We create chemistry

Safety data sheet

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

1.1. Product identifier

Citronellol

Chemical name: Citronellol
CAS Number: 106-22-9

REACH registration number: 01-2119453995-23-0000, 01-2119453995-23-0008

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

Relevant identified uses: Chemical, Chemical for detergents, Cosmetic and oral care chemical, flavoring substance

For the detailed identified uses of the product see appendix of the safety data sheet.

1.3. Details of the supplier of the safety data sheet

Company:
BASF SE
67056 Ludwigshafen
GERMANY

Contact address:
BASF plc
4th and 5th Floors, 2 Stockport Exchange
Railway Road, Stockport, SK1 3GG
UNITED KINGDOM

Telephone: +44 161 475 3000
E-mail address: product-safety-uk-and-ireland@basf.com

1.4. Emergency telephone number

International emergency number:
Telephone: +49 180 2273-112

SECTION 2: Hazards Identification

2.1. Classification of the substance or mixture

According to Regulation (EC) No 1272/2008 [CLP]

Skin Corr./Irrit. 2
Eye Dam./Irrit. 2
Skin Sens. 1B

H319, H315, H317

For the classifications not written out in full in this section the full text can be found in section 16.

2.2. Label elements

According to Regulation (EC) No 1272/2008 [CLP]

Pictogram:

Signal Word:
Warning

Hazard Statement:

H319	Causes serious eye irritation.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.

Precautionary Statements (Prevention):

P280	Wear protective gloves and eye/face protection.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P272	Contaminated work clothing should not be allowed out of the workplace.
P264	Wash with plenty of water and soap thoroughly after handling.

Precautionary Statements (Response):

P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333 + P311	If skin irritation or rash occurs: Call a POISON CENTER or doctor/physician.
P303 + P352	IF ON SKIN (or hair): Wash with plenty of soap and water.
P332 + P313	If skin irritation occurs: Get medical advice/attention.
P362 + P364	Take off contaminated clothing and wash it before reuse.
P337 + P311	If eye irritation persists: Call a POISON CENTER or doctor/physician.

Precautionary Statements (Disposal):

P501	Dispose of contents/container to hazardous or special waste collection point.

2.3. Other hazards

According to Regulation (EC) No 1272/2008 [CLP]

The product does not contain a substance fulfilling the PBT (persistent/bioaccumulative/toxic) criteria or the vPvB (very persistent/very bioaccumulative) criteria.

SECTION 3: Composition/Information on Ingredients

3.1. Substances

Chemical nature

Citronellol

CAS Number: 106-22-9
EC-Number: 203-375-0

For the classifications not written out in full in this section, including the hazard classes and the hazard statements, the full text is listed in section 16.

3.2. Mixtures

Not applicable

SECTION 4: First-Aid Measures

4.1. Description of first aid measures

Remove contaminated clothing.

If inhaled:
Keep patient calm, remove to fresh air, seek medical attention.

On skin contact:
Wash thoroughly with soap and water.

On contact with eyes:
Wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

On ingestion:
Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

4.2. Most important symptoms and effects, both acute and delayed
Symptoms: The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11., (Further) symptoms and / or effects are not known so far

4.3. Indication of any immediate medical attention and special treatment needed
Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

SECTION 5: Fire-Fighting Measures

5.1. Extinguishing media
Suitable extinguishing media:
carbon dioxide, foam, dry powder

5.2. Special hazards arising from the substance or mixture
carbon oxides, harmful vapours
The substances/groups of substances mentioned can be released in case of fire.

5.3. Advice for fire-fighters
Special protective equipment:
Wear a self-contained breathing apparatus.

Further information:
Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.
Cool endangered containers with water-spray.

SECTION 6: Accidental Release Measures

6.1. Personal precautions, protective equipment and emergency procedures
Use personal protective clothing. Information regarding personal protective measures see, section 8.
Ensure adequate ventilation. Do not breathe vapour/spray. Avoid contact with the skin, eyes and clothing.

6.2. Environmental precautions
Do not discharge into drains/surface waters/groundwater.

6.3. Methods and material for containment and cleaning up
For small amounts: Contain with absorbent material (e.g. sand, silica gel, acid binder, general purpose binder, sawdust).
For large amounts: Dike spillage. Pump off product.
Dispose of absorbed material in accordance with regulations.

6.4. Reference to other sections
Information regarding exposure controls/personal protection and disposal considerations can be found in section 8 and 13.

SECTION 7: Handling and Storage

7.1. Precautions for safe handling

Ensure thorough ventilation of stores and work areas. Wear suitable protective clothing and eye/face protection. Avoid contact with the skin, eyes and clothing. Keep container tightly sealed. This product may cause irritations; wash your hands after every contact.

Protection against fire and explosion:
Take precautionary measures against static discharges. Avoid all sources of ignition: heat, sparks, open flame.

7.2. Conditions for safe storage, including any incompatibilities

Suitable materials for containers: Low density polyethylene (LDPE), glass, High density polyethylene (HDPE), Aluminium, Stove-lacquer RDL 50
Further information on storage conditions: Protect from air. Containers should be stored tightly sealed in a dry place. Protect against heat.

7.3. Specific end use(s)

See exposure scenario(s) in the attachment to this safety data sheet.

SECTION 8: Exposure Controls/Personal Protection

8.1. Control parameters

Components with occupational exposure limits

No occupational exposure limits known.

