SAFETY DATA SHEET

according to Regulation (EC) No.-

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www.markherb.com

Section 1. Product and Company Information

GHS Product Name:	(±)-Citronellal
Product Code:	TER-13-1000
CAS:	[106-23-0]
Molecular Formula:	$C_{10}H_{18}O$
Synonims:	3,7-dimethyloct-6-enal; D-Rhodinal; 2,3-Dihydrocitral; 3,7-Dimethyl-6-octen-1-al; 3,7-dimethyloct-6-en-1-al
Company:	MarkHerb
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Section 2. Hazards Identification

2.1 GHS classification

PHYSICAL HAZARDS

Flammable liquids (Category 4), H227

HEALTH HAZARDS

Skin corrosion/irritation (Category 2), H315

Skin Sensitisation (Category 1B), H317

Serious eye damage/eye irritation (Category 2A), H319

Acute toxicity - oral (Category 4), H302

Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335

ENVIRONMENTAL HAZARDS

Harmful to aquatic life with long lasting effects. Will likely be mobile in the environment due to its volatility. Is not likely mobile in the environment due its low water solubility. The product contains volatile organic compounds (VOC) which will evaporate easily from all surfaces. Spillage unlikely to penetrate soil. The product is insoluble and floats on water. The product evaporates slowly.

2.2 GHS label elements, including precautionary statements

Pictograms or hazard symbols

Signal word Warning

Hazard statements

H227	Combustible liquid
H302	Harmful if swallowed
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H335	May cause respiratory irritation

Precautionary statements

Prevention

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P264	Wash skin thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed out of the workplace
P273	Avoid release to the environment.
P280	Wear protective gloves/eye protection/face protection.

Response

P301 + P312 + P330	IF SWALLOWED: Call POISON CENTER/doctor if you feel unwell. Rinse mouth.
P302 + P352	IF ON SKIN: Wash with plenty of water.
P304 + P340 + P312	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
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 + P313	If skin irritation or rash occurs: Get medical advice/attention.
P337 + P313	If eye irritation persists: Get medical advice/attention.
P362	Take off contaminated clothing and wash before reuse.
P370 + P378	In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinguish.
P391	Collect spillage

Storage

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.
P403 + P235	Store in a well-ventilated place. Keep cool.
P405	Store locked-up.

Disposal

P501	Dispose of contents/container to an approved waste disposal plant.

Section 3. Information on Basic Physical and Chemical Properties

Physical States:	[ ] Gas [X] Liquid [ ] Solid
Melting Point:	No data
Boiling Point:	206-208°C (402.8-406.4°F)
Flash Pt:	86°C (187°F) - closed cup
Evaporation Rate:	No data
Flammability (solid, gas):	No data available.
Explosive Limits:	**LEL:** 1.2% (V) **UEL:** 4.5% (V)
Vapor Pressure (vs. Air or mm Hg):	0.16 hPa (0.12 mmHg) at 20°C (68°F)
Vapor Density (vs. Air = 1):	5.4

Specific Gravity (Water = 1):	0.857 g/cm^3 at 25^{o}C
Solubility in Water:	0.088 g/L at 25^{o}C (insoluble)
Solubility Notes:	No data.
Autoignition Pt:	202^{o}C at 760 mmHg (1.013 hPa)
Percent Volatile:	No data
Partition coefficient:	log Pow: 3.62 at 25^{o}C (n-octanol/water)
pH:	7

Section 4. First aid measures

Description of first aid measures

If inhaled

If breathed in, move person into fresh air and keep at rest. If not breathing, give artificial respiration.

In case of skin contact

Remove contaminated clothes. Wash off with soap and plenty of water for at least 15 minutes.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes.

If swallowed

DO NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water.

Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see **section 2.2**).

Indication of any immediate medical attention and special treatment needed

No data available

Section 5. Fire Fighting Measures

Suitable extinguishing

Media: Dry chemical powder, alcohol-resistant foam, water spray, carbon dioxide. For safety reasons do not use full water jet.

Precautions for firefighters: Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Structural firefighters protective clothing will only provide limited protection. Wear self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode when fighting fires.

Special protective:

equipment for firefighters: In case of fire and/or explosion do not breathe fumes. Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk. Water runoff can cause environmental damage. Ventilate closed spaces before entering them. Keep run-off water out of sewers and water sources. Dike for water control.

Section 6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

General Information:

Use proper personal protective equipment as indicated in **Section 8**.

Spills/Leaks:

Clean up spills immediately, observing precautions in the Protective Equipment section. Cover with sand, dry lime or soda ash and place in a closed container for disposal. Remove all sources of ignition. Use a spark-proof tool. Provide ventilation.

Section 7. Handling and Storage

Precautions for safe handling:

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Storage:

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Air and moisture sensitive. Heat sensitive. Handle under inert gas. Protect from moisture.

Recommended storage temperature: 2-8^{o}C

Specific end uses

Use in a laboratory fume hood where possible. Refer to employer is COSHH risk assessment.

Section 8. Exposure Controls / Personal Protection

Engineering controls:

Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location. Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source.

Control parameters: Not set up

Personal protective equipment:

Respiratory protection: Dust respirator. Follow local and national regulations.

Hand protection: Protective gloves.

Eye protection: Wear safety glasses and chemical goggles if splashing is possible.

Skin and body protection: Wear appropriate protective gloves and clothing to prevent skin exposure.

Section 9. Stability and Reactivity

Reactivity

Stable under recommended transport or storage conditions.

Chemical Stability

Stable under normal conditions, air sensitive

Conditions to Avoid

Heat, flames, and other sources of ignition.

Incompatibilities with Other Materials

Strong oxidising/reducing agents, strong acids/alkalis.

Hazardous Decomposition Products

Carbon dioxide, carbon monoxide and other unidentified organic compounds may be formed upon combustion.

Hazardous Polymerization

Has not been reported.

Section 10. Toxicological Information

Acute Toxicity:	LD_{50} Oral - Rat - 2,420mg/kg
	LD_{50} Dermal - Rabbit - 2,500-5,000 mg/kg
Skin corrosion/irritation:	Skin - Rabbit
	Result: Irritating to skin
Serious eye damage/irritation:	No data
Germ cell mutagenicity:	No data
Carcinogenicity:	IARC = No data NTP = No data
Reproductive toxicity:	No data

Section 11. Ecological Information

Toxicity:

Toxicity to fish: LC_{50} - Leuciscus idus (Golden orfe) - 22 mg/l - 96 h

Toxicity to daphnia and other aquatic invertebrates: EC_{50} - Daphnia magna (Water flea) - 8.7 mg/l - 48 h

Toxicity to algae: IC_{50} - algae - 7.5 mg/l - 72 h

Persistence and degradability:

Biodegradability	Result: 60% - Readily biodegradable
Bioaccumulative potential:	No data
Mobility in soil:	No data
Results of PBT & vPvB assessment:	No data
Other adverse effects:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Toxic to aquatic life with long lasting effects.

Section 12. Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 13. Transport Information

Hazards Class

Not a hazardous material for transportation

UN number

ADR/RID: 3082 IMDG: 3082 IATA: 3082

UN proper shipping name

ADR/RID

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Citronellal)

IMDG

ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Citronellal)

IATA

Environmentally hazardous substance, liquid, n.o.s. (Citronellal)

Transport hazard class(es)

ADR/RID: 9 IMDG: 9 IATA: 9

Section 14. Regulatory Information

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

no data

Chemical Safety Assessment

no data

Section 15. Additional Information

This MSDS above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if the company has been advised of the possibility of such damages.

----End of safety data sheet----