

Safety Data Sheet

Citral



Revision Date: 11/02/2018

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1. Identification

Product Description	Citral
CAS #	5392-40-5
FEMA Number	2303
True Terpenes Item #	RM10005
Recommended Use	Concentrated aromatic and flavor ingredient which may be used in flavor and fragrance compounds according to legal and IFRA or FEMA GRAS/FDA guidelines.
Recommended Restrictions	For manufacturing use only
Company	True Terpenes (888) 954-8550 TrueTerpenes.com
Emergency Contact	Poison Control Helpline: 1 (800) 222-1222

2. Hazard(s) Identification



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Physical Hazards

Not Classified

Health Hazards

Acute toxicity, oral	Category 5
Acute toxicity, dermal	Category 5
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Sensitization, skin	Category 1

Environmental Hazards

Hazardous to the aquatic environment, acute hazard	Category 2
Hazardous to the aquatic environment, long-term hazard	Category 2

Label Elements



Signal Word

Warning

Hazard Statement

May be harmful if swallowed. Harmful in contact with skin. Causes skin irritation. Causes skin and eye irritation. May cause an allergic skin reaction. Causes serious eye irritation. Toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Precautionary Statement

Prevention

Avoid breathing mist or vapor. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wear eye protection/face protection. Wear protective gloves/protective clothing.



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Response	IF ON SKIN: Wash with plenty of water. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER/doctor if you feel unwell. If skin irritation or rash occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. Collect spillage.
Storage	Store away from incompatible materials.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not Otherwise Classified (HNOC)	After prolonged contact with highly porous materials, this product may spontaneously combust.
Supplemental Information	100% of the mixture consists of component(s) of unknown acute inhalation toxicity.

3. Composition / Information on Ingredients

Substances

Chemical Name	Common Name and Synonyms	CAS Number	Percent
CITRAL	2,6-Octadienal, 3,7-dimethyl-, (2E)- 2,6-Dimethyloctadien-2,6-al-8 3,7-DIMETHYL-2,6-OCTADIENAL 3,7- dimethylocta-2,6-dienal	5392-40-5	>= 80



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4. First-Aid Measures

Inhalation

If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. For breathing difficulties, oxygen may be necessary. Call a physician if symptoms develop or persist.

Skin Contact

Take off immediately all contaminated clothing. Get medical attention if irritation develops and persists. Wash skin thoroughly with soap and water for several minutes.

Eye Contact

Remove contact lenses, if present and easy to do. Get medical attention if irritation develops and persists. Promptly wash eyes with plenty of water while lifting the eye lids.

Ingestion

Call a physician or poison control center immediately. If swallowed, rinse mouth with water (only if the person is conscious). Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs.

Most Important Symptoms / Effects, Acute and Delayed

Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Skin irritation. May cause redness and pain. May cause an allergic skin reaction. Dermatitis. Rash.

Indication of Immediate Medical Attentional and Special Treatment Needed

Not available.

General Advice

Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.



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5. Fire-Fighting Measures

Suitable Extinguishing Media	Water spray, fog, CO ₂ , dry chemical, or alcohol resistant foam.
Unsuitable Extinguishing Media	Do not use a solid water stream as it may scatter and spread fire.
Specific Hazards Arising from the Chemical	Fire may produce irritating, corrosive and/or toxic gases. Porous material such as rags, paper, insulation, or organic clay may spontaneously combust when wetted with this material.
Special Protective Equipment and 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.
Firefighting Equipment / Instructions	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.
Specific Methods	Use water spray to cool unopened containers.
General Fire Hazards	Static charges generated by emptying package in or near flammable vapor may cause flash fire.



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6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

Keep unnecessary personnel away. Avoid contact with skin or inhalation of spillage, dust or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Eliminate all sources of ignition.

Methods and Materials for Containment and Cleaning Up

Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb with inert absorbent such as dry clay, sand or diatomaceous earth, commercial sorbents, or recover using pumps.

The product is immiscible with water and will spread on the water surface.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Prevent product from entering drains. Absorb in vermiculite, dry sand or earth and place into containers.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills in original containers for re-use. This material and its container must be disposed of as hazardous waste. Collect and dispose of spillage as indicated in section 13 of the SDS.

Environmental Precautions

Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid release to the environment. Retain and dispose of contaminated wash water. Contact local authorities in case of spillage to drain/aquatic environment.



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7. Handling and Storage

Precautions for Safe Handling

Do not handle or store near an open flame, heat or other sources of ignition. Porous material such as rags, paper, insulation, or organic clay may spontaneously combust when wetted with this material. May auto-oxidize with sufficient heat generation to ignite if spread (as a thin film) or absorbed on porous or fibrous material. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Contaminated rags and cloths must be put in fireproof containers for disposal. Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Wash thoroughly after handling.

Conditions for Safe Storage, Including any Incompatibilities

Do not store in direct sunlight. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Keep under a nitrogen blanket.