PNEC
freshwater: 0.0024 mg/l

marine water: 0.00024 mg/l

intermittent release: 0.024 mg/l

STP: 580 mg/l

sediment (freshwater): 0.0256 mg/kg

sediment (marine water): 0.00256 mg/kg

soil: 0.00371 mg/kg

DNEL
worker:

Long-term exposure- systemic effects, Inhalation: 161.6 mg/m3

worker:
Long-term exposure- systemic effects, dermal: 327.4 mg/kg

worker:
Short-term exposure - local effects, dermal: 2.95 mg/cm2

consumer:
Long-term exposure- systemic effects, Inhalation: 47.8 mg/m3

consumer:
Long-term exposure- systemic effects, dermal: 196.4 mg/kg

consumer:
Long-term exposure- systemic effects, oral: 13.8 mg/kg

consumer:
Short-term exposure - local effects, dermal: 2.95 mg/cm2

worker:
Long- and short-term exposure - local effects, Inhalation: 10 mg/m3

consumer:
Long- and short-term exposure - local effects, Inhalation: 10 mg/m3

8.2. Exposure controls

Personal protective equipment

Respiratory protection:
Suitable respiratory protection for higher concentrations or long-term effect: Gas filter for gases/vapours of organic compounds (boiling point >65 °C, e. g. EN 14387 Type A)

Hand protection:
Chemical resistant protective gloves (EN 374)
Suitable materials for short-term contact (recommended: At least protective index 2, corresponding > 30 minutes of permeation time according to EN 374)
butyl rubber (butyl) - 0.7 mm coating thickness
nitrile rubber (NBR) - 0.4 mm coating thickness
Supplementary note: The specifications are based on tests, literature data and information of glove manufacturers or are derived from similar substances by analogy. Due to many conditions (e.g. temperature) it must be considered, that the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing.

Eye protection:
Safety glasses with side-shields (frame goggles) (e.g. EN 166)

Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

General safety and hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wearing of closed work clothing is required additionally to the stated personal protection equipment. Avoid contact with skin and eyes. No eating, drinking, smoking or tobacco use at the place of work. Hands and/or face should be washed before breaks and at the end of the shift. Store work clothing separately.

SECTION 9: Physical and Chemical Properties

9.1. Information on basic physical and chemical properties

Form:	oily	
Colour:	colourless	
Odour:	mild, of essential oil	
Odour threshold:	not determined	
pH value:	approx. 7	
Boiling point:	223.8 °C (1,013 hPa)	(measured)
Flash point:	107 °C	(DIN 51758, closed cup)
Evaporation rate:	not determined	
Flammability:	not flammable	
Lower explosion limit:	No data available.	
Upper explosion limit:	No data available.	
Ignition temperature:	240 °C	(DIN 51794)
Vapour pressure:	< 0.01 hPa (20 °C)	(measured)
Density:	0.8549 g/cm3 (20 °C) 0.83 g/cm³ (55 °C)	(pyknometer)
Relative density:	0.8549 (20 °C)	(pyknometer)
Relative vapour density (air):	not determined	
Solubility in water:	307 mg/l (25 °C)	
Partitioning coefficient n-octanol/water (log Kow):	3.41 (25 °C)	(Directive 92/69/EEC, A.8)

Self ignition:	Based on its structural properties the product is not classified as self-igniting.	
Thermal decomposition:	> 200 °C	
Viscosity, dynamic:	11.1 mPa.s (20 °C)	(OECD 114)
	5.33 mPa.s (40 °C)	(OECD 114)
Viscosity, kinematic:	13 mm2/s (20 °C)	(OECD 114)
	6.34 mm2/s (40 °C)	(OECD 114)
Explosion hazard:	Based on the chemical structure there is no indicating of explosive properties.	
Fire promoting properties:	Based on its structural properties the product is not classified as oxidizing.	

9.2. Other information

Self heating ability:	It is not a substance capable of spontaneous heating.	
pKA:	The substance does not dissociate.	
Adsorption/water - soil:	KOC: 70.79; log KOC: 1.85	(calculated)
Surface tension:	Based on chemical structure, surface activity is not to be expected.	
Grain size distribution:	The substance / product is marketed or used in a non solid or granular form.	
Molar mass:	156.27 g/mol	

SECTION 10: Stability and Reactivity

10.1. Reactivity

No hazardous reactions if stored and handled as prescribed/indicated.

Corrosion to metals:	No corrosive effect on metal.	
Formation of flammable gases:	Remarks:	Forms no flammable gases in the presence of water.

10.2. Chemical stability

The product is stable if stored and handled as prescribed/indicated.

10.3. Possibility of hazardous reactions

No hazardous reactions if stored and handled as prescribed/indicated.

10.4. Conditions to avoid

Avoid all sources of ignition: heat, sparks, open flame. Avoid contact with air.

10.5. Incompatible materials

Substances to avoid:
acids, bases

10.6. Hazardous decomposition products

Hazardous decomposition products:
No hazardous decomposition products if stored and handled as prescribed/indicated.

SECTION 11: Toxicological Information

11.1. Information on toxicological effects

Acute toxicity

Assessment of acute toxicity:
Of low toxicity after single ingestion. Of low toxicity after short-term skin contact.

Experimental/calculated data:
LD50 rat (oral): 3,450 mg/kg

LD50 rabbit (dermal): 2,650 mg/kg

Irritation

Assessment of irritating effects:
Skin contact causes irritation. Eye contact causes irritation.

