cis,cis-1,5-Cyclooctadiene

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product Description: cis,cis-1,5-Cyclooctadiene

Cat No.: B21196
CAS-No: 1552-12-1
Molecular Formula: C8 H12

Supplier: Alfa Aesar
Avocado Research Chemicals, Ltd.
Shore Road
Port of Heysham Industrial Park
Heysham, Lancashire LA3 2XY
United Kingdom
Office Tel: +44 (0) 1524 850506
Office Fax: +44 (0) 1524 850608

Emergency Telephone Number: Call Carechem 24 at
+44 (0) 1865 407333 (English only);
+44 (0) 1235 239670 (Multi-language)

E-mail address: uktech@alfa.com
www.alfa.com
Product Safety Department

Recommended Use: Laboratory chemicals.
Uses advised against: No Information available

SECTION 2. HAZARD IDENTIFICATION

Classification of the substance or mixture

<table>
<thead>
<tr>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable liquids</td>
</tr>
<tr>
<td>Acute Oral Toxicity</td>
</tr>
<tr>
<td>Acute Inhalation Toxicity - Vapors</td>
</tr>
<tr>
<td>Skin Corrosion/Irritation</td>
</tr>
<tr>
<td>Serious Eye Damage/Eye Irritation</td>
</tr>
<tr>
<td>Skin Sensitization</td>
</tr>
<tr>
<td>Specific target organ toxicity - (single exposure)</td>
</tr>
<tr>
<td>Chronic aquatic toxicity</td>
</tr>
</tbody>
</table>

Label Elements

Emergency Overview
Flammable liquid and vapor. Harmful if swallowed. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. Harmful if inhaled. May cause respiratory irritation. Toxic to aquatic life with long lasting effects.
**Signal Word**

**Warning**

**Hazard Statements**
H226 - Flammable liquid and vapor
H302 - Harmful if swallowed
H317 - May cause an allergic skin reaction
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H332 - Harmful if inhaled
H335 - May cause respiratory irritation
H411 - Toxic to aquatic life with long lasting effects

**Precautionary Statements**

**Prevention**
P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P240 - Ground/bond container and receiving equipment
P270 - Do not eat, drink or smoke when using this product
P261 - Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray
P264 - Wash face, hands and any exposed skin thoroughly after handling
P271 - Use only outdoors or in a well-ventilated area
P272 - Contaminated work clothing should not be allowed out of the workplace
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection

**Response**
P303 + P361 + P353 - IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower
P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P312 - Call a POISON CENTER or doctor/ physician if you feel unwell
P330 - Rinse mouth
P363 - Wash contaminated clothing before reuse
P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction

**Storage**
P403 + P233 - Store in a well-ventilated place. Keep container tightly closed

**Disposal**
P501 - Dispose of contents/ container to an approved waste disposal plant

**Physical and Chemical Hazards**
Flammable Liquid. Vapors may cause flash fire or explosion.

**Health Hazards**
Harmful if swallowed. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. Harmful if inhaled. May cause respiratory irritation.

**Environmental hazards**
Toxic to aquatic life with long lasting effects.

---

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,5-Cyclooctadiene</td>
<td>1552-12-1</td>
<td>&lt;=100</td>
</tr>
</tbody>
</table>
SECTION 4. FIRST AID MEASURES

General Advice
If symptoms persist, call a physician.

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact
Wash off immediately with plenty of water for at least 15 minutes. If skin irritation persists, call a physician.

Inhalation
Move to fresh air. If not breathing, give artificial respiration. Get medical attention if symptoms occur.

Ingestion
Clean mouth with water and drink afterwards plenty of water.

Most important symptoms and effects
Breathing difficulties. May cause allergic skin reaction. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting: Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

Self-Protection of the First Aider
Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

Notes to Physician
Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Cool closed containers exposed to fire with water spray.

Extinguishing media which must not be used for safety reasons
No information available.

Specific Hazards Arising from the Chemical
Flammable. Containers may explode when heated. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back.

Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Ensure adequate ventilation. Use personal protective equipment. Remove all sources of ignition. Take precautionary measures against static discharges.

Environmental Precautions
Do not flush into surface water or sanitary sewer system.

Methods for Containment and Clean Up
Soak up with inert absorbent material. Keep in suitable, closed containers for disposal. Remove all sources of ignition. Use
spark-proof tools and explosion-proof equipment.

Refer to protective measures listed in Sections 8 and 13.

SECTION 7. HANDLING AND STORAGE

Handling
Wear personal protective equipment. Ensure adequate ventilation. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. Take precautionary measures against static discharges.