8. Exposure Controls / Personal Protection

Occupational Exposure Limits

US. ACGIH Threshold Limit Values



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Material	Type	Value	Form
CITRAL (CAS 5392-40-5)	TWA	5 ppm	Inhalable fraction and vapor.
Biological Limit Values	No biological exposure limits noted for the ingredient(s).		
Appropriate Engineering Controls	Use explosion-proof ventilation equipment to stay below exposure limits. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Adequate ventilation should be provided so that exposure limits are not exceeded.		
Individual Protection Measures, Such as Personal Protective Equipment			
Eye / Face Protection	Wear safety glasses with side shields (or goggles). Face shield is recommended.		
Skin Protection			
Hand Protection	Chemical resistant gloves.		
Other	Use of an impervious apron is recommended.		
Respiratory Protection	In case of insufficient ventilation, wear suitable respiratory equipment. Respiratory protection not required.		
Thermal Hazards	Wear appropriate thermal protective clothing, when necessary.		
General Hygiene Considerations	Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Contaminated work clothing should not be allowed out of the workplace.		



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9. Physical and Chemical Properties

Appearance	Refer to Spec Sheet
Physical State	Liquid
Form	Liquid
Color	Refer to Spec Sheet
Odor	Characteristic
Odor Threshold	Not available
pH	5
Melting Point / Freezing Point	14 °F (-10 °C)
Initial Boiling Point and Boiling Range	442.4 - 444.2 °F (228 - 229 °C) at 760.00 mmHg
Flash Point	> 200.0 °F (> 93.3 °C) Closed Cup
Evaporation Rate	Not available
Flammability (solid, gas)	Not applicable
Upper / Lower Flammability or Explosive Limits	
Flammability Limit - Lower (%)	Not available



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Flammability Limit - Upper (%)	Not available
Explosive Limit - Lower (%)	Not available
Explosive Limit - Upper (%)	Not available
Vapor Pressure	0.2 mm Hg at 20 °C
Vapor Density	5.3
Relative Density	Not available
Solubility(ies)	
Solubility (water)	Insoluble
Partition Coefficient (n-octanol/water)	Not available
Auto-ignition Temperature	Not available
Decomposition Temperature	Not available
Viscosity	Not available
Other Information	
Density	0.89 g/cm ³ estimated at 15 °C
Explosive Properties	Not explosive
Flammability Class	Combustible IIIB estimated
Molecular Formula	C ₁₀ H ₁₆ O
Molecular Weight	152.23 g/mol
Oxidizing Properties	Not oxidizing



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Specific Gravity 0.89 at 25 °C

10. Stability and Reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical Stability	Material is stable under normal conditions.
Possibility of Hazardous Reaction	No dangerous reaction known under conditions of normal use.
Conditions to Avoid	Porous material such as rags, paper, insulation, or organic clay may spontaneously combust when wetted with this material.
Incompatible Materials	Strong oxidizing agents.
Hazardous Decomposition Products	No hazardous decomposition products if stored and handled as indicated.

11. Toxicological Information

Information on Likely Routes of Exposure



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Inhalation	Prolonged inhalation may be harmful.
Skin Contact	Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.
Eye Contact	Causes serious eye irritation. Causes mild eye irritation.
Ingestion	May be harmful if swallowed.
Symptoms Related to the Physical, Chemical and Toxicological Characteristics	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Skin irritation. May cause redness and pain. May cause an allergic skin reaction. Dermatitis. Rash.

Information on Toxicological Effects

Acute Toxicity Harmful in contact with skin. May be harmful if swallowed.

Product	Species	Test Results
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CITRAL (CAS 5392-40-5)

Acute

Dermal LD50	Rat	> 2000 mg/kg
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Oral LD50	Rat	4950 mg/kg
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Skin Corrosion / Irritation Causes skin irritation.
Species, rabbit: Result - Irritant. Method: BASF-Test

Serious Eye Damage / Eye Irritation Causes serious eye irritation.
Species, rabbit: Result - Slightly irritating. Method: BASF-Test

Respiratory or Skin Sensitization

Respiratory Sensitization Not a respiratory sensitizer.

Skin Sensitization May cause an allergic skin reaction.



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Guinea pig maximization test. Species: guinea pig. Result: sensitizing

Germ Cell Mutagenicity

No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not available.

Reproductive Toxicity

This product is not expected to cause reproductive or developmental effects.

Specific Target Organ Toxicity - Single Exposure

Not classified.

Specific Target Organ Toxicity - Repeated Exposure

Not classified.

Aspiration Hazard

Not an aspiration hazard.

Chronic Effects

Prolonged inhalation may be harmful.



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12. Ecological Information

Ecotoxicity

Toxic to aquatic life with long lasting effects.

Product

CITRAL (CAS 5392-40-5)

Species

Test Results

Acute

Other EC20

Activated sludge of a predominantly domestic sewage

68 mg/l, 0.5 hours OECD Guideline 209 aquatic

Aquatic

Other EC50

Bacterium

2100 mg/l, 0.5 hours DIN 38412 Part 27 (draft) aquatic - The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested. The details of the toxic effect relate to the nominal concentration.