Experimental/calculated data:
Skin corrosion/irritation rabbit: Irritant. (OECD Guideline 404)

Serious eye damage/irritation rabbit: Irritant. (Draize test)

Respiratory/Skin sensitization

Assessment of sensitization:
Sensitization after skin contact possible.

Experimental/calculated data:
Mouse Local Lymph Node Assay (LLNA) mouse: skin sensitizing (OECD Guideline 429)

Germ cell mutagenicity

Assessment of mutagenicity:
Results from a number of mutagenicity studies with microorganisms, mammalian cell culture and mammals are available. Taking into account all of the information, there is no indication that the substance is mutagenic. The product has not been fully tested. The statements have been derived in parts from products of a similar structure or composition.

Carcinogenicity

Assessment of carcinogenicity:
Did not show carcinogenic effects in animal experiments. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Reproductive toxicity

Assessment of reproduction toxicity:
The results of animal studies gave no indication of a fertility impairing effect. The results were determined in a Screening test (OECD 421/422). The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Developmental toxicity

Assessment of teratogenicity:
No indications of a developmental toxic / teratogenic effect were seen in animal studies. The results were determined in a Screening test (OECD 421/422). The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Specific target organ toxicity (single exposure)

Assessment of STOT single:
Based on available Data, the classification criteria are not met.

Repeated dose toxicity and Specific target organ toxicity (repeated exposure)

Assessment of repeated dose toxicity:
The information available on the product provides no indication of toxicity on target organs after repeated exposure. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Aspiration hazard

No aspiration hazard expected.

SECTION 12: Ecological Information

12.1. Toxicity

Assessment of aquatic toxicity:

Acutely toxic for aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish:
LC50 (96 h) 14.66 mg/l, Leuciscus idus (DIN 38412 Part 15, static)
The details of the toxic effect relate to the nominal concentration.

Aquatic invertebrates:
EC50 (48 h) 17.48 mg/l, Daphnia magna (Directive 79/831/EEC, static)
The details of the toxic effect relate to the nominal concentration. The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested.

Aquatic plants:
EC50 (72 h) 2.4 mg/l (growth rate), Scenedesmus subspicatus (DIN 38412 Part 9, static)
The details of the toxic effect relate to the nominal concentration. The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested.

Microorganisms/Effect on activated sludge:
EC10 (30 min) 580 mg/l, Pseudomonas putida (DIN 38412 Part 27 (draft), aquatic)
The details of the toxic effect relate to the nominal concentration.

Chronic toxicity to fish:
Study scientifically not justified.

Chronic toxicity to aquatic invertebrates:
Study scientifically not justified.

Assessment of terrestrial toxicity:
No data available.
Study scientifically not justified.

12.2. Persistence and degradability

Assessment biodegradation and elimination (H2O):
Readily biodegradable (according to OECD criteria).

Elimination information:
80 - 90 % BOD of the ThOD (28 d) (OECD 301F; ISO 9408; 92/69/EEC, C.4-D) (aerobic, activated sludge, domestic)

Assessment of stability in water:
Substance is readily biodegradable, therefore hydrolysis is not expected to be relevant.
Information on Stability in Water (Hydrolysis):
Study scientifically not justified.

12.3. Bioaccumulative potential

Assessment bioaccumulation potential:
Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

12.4. Mobility in soil

Assessment transport between environmental compartments:
Volatility: The substance will slowly evaporate into the atmosphere from the water surface.
Adsorption in soil: Adsorption to solid soil phase is not expected.

12.5. Results of PBT and vPvB assessment

According to Annex XIII of Regulation (EC) No.1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): The product does not fulfill the criteria for PBT (Persistent/bioaccumulative/toxic) and vPvB (very persistent/very bioaccumulative). Self classification

12.6. Other adverse effects

The substance is not listed in Regulation (EC) 1005/2009 on substances that deplete the ozone layer.

SECTION 13: Disposal Considerations

13.1. Waste treatment methods

Observe national and local legal requirements.

The UK Environmental Protection (Duty of Care) Regulations (EP) and amendments should be noted (United Kingdom).
This product and any uncleaned containers must be disposed of as hazardous waste in accordance with the 2005 Hazardous Waste Regulations and amendments (United Kingdom)

SECTION 14: Transport Information

Land transport

ADR

	Not classified as a dangerous good under transport regulations
UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

RID

	Not classified as a dangerous good under transport regulations
UN number:	Not applicable

UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

Inland waterway transport

ADN

Not classified as a dangerous good under transport regulations

UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user:	None known

Transport in inland waterway vessel

Not evaluated

Sea transport

IMDG

Not classified as a dangerous good under transport regulations

UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

Air transport

IATA/ICAO

Not classified as a dangerous good under transport regulations

UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for	None known

user

14.1. UN number
See corresponding entries for “UN number” for the respective regulations in the tables above.

14.2. UN proper shipping name
See corresponding entries for “UN proper shipping name” for the respective regulations in the tables above.

14.3. Transport hazard class(es)
See corresponding entries for “Transport hazard class(es)” for the respective regulations in the tables above.

14.4. Packing group
See corresponding entries for “Packing group” for the respective regulations in the tables above.

14.5. Environmental hazards
See corresponding entries for “Environmental hazards” for the respective regulations in the tables above.

14.6. Special precautions for user
See corresponding entries for “Special precautions for user” for the respective regulations in the tables above.

