SAFETY DATA SHEET

1. Identification

Product identifier trans-2-NONEN-1-AL FCC

Other means of identification

<table>
<thead>
<tr>
<th>BRI Product Code</th>
<th>353</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number</td>
<td>18829-56-6</td>
</tr>
<tr>
<td>FEMA number</td>
<td>3213</td>
</tr>
</tbody>
</table>

Synonyms


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 Inc (BRI)
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 Flammable liquids Category 4
Health hazards Skin corrosion/irritation Category 2

Serious eye damage/eye irritation Category 2A

Environmental hazards Not classified.
OSHA defined hazards Not classified.

Label elements

Signal word Warning
Hazard statement Combustible liquid. Causes skin irritation. Causes serious eye irritation.
Precautionary statement

Prevention Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Wash thoroughly after handling. Wear protective gloves/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. If skin irritation occurs: Get medical advice/attention. If eye irritation persists: Get medical advice/attention. Take off contaminated clothing and wash 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 relevant area regulations.

Hazard(s) not otherwise classified (HNOC) None known.
3. Composition/information on ingredients

Substances

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>trans-2-NONEN-1-AL FCC</td>
<td>(* Alt. CAS #) CAS: 2463-53-8;</td>
<td>18829-56-6</td>
<td>99.5</td>
</tr>
<tr>
<td></td>
<td>2-Nonenal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(E)-3-Hexyl acrolein</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(E)-Non-2-enal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-Nonenal-1-al</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-Nonenal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2-Nonenal, (2E)-e-2-Nonenal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FEMA CAS: 2463-53-8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heptylidene acetaldehyde</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Iris Aldehyde</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Orris ald</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Stabilizers

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>synthetic alpha tocopherol</td>
<td></td>
<td>10191-41-0</td>
<td>0.5</td>
</tr>
</tbody>
</table>

*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. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye contact
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

Ingestion
Rinse mouth. Get medical attention if symptoms occur.

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.

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
Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

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
The product is combustible, and heating may generate vapors which may form explosive vapor/air mixtures. 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
In case of fire and/or explosion do not breathe fumes. 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
Combustible liquid.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. 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
Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material.

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. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.

Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

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

7. Handling and storage

Precautions for safe handling
Keep away from open flames, hot surfaces and sources of ignition. When using do not smoke. Avoid contact with eyes, skin, and clothing. Provide adequate ventilation. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities
Keep away from heat, sparks and open flame. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see Section 10 of the SDS). Recommended Packaging: Glass, Aluminum or Phenolic Lined Steel. Store tightly sealed under inert gas 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
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. Eye wash facilities and emergency shower must be available when handling this product.

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
Wear protective gloves.

Other
Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.

Respiratory protection
If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.

Thermal hazards
Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations
When using do not smoke. 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.

9. Physical and chemical properties

Appearance

Physical state
Liquid.

Color
white to slightly yellow

Odor
powerful waxy orris-like odor.

Odor threshold
Not available.

pH
Not available.

Melting point/freezing point
Not available.

Initial boiling point and boiling range

Flash point
185 °F (85 °C) Closed Cup

Evaporation rate
Not available.

Flammability (solid, gas)
Not applicable.
### Upper/lower flammability or explosive limits

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability limit - lower (%)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Flammability limit - upper (%)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Explosive limit - lower (%)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Explosive limit - upper (%)</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

### Vapor pressure
0.21 mmHg at 20°C; US EPA. 2014. Estimation Programs Interface Suite™ for Microsoft® Windows, v 4.11. US EPA, Washington, DC, USA.

### Vapor density
4.8 Relative to air; air = 1

### Relative density
Not available.

### Solubility(ies)
- **Solubility (water)**: Not available.

### Auto-ignition temperature
Not available.

### Decomposition temperature
Not available.

### Viscosity
Not available.

### Other information
- **Density**: 0.840 - 0.846 g/cm³
- **Flammability class**: Combustible IIIA estimated
- **Molecular formula**: C₉H₁₆O
- **Molecular weight**: 140.23
- **Specific gravity**: 0.84 - 0.846 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 reactions
No dangerous reaction known under conditions of normal use.

