	500	57)

Notation
57) Hazardous to the Aquatic Environment in category Chronic 2

Deco-Paint Directive

VOC content	100 %

Industrial Emissions Directive (IED)

VOC content	100 %

Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

not listed

Regulation concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)

not listed

Water Framework Directive (WFD)

not listed

Regulation on the marketing and use of explosives precursors

not listed

Regulation on drug precursors

not listed

Regulation on substances that deplete the ozone layer (ODS)

not listed

Regulation concerning the export and import of hazardous chemicals (PIC)

not listed

Regulation on persistent organic pollutants (POP)

not listed

National regulations(GB)

List of substances subject to authorisation (GB REACH, Annex 14) / SVHC - candidate list

not listed

Restrictions according to GB REACH, Annex 17

Dangerous substances with restrictions (GB REACH, Annex 17)			
Name of substance	**Name acc. to inventory**	**CAS No**	**No**
Oil of citronella	this product meets the criteria for classification in accordance with Regulation No 1272/2008/EC		3

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

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
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)

Alignment to regulation:
Restructuring: section 9, section 14

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relev-ant
2.1		Classification acc. to GHS: change in the listing (table)	yes
2.1		The most important adverse physicochemical, human health and environmental effects: Spillage and fire water can cause pollution of watercourses.	yes
2.2	Labelling of packages where the contents do not exceed 125 ml: Signal word: Danger		yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes
2.2		Labelling of packages where the contents do not exceed 125 ml: change in the listing (table)	yes
2.3	Other hazards: There is no additional information.	Other hazards: This material is combustible, but will not ignite readily.	yes

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
2.3		Results of PBT and vPvB assessment: According to the results of its assessment, this substance is not a PBT or a vPvB.	yes

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
ADN	Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)
ADR	Accord relatif au transport international des marchandises dangereuses par route (Agreement concerning the International Carriage of Dangerous Goods by Road)
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
EC No	The EC Inventory (EINECS, ELINCS and the NLP-list) is the source for the seven-digit EC number, an identifier of substances commercially available within the EU (European Union)
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
GB REACH	The REACH etc. (Amendment etc.) (EU Exit) Regulations 2019, SI 2019/758 (as amended)
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

Abbr.	Descriptions of used abbreviations
log KOW	n-Octanol/water
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
VOC	Volatile Organic Compounds
vPvB	Very Persistent and very Bioaccumulative

Key literature references and sources for data

Agreement concerning the International Carriage of Dangerous Goods by Road (ADR). Regulations concerning the International Carriage of Dangerous Goods by Rail (RID). 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
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.
H411	Toxic to aquatic life with long lasting effects.

Disclaimer

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