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Regulation:	Not evaluated
Shipment approved:	Not evaluated
Pollution name:	Not evaluated
Pollution category:	Not evaluated
Ship Type:	Not evaluated

SECTION 15: Regulatory Information

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

Prohibitions, Restrictions and Authorizations

Annex XVII of Regulation (EC) No 1907/2006: Number on List: 3

The data should be considered when making any assessment under the Control of Substances Hazardous to Health Regulations (COSHH), and related guidance, for example, 'COSHH Essentials' (United Kingdom).

If other regulatory information applies that is not already provided elsewhere in this safety data sheet, then it is described in this subsection.

15.2. Chemical Safety Assessment

Chemical Safety Assessment performed

SECTION 16: Other Information

Assessment of the hazard classes according to UN GHS criteria (most recent version)

Acute Tox. 5 (oral)
Acute Tox. 5 (dermal)
Skin Corr./Irrit. 2
Aquatic Acute 2
Eye Dam./Irrit. 2A
Skin Sens. 1B

Any other intended applications should be discussed with the manufacturer. Corresponding occupational protection measurements must be followed.

Full text of the classifications, including the hazard classes and the hazard statements, if mentioned in section 2 or 3:

Skin Corr./Irrit.	Skin corrosion/irritation
Eye Dam./Irrit.	Serious eye damage/eye irritation
Skin Sens.	Skin sensitization
H319	Causes serious eye irritation.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.

If you have any queries relating to this MSDS, it's contents or any other product safety related questions, please write to the following e-mail address: product-safety-uk-and-ireland@basf.com

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. This safety data sheet is neither a Certificate of Analysis (CoA) nor technical data sheet and shall not be mistaken for a specification agreement. Identified uses in this safety data sheet do neither represent an agreement on the corresponding contractual quality of the substance/mixture nor a contractually designated use. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.

Annex: Exposure Scenarios

Index

1. Use in/as Formulation
ERC2; PROC1, PROC2, PROC3, PROC5, PROC8b, PROC15

2. Formulation
ERC2; PROC1, PROC2, PROC3, PROC5, PROC8b, PROC9, PROC14, PROC15

3. Use in Cleaning Agents, (use in industrial settings)
PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13; PC35

4. Use in Cleaning Agents, (use in professional settings)
ERC8d; PROC5, PROC6, PROC8, PROC9, PROC8a, PROC8b, PROC10, PROC11, PROC19

5. Use in Cleaning Agents, (consumer use)
ERC8d; PROC5, PROC6, PROC8, PROC9; PC31, PC35

6. Use in/as Air care products, (consumer use)
ERC8a; PC3

7. Use in Personal care products, (consumer use)
ERC8d; PC28, PC39

8. Consumer applications
ERC8d; PC8, PC9a, PC9b, PC9c, PC18; AC31, AC32, AC34, AC35, AC36

****

1. Short title of exposure scenario

Use in/as Formulation
ERC2; PROC1, PROC2, PROC3, PROC5, PROC8b, PROC15

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC2: Formulation of preparations
Operational conditions	
Annual amount per site	950,000 kg
Minimum emission days per year Continuous	250
Emission factor air	2.5 %
Emission factor water	0.05 %
Emission factor soil	0.01 %

	REACH exposure scenarios for fragrances, released 2010
Receive Surf. Water (Flow Rate).	18,000 m3/d
Dilution factor river	10
Dilution factor coast	100
Other Factors: Environment	Indoor use.
Risk Management Measures	
	No special measures are required.
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	2,000 m3/d
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Environment
Risk Characterization Ratio (RCR)	0.2157
	Risk from environmental exposure is driven by freshwater sediment.
Maximum amount of safe use	529 kg/d
Risk from environmental exposure is driven by freshwater sediment.	

Contributing exposure scenario	
Use descriptors covered	PROC1: Use in closed process, no likelihood of exposure. PROC3: Use in closed batch process (synthesis or formulation). Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 100 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0.034 hPa
Duration and Frequency of activity	480 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Wear chemically resistant gloves in combination with ‘basic’ employee training.	Effectiveness: 90 %
Use suitable eye protection.	
Risk Management Measures are based on qualitative risk characterisation.	
Exposure estimate and reference to its source	
PROC1	

Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	0.07 mg/m³
Risk Characterization Ratio (RCR)	0.000
PROC1	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	10.0 µg/cm³
Risk Characterization Ratio (RCR)	0.000
PROC1	
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.03 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.01
PROC3	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.54 mg/m³
Risk Characterization Ratio (RCR)	0.124
PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	10 µg/cm³
Risk Characterization Ratio (RCR)	0.000
PROC3	
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves and working clothes have been considered additionally.
	Consumer - dermal, long-term - systemic
Exposure estimate	0.03 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001
Additional good practice advice	
Keep substance away from direct sunlight. When not in use, keep containers tightly closed. Store substance in dry places. Store substance in cool places. Store substance in well ventilated places. Segregate substance from incompatible materials.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC2: Use in closed, continuous process with occasional controlled exposure. Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 100 %

Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0.034 hPa
Duration and Frequency of activity	480 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
Use suitable eye protection.	
Risk Management Measures are based on qualitative risk characterisation.	
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	6.51 mg/m³
Risk Characterization Ratio (RCR)	0.04
Assessment method	ECETOC TRA modified version: Use of gloves has been considered additionally., ECETOC TRA v2.0 Worker; modified version
	Worker - dermal, long-term - local
Exposure estimate	20.0 µg/cm³
Risk Characterization Ratio (RCR)	0.001
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.14 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.03
Additional good practice advice	
Keep substance away from direct sunlight. When not in use, keep containers tightly closed. Store substance in dry places. Store substance in cool places. Store substance in well ventilated places. Segregate substance from incompatible materials.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 100 %

Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0.034 hPa
Duration and Frequency of activity	240 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
Use suitable eye protection.	
Risk Management Measures are based on qualitative risk characterisation.	
Exposure estimate and reference to its source	
PROC5	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	19.54 mg/m³
Risk Characterization Ratio (RCR)	0.121
PROC5	
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	200.0 µg/cm³
Risk Characterization Ratio (RCR)	0.007
PROC5	
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	1.37 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.03
Additional good practice advice	
Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol

	Content: >= 0 % - <= 20 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0.034 hPa
Duration and Frequency of activity	480 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
Use suitable eye protection.	Effectiveness: 90 %
Risk Management Measures are based on qualitative risk characterisation.	
Exposure estimate and reference to its source	
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	6.51 mg/m³
Risk Characterization Ratio (RCR)	0.04
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker; modified version, ECETOC TRA modified version: Use of gloves has been considered additionally., The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - local
Exposure estimate	20 µg/cm³
Risk Characterization Ratio (RCR)	0.007
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.14 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.003
Additional good practice advice	
Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	
Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 100 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0.034 hPa
Duration and Frequency of activity	60 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Wear chemically resistant gloves in combination with 'basic' employee training.	Effectiveness: 90 %
Use suitable eye protection.	
Risk Management Measures are based on qualitative risk characterisation.	
Exposure estimate and reference to its source	
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	6.51 mg/m³
Risk Characterization Ratio (RCR)	0.04
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	100.0 µg/cm³
Risk Characterization Ratio (RCR)	0.003
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.69 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.015
PROC15	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	6.51 mg/m³
Risk Characterization Ratio (RCR)	0.04

PROC15	
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	10.0 µg/cm³
Risk Characterization Ratio (RCR)	0.000
PROC15	
Assessment method	ECETOC TRA v2.0 Worker, Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.03 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001
Additional good practice advice	
Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	

Contributing exposure scenario	
Use descriptors covered	PROC15: Use a laboratory reagent. Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 20 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0.034 hPa
Duration and Frequency of activity	240 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Wear chemically resistant gloves in combination with ‘basic’ employee training.	Effectiveness: 90 %
Use suitable eye protection.	
Risk Management Measures are based on qualitative risk characterisation.	
Exposure estimate and reference to its source	
PROC15	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic

Exposure estimate	3.91 mg/m³
Risk Characterization Ratio (RCR)	0.024
PROC15	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	2.0 µg/cm³
Risk Characterization Ratio (RCR)	0.000
PROC15	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.01 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000
Additional good practice advice	
Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	
Please note that a modified version has been used (see exposure estimates)	

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2. Short title of exposure scenario

Formulation
ERC2; PROC1, PROC2, PROC3, PROC5, PROC8b, PROC9, PROC14, PROC15

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	ERC2: Formulation of preparations
Operational conditions	
Annual amount per site	950,000 kg
Minimum emission days per year Continuous	220
Emission factor air	0 %
Emission factor water	3 %
Emission factor soil	0 %
Receive Surf. Water (Flow Rate).	18,000 m3/d

Dilution factor river	10
Dilution factor coast	100
Risk Management Measures	
Type of STP	Municipal STP
Assumed sewage treatment plant flow (m3/d)	2,000 m3/d
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Environment
Risk Characterization Ratio (RCR)	0.837
	Risk from environmental exposure is driven by freshwater sediment.
Maximum amount of safe use	11 kg/d
Risk from environmental exposure is driven by marine sediment.	

Contributing exposure scenario	
Use descriptors covered	PROC1: Use in closed process, no likelihood of exposure. PROC2: Use in closed, continuous process with occasional controlled exposure. PROC3: Use in closed batch process (synthesis or formulation). PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 20 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0.034 hPa
Duration and Frequency of activity	240 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Wear chemically resistant gloves in combination with ‘basic’ employee training.	Effectiveness: 90 %
Use suitable eye protection.	
Risk Management Measures are based on qualitative risk characterisation.	
Exposure estimate and reference to its source	
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The

	concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	0.01 mg/m³
Risk Characterization Ratio (RCR)	0.000
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	2.0 µg/cm³
Risk Characterization Ratio (RCR)	0.000
PROC1	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.01 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000
PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	0.78 mg/m³
PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	4.0 µg/cm³
Risk Characterization Ratio (RCR)	0.000
PROC2	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.03 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001
PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	2.34 mg/m³

Risk Characterization Ratio (RCR)	0.015
PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	2.0 µg/cm³
Risk Characterization Ratio (RCR)	0.000
PROC3	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.01 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000
PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	3.91 mg/m³
Risk Characterization Ratio (RCR)	0.024
PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - systemic
Exposure estimate	0.27 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.006
PROC5	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach., ECETOC TRA modified version: Use of gloves has been considered additionally.
	Worker - dermal, long-term - local
Exposure estimate	40 µg/cm³
Risk Characterization Ratio (RCR)	0.001
Additional good practice advice	
Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	
Please note that a modified version has been used (see exposure estimates)	

