Section 1: Chemical Product and Company Information

Product name: Citric acid monohydrate
Supplier/ Further Information: Martrex, Inc.
P. O. Box 1709
14525 Highway 7
Minnetonka, Minnesota 55345-3793
Phone: 952/933-5000
Toll Free: 800/328-3627
FAX: 952/933-1889
EPA Registration Number: n/a
CAS#: 5949-29-1
Chemical Name: Citric acid monohydrate
Synonyms: 2-Hydroxy-1,2,3-propanetricarboxylic acid monohydrate
Chemical Family: Carboxylic Acid

Section 2: Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Hazardous Components</th>
<th>CAS#</th>
<th>%</th>
<th>OSHA PEL</th>
<th>OSHA STEL</th>
<th>OSHA TWL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric acid monohydrate</td>
<td>5949-29-1</td>
<td>&gt;97%</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Section 3: Hazards Identification

Main hazards: Danger! Causes severe eye irritation and possible injury. Causes skin and respiratory tract irritation.

Potential Health Effects
Primary Routes of Exposure / Entry: Inhalation (breathing), eye contact, skin contact
Target Organs: Respiratory system, eyes, skin

Acute Exposure Symptoms
Inhalation: Causes respiratory tract irritation.
Eye Contact: Causes severe eye irritation and possible injury
Skin Contact: Causes skin irritation. Some references state that citric acid has allergenic properties but, no animal or human studies were found to support this claim. It does not seem likely that citric acid is a sensitizer since it is found in the body as an essential component of the citric acid cycle which releases energy for physiological functions. Citric acid is widely distributed in plants and in animal tissues and fluids.
Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Excessive intake of citric acid may cause erosion of the teeth.

Chronic Exposure Symptoms: Repeated exposure may cause erosion of teeth. Chronic exposure may cause effects similar to those of acute exposure. See section 11 Toxicological Information

Medical Conditions Aggravated By Long-Term Exposure: See section 11 Toxicological Information
Section 4: First Aid Measures

**Inhalation:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. **Get medical assistance.**

**Eye Exposure:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. **Get medical aid immediately.**

**Skin Exposure:** In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

**Ingestion:** If swallowed, **do not induce vomiting** unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. **Seek immediate medical attention.**

**NOTE TO THE PHYSICIAN:** Treat symptomatically and supportively.

Section 5: Fire Fighting Measures

**Flamibility Classification:**

- **General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

  - NFPA= (estimated) Health: 3; Flammability: 1; Instability: 0
  - DOT= see Section 14
  - Flash Point [Method]: n/a
  - Auto-ignition Temperature: 1010°C (1850°F)
  - Lower explosion limit (LEL): n/a
  - Upper explosion limit (UEL): n/a
  - Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or chemical foam.
  - Unusual Fire and Explosive Hazards: In sufficient quantity and reduced particle size is capable of creating a dust explosion.
  - Hazardous Decomposition Materials: Irritating and highly toxic gases may be generated by thermal decomposition or combustion.
  - Special Procedures: n/a

**Fire-Fighting Instructions:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. This material in sufficient quantity and reduced particle size is capable of creating a dust explosion.

**Personal Protective Equipment:** Wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear.

**CAUTION:** no data

Section 6: Accidental Release Measures

**General Information:** Use proper personal protective equipment as indicated in Section 8.

**Spill and Leak Procedures:** Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation. Spill may be carefully neutralized with lime (calcium oxide, CaO).

**Environmental and Regulatory Reporting:** In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations. Follow local/state/national regulations.

**Note:** Local regulations may prescribe or limit action to be taken.
**Section 7: Handling and Storage**

**Minimum/maximum Storage Temperature:** n/a

**HANDLING:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. Keep container tightly closed. Avoid ingestion and inhalation. Do not get in eyes. Avoid contact with skin and clothing.

**STORAGE** Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

**REGULATORY REQUIREMENTS:** See Section 8 for employee exposure controls and Section 15 for other regulatory requirements.

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**Section 8: Exposure Controls / Personal Protection**

**Exposure Limits:**

<table>
<thead>
<tr>
<th>Hazardous Component</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>OSHA - Final PELs</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric acid monohydrate</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
</tbody>
</table>

*NOTE: Limits/standards shown for guidance only. Follow applicable regulations.*

**Engineering Controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

**Respiratory Protection:** Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

**Eye Protection:** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA’s eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Hand Protection:** Wear appropriate protective gloves to prevent skin exposure.

