

Safety Data Sheet

Geraniol



Revision Date: 11/02/2018

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1. Identification

| | |
|---------------------------------|--|
| Product Description | Geraniol |
| CAS # | 106-24-1 |
| FEMA Number | 2507 |
| True Terpenes Item # | RM10010 |
| 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 |
| | Skin corrosion/irritation | Category 2 |
| | Serious eye damage/eye irritation | Category 1 |
| | Sensitization, skin | Category 1 |
| Environmental Hazards | Hazardous to the aquatic environment, acute hazard | Category 2 |

Label Elements



Signal Word Danger

Hazard Statement Combustible liquid. May be harmful if swallowed. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye damage. Toxic to aquatic life.

Precautionary Statement

Prevention Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. 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 protective gloves/protective clothing/eye protection/face protection.

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. Immediately call a POISON CENTER/doctor. If skin



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irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. In case of fire: Use appropriate media to extinguish.

Storage

Store in a well-ventilated place. Keep cool.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not Otherwise Classified (HNOC)

None known.

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 |
|---------------|---|------------|---------|
| GERANIOL | 2-trans-3,7-dimethyl-2,6-octadien-1-ol (2E)-3,7-dimethylocta-2,6-dien-1-ol | 106-24-1 | 100 |



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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. Permanent eye damage including blindness could result. 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, CO2, 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. |
| 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

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



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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. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged exposure. Wash thoroughly after handling. |
| Conditions for Safe Storage, Including any Incompatibilities | Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. |

8. Exposure Controls / Personal Protection

| | |
|--|--|
| Occupational Exposure Limits | This substance has no PEL, TLV, or other recommended exposure limit. |
| 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. Adequate ventilation should be provided so that exposure limits are not exceeded. |
| Individual Protection Measures, Such as Personal Protective Equipment | |



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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

Respiratory protection not required. If ventilation is insufficient, suitable respiratory protection must be provided.

Thermal Hazards

Wear appropriate thermal protective clothing, when necessary.

General Hygiene Considerations

When using do not smoke. 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.

9. Physical and Chemical Properties

Appearance

Refer to Spec Sheet

Physical State

Liquid

Form

Liquid

Color

Refer to Spec Sheet

Odor

Characteristic



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| | |
|---|-----------------------------------|
| Odor Threshold | Not available |
| pH | Not available |
| Melting Point / Freezing Point | 5 °F (-15 °C) |
| Initial Boiling Point and Boiling Range | 446 °F (230 °C) 101.325 kPa |
| 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 |
| Flammability Limit - Upper (%) | Not available |
| Explosive Limit - Lower (%) | Not available |
| Explosive Limit - Upper (%) | Not available |
| Vapor Pressure | 0.01 mm Hg at 25 °C |
| Vapor Density | 5.3 |
| Relative Density | Not available |
| Solubility(ies) | |
| Solubility (water) | Insoluble |
| Partition Coefficient (n-octanol/water) | Not available |



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| | |
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| Auto-ignition Temperature | Not available |
| Decomposition Temperature | Not available |
| Viscosity | Not available. |
| Other Information | |
| Density | 0.89 g/cm ³ estimated at 20 °C |
| Explosive Properties | Not explosive |
| Flammability Class | Combustible IIIB estimated |
| Molecular Formula | C ₁₀ H ₁₈ O |
| Molecular Weight | 154.24 g/mol |
| Oxidizing Properties | Not oxidizing |
| Specific Gravity | 0.88 at 20 °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. |



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| | |
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| Conditions to Avoid | Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Contact with incompatible materials. |
| 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

| | |
|---------------------|--|
| Inhalation | No adverse effects due to inhalation are expected. |
| Skin Contact | Causes skin irritation. May cause an allergic skin reaction. |
| Eye Contact | Causes serious eye damage. |
| 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. Permanent eye damage including blindness could result. Skin irritation. May cause redness and pain. May cause an allergic skin reaction. Dermatitis. Rash. Signs and symptoms of exposure: burning sensation, cough, wheezing, laryngitis, shortness of breath, headache

Information on Toxicological Effects



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Acute Toxicity

May be harmful if swallowed.

Skin Corrosion / Irritation

Causes skin irritation.
Irritation reactions were observed in rabbit in a 4 h semi-occlusive irritation test.
Irritation was noted in guinea pig with the substance at concentrations between 0.5% and 100%, in an irritation test conducted prior to a Buehler sensitizing assay.
Species:rabbit
Result: Irritant.
Method: OECD Guideline 404

Serious Eye Damage / Eye Irritation

Causes serious eye damage.
Well defined signs of irritation were observed in a rabbit in an eye irritation test with the substance at 100%. The changes were not reversible after an observation period of 21 days.
Species: rabbit
Result: Risk of serious damage to eyes.
Method: OECD Guideline 405
rabbit - Risk of serious damage to eyes. - 24 h - Directive 67/548/EEC, Annex V, B.5.

Respiratory or Skin Sensitization

Respiratory Sensitization

Not a respiratory sensitizer.

Skin Sensitization

May cause an allergic skin reaction.
The substance was considered as a skin sensitizer in a Local Lymph Node Assay (LLNA) in a mouse.
Species: mouse
Result: sensitizing
Method: OECD Guideline 429
guinea pig - May cause sensitisation by skin contact.

Germ Cell Mutagenicity

No mutagenicity was observed in bacteria (Ames tests).
Polyploidization effects were noted at 0.125 mg/mL in dimethyl sulfoxide



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(DMSO) in an in vitro
Mammalian Chromosome Aberration Test.
Not genotoxic in a cytogenetic assay in Chinese hamster ovary cells.

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

The substance is not classified according to the limited effects observed in LD50 determination studies.

Specific Target Organ Toxicity - Repeated Exposure

No effects were observed in rat in an oral 27 week study at 100 mg/kg/day.

Aspiration Hazard

Not an aspiration hazard.



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12. Ecological Information

Ecotoxicity

Toxic to aquatic life with long lasting effects.

Product

Species

Test Results

GERANIOL (CAS 106-24-1)

Other EC50

Activated sludge of a predominantly domestic sewage

70 mg/l, 0.5 hours

Aquatic

Algae EC50

Green algae (Desmodesmus subspicatus)

13.1 mg/l, 72 hours

Crustacea EC50

Daphnia magna

10.8 mg/l, 48 hours

Fish LC50

Danio rerio

22 mg/l, 96 hours

Fathead minnow (Pimephales promelas) > 3.2 - < 7.9 mg/l, 96 hours

Persistence and Degradability

Test method: OECD 301 A (new version)(aerobic), Activated sludge, domestic

Method of analysis: DOC reduction

Degree of elimination: 90-100% (3 d)

Evaluation: Readily biodegradable (according to OECD criteria).

Biodegradability

Percent degradation (Aerobic biodegradation)

> 90 % OECD 301A (new version)(aerobic), activated sludge, domestic DOC reduction, Readily biodegradable (according to OECD criteria)



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| | |
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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

Not regulated as dangerous goods.

ADR

Not regulated as dangerous goods.

RID

Not regulated as dangerous goods.

DOT BULK

Not regulated as dangerous goods.

DOT NON-BULK

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.



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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)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely Hazardous Substance

Not listed.

SARA 311/312 Hazardous Chemical

Yes



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Classified Hazard Categories

Flammable (gases, aerosols, liquids, or solids)
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

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

Not listed.

16. Other Information



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Revision Date New Document

Version # 00

HMIS® Ratings

Health 3

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 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



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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.

