Citric Acid Monohydrate Granular USP MSDS
Dear Customer,

This File Contains Both The ANSI Material Safety Data Sheet and The GHS Safety Data Sheet For The Same Product

Spectrum is currently transitioning all chemical product labeling from the ANSI\textsuperscript{1} format to the GHS\textsuperscript{2} format (see note below). In order to ensure that you receive complete labelling during the transition, we have included both the ANSI MSDS and the GHS SDS in a single file. The ANSI MSDS is given first, followed by the GHS SDS. Please use whichever matches the container label.

Why It Matters:

The complete precautionary labeling for this chemical consists of BOTH the label on the container AND the matching Material Safety Data Sheet (for ANSI labels) or Safety Data Sheet (for GHS labels). Both elements of the labeling [Label + (M)SDS] are written to be read and understood together, so as to provide complete precautionary information. It is intended for you to read and understood BOTH before handling or using the chemical.

Picking the Right One: 2 Easy Ways To Tell Whether Your Container Has an ANSI Label or a GHS Label

1) GHS labels: any pictogram displayed in the upper left-hand corner will be inside a red diamond. ANSI labels: pictograms, if present, will be inside individual black boxes.

2) GHS labels: on the bottom of the right-hand panel of the label, locate the Lot Number. Directly to the left will be a string of control characters, followed by a single letter. For GHS labels, the string of characters will end in "GHS:"

---

**Label in ANSI Format**

![Label Image]

---

CORPORATE OFFICES
14422 South San Pedro Street
Gardena, California 90248
PHONE 310.516.8000
FAX 310.516.9843

AN ISO 9001:2008 REGISTERED COMPANY  www.spectrumchemical.com
Sincerely,

Regulatory Affairs
SAFETY DATA SHEET

Product identifier

Product code: CI132
Product Name: CITRIC ACID MONOHYDRATE, GRANULAR, USP

Other means of identification

Synonyms: 2-Hydroxy-1,2,3-propanetricarboxylic acid monohydrate
CAS #: 5949-29-1
RTECS #: GE7810000
Ci#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: In beverages. In foods.
Uses advised against No information available

Supplier: Spectrum Chemicals and Laboratory Products, Inc.
14422 South San Pedro St.
Gardena, CA  90248
(310) 516-8000

Order Online At: https://www.spectrumchemical.com

Emergency telephone number Chemtrec 1-800-424-9300
Contact Person: Martin LaBenz (West Coast)
Contact Person: Ibad Tirmiz (East Coast)

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Category 2A</td>
</tr>
<tr>
<td>Specific target organ toxicity (single exposure)</td>
<td>Category 3</td>
</tr>
</tbody>
</table>

Label elements
Warning

Hazard statements
Causes serious eye irritation
May cause respiratory irritation

Hazards not otherwise classified (HNOC)
Not Applicable

Other hazards
Causes mild skin irritation

Precautionary Statements - Prevention
Wash face, hands and any exposed skin thoroughly after handling
Wear eye/face protection
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
If skin irritation occurs: Get medical advice/attention
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell.

Precautionary Statements - Storage
Store in a well-ventilated place. Keep container tightly closed
Store locked up

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
<th>Trade Secret</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric Acid, Monohydrate</td>
<td>5949-29-1</td>
<td>100</td>
<td>*</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

First aid measures
General Advice: Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126)

Skin Contact: Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention. If skin irritation persists, call a physician.

Eye Contact: Flush eye with water for 15 minutes. Get medical attention.
Inhalation: Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Obtain medical attention.

Most important symptoms and effects, both acute and delayed
Symptoms Causes eye irritation. Mild skin irritation. Irritating to respiratory system. May cause irritation of respiratory tract. Central nervous system effects. May affect the cardiovascular system. May affect respiration.

Indication of any immediate medical attention and special treatment needed
Notes to Physician: Treat symptomatically

Protection of first-aiders
First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media: Dry chemical. Water spray mist or foam.

Unsuitable Extinguishing Media: No information available.

Specific hazards arising from the chemical

Hazardous Combustion Products: Carbon oxides

Specific hazards: May be combustible at high temperatures. Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Special Protective Actions for Firefighters

Specific Methods: No information available.

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

Personal precautions, protective equipment and emergency procedures

Personal Precautions: Ensure adequate ventilation. Use personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Remove all sources of ignition.

Environmental precautions Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Methods for containment Stop leak if you can do it without risk. Cover with plastic sheet to prevent spreading.