Storage
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Specific Use(s)
Use in laboratories

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

Monitoring methods
BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents. MDHS70 General methods for sampling airborne gases and vapours MDHS 88 Volatile organic compounds in air. Laboratory method using diffusive samplers, solvent desorption and gas chromatography MDHS 96 Volatile organic compounds in air - Laboratory method using pumped solid sorbent tubes, solvent desorption and gas chromatography

Exposure Controls

Engineering Measures
Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting/equipment. Ensure that eyewash stations and safety showers are close to the workstation location. Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source.

Personal protective equipment

<table>
<thead>
<tr>
<th>Eye Protection</th>
<th>Goggles (European standard - EN 166)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand Protection</td>
<td>Protective gloves</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Glove material</th>
<th>Breakthrough time</th>
<th>Glove thickness</th>
<th>EU standard</th>
<th>Glove comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrile rubber</td>
<td>See manufacturers</td>
<td>-</td>
<td>EN 374</td>
<td>(minimum requirement)</td>
</tr>
<tr>
<td>Neoprene</td>
<td>recommendations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural rubber</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Inspect gloves before use.
Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)
Ensure gloves are suitable for the task: Chemical compatibility, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.
Remove gloves with care avoiding skin contamination.

<table>
<thead>
<tr>
<th>Skin and body protection</th>
<th>Long sleeved clothing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory Protection</td>
<td>When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.</td>
</tr>
</tbody>
</table>
To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly.

**Large scale/emergency use**

Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

**Recommended Filter type:** Organic gases and vapours filter Type A Brown conforming to EN14387

**Small scale/Laboratory use**

Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

**Recommended half mask:** Valve filtering: EN405; or; Half mask: EN140; plus filter, EN 141

When RPE is used a face piece Fit Test should be conducted.

**Hygiene Measures**

Handle in accordance with good industrial hygiene and safety practice.

**Environmental exposure controls**

Prevent product from entering drains. Do not allow material to contaminate ground water system.

### SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Component</th>
<th>Log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,5-Cyclooctadiene</td>
<td>3.16</td>
</tr>
</tbody>
</table>

**Appearance**

Colorless

**Physical State**

Liquid

**Odor**

Unpleasant

**Odor Threshold**

No data available

**pH**

No information available

**Melting Point/Range**

-70 °C / -94 °F

**Softening Point**

No data available

**Boiling Point/Range**

151 - 152 °C / 303.8 - 305.6 °F

**Flash Point**

32 °C / 89.6 °F

**Evaporation Rate**

No data available

**Flammability (solid,gas)**

Not applicable

**Explosion Limits**

No data available

**Vapor Pressure**

5.4 hPa @ 20 °C

**Vapor Density**

No data available

**Specific Gravity / Density**

0.88 g/cm3

**Bulk Density**

Not applicable

**Water Solubility**

No information available

**Solubility in other solvents**

No information available

**Partition Coefficient (n-octanol/water)**

No data available

**Autoignition Temperature**

270 °C / 518 °F

**Decomposition Temperature**

No data available

**Viscosity**

1.4 mPas @ 20°C

**Explosive Properties**

No information available

**Oxidizing Properties**

No information available

**Molecular Formula**

C8 H12

**Molecular Weight**

108.18

### SECTION 10. STABILITY AND REACTIVITY

**Stability**

Stable under normal conditions.

**Hazardous Reactions**

None under normal processing.
Hazardous Polymerization: No information available.

Conditions to Avoid: Keep away from open flames, hot surfaces and sources of ignition.

Materials to avoid: No information available.

Hazardous Decomposition Products: None under normal use conditions.

SECTION 11. TOXICOLOGICAL INFORMATION

Product Information

(a) acute toxicity:

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,5-Cyclooctadiene</td>
<td>LD50 = 1900 mg/kg (Rat)</td>
<td>LD50 &gt; 10000 mg/kg (Rat)</td>
<td></td>
</tr>
</tbody>
</table>

(b) skin corrosion/irritation; Category 2

(c) serious eye damage/irritation; Category 2

(d) respiratory or skin sensitization;
   - Respiratory: No data available
   - Skin: Category 1
   - No information available

(e) germ cell mutagenicity; No data available

(f) carcinogenicity; No data available
   - There are no known carcinogenic chemicals in this product

(g) reproductive toxicity; No data available

(h) STOT-single exposure; Category 3
   - Results / Target organs: Respiratory system

(i) STOT-repeated exposure; No data available
   - Target Organs: None known.

(j) aspiration hazard; No data available

Symptoms / effects, both acute and delayed:
- Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting:
- Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity effects: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment.
cis,cis-1,5-Cyclooctadiene

**Component** | **Freshwater Fish** | **Water Flea** | **Freshwater Algae** | **Microtox**
--- | --- | --- | --- | ---
1,5-Cyclooctadiene | LC50: = 9.4 mg/L, 48h static (Leuciscus idus) |  |  | 

**Persistence and Degradability**
- **Persistence**
  - No information available
- **Degradation in sewage treatment plant**
  - Contains substances known to be hazardous to the environment or not degradable in waste water treatment plants.