**Skin and Body Protection:** Wear appropriate protective clothing to prevent skin exposure.

**Other Protective Clothing and Equipment:** n/a

**Hygienic Work Practices:** 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. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

**Environmental Controls:** See Sections 6, 7, 12, 13.

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**Section 9: Physical and Chemical Properties**

**Chemical Name:** Citric acid monohydrate

**Physical State:** Crystalline powder

**Color and Appearance:** White

**Odor:** Odorless

**pH (in water):** 2.2 (0.1N soln)

**Vapor Pressure:** 3.70E-009 mm Hg @ 25°C

**Vapor Density (Air = 1):** n/a

**Evaporation Rate:** n/a

**Viscosity:** n/a

**Boiling Point / Range:** 175°C

**Freezing/Melting Point:** 100°C

**Decomposition Temperature:** 175°C

**Solubility:** Freely Soluble

**Specific Gravity/Density:** 1.542 g/cm³

**Chemical Formula:** C₆H₈O₇·H₂O

**Formula Wt:** 210.15
Section 10: Stability and Reactivity

| Chemical Stability: Stable □ Unstable □ | Material is stable under normal conditions. |
| Conditions to Avoid: Dust generation, moisture. |
| Chemical Incompatibility: Metals, strong oxidizing agents, strong reducing agents, strong bases, metal nitrates. |
| Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide. |
| Hazardous Polymerization: Will not occur. |

Section 11: Toxicological Information

| Cas#: 5949-29-9 |
| LD50/LC50: n/a |
| Carcinogenicity: Not listed by ACGIH, IARC, NTP, or CA Prop 65. |
| Epidemiology: No information available |
| Teratogenicity: No information available. |
| Reproductive Effects: No information available. |
| Mutagenicity: No information available. |
| Neurotoxicity: No information available. |
| Other Studies: |

Section 12: Ecological Information

No information available.

Section 13: Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed. |
RCRA U-Series: None listed. |

Section 14: Transport Information

US DOT: Not Regulated |
Canada TDG: Not Regulated |

Section 15: Regulatory Information

US FEDERAL

TSCA
CAS# 5949-29-1 is not on the TSCA Inventory because it is a hydrate. It is considered to be listed if the CAS number for the anhydrous form is on the inventory (40CFR720.3(u)(2)).

Health & Safety Reporting List
None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules
None of the chemicals in this product are under a Chemical Test Rule.

Section 12b
None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule
None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs
None of the chemicals in this material have an RQ.

SARA Section 302 Extremely Hazardous Substances
None of the chemicals in this product have a TPQ.

SARA Codes
CAS # 5949-29-1: immediate.

Section 313
No chemicals are reportable under Section 313.

Clean Air Act:
This material does not contain any hazardous air pollutants.
This material does not contain any Class 1 Ozone depletors.
This material does not contain any Class 2 Ozone depletors.

Clean Water Act:
None of the chemicals in this product are listed as Hazardous Substances under the CWA.
None of the chemicals in this product are listed as Priority Pollutants under the CWA.
None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:
None of the chemicals in this product are considered highly hazardous by OSHA.

STATE
CAS# 5949-29-1 is not present on state lists from CA, PA, MN, MA, FL, or NJ.

California Prop 65
California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations
European Labeling in Accordance with EC Directives
Hazard Symbols:
XI
Risk Phrases:
R 36/37/38 Irritating to eyes, respiratory system and skin.

Safety Phrases:
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 37/39 Wear suitable gloves and eye/face protection.

WGK (Water Danger/Protection)
CAS# 5949-29-1: 0

Canada - DSL/NDSL
CAS# 5949-29-1 is listed on Canada's DSL List.

Canada - WHMIS
This product has a WHMIS classification of E.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

Canadian Ingredient Disclosure List
n/a

Section 16: Other Information
ACGIH - American Conference of Governmental Industrial Hygienists
ANSI - American National Standards Institute
CAS - Chemical Abstracts Service
CERCLA - Comprehensive Environmental Response, Compensation & Liability Act of 1980
CFR - Code of Federal Regulations
CHEMTREC - Chemical Transportation Emergency Center
# NFPA Rating Explanation Guide

<table>
<thead>
<tr>
<th>Rating Number</th>
<th>Health Hazard</th>
<th>Flammability Hazard</th>
<th>Instability Hazard</th>
<th>Rating Symbol</th>
<th>Special Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Can be lethal</td>
<td>Will vaporize and readily burn at normal temperatures</td>
<td>May explode at high temperatures and pressures</td>
<td>ALK</td>
<td>Alkaline</td>
</tr>
<tr>
<td>3</td>
<td>Can cause serious or permanent injury</td>
<td>Can be ignited under almost all ambient temperatures</td>
<td>May explode at high temperature</td>
<td>ACID</td>
<td>Acidic</td>
</tr>
<tr>
<td>2</td>
<td>Can cause temporary incapacitation or residual injury</td>
<td>Must be heated or high ambient temperature</td>
<td>Violent chemical change at high temperature</td>
<td>BIO</td>
<td>BioHazard</td>
</tr>
<tr>
<td>1</td>
<td>Can cause significant irritation</td>
<td>Must be preheated before ignition can occur</td>
<td>Normally stable. High temperatures make unstable</td>
<td>COR</td>
<td>Strong Corrosive</td>
</tr>
<tr>
<td>0</td>
<td>No Hazard</td>
<td>Will not burn</td>
<td>Stable</td>
<td>OXY</td>
<td>Oxidizer</td>
</tr>
</tbody>
</table>

*Reacts violently or explosively with water or oxidizer*