#### 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 are known.

### 11. Toxicological information

#### Toxicological information
**trans-2-NONEN-1-AL FCC**

<table>
<thead>
<tr>
<th>Test</th>
<th>Endpoint</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Corn oil. Dose orally administered.</td>
<td>500 - 2000 mg/kg OECD 474, In vivo Mouse Micronucleus Test.</td>
<td></td>
</tr>
<tr>
<td>Result</td>
<td>Not mutagenic.</td>
<td></td>
</tr>
<tr>
<td>Species</td>
<td>Mouse</td>
<td></td>
</tr>
<tr>
<td>Notes</td>
<td>RIFM</td>
<td></td>
</tr>
</tbody>
</table>

#### Information on likely routes of exposure

<table>
<thead>
<tr>
<th>Route</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>No adverse effects due to inhalation are expected.</td>
</tr>
<tr>
<td>Skin contact</td>
<td>Causes skin irritation.</td>
</tr>
<tr>
<td>Eye contact</td>
<td>Causes serious eye irritation.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Expected to be a low ingestion hazard.</td>
</tr>
</tbody>
</table>

#### 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.

#### Information on toxicological effects

#### Acute toxicity

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Material name: trans-2-NONEN-1-AL FCC

353    Version #: 05    Revision date: 19-October-2023    Issue date: 23-May-2015
<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>trans-2-NONEN-1-AL FCC (CAS 18829-56-6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Dermal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Liquid</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rabbit</td>
<td>3700 mg/kg</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Liquid</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat</td>
<td>5000 mg/kg</td>
</tr>
</tbody>
</table>

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

**Skin corrosion/irritation**

- **Irritation Corrosion - Skin**
  - trans-2-NONEN-1-AL FCC
  - 4 % Patch test, Vehicle Petrolatum.
  - Result: No irritation observed.
  - Species: Human
  - Organ: Skin
  - Notes: RIFM

- **Serious eye damage/eye irritation**
  - **Irritation Corrosion - Eye**
    - trans-2-NONEN-1-AL FCC
    - 0.125 %, Irritation clear on day 7. Vehicle Ethanol SDA 39C.
    - Result for similar material 2-Decenal.
    - Result: Irritation noted.
    - Species: Rabbit
    - Organ: Eye
    - Observation Period: 7 days
    - Severity: mild
    - Notes: RIFM

**Respiratory or skin sensitization**

- **Respiratory sensitization**
  - Not a respiratory sensitizer.

- **Skin sensitization**
  - This product is not expected to cause skin sensitization.

- **Skin sensitization**
  - trans-2-NONEN-1-AL FCC
  - 4 % Patch test, Vehicle Petrolatum.
  - Result: Not sensitizing.
  - Species: Human
  - Organ: Skin
  - Notes: RIFM

**Germ cell mutagenicity**

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

**Carcinogenicity**

- This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

  - **IARC Monographs. Overall Evaluation of Carcinogenicity**
    - Not listed.

    - 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.

**12. Ecological information**

**Ecotoxicity**

- The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

**Persistence and degradability**

- No data is available on the degradability of this product.
Bioaccumulative potential

Partition coefficient n-octanol / water (log Kow)
trans-2-NONEN-1-AL FCC


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. 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 NA1993
UN proper shipping name Combustible liquid, n.o.s.
Transport hazard class(es) Combustible liquid
Class -
Subsidiary risk None
Label(s) III
Packing group None
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
Special provisions 148, IB3, T1, TP1
Packaging exceptions 150
Packaging non bulk 203
Packaging bulk 241

IATA
Not regulated as dangerous goods.

IMDG
Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not established.

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 - Yes
- Pressure Hazard - No
- Reactivity Hazard - No

**SARA 302 Extremely hazardous substance**
- Not listed.

**SARA 311/312 Hazardous chemical**
- Yes

**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.

**International Inventories**

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
</tr>
<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>No</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Taiwan Toxic Chemical Substances (TCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*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, including date of preparation or last revision**

**Issue date**
23-May-2015

**Revision date**
19-October-2023

**Version #**
05

**Disclaimer**
Bedoukian Research Inc (BRI) 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**
Hazard(s) identification: Disposal
Composition / Information on Ingredients: Disclosure Overrides