1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product Identifier

Citriodiol® 19.9% Emulsion

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

This is a ready to use insect repellent containing Citriodiol® as the active ingredient.

1.3. Details of the supplier of the safety data sheet

Citrefine International Limited
Moorfield Road
Yeadon
Leeds
LS19 7BN
UK

Tel: +44 (0)113 238 7900
Fax: +44 (0)113 202 9900
enquiries@citrefine.com
http://www.citrefine.com

1.4. Emergency telephone number

Tel: +44 (0)113 238 7900 Mon-Fri 9am-5pm GMT

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

EC Regulation 1272/2008
Hazard Classes and Categories: Serious eye damage/serious eye irritation category 2
Hazard Statements: H319 - Causes serious eye irritation

2.2 Label Elements

Product Identifier	Citriodiol® 19.9% Emulsion
GHS Pictogram	
Signal Word	Warning
Hazard Statement	Causes serious eye irritation (H319) Contains citronellal, citronellol, eucalyptol, limonene, and linalool. May produce an allergic reaction (EUH208)
Precautionary Statement Prevention	Keep out of reach of children (P102) Use only outdoors or in a well-ventilated area (P271) Keep away from open flames – No smoking (P210)
Precautionary Statement Response	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. (P305 + P351 + P338) IF SWALLOWED: Get medical advice/attention if you feel unwell. (P301+P314)
Precautionary Statement Disposal	Dispose of container/contents in accordance with local regulation. (P501)

2.3 Other Hazards

This substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII

For full text of all codes see Section 16

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Components of Citriodiol® 19.9% Emulsion:

Component	REACH Reg. No.	EC No.	CAS No.*	Classification According to Regulation (EC)1272/2008	Concentration in mixture
Eucalyptus citriodora oil, hydrated, cyclized (Citriodiol®)	n/a		1245629-80-4	Eye Irrit. 2: H319	<20% *w/w*
Ethanol	01-2119457610-43-XXXX	200-578-6	64-17-5	Flam. Liq. 2: H225,	0-10% w/*w*
3-(2-Ethylhexyloxy)propan-1,2-diol	01-0000015745-65-0001	408-080-2	70445-33-9	Eye Dam. 1: H318, Acute tox 4 :H332 Aquatic Chr. 3:H412	0-2% w/*w*

4. FIRST AID MEASURES

4.1 Description of first aid measures

General	In case of accident or if you feel unwell, seek medical advice and show the label if possible.
Inhalation	May cause nausea, headache, dizziness and intoxication. Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.
Ingestion	May cause discomfort if swallowed. May cause nausea, headache, dizziness and intoxication. Rinse mouth thoroughly. Do not induce vomiting. Seek medical attention if symptoms persist.
Skin contact	Wash skin thoroughly with soap and water. Get medical attention if any discomfort continues.
Eye contact	May irritate eyes. Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water or eye wash solution while lifting the eye lids. Continue to rinse for at least 15 minutes. Contact physician if irritation persists.

4.2 Most important symptoms and effects, both acute and delayed

In cases of ingestion, central nervous system depression. Danger of serious eye irritation. Temporary skin irritation after direct contact on sensitive people.

4.3 Indication of any immediate medical attention and special treatment needed

No specific symptoms associated with exposure to this mixture.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Dry powder, alcohol resistant foam, carbon dioxide

Unsuitable extinguishing media

Water Jet (Citriodiol® 19.9% Emulsion is insoluble in water)

5.2 Special hazards arising from the substance or mixture

As a mixture of organic compounds, combustion of Citriodiol® 19.9% Emulsion can produce oxides of carbon.

5.3 Advice for firefighters

Wear self-contained breathing apparatus and a chemical protective suit. Fight fire from a safe distance and stay upwind. Do not allow extinguishing water to reach ground water or sewage system.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions, protective equipment and emergency procedures

Use personal protective equipment if required.

6.2 Environmental Procedures

Do not allow product to enter drains or ground water.

6.3 Methods and material for containment and cleaning up

Extinguish all ignition sources. Avoid sparks, flames, heat & smoking. Ventilate. Stop leak if possible without risk. Absorb with sand or other inert absorbent. Collect in containers and seal securely. Containers with collected spillage must be properly labelled with correct contents and hazard symbol.