Contributing exposure scenario

Use descriptors covered	PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing). PROC14: Production of preparations or articles by tabletting, compression, extrusion, pelettisation. PROC15: Use a laboratory reagent. PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 0.5 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0.034 hPa
Duration and Frequency of activity	480 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Exposure estimate and reference to its source	
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	0.16 mg/m³
Risk Characterization Ratio (RCR)	0.001
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - local
Exposure estimate	5.0 µg/cm³
Risk Characterization Ratio (RCR)	0.000
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - systemic
Exposure estimate	0.03 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.01
PROC9	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	0.16 mg/m³

Risk Characterization Ratio (RCR)	0.001
PROC9	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - local
Exposure estimate	5.0 µg/cm³
Risk Characterization Ratio (RCR)	0.000
PROC9	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - systemic
Exposure estimate	0.03 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.001
PROC14	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	0.16 mg/m³
Risk Characterization Ratio (RCR)	0.001
PROC14	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - systemic
Exposure estimate	0.02 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000
PROC14	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - local
Exposure estimate	2.5 µg/cm³
Risk Characterization Ratio (RCR)	0.000
PROC15	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - inhalation, long-term - systemic
Exposure estimate	0.16 mg/m³
Risk Characterization Ratio (RCR)	0.001
PROC15	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - systemic
Exposure estimate	0.00 mg/kg bw/day

Risk Characterization Ratio (RCR)	0.000
PROC15	
Assessment method	ECETOC TRA v2.0 Worker; modified version, The concentration of the substance has been considered using a linear approach.
	Worker - dermal, long-term - local
Exposure estimate	0.5 µg/cm³
Risk Characterization Ratio (RCR)	0.000
Additional good practice advice	
Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.	
Guidance to Downstream Users	
For scaling see: http://www.ecetoc.org/tra	
Please note that a modified version has been used (see exposure estimates)	

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3. Short title of exposure scenario

Use in Cleaning Agents, (use in industrial settings)
PROC5, PROC7, PROC8a, PROC8b, PROC10, PROC13; PC35

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact). PROC7: Industrial spraying PROC8a: Transfer of substance or preparation (charging/discharging) from/to ves-sels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring. PC35: Washing and Cleaning Products (including solvent based products). Use domain: industrial
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 1 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0.034 hPa
Duration and Frequency of activity	240 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	

Provide basic employee training to prevent/minimize exposures.	
Exposure estimate and reference to its source	
PROC5	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1.95 mg/m³
Risk Characterization Ratio (RCR)	0.012
PROC5	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.37 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.03
PROC5	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	200 µg/cm³
Risk Characterization Ratio (RCR)	0.007
PROC7	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	39.08 mg/m³
Risk Characterization Ratio (RCR)	0.241
PROC7	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	4.29 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.094
PROC7	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	200 µg/cm³
Risk Characterization Ratio (RCR)	0.007
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.91 mg/m³
Risk Characterization Ratio (RCR)	0.024
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.37 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.03
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	100 µg/cm³
Risk Characterization Ratio (RCR)	0.003
PROC8b	

Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	1.95 mg/m³
Risk Characterization Ratio (RCR)	0.012
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.69 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.015
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	100 µg/cm³
Risk Characterization Ratio (RCR)	0.003
PROC10	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.91 mg/m³
Risk Characterization Ratio (RCR)	0.024
PROC10	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.74 mg/m³
Risk Characterization Ratio (RCR)	0.06
PROC10	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	200 µg/cm³
Risk Characterization Ratio (RCR)	0.007
PROC13	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	3.91 mg/m³
Risk Characterization Ratio (RCR)	0.024
PROC13	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.37 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.03
PROC13	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	200 µg/cm³
Risk Characterization Ratio (RCR)	0.007
Additional good practice advice	
Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.	
Guidance to Downstream Users	

For scaling see: http://www.ecetoc.org/tra

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4. Short title of exposure scenario

Use in Cleaning Agents, (use in professional settings)
ERC8d; PROC5, PROC6, PROC8, PROC9, PROC8a, PROC8b, PROC10, PROC11, PROC19

Control of exposure and risk management measures

Contributing exposure scenario		
Use descriptors covered	ERC8d: Wide dispersive outdoor use of processing aids in open systems	
Operational conditions		
Annual amount for wide disperse uses	950,000 kg	
Minimum emission days per year Dispersive use	365	
Emission factor air	90 %	
Emission factor water	10 %	
Emission factor soil	0 %	
Receive Surf. Water (Flow Rate).	18,000 m3/d	
Dilution factor river	10	
Dilution factor coast	100	
Other Factors: Environment	Outdoor use.	
Risk Management Measures		
	No special measures are required.	
Type of STP		Municipal STP
Assumed sewage treatment plant flow (m3/d)		2,000 m3/d
Exposure estimate and reference to its source		
Assessment method	ECETOC TRA v2.0 Environment	
Risk Characterization Ratio (RCR)	0.203	
	Risk from environmental exposure is driven by freshwater.	
Maximum amount of safe use	2,564 kg/d	
Risk from environmental exposure is driven by freshwater sediment.		

