

1. Identification

| | | |
|---|--|-----------------|
| Product identifier | CITRONELLYL TIGLATE | |
| Other means of identification | | |
| BRI Product Code | 421 | |
| CAS number | 24717-85-9 | |
| FEMA number | 4295 | |
| Synonyms | 2-Butenoic acid, 2-methyl-, 3,7-dimethyl-6-octenyl ester, (2E)- * 3,7-Dimethyloct-6-en-1-yl 2-methylbut-2-enoate | |
| Recommended use | flavors and fragrances For Manufacturing Use Only | |
| Recommended restrictions | Not for use in Tobacco or Nicotine delivery device applications and/or products. | |
| Manufacturer/Importer/Supplier/Distributor information | | |
| Manufacturer | | |
| Company name | Bedoukian Research | |
| Address | 6 Commerce Drive Danbury, CT 06810 United States | |
| Telephone | 1-203-830-4000 | |
| Website | www.bedoukian.com | |
| E-mail | customerservice@bedoukian.com | |
| Contact person | Joseph Bania | |
| Emergency phone number | Chemtrec (North America) | 1-800-424-9300 |
| | Chemtrec (International) | +1-703-527-3887 |

2. Hazard(s) identification

| | | |
|------------------------------|--|-------------|
| Physical hazards | Not classified. | |
| Health hazards | Sensitization, skin | Category 1B |
| Environmental hazards | Hazardous to the aquatic environment, acute hazard | Category 1 |
| | Hazardous to the aquatic environment, long-term hazard | Category 1 |
| OSHA defined hazards | Not classified. | |
| Label elements | | |



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|--|--|
| Signal word | Warning |
| Hazard statement | May cause an allergic skin reaction. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects. |
| Precautionary statement | |
| Prevention | Avoid breathing mist or vapor. Contaminated work clothing must not be allowed out of the workplace. Avoid release to the environment. Wear protective gloves. |
| Response | If on skin: Wash with plenty of water. If skin irritation or rash occurs: Get medical advice/attention. Wash contaminated clothing before reuse. Collect spillage. |
| Storage | Store away from incompatible materials. |
| Disposal | Dispose of contents/container in accordance with relevant area regulations. |
| Hazard(s) not otherwise classified (HNOC) | None known. |
| Supplemental information | Contains CITRONELLYL TIGLATE, synthetic alpha tocopherol. May produce an allergic reaction. |

3. Composition/information on ingredients

Substances

| Chemical name | Common name and synonyms | CAS number | % |
|---------------------|--|------------|-----|
| CITRONELLYL TIGLATE | 2-Butenoic acid, 2-methyl-, 3,7-dimethyl-6-octenyl ester, (2E)- 3,7-Dimethyloct-6-en-1-yl 2-methylbut-2-enoate | 24717-85-9 | 100 |

Stabilizers

| Chemical name | Common name and synonyms | CAS number | % |
|----------------------------|--------------------------|------------|-----|
| synthetic alpha tocopherol | | 10191-41-0 | 0.1 |

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

Composition comments Occupational Exposure Limits for stabilizers are listed in Section 8.

4. First-aid measures

Inhalation

Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact

Remove contaminated clothing immediately and wash skin with soap and water. In case of eczema or other skin disorders: Seek medical attention and take along these instructions.

Eye contact

Rinse with water. Get medical attention if irritation develops and persists.

Ingestion

Rinse mouth. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

May cause an allergic skin reaction. Dermatitis. Rash.

Indication of immediate medical attention and special treatment needed

Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

General information

Wash contaminated clothing before reuse.

5. Fire-fighting measures

Suitable extinguishing media

Water fog. Foam. Dry chemical powder. Carbon dioxide (CO₂).

Unsuitable extinguishing media

Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical

During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters

Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions

Move containers from fire area if you can do so without risk.

Specific methods

Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards

No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Avoid breathing mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up

Prevent product from entering drains.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

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

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

Environmental precautions

Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so.