Acute

Algae EC50

Green algae (*Chlamydomonas variabilis*)

103.8 mg/l, 72 hours DIN 38412 Part 9 static - The product has low solubility in the test medium. An aqueous solution



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		prepared with solubilizers has been tested. The details of the toxic effect relate to the nominal concentration.
Crustacea EC50	Daphnia magna	7 mg/l, 48 hours Directive 79/831/EEC static - The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested. The details of the toxic effect relate to the nominal concentration.
Fish LC50	Ide, silver or golden orfe (Leuciscus idus)	> 4.6 - < 10 mg/l, 96 hours DIN 38415 Part 15 static - The product has low solubility in the test medium. An aqueous solution prepared with solubilizers has been tested. The details of the toxic effect relate to the nominal concentration.

Persistence and Degradability

Biological/Abiological Degradation
Test method: OECD 301C; ISO 9408; 92/69/EEC, C.4-F (aerobic), activated sludge, domestic
Method of analysis: BOD of the ThOD
Degree of elimination: 92% (28 d)

Test method: OECD 301F; ISO 9408; 92/69/EEC, C.4-D, activated sludge, domestic
Method of analysis: BOD of the ThOD
Degree of elimination: > 90% (28d)
Evaluation: Readily biodegradable (according to OECD criteria).



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Bioaccumulative Potential	No data available.
Mobility in Soil	No data available.
Other Adverse Effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal Considerations

Disposal Instructions	Do not discharge into drains, water courses or onto the ground. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local Disposal Regulations	Dispose in accordance with all applicable regulations.
Hazardous Waste Code	Not established.
Waste from Residues / Unused Products	Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated Packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.



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14. Transport Information

ADN

UN Number	3082
UN Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CITRAL)
Transport Hazard Class(es)	9
Subsidiary Class(es)	-
Packing Group	III
Environmental Hazards	Yes
Labels Required	9

ADR

UN Number	3082
UN Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CITRAL)
Transport Hazard Class(es)	9
Subsidiary Class(es)	-
Packing Group	III
Environmental Hazards	Yes
Labels Required	9



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RID

UN Number	3082
UN Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CITRAL)
Transport Hazard Class(es)	9
Subsidiary Class(es)	-
Packing Group	III
Environmental Hazards	Yes
Labels Required	9
Special Precautions for User	Read safety instructions, SDS and emergency procedures before handling.

DOT BULK

UN Number	3082
UN Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CITRAL)
Hazard Class(es)	9
Packing Group	III
Environmental Hazards	
Marine Pollutant	Yes
Packaging Exceptions	155
Packaging Bulk	241
Labels Required	9



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DOT NON-BULK

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

UN Number	3082
UN Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CITRAL)
Transport Hazard Class(es)	9
Subsidiary Class(es)	-
Packing Group	III
Environmental Hazards	
Marine Pollutant	Yes
Labels Required	9
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.

ADN; ADR; DOT BULK; IMDG; RID



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Marine Pollutant



15. Regulatory Information

US Federal Regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency Release Notification

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not available.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1052)

Not regulated.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)



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Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely Hazardous Substance

Not listed.

SARA 311/312 Hazardous Chemical

Yes

Classified Hazard Categories

Acute toxicity (any route of exposure)
Skin corrosion or irritation
Serious eye damage or eye irritation
Respiratory or skin sensitization

SARA 313 (TRI reporting)

Not regulated.

Other Federal Regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)

Not regulated.

US State Regulations

California Proposition 65



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California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed Substance

Not listed.

International Inventories

Country(s) or Region	Inventory Name	On Inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	Yes
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Toxic Chemical Substances (TCS)	Yes
United States and Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes



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*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

*A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other Information

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Version # 00

HMIS® Ratings

Health 2

Flammability 1

Physical Hazard 0

Disclaimer

True Terpenes cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available. The above information



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relates only to this product and not to its use in combination with any other material or any particular process and is designed only as guidance for the safe handling, use, processing, storage, transportation, and disposal and should not be considered as a guarantee or quality specification. This product has not been evaluated for safe use in e-cigarettes or any vaping application where the product(s) is/are intentionally vaporized and inhaled. True Terpenes has performed no testing on these products in e-cig/vaping applications. It is the sole responsibility of the individual(s) purchasing this product to assess its' safety in the final application. The above information relates only to this product and not to its use in combination with any other material or any particular process and is designed only as guidance for the safe handling, use, processing, storage, transportation, disposal, and should not be considered as a guarantee or quality specification. The above information is based on data provided by and collected from recognized sources such as distributors, manufacturers, and technical groups and is considered to be accurate to the best of True Terpenes knowledge as of the date of this document. It is the responsibility of the user to review all safety information about this product and determine its safety and suitability in their own processes and operations. Appropriate warnings and safe handling procedures should be provided to all handlers and users, taking into account the intended use and the specific conditions and factors relating to such use in accordance with all applicable laws and regulations.