Contributing exposure scenario	
Use descriptors covered	PROC8a: Transfer of substance or preparation (charging/discharging) from/to ves-sels/large containers at non-dedicated facilities PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large

	containers at dedicated facilities PROC10: Roller application or brushing PROC11: Non industrial spraying PROC19: Hand-mixing with intimate contact and only PPE available. PC31: Polishes and Wax Blends., PC35: Washing and Cleaning Products (including solvent based products). Use domain: professional
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 1 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0.034 hPa
Duration and Frequency of activity	480 min 220 days per year
Indoor/Outdoor	Indoor
Risk Management Measures	
Provide basic employee training to prevent/minimize exposures.	
Exposure estimate and reference to its source	
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.28 mg/m³
Risk Characterization Ratio (RCR)	0.101
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	1.37 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.03
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	100 µg/cm³
Risk Characterization Ratio (RCR)	0.003
PROC8b	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	6.51 mg/m³
Risk Characterization Ratio (RCR)	0.04
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	0.69 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.015
PROC8a	
Assessment method	ECETOC TRA v2.0 Worker

	Worker - dermal, long-term - local
Exposure estimate	100 µg/cm³
Risk Characterization Ratio (RCR)	0.003
PROC10	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.28 mg/m³
Risk Characterization Ratio (RCR)	0.101
PROC10	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	2.74 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.06
PROC10	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	200 µg/cm³
Risk Characterization Ratio (RCR)	0.007
PROC11	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	65.13 mg/m³
Risk Characterization Ratio (RCR)	0.403
PROC11	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	10.71 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.234
PROC11	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	500 µg/cm³
Risk Characterization Ratio (RCR)	0.017
PROC19	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - inhalation, long-term - systemic
Exposure estimate	16.28 mg/m³
Risk Characterization Ratio (RCR)	0.101
PROC19	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - systemic
Exposure estimate	14.14 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.309
PROC19	
Assessment method	ECETOC TRA v2.0 Worker
	Worker - dermal, long-term - local
Exposure estimate	500 µg/cm³
Risk Characterization Ratio (RCR)	0.007
Additional good practice advice	

Keep substance away from direct sunlight. Store substance in cool places. Store substance in dry places. Store substance in well ventilated places. Segregate substance from incompatible materials. When not in use, keep containers tightly closed.
Guidance to Downstream Users
For scaling see: http://www.ecetoc.org/tra

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5. Short title of exposure scenario

Use in Cleaning Agents, (consumer use)
ERC8d; PROC5, PROC6, PROC8, PROC9; PC31, PC35

Control of exposure and risk management measures

Contributing exposure scenario		
Use descriptors covered	ERC8d: Wide dispersive outdoor use of processing aids in open systems	
Operational conditions		
Annual amount for wide disperse uses	950,000 kg	
Minimum emission days per year Dispersive use	365	
Emission factor air	90 %	
Emission factor water	10 %	
Emission factor soil	0 %	
Receive Surf. Water (Flow Rate).	18,000 m3/d	
Dilution factor river	10	
Dilution factor coast	100	
Other Factors: Environment	Outdoor use.	
Risk Management Measures		
	No special measures are required.	
Type of STP		Municipal STP
Assumed sewage treatment plant flow (m3/d)		2,000 m3/d
Exposure estimate and reference to its source		
Assessment method	ECETOC TRA v2.0 Environment	
Risk Characterization Ratio (RCR)	0.203	
	Risk from environmental exposure is driven by freshwater.	
Maximum amount of safe use	2,564 kg/d	
Risk from environmental exposure is driven by freshwater sediment.		

Contributing exposure scenario	
Use descriptors covered	SU21: Consumer uses PC31: Polishes and Wax Blends., PC35: Washing and Cleaning Products (including solvent based products)., Furniture, floor and leather care, Laundry regular, Laundry compact, Fabric conditioners, Laundry additives, Hand dishwashing liquids, Machine dishwashing products, Surface cleaning, Laundry aids, Wipes
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 0.5 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0.034 hPa
Duration and Frequency of activity	Exposure duration:
Duration and Frequency of activity	Application duration:
Duration and Frequency of activity	Spray duration: Relevant for the spraying process.
Indoor/Outdoor	Indoor
Release area	
Risk Management Measures	
Consumer Measures	Ensure spraying away from persons.
	Relevant for the spraying process.
Exposure estimate and reference to its source	
PC31	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	1.18 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.0429
PC31	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0.0080 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00504
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0.245 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.0089
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)

	Consumer - dermal, long-term - systemic
Exposure estimate	0.245 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.366
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0.0156 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000568
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0.236 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00858
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0.015 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00545
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - oral, long-term - systemic
Exposure estimate	0.0000 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00000
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - oral, long-term - systemic
Exposure estimate	0.0000 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00000
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0.914 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.0332
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0.0060 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000378
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic

Exposure estimate	0.0083 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00303
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0.0128 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000804
PC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0.458 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.0167

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6. Short title of exposure scenario

Use in/as Air care products, (consumer use)
ERC8a; PC3

Control of exposure and risk management measures

Contributing exposure scenario	
Use descriptors covered	SU21: Consumer uses PC3: Air care products., Air care products (non-aerosol), Air care products (aerosol)
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 1 % Relevant for air care products (aerosol)
	Citronellol Content: >= 0 % - <= 100 % Relevant for air care products (non-aerosol)
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0.034 hPa
Duration and Frequency of activity	Exposure duration:
Duration and Frequency of activity	Application duration:
Duration and Frequency of activity	Spray duration: Relevant for the spraying process.
Indoor/Outdoor	Indoor
Release area	
Risk Management Measures	
Consumer Measures	Ensure spraying away from persons.

Exposure estimate and reference to its source	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0.0596 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00375
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0.0494 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00311

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7. Short title of exposure scenario

Use in Personal care products, (consumer use)
ERC8d; PC28, PC39

Control of exposure and risk management measures

Contributing exposure scenario		
Use descriptors covered	ERC8d: Wide dispersive outdoor use of processing aids in open systems	
Operational conditions		
Annual amount for wide disperse uses	950,000 kg	
Minimum emission days per year Dispersive use	365	
Emission factor air	90 %	
Emission factor water	10 %	
Emission factor soil	0 %	
Receive Surf. Water (Flow Rate).	18,000 m3/d	
Dilution factor river	10	
Dilution factor coast	100	
Other Factors: Environment	Outdoor use.	
Risk Management Measures		
	No special measures are required.	
Type of STP		Municipal STP
Assumed sewage treatment plant flow (m3/d)		2,000 m3/d
Exposure estimate and reference to its source		
Assessment method	ECETOC TRA v2.0 Environment	
Risk Characterization Ratio (RCR)	0.203	

	Risk from environmental exposure is driven by freshwater.
Maximum amount of safe use	2,564 kg/d
Risk from environmental exposure is driven by freshwater sediment.	

Contributing exposure scenario	
Use descriptors covered	SU21: Consumer uses PC28: Perfumes, Fragrances., PC39: Cosmetics, personal care products. In accordance to the Article 14 (5b) of the REACh Regulation (EC) No 1907/2006, exposure estimation and risk characterisation needs not to be performed for end uses in cosmetic products within the scope of Directive EC 1223/2009.

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8. Short title of exposure scenario

Consumer applications
ERC8d; PC8, PC9a, PC9b, PC9c, PC18; AC31, AC32, AC34, AC35, AC36

Control of exposure and risk management measures

Contributing exposure scenario		
Use descriptors covered	ERC8d: Wide dispersive outdoor use of processing aids in open systems	
Operational conditions		
Annual amount for wide disperse uses	950,000 kg	
Minimum emission days per year Dispersive use	365	
Emission factor air	90 %	
Emission factor water	10 %	
Emission factor soil	0 %	
Receive Surf. Water (Flow Rate).	18,000 m3/d	
Dilution factor river	10	
Dilution factor coast	100	
Other Factors: Environment	Outdoor use.	
Risk Management Measures		
	No special measures are required.	
Type of STP		Municipal STP

Assumed sewage treatment plant flow (m3/d)	2,000 m3/d
Exposure estimate and reference to its source	
Assessment method	ECETOC TRA v2.0 Environment
Risk Characterization Ratio (RCR)	0.203
	Risk from environmental exposure is driven by freshwater.
Maximum amount of safe use	2,564 kg/d
Risk from environmental exposure is driven by freshwater sediment.	

Contributing exposure scenario	
Use descriptors covered	PC8: Biocidal Products. In accordance to the Article 15 (2) of the REACh Regulation (EC) No 1907/2006, exposure estimation and risk characterisation needs not to be performed for end uses in biocidal products within the scope of Regulation (EU) 528/2012.

Contributing exposure scenario	
Use descriptors covered	SU21: Consumer uses PC18: Ink and Toners., PC9a: Coatings and paints, thinners, paint removers, PC9b: Fillers, putties, plasters, modelling clay, PC9c: Finger paints, Surface cleaning, Hand dishwashing liquids
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 0.5 %
Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0.034 hPa
Duration and Frequency of activity	Exposure duration:
Duration and Frequency of activity	Application duration:
Duration and Frequency of activity	Spray duration: Relevant for the spraying process.
Indoor/Outdoor	Indoor
Release area	
Risk Management Measures	
Consumer Measures	Ensure spraying away from persons.
	Relevant for the spraying process.
Exposure estimate and reference to its source	
PC9a	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0.914 mg/kg bw/day

Risk Characterization Ratio (RCR)	0.0332
	Calculated as PC35
PC9a	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0.006 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000378
	Calculated as PC35
PC9b	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0.914 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.0332
	Calculated as PC35
PC9b	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0.006 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000378
	Calculated as PC35
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0.015 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000545
	Calculated as PC35
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - oral, long-term - systemic
Exposure estimate	0.0000 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000002
	Calculated as PC35
PC18	
	Exposure is considered negligible.

Contributing exposure scenario	
Use descriptors covered	SU21: Consumer uses Fabric conditioners, Wipes, Air care products (aerosol) AC31: Scented clothes AC32: Scented eraser AC34: Scented toys AC35: Scented paper articles AC36: Scented CD
Operational conditions	
Concentration of the substance	Citronellol Content: >= 0 % - <= 1 %

Physical state	Liquid, low fugacity
Vapour pressure of the substance during use	0.034 hPa
Duration and Frequency of activity	Exposure duration:
Duration and Frequency of activity	Spray duration: Relevant for the spraying process.
Duration and Frequency of activity	Application duration:
Indoor/Outdoor	Indoor
Release area	
Risk Management Measures	
Consumer Measures	Ensure spraying away from persons.
	Relevant for the spraying process.
Exposure estimate and reference to its source	
AC31	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0.0156 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000568
	Calculated as PC35
AC32	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0.458 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.0167
	Calculated as PC35
AC34	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0.0156 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.000568
	Calculated as PC35
AC35	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - dermal, long-term - systemic
Exposure estimate	0.458 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.0167
	Calculated as PC35
AC36	
Assessment method	AISE Reach Exposure Assessment Consumer Tool (REACT)
	Consumer - inhalation, long-term - systemic
Exposure estimate	0.0596 mg/kg bw/day
Risk Characterization Ratio (RCR)	0.00375

	Calculated as PC35

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