**Bioaccumulative Potential**
- Bioaccumulation is unlikely

<table>
<thead>
<tr>
<th>Component</th>
<th>log Pow</th>
<th>Bioconcentration factor (BCF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,5-Cyclooctadiene</td>
<td>3.16</td>
<td>No data available</td>
</tr>
</tbody>
</table>

**Mobility in soil**
- No information available

**Endocrine Disruptor Information**
- This product does not contain any known or suspected endocrine disruptors

**Persistent Organic Pollutant**
- This product does not contain any known or suspected substance

**Ozone Depletion Potential**
- This product does not contain any known or suspected substance

**SECTION 13. DISPOSAL CONSIDERATIONS**

**Waste from Residues / Unused Products**
- Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

**Contaminated Packaging**
- Dispose of this container to hazardous or special waste collection point. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Keep product and empty container away from heat and sources of ignition.

**Other Information**
- Do not dispose of waste into sewer. Waste codes should be assigned by the user based on the application for which the product was used. Can be incinerated, when in compliance with local regulations. Do not let this chemical enter the environment. Do not empty into drains.

**SECTION 14. TRANSPORT INFORMATION**

**Road and Rail Transport**
- **UN-No**: UN2520
- **Proper Shipping Name**: CYCLOOCTADIENES
- **Hazard Class**: 3
- **Packing Group**: III

<table>
<thead>
<tr>
<th>IMDG/IMO</th>
<th>UN-No</th>
<th>Proper Shipping Name</th>
<th>Hazard Class</th>
<th>Packing Group</th>
<th>Marine Pollutant</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN2520</td>
<td>CYCLOOCTADIENES</td>
<td>3</td>
<td>III</td>
<td>This product contains a chemical which is listed as a marine pollutant according to IMDG/IMO</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IATA</th>
<th>UN-No</th>
<th>Proper Shipping Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN2520</td>
<td>CYCLOOCTADIENES</td>
<td></td>
</tr>
</tbody>
</table>
SAFETY DATA SHEET

cis,cis-1,5-Cyclooctadiene

Hazard Class
3

Packing Group
III

Special Precautions for User
No special precautions required

SECTION 15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Component</th>
<th>The Inventory of Hazardous Chemicals (2015 Edition)</th>
<th>List of dangerous goods GB 12268 - 2012</th>
<th>Taiwan Toxic Chemical Substances Inventory</th>
<th>IECSC</th>
<th>EINECS</th>
<th>TSCA</th>
<th>DSL</th>
<th>PICCS</th>
<th>ENCS</th>
<th>AICS</th>
<th>KECL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,5-Cyclooctadiene</td>
<td>-</td>
<td>X</td>
<td>216-291-4</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

National Regulations

SECTION 16. OTHER INFORMATION

Prepared By
Health, Safety and Environmental Department

Revision Date
29-Jun-2018

Revision Summary
SDS authoring systems update, replaces ChemGes SDS No. 1552-12-1/2.

Training Advice
Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.
Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.
First aid for chemical exposure, including the use of eye wash and safety showers.

Legend

- CAS - Chemical Abstracts Service
- EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
- PICCS - Philippines Inventory of Chemicals and Chemical Substances
- IECSC - Chinese Inventory of Existing Chemical Substances
- KECL - Korean Existing and Evaluated Chemical Substances
- WEL - Workplace Exposure Limit
- ACGIH - American Conference of Governmental Industrial Hygienists
- DNEL - Derived No Effect Level
- RPE - Respiratory Protective Equipment
- LC50 - Lethal Concentration 50%
- NOEC - No Observed Effect Concentration
- PBT - Persistent, Bioaccumulative, Toxic
- CAS - Chemical Abstracts Service
- TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
- DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
- ENCS - Japanese Existing and New Chemical Substances
- AICS - Australian Inventory of Chemical Substances
- KECL - Korean Existing and Evaluated Chemical Substances
- WEL - Workplace Exposure Limit
- ACGIH - American Conference of Governmental Industrial Hygienists
- DNEL - Derived No Effect Level
- RPE - Respiratory Protective Equipment
- LC50 - Lethal Concentration 50%
- NOEC - No Observed Effect Concentration
- PBT - Persistent, Bioaccumulative, Toxic
- ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road
- IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code
- OECD - Organisation for Economic Co-operation and Development
- ICAO/IATA - International Civil Aviation Organization/International Air Transport Association
- MARPOL - International Convention for the Prevention of Pollution from Ships
- ATE - Acute Toxicity Estimate
BCF - Bioconcentration factor
VOC - Volatile Organic Compounds

Key literature references and sources for data
Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet