## 1. Identification

### Product identifier

2,4-HEXADIEN-1-AL

### Other means of identification

- **BRI Product Code**: 360
- **CAS number**: 142-83-6
- **FEMA number**: 3429
- **Synonyms**:
  - (* Alt. CAS #) CAS: 80466-34-8; 2,4-Hexadienal * Contains 2,4-Hexadienal, (2E,4E)- * e,e-2,4-Hexadienal * Sorbaldehyde * Sorbic aldehyde * trans,trans-2,4-Hexadien-1-al
  
### Recommended use

For Manufacturing Use Only

### Recommended restrictions

Not for use in Tobacco or Nicotine delivery device applications and/or products.

### Manufacturer/Importer/Supplier/Distributor information

- **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

- Flammable liquids: Category 3

### Health hazards

- Acute toxicity, oral: Category 3
- Acute toxicity, dermal: Category 3
- Skin corrosion/irritation: Category 2
- Serious eye damage/eye irritation: Category 2A
- Sensitization, skin: Category 1
- Carcinogenicity: Category 2
- Aspiration hazard: Category 1

### Environmental hazards

Not classified.

### OSHA defined hazards

Not classified.

### Label elements

- **Signal word**: Danger
- **Hazard statement**: Flammable liquid and vapor, Toxic if swallowed. May be fatal if swallowed and enters airways. Toxic in contact with skin. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. Suspected of causing cancer.
- **Precautionary statement Prevention**: Avoid breathing mist or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated clothing must not leave the workplace. Use proper grounding and bonding to prevent static discharge. Use explosion-proof electrical/vent/lighting equipment and non-sparking tools. Wear protective gloves, clothing, eye and face protection. Read and understand all safety precautions before handling.
Response

If swallowed: Immediately call a poison center/doctor. Rinse mouth. Do NOT induce vomiting. 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 immediately all contaminated clothing and wash it before reuse. In case of fire: Use appropriate media to extinguish. If on skin: Wash with soap and water. If in eyes: Rinse with water for several minutes.

Storage

Store locked up. Store in a cool, well-ventilated area.

Disposal

Dispose of contents/container in accordance with relevant area regulations.

Hazard(s) not otherwise classified (HNOC)

None known.

Supplemental information

Contains 2,4-HEXADIEN-1-AL. May produce an allergic reaction.

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>2,4-HEXADIEN-1-AL</td>
<td>(* Alt. CAS #) CAS: 80466-34-8; 2,4-Hexadienal Contains 2,4-Hexadienal, (2E,4E)-e,e-2,4-Hexadienal Sorbaldehyde Sorbic aldehyde trans,trans-2,4-Hexadien-1-al</td>
<td>142-83-6</td>
<td>100</td>
</tr>
</tbody>
</table>

Stabilizers

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
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</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 immediately and wash skin with soap and water. Get medical advice/attention if you feel unwell. In case of eczema or other skin disorders: Seek medical attention and take along these instructions. 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

Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Most important symptoms/effects, acute and delayed

Aspiration may cause pulmonary edema and pneumonitis. 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 attention and special treatment needed

Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General information

Take off immediately all contaminated clothing. IF exposed or concerned: Get medical advice/attention. 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. 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

Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. 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
Flammable liquid and vapor.

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. Avoid breathing mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spills 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. Take precautionary measures against static discharge. Use only non-sparking tools.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. 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.

Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers. For waste disposal, see section 13 of the SDS.

Environmental precautions
Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling
Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Explosion-proof general and local exhaust ventilation. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Do not taste or swallow. Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. When using, do not eat, drink or smoke. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Wash contaminated clothing before reuse. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities
Store locked up. Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. 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 or Aluminum. 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
Explosion-proof general and local exhaust ventilation. 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. Provide eyewash station. Eye wash fountain and emergency showers are recommended.

Individual protection measures, such as personal protective equipment

Eye/face protection
Chemical respirator with organic vapor cartridge and full facepiece.

Skin protection
Wear appropriate chemical resistant gloves.

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

Other
Wear appropriate thermal protective clothing, when necessary.

Respiratory protection
Chemical respirator with organic vapor cartridge and full facepiece.

Thermal hazards
Wear appropriate thermal protective clothing, when necessary.
Observe any medical surveillance requirements. 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

- Physical state: Liquid.
- Color: Yellow

Odor

- fresh, green, floral, citrusy odor.

Odor threshold

Not available.

pH

Not available.

Melting point/freezing point

Not available.

Initial boiling point and boiling range

345.2 °F (174 °C) Literature reference.

Flash point

130 °F (54 °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

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

Vapor density

3.3 Relative to air; air = 1

Relative density

Not available.

Solubility(ies)

Solubility (water)

Not available.

Partition coefficient (n-octanol/water)


Auto-ignition temperature

Not available.

Decomposition temperature

Not available.

Viscosity

Not available.

Other information

Density

0.888 - 0.898 g/cm3

Explosive properties

Not explosive.

Flammability class

Combustible II estimated

Molecular formula

C6H8O

Molecular weight

96.13

Oxidizing properties

Not oxidizing.

Specific gravity

0.888 - 0.898 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

Hazardous polymerization does not occur.

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.
11. Toxicological information

Information on likely routes of exposure

- **Inhalation**: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- **Skin contact**: Toxic in contact with skin. Causes skin irritation. May cause an allergic skin reaction.
- **Eye contact**: Causes serious eye irritation. 
- **Ingestion**: Toxic if swallowed. Droplets of the product aspirated into the lungs through ingestion or vomiting may cause a serious chemical pneumonia.

Symptoms related to the physical, chemical and toxicological characteristics

- Aspiration may cause pulmonary edema and pneumonitis. 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**: May be fatal if swallowed and enters airways. Toxic in contact with skin.

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-HEXADIEN-1-AL (CAS 142-83-6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dermal</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Liquid</strong></td>
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<td></td>
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<tr>
<td>LD50</td>
<td>Rabbit</td>
<td>270 mg/kg</td>
</tr>
<tr>
<td>Oral</td>
<td>Rat</td>
<td>300 mg/kg</td>
</tr>
</tbody>
</table>

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

- **Skin corrosion/irritation**: Causes skin irritation.
  - Irritation Corrosion - Skin 2,4-HEXADIEN-1-AL 0.25% Buehler, 0.25% highest non-irritation concentration. Vehicle Diethyl phthalate. Result: Irritation noted. Species: Guinea pig Organ: Skin

- **Serious eye damage/eye irritation**: Causes serious eye irritation.
- **Respiratory or skin sensitization**
  - Respiratory sensitization: Not a respiratory sensitizer.
  - Skin sensitization: May cause an allergic skin reaction.
  - Skin sensitization 2,4-HEXADIEN-1-AL 0.25 % Buehler, Vehicle 80% ethanol/20% distilled water. Result: Sensitization noted. Species: Guinea pig Organ: Skin

- **Germ cell mutagenicity**: No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
- **Carcinogenicity**: Suspected of causing cancer.
  - IARC Monographs. Overall Evaluation of Carcinogenicity 2,4-HEXADIEN-1-AL (CAS 142-83-6) 2B Possibly carcinogenic to humans.
  - 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: May be fatal if swallowed and enters airways.

Chronic effects: Prolonged exposure may cause chronic effects.

Further information: May cause allergic respiratory and skin reactions.

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)

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: UN1992
- UN proper shipping name: Flammable liquid, toxic, n.o.s. (2,4-hexadien-1-al)
- Transport hazard class(es)
  - Class: 3
  - Subsidiary risk: 6.1(PGIII)
  - Label(s): 3, 6.1
- Packing group: III
- Special precautions for user: Read safety instructions, SDS and emergency procedures before handling.
- Special provisions:
  - B1, IB3, T7, TP1, TP28
- Packaging exceptions: 150
- Packaging non bulk: 203
- Packaging bulk: 242

IATA
- UN number: UN1992
- UN proper shipping name: Flammable liquid, toxic, n.o.s. (2,4-hexadien-1-al)
- Transport hazard class(es)
  - Class: 3
  - Subsidiary risk: 6.1(PGIII)
- Packing group: III
- Environmental hazards: No.
- ERG Code: 3P
- 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: UN1992
UN proper shipping name: FLAMMABLE LIQUID, TOXIC, N.O.S. (2,4-hexadien-1-al)

Transport hazard class(es):
- Class: 3
- Subsidiary risk: 6.1(PGIII)

Packing group: III

Environmental hazards: No.

Marine pollutant: F-E, S-D

EmS: Read safety instructions, SDS and emergency procedures before handling.

Special precautions for user: Not established.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

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.
- Superfund Amendments and Reauthorization Act of 1986 (SARA)
  - Hazard categories:
    - Immediate Hazard - Yes
    - Delayed Hazard - Yes
    - 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.

**US state regulations**

WARNING: This product contains a chemical known to the State of California to cause cancer.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance
2,4-HEXADIEN-1-AL (CAS 142-83-6) Listed: March 4, 2005

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))
2,4-HEXADIEN-1-AL (CAS 142-83-6)

**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>
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<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
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<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
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<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
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<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
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<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
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<td>New Zealand</td>
<td>New Zealand Inventory</td>
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<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
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<tr>
<td>Taiwan</td>
<td>Taiwan Toxic Chemical Substances (TCS)</td>
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<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
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</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).*

**IFRA restriction**

There is an IFRA guideline regarding this product. Please visit www.ifraorg.org for the full text of the guideline, or contact Bedoukian Research, Inc. for more information.

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

**Issue date**
26-May-2015

**Revision date**
30-October-2019

**Version #**
05

**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**

Hazard(s) identification: Disposal
Hazard(s) identification: Prevention
Hazard(s) identification: Response
Hazard(s) identification: Storage
Toxicological Information: Toxicological Data