7. Handling and storage

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|---|--|
| Precautions for safe handling | Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. Provide adequate ventilation. Wear appropriate personal protective equipment. Avoid release to the environment. |
| Conditions for safe storage, including any incompatibilities | Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS). Recommended Packaging: Glass, Plastic, Aluminum or Phenolic Lined Steel. Store tightly sealed under inert gas in a cool, well-ventilated area. |

8. Exposure controls/personal protection

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|--|---|
| 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 | 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. |
| Individual protection measures, such as personal protective equipment | |
| Eye/face protection | Face shield is recommended. Wear safety glasses with side shields (or goggles). |
| Skin protection | |
| Hand protection | For prolonged or repeated skin contact use suitable protective gloves. |
| Other | Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended. |
| Respiratory protection | In case of insufficient ventilation, wear suitable respiratory equipment. |
| Thermal hazards | Wear appropriate thermal protective clothing, when necessary. |
| General hygiene considerations | Contaminated work clothing should not be allowed out of the workplace. |

9. Physical and chemical properties

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|---|---|
| Appearance | |
| Physical state | Liquid. |
| Color | Colorless |
| Odor | leafy, rosy, geranium note. |
| Odor threshold | Not available. |
| pH | Not available. |
| Melting point/freezing point | Not available. |
| Initial boiling point and boiling range | 551.17 °F (288.43 °C) US EPA. 2014. Estimation Programs Interface Suite™ for Microsoft® Windows, v 4.11. US EPA, Washington, DC, USA. |
| Flash point | 276 °F (136 °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 | 0.002 mmHg at 20°C; US EPA. 2014. Estimation Programs Interface Suite™ for Microsoft® Windows, v 4.11. US EPA, Washington, DC, USA. |
| Vapor density | 8.2 Relative to air; air = 1 |
| Relative density | Not available. |
| Solubility(ies) | |
| Solubility (water) | Not available. |
| Partition coefficient (n-octanol/water) | 5.88 US EPA. 2014. Estimation Programs Interface Suite™ for Microsoft® Windows, v 4.11. US EPA, Washington, DC, USA. |
| Auto-ignition temperature | Not available. |

| | |
|----------------------------------|--|
| Decomposition temperature | Not available. |
| Viscosity | Not available. |
| Other information | |
| Density | 0.897 - 0.907 g/cm ³ |
| Explosive properties | Not explosive. |
| Flammability class | Combustible III B estimated |
| Molecular formula | C ₁₅ H ₂₆ O ₂ |
| Molecular weight | 238.37 |
| Oxidizing properties | Not oxidizing. |
| Specific gravity | 0.897 - 0.907 at 25°C |

10. Stability and reactivity

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|---|---|
| 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 reactions | Hazardous polymerization does not occur. |
| Conditions to avoid | Contact with incompatible materials. |
| Incompatible materials | Strong oxidizing agents. |
| Hazardous decomposition products | No hazardous decomposition products are known. |

11. Toxicological information

Information on likely routes of exposure

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|---------------------|--|
| Inhalation | May cause allergy or asthma symptoms or breathing difficulties if inhaled. |
| Skin contact | May cause an allergic skin reaction. |
| Eye contact | Direct contact with eyes may cause temporary irritation. |
| Ingestion | Expected to be a low ingestion hazard. |

Symptoms related to the physical, chemical and toxicological characteristics May cause an allergic skin reaction. Dermatitis. Rash.

Information on toxicological effects

Acute toxicity

| Product | Species | Test Results |
|--------------------------------------|---------|--------------|
| CITRONELLYL TIGLATE (CAS 24717-85-9) | | |
| Acute | | |
| Dermal | | |
| <i>Liquid</i> | | |
| LD50 | Rabbit | > 5000 mg/kg |
| Oral | | |
| <i>Liquid</i> | | |
| LD50 | Rat | > 5000 mg/kg |

* Estimates for product may be based on additional component data not shown.

Skin corrosion/irritation Prolonged skin contact may cause temporary irritation.

Irritation Corrosion - Skin

CITRONELLYL TIGLATE

8 % Patch test, Vehicle Petrolatum.
Result: No irritation observed.
Species: Human
Organ: Skin
Notes: RIFM

Serious eye damage/eye irritation Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization

Respiratory sensitization Not a respiratory sensitizer.

Skin sensitization May cause an allergic skin reaction.

Skin sensitization

CITRONELLYL TIGLATE

8 % Patch test, Vehicle Petrolatum.

Result: Not sensitizing.

Species: Human

Organ: Skin

Notes: RIFM

LLNA-BrdU ELISA, Vehicle Acetone:Olive oil (4:1). The calculated EC1.6 value was 64.8%. Therefore, the test substance is considered as weak sensitizer.

Result: Sensitizer

Species: Mouse

Notes: ECHA

Germ cell mutagenicity

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

Germ cell mutagenicity: Ames test

CITRONELLYL TIGLATE

OECD 471, Strain WP2uvrA with and without metabolic activation. Vehicle DMSO.

Result: Not mutagenic.

