trans-Crotonic acid

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

Product Description: trans-Crotonic acid

Cat No.: A15765
Synonyms: trans-2-Butenoic acid; trans-3-Methylacrylic acid
CAS-No: 107-93-7
Molecular Formula: C4 H6 O2

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

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Appearance</th>
<th>Odor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid</td>
<td>Off-white</td>
<td>pungent</td>
</tr>
</tbody>
</table>

Emergency Overview
Causes serious eye damage.

Classification of the substance or mixture

| Serious Eye Damage/Eye Irritation | Category 1 |

Label Elements

Signal Word
Danger
Hazard Statements
H318 - Causes serious eye damage

Precautionary Statements
Prevention
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection

Response
P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER or doctor/ physician

Storage
P403 - Store in a well-ventilated place

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

Physical and Chemical Hazards
None identified.

Health Hazards
Causes eye burns.

Environmental hazards
Contains no substances known to be hazardous to the environment or not degradable in waste water treatment plants. Will likely be mobile in the environment due to its water solubility. The product is water soluble, and may spread in water systems.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crotonic acid</td>
<td>107-93-7</td>
<td>&gt;95</td>
</tr>
</tbody>
</table>

SECTION 4. FIRST AID MEASURES

General Advice
Immediate medical attention is required. Show this safety data sheet to the doctor in attendance.

Eye Contact
Immediate medical attention is required. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Keep eye wide open while rinsing.

Skin Contact
Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Call a physician immediately.

Inhalation
Move to fresh air. If breathing is difficult, give oxygen. Call a physician or Poison Control Center immediately. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Ingestion
Do not induce vomiting. Immediate medical attention is required. Never give anything by mouth to an unconscious person. Drink plenty of water.

Most important symptoms and effects
Causes burns by all exposure routes. Causes eye burns. Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation.

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
CO\(_2\), dry chemical, dry sand, alcohol-resistant foam. 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
The product causes burns of eyes, skin and mucous membranes. Combustible material. Containers may explode when heated.

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. Thermal decomposition can lead to release of irritating gases and vapors.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Evacuate personnel to safe areas. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Remove all sources of ignition. Take precautionary measures against static discharges.

Environmental Precautions
Do not allow material to contaminate ground water system. Should not be released into the environment. See Section 12 for additional ecological information.

Methods for Containment and Clean Up
Avoid dust formation. Sweep up or vacuum up spillage and collect in suitable container for disposal. Remove all sources of ignition.

Refer to protective measures listed in Sections 8 and 13.

SECTION 7. HANDLING AND STORAGE

Handling
Do not breathe dust. Do not get in eyes, on skin, or on clothing. Do not ingest. Use only under a chemical fume hood. Wear personal protective equipment. Keep away from open flames, hot surfaces and sources of ignition.

Storage
Corrosives area. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition.

Specific Use(s)
Use in laboratories

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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. MDHS14/3 General methods for sampling and gravimetric analysis of respirable and
Exposure Controls

Engineering Measures
Ensure adequate ventilation, especially in confined areas. 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

| Eye Protection | Goggles (European standard - EN 166) |
| Hand Protection | Protective gloves |

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

Skin and body protection
Long sleeved clothing

Respiratory Protection
When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
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: Particulates filter conforming to EN 143

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
No information available.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| Appearance       | Off-white |
| Physical State   | Solid     |
| Odor             | Pungent   |
| Odor Threshold   | No data available |
| pH               | 3         | 1% aq. solution |
| Melting Point/Range | 72 - 73 °C / 161.6 - 163.4 °F |
| Softening Point  | No data available |
| Boiling Point/Range | 185 - 199 °C / 365 - 390.2 °F | @ 760 mmHg |
SECTION 10. STABILITY AND REACTIVITY

Stability
Stable under normal conditions.

Hazardous Reactions
None under normal processing.

Hazardous Polymerization
Hazardous polymerization does not occur.

Conditions to Avoid

Materials to avoid

Hazardous Decomposition Products
Carbon monoxide (CO). Carbon dioxide (CO2). Thermal decomposition can lead to release of irritating gases and vapors.

SECTION 11. TOXICOLOGICAL INFORMATION

Product Information

(a) acute toxicity:

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral (Rat)</th>
<th>LD50 Dermal (Rat)</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crotonic acid</td>
<td>2610 mg/kg</td>
<td>&gt; 2000 mg/kg</td>
<td></td>
</tr>
</tbody>
</table>

(b) skin corrosion/irritation;
No data available

(c) serious eye damage/irritation;
Category 1

(d) respiratory or skin sensitization;

Respiratory
Based on available data, the classification criteria are not met

Skin
Based on available data, the classification criteria are not met

(e) germ cell mutagenicity;
Based on available data, the classification criteria are not met

(f) carcinogenicity;
Based on available data, the classification criteria are not met
There are no known carcinogenic chemicals in this product.

(g) reproductive toxicity; Based on available data, the classification criteria are not met.

(h) STOT-single exposure; Based on available data, the classification criteria are not met.

(i) STOT-repeated exposure; Based on available data, the classification criteria are not met.

Target Organs No information available.

(j) aspiration hazard; Not applicable.

Solid

Other Adverse Effects The toxicological properties have not been fully investigated. See actual entry in RTECS for complete information.

Symptoms / effects, both acute and delayed Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated: Ingestion causes severe swelling, severe damage to the delicate tissue and danger of perforation.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity effects Do not empty into drains.

Persistence and Degradability

Persistence Soluble in water, Persistence is unlikely, based on information available.

Bioaccumulative Potential Bioaccumulation is unlikely

Mobility in soil The product is water soluble, and may spread in water systems. Will likely be mobile in the environment due to its water solubility. Highly mobile in soils.

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.

Other Information Waste codes should be assigned by the user based on the application for which the product was used. Do not empty into drains. Do not dispose of waste into sewer. Large amounts will affect pH and harm aquatic organisms.

SECTION 14. TRANSPORT INFORMATION

Road and Rail Transport
UN-No UN2823
Proper Shipping Name Crotonic acid, solid
Hazard Class 8
Packing Group III

IMDG/IMO
UN-No UN2823
Proper Shipping Name Crotonic acid, solid
Hazard Class 8
Packing Group III

IATA
UN-No UN2823
Proper Shipping Name Crotonic acid, solid
Hazard Class 8
Packing Group III

Special Precautions for User No special precautions required

SECTION 15. REGULATORY INFORMATION

International Inventories X = listed

<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 Inventor y</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>
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</thead>
<tbody>
<tr>
<td>Crotonic acid</td>
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<td>-</td>
<td>X</td>
<td>X</td>
<td>203-533-9</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>X</td>
</tr>
</tbody>
</table>

National Regulations

SECTION 16. OTHER INFORMATION

Prepared By Health, Safety and Environmental Department
Creation Date 17-Nov-2005
Revision Date 26-Feb-2018

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
<table>
<thead>
<tr>
<th>Key literature references and sources for data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suppliers safety data sheet, Chemadvisor -LOLI, Merck index, RTECS</td>
</tr>
</tbody>
</table>

**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