6.4 Reference to other sections

For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with eyes. Handle in accordance with good industrial hygiene and safety practices. Wash hands afters use.

7.2 Conditions for safe storage, including any incompatibilities

Store in tightly closed original container in a dry, cool and well ventilated place. Keep away from heat, sparks and open flames.

7.3 Specific end uses

Citriodiol® 19.9% Emulsion is a ready to use insect repellent.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

8.1 Control Parameters

Name	Std	LT – ppm	LT – mg/m3	ST – ppm	ST – mg/m3
ETHANOL	WEL	1000 ppm	1920 mg/m3	N/A	N/A

WEL = Workplace Exposure Limits

8.2 Exposure Controls

Appropriate engineering controls

Provide adequate ventilation to minimise the risk of inhalation of vapours.

Eye/face protection

Use safety glasses or eye protection tested and approved under appropriate government standards, for example EN 166. If handling large amounts a face shield may be more suitable.

Respiratory Equipment

Under normal usage conditions respiratory protection will not be necessary. Protection may be required under exceptional circumstances, for example when excessive air contamination exists.

Hand Protection

Wear suitable protective gloves. Gloves selected should meet the standards set out in EN 374. Suitable material would be nitrile rubber.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Physical state	Liquid
b)	Colour	White
c)	Odour	Characteristic, citrus
d)	Melting point/freezing point	No data available
e)	Boiling point or initial boiling point and boiling range	No data available
f)	Flammability (solid, liquid, gas)	43.5°C[1]
g)	Lower and upper explosion limit	No data available
h)	Flash point	No data available
i)	Auto-ignition temperature	No data available
j)	Decomposition Temperature	No data available
k)	pH	No data available
l)	Kinematic viscosity	No data available
m)	Solubility	No data available
n)	Partition coefficient: n-octanol/water	No data available
o)	Vapour pressure	No data available
p)	Density and/or relative density	No data available
q)	Relative vapour density	No data available
r)	Particle characteristics	No data available

9.2 Other information

No data available

[1] While this flashpoint is sufficient for classification as a flammable liquid, further sustained combustibility testing has been performed in accordance with the UN Transport "Manual of Tests and Criteria, Part III, subsection 32.5.2". The result was that the material did not sustain combustion and therefore is not classified as flammable.

10. STABILITY AND REACTIVITY

10.1 Reactivity

No data available. Product is not expected to react under normal storage conditions.

10.2 Chemical stability

Stable under ambient conditions

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

Heat, sparks and open flame

10.5 Incompatible materials

Strong oxidising agents

10.6 Hazardous decomposition products

No data available

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

	Endpoint	Value	Test method
a)	Acute Toxicity	**Citriodiol®**	
		Rat LD_{50} oral: >2000 mg/kg	OECD 401
		Rat LD_{50} dermal: >2000 mg/kg	OECD 402
		Rat LC_{50} inhalation determined on 50% aerosol spray > 2.06 mg/L: equivalent to >1.03mg/L for Citriodiol®	EPA/FIFRA Guideline 81-3
		Ethanol	
		Rat LD_{50} oral: >2000 mg/kg (literature)	OECD 401
		Mouse LC_{50} inhalation: >20 mg/kg 4h (literature)	
		Rabbit LD_{50} dermal: >2000 mg/kg (literature)	OECD 402
		3-(2-Ethylhexyloxy)propan-1,2-diol	
		Rat LD_{50} dermal: >2000 mg/kg	OECD 402
		Rat LD_{50} oral: >2000 mg/kg	OECD 401
		Rat LC_{50} inhalation 3.07mg/L	OECD403
b)	Skin corrosion/irritation	**Citriodiol®**	
		Skin – Mild irritant (not sufficient for classification)	OECD 404
		Ethanol	
		Rabbit: Skin – not irritating (literature)	OECD 404

		3-(2-Ethylhexyloxy)propan-1,2-diol	
		Mildly irritant - does not need to be labelled	OECD 404
		No corrosivity study conducted but no components are classified as corrosive and material has a pH between 6.5-9	
c)	Serious eye damage/irritation	**Citriodiol®**	
		Moderate irritant	OECD 405
		Ethanol	
		Rabbit, Result: slightly irritating	literature value
		3-(2-Ethylhexyloxy)propan-1,2-diol	
		Risk of serious damage to eyes., concentrate	OECD 405
		Mildly irritant - does not need to be labelled,- 5 % solution	OECD 405
d)	Respiratory or skin sensitisation	**Citriodiol®**	
		Non sensitiser	OECD 406
		Ethanol	
		Guinea pig: not sensitising (literature)	OECD 406
		3-(2-Ethylhexyloxy)propan-1,2-diol	
		Guinea pig: not sensitising (literature)	Buehler Test
e)	Germ Cell Mutagenicity	**Citriodiol®**	
		Not genotoxic	OECD 471, OECD
		Ethanol	473, OECD 474
		Ames Test: not mutagenic (literature)	
		3-(2-Ethylhexyloxy)propan-1,2-diol	OECD 471
		Ames Test: not mutagenic	OECD 471
		Micronucleus Test, not mutagenic	OECD 474
f)	Carcinogenicity	No study conducted. No carcinogenic potential identified in components for which data are available.	
g)	Toxicity for reproduction	**Citriodiol®**	OPPTS 870.3800
		No reproductive toxicity and no adverse systemic effects	
		3-(2-Ethylhexyloxy)propan-1,2-diol	
		Rat oral NOAEL 800mg/kg	OECD 414
h)	STOT-single exposure	This mixture does not meet the criteria for classification as for STOT single exposure	
i)	STOT- Repeated exposure	This mixture does not meet the criteria for classification as for STOT repeated exposure	
j)	Aspiration Hazard	This mixture does not meet the classification criteria for an aspiration hazard.	

11.2 Information on other hazards

No data available.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Endpoint	Value	Test method
Toxicity to fish	**Citriodiol®**	
	Danio rerio EC_{50}: >35mg/L –96 hours	OECD 203
	Ethanol	
	Leuciscus idus LC_{50}:>100mg/L – 48hr (literature)	OECD 203
	3-(2-Ethylhexyloxy)propan-1,2-diol	
	Brachidanio rerio LC_{50}*:60.2mg/L*	OECD 203
Toxicity to invertebrates	**Citriodiol®**	
	Daphnia Magna EC_{50}: >26mg/L –48 hours	OECD 202
	Daphnia magna (21-days) NOELRrepro` 4.00 mg/L LOELRrepro 10.00 mg/L	OECD 211
	Ethanol	
	Daphnia Magna EC_{50}: >100mg/L –24hr (literature)	OECD 202
	3-(2-Ethylhexyloxy)propan-1,2-diol	
	Daphnia Magna EC_{50}: 89.6mg/L –24hr	
Toxicity to algae	**Citriodiol®**	
	Pseudokirchneriella EC_{50}: >37mg/L –72 hours	OECD 201
	Ethanol	
	Chlorella pyrenoidosa EC_{50}: >100mg/L (literature)	OECD 201
	3-(2-Ethylhexyloxy)propan-1,2-diol	
	Desmodesmus subspicatus (green algae))EC_{50}: 48.3mg/L – 72hr	OECD 201

12.2 Persistence and degradability

Citriodiol® is readily biodegradable	OECD 301F
Ethanol is readily biodegradable (literature)	OECD 301D
3-(2-Ethylhexyloxy)propan-1,2-diol is Inherently biodegradable	OECD 302B

12.3 Bioaccumulative potential

Bioconcentration/accumulation is unlikely as Citriodiol® is readily metabolised in the human body and by other higher organisms. Low estimated bioconcentration/ accumulation tendencies predicted by QSAR for the major components of Eucalyptus citriodora oil, hydrated, cyclized are likely to be further offset by the amenability of those substances to biodegradation by microorganisms in the aquatic and terrestrial environments.

Component	Bioconcentration factor (BCFWIN)
p-Menthane-3,8-diol	11.47
Isopulegol	79.13
Citronellal	177.5
Citronellol	204.5

3-(2-Ethylhexyloxy)propan-1,2-diol - Log P_{OW} 2.53
Ethanol – no data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

No components are known to be PBT or vPvB

12.6 Endocrine disrupting properties

No data available.

12.7 Other adverse effects

No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Dispose of in accordance with local authority regulations. Do not allow into drains or water courses.

Recommendation: Clarify the exact Waste Code with your disposer.

Suggested European Waste Code according to Commission Decision 2000/532/EC:
07 04 99 (wastes from the manufacture, formulation, supply and use of organic plant protection products (except 02 01 08 and 02 01 09), wood preserving agents (except 03 02) and other biocides).

Packaging Suggested European Waste Codes according to 2000/532/EC:
Contaminated packaging: 15 01 10 (packaging containing residues of or contaminated by dangerous substances).

Cleaned packaging: 15 01 02 (plastic packaging). Cleaned, not contaminated packaging can be recycled. Recommended cleaning agent: water and soap.

14. TRANSPORT INFORMATION

Symbol for transport

None

14.2 UN proper shipping name

None

14.3 Transport hazard class(es)

None

14.4 Packing Group

None

14.5 Environmental hazards

None

14.6 Special precautions for user

No data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code

Not classified as a marine pollutant and is not intended to be shipped in bulk.

15. REGULATORY INFORMATION

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

Eucalyptus citriodora oil, hydrated, cyclized (Citriodiol®) is an active substance for insect repellent products (PT19) currently under review according to the criteria of the Biocidal Products Regulation (EU) 528/2012.

In the USA the substance is registered under the name Oil of lemon eucalyptus (OLE) with the USEPA as a biopesticide (Reg. No. 84878-3) for use in personal insect repellent products intended for application to humans.
In Canada the substance is registered under the name Oil of Lemon Eucalyptus, hydrated, Cyclized with the PMRA (Approval No. 30821).

In Australia the substance is registered under the name Oil of Lemon Eucalyptus (hydrated,

cyclized) with the APVMA (Product Number 59492)

SDS written in accordance with REACH (Regulation (EC) No 1907/2006

Classification in accordance with CLP (Regulation (EC) No 1272/2008

Waste information based on the European List of Waste (Commission Decision 2000/532/EC)

15.2 Chemical safety assessment

No chemical safety assessment has been carried out for this mixture by the supplier.

16. OTHER INFORMATION

Revision Date 04/11/2022

Rev. No. 1.5

Full text of Hazard Statements
H318 – Causes serious eye damage
H319 – Causes serious eye irritation
H225 – Highly flammable liquid and vapour
H332 – Harmful if inhaled.
H412 – Harmful to aquatic life with long lasting effects.
H336 – May cause drowsiness or dizziness

Supplemental Hazard Information
EUH208 – Contains citronellal, citronellol, eucalyptol and limonene. May produce an allergic reaction

Full text of Precautionary Statements
P102 – Keep out of reach of children
P210 - Keep away from open flames – No smoking
P271 – Use only outdoors or in a well-ventilated area
P501 – Dispose of container/contents in accordance with local regulation.

Combined statements

P305+P351+P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P301+P314 – IF SWALLOWED: Get medical advice/ attention if you feel unwell.

Product Identifier and CAS Number

Citriodiol®, previously defined as “a mixture of cis- and trans-p-menthane-3,8-diol/citriodiol” with the CAS No. 42822-86-6, has now been formally redefined as “Eucalyptus citriodora oil, hydrated, cyclized” with the CAS No. 1245629-80-4. This name change was triggered by ECHA and published in the Art. 95 list, date October 4, 2016 at p.105.

Changes

Section 9 – Update to be in line with Regulation (EU) 2020/878.
Section 11 – Addition of Section 11.2
Section 12 – Addition of Section 12.6, and ‘Other adverse effects’ moved to Section 12.7

Classification and procedures used to derive the classification for mixtures according to Regulation (EC) 1272/2008

Classification according to Regulation (EC) Nr. 1272/2008	Classification procedure
Eye irritation category 2, H319	Calculation method

Bibliography and sources of the data:
For Citriodiol® reported endpoints refer to studies included as part of the dossier submitted under the criteria of Biocidal Products Directive (EU) 98/8/EC and Biocidal Products Regulation (EU) 528/2012.

Data for 3-(2-Ethylhexyloxy)propan-1,2-diol and ethanol sourced from raw material suppliers MSDS.

This Safety Data Sheet has been produced in accordance with Regulation (EC) 895/2014 amending Regulation (EC) 1907/2006 REACH.

The information contained in this Safety Data Sheet is correct to the best of our knowledge and belief at the date of publication however no guarantee is made to its accuracy. This document is designed only as guidance for the safe use, storage and handling of this material. This information relates only to the specific material designated and may not be valid when the material is used in combination with any other materials.