Species: Escherichia coli

Notes: ECHA

OECD 471, Strains TA 1535, TA 1537, TA 98, and TA 100 with and without metabolic activation. Vehicle DMSO.

Result: Not mutagenic.

Species: Salmonella typhimurium

Notes: ECHA

Carcinogenicity

Not classifiable as to carcinogenicity to humans.

IARC Monographs. Overall Evaluation of Carcinogenicity

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens

Not listed.

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.

Further information

May cause allergic respiratory and skin reactions.

12. Ecological information

Ecotoxicity

Very toxic to aquatic life with long lasting effects.

| Product | Species | Test Results |
|--------------------------------------|---------|--------------------|
| CITRONELLYL TIGLATE (CAS 24717-85-9) | | |
| Aquatic | | |
| <i>Acute</i> | | |
| Algae | EC50 | > 0.085 mg/l, 72 h |
| Crustacea | EC50 | 0.1 mg/l, 48 h |

* Estimates for product may be based on additional component data not shown.

Persistence and degradability

No data is available on the degradability of this product.

Biodegradability

Percent degradation (Aerobic biodegradation-ready)

CITRONELLYL TIGLATE

OECD 310, 89% biodegradation in 28 days.

Result: Readily biodegradable.

Species: Activated sludge of a predominantly domestic sewage

Bioaccumulative potential

| | |
|------------------------------|---|
| 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

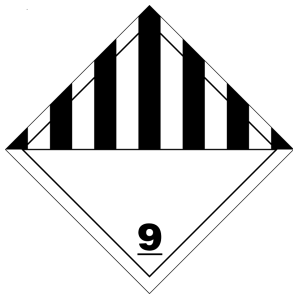
| | |
|--|--|
| Disposal instructions | Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations. |
| Local disposal regulations | Dispose in accordance with all applicable regulations. |
| Hazardous waste code | The waste code should be assigned in discussion between the user, the producer and the waste disposal company. |
| Waste from residues / unused products | Dispose of in accordance with local regulations. 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. |

14. Transport information

| | |
|-------------------------------------|--|
| DOT | |
| UN number | UN3082 |
| UN proper shipping name | Environmentally hazardous substances, liquid, n.o.s. (CITRONELLYL TIGLATE) |
| Transport hazard class(es) | |
| Class | 9 |
| Subsidiary risk | - |
| Label(s) | 9 |
| Packing group | III |
| Special precautions for user | Read safety instructions, SDS and emergency procedures before handling. |
| Special provisions | 8, 146, 335, IB3, T4, TP1, TP29 |
| Packaging exceptions | 155 |
| Packaging non bulk | 203 |
| Packaging bulk | 241 |
| IATA | |
| UN number | UN3082 |
| UN proper shipping name | Environmentally hazardous substance, liquid, n.o.s. (CITRONELLYL TIGLATE) |
| Transport hazard class(es) | |
| Class | 9 |
| Subsidiary risk | - |
| Packing group | III |
| Environmental hazards | No. |
| ERG Code | 9L |
| Special precautions for user | Read safety instructions, SDS and emergency procedures before handling. |
| Other information | |
| Passenger and cargo aircraft | Allowed with restrictions. |
| Cargo aircraft only | Allowed with restrictions. |
| IMDG | |
| UN number | UN3082 |
| UN proper shipping name | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (CITRONELLYL TIGLATE) |
| Transport hazard class(es) | |
| Class | 9 |
| Subsidiary risk | - |
| Packing group | III |
| Environmental hazards | |
| Marine pollutant | No. |
| EmS | F-A, S-F |

Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not established.

DOT; IATA; IMDG



15. Regulatory information

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

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

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical No

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 Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

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 |

| Country(s) or region | Inventory name | On inventory (yes/no)* |
|-----------------------------|---|------------------------|
| Europe | European List of Notified Chemical Substances (ELINCS) | No |
| Japan | Inventory of Existing and New Chemical Substances (ENCS) | Yes |
| Korea | Existing Chemicals List (ECL) | No |
| 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 & Puerto Rico | Toxic Substances Control Act (TSCA) Inventory | Yes |

*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).

IFRA restriction This product contains Geraniol. Geraniol has an IFRA standard associated with it. There are restriction limits for Geraniol in finished products. Visit www.ifraorg.org for the full text of the guideline, or contact Bedoukian Research for more information.

16. Other information, including date of preparation or last revision

Issue date 17-May-2015

Revision date 23-January-2023

Version # 02

Disclaimer Bedoukian Research 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.

Revision information This document has undergone significant changes and should be reviewed in its entirety.