Methods for cleaning up Sweep up and shovel into suitable containers for disposal. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions: Provide sufficient air exchange and/or exhaust in work rooms. Avoid dust formation. Keep away from incompatible materials.

Safe Handling Advice: Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Do not ingest. Do not breathe vapours/dust. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities

Technical Measures/Storage Conditions: Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Store away from incompatible materials.


8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

<table>
<thead>
<tr>
<th>Components</th>
<th>OSHA</th>
<th>NIOSH</th>
<th>ACGIH</th>
<th>AIHA WHEEL</th>
</tr>
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<tbody>
<tr>
<td>Citric Acid, Monohydrate - 5949-29-1</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

Canada

<table>
<thead>
<tr>
<th>Components</th>
<th>Alberta</th>
<th>British Columbia</th>
<th>Ontario</th>
<th>Quebec</th>
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<tbody>
<tr>
<td>Citric Acid, Monohydrate - 5949-29-1</td>
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<td>None</td>
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</table>

Product code: CI132

Product name: CITRIC ACID
MONOHYDRATE, GRANULAR, USP
Australia and Mexico

<table>
<thead>
<tr>
<th>Components</th>
<th>Australia</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric Acid, Monohydrate 5949-29-1</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

**Appropriate engineering controls**

**Engineering measures to reduce exposure:** Ensure adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Individual protection measures, such as personal protective equipment**

**Personal Protective Equipment**

- **Eye protection:** Goggles. Safety glasses with side-shields.
- **Skin and body protection:** Chemical resistant apron. Long sleeved clothing. Gloves.
- **Respiratory protection:** Effective dust mask. Wear respirator with dust filter.
- **Hygiene measures:** Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.

**9. PHYSICAL AND CHEMICAL PROPERTIES**
9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Physical state:</th>
<th>Appearance:</th>
<th>Color:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Odor:</th>
<th>Taste</th>
<th>Formula:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odorless.</td>
<td>Acid. Sour.</td>
<td>C6H8O7•H2O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Molecular/Formula weight:</th>
<th>Flash point (°C):</th>
<th>Flashpoint (°C/°F):</th>
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<table>
<thead>
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<th>Lower Explosion Limit (%):</th>
<th>Upper Explosion Limit (%):</th>
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</thead>
<tbody>
<tr>
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<td>8</td>
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<thead>
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<th>Autoignition Temperature (°C/°F):</th>
<th>pH:</th>
<th>Melting point/range(°C/°F):</th>
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<tbody>
<tr>
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<td>100-153 °C/212-307.4 °F</td>
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<table>
<thead>
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<th>Decomposition temperature(°C/°F):</th>
<th>Specific gravity:</th>
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<tbody>
<tr>
<td>No information available</td>
<td>Loses water of crystallization in dry air or when heated at about 40-50°C/104-122°F</td>
<td>1.54</td>
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</table>

<table>
<thead>
<tr>
<th>Bulk density:</th>
<th>Vapor pressure @ 20°C (kPa):</th>
<th>Density (g/cm³):</th>
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<tbody>
<tr>
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</tbody>
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<table>
<thead>
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<th>Evaporation rate:</th>
<th>Vapor density:</th>
<th>VOC content (g/L):</th>
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<td>No information available</td>
<td>No information available</td>
</tr>
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</table>

<table>
<thead>
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<th>Odor threshold (ppm):</th>
<th>Partition coefficient (n-octanol/water):</th>
<th>Viscosity:</th>
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</thead>
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<td>No information available</td>
<td>No information available</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Miscibility:</th>
<th>Solubility:</th>
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<tbody>
<tr>
<td>No information available</td>
<td>Easily soluble in cold water Easily soluble in hot water Easily soluble in methanol Soluble in Ether Solubility in Ether: 2.17 g/100 g Solubility in Methanol: 197 g/100 g @ 19 deg. C</td>
</tr>
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10. STABILITY AND REACTIVITY

Reactivity
Reactive with oxidizing agents Reacts with reducing agents Reacts with bases Potentially explosive reaction with metal nitrates

Chemical stability
Stability: Stable at normal conditions
Possibility of Hazardous Reactions: Hazardous polymerization does not occur

Conditions to avoid:
Heat. Ignition sources. Incompatible materials. Avoid dust formation. Dust may form explosive mixture in air. Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Incompatible Materials:

Product code: CI132
Product name: CITRIC ACID MONOHYDRATE, GRANULAR, USP

6 / 12
Hazardous decomposition products: Carbon oxides.

Other Information

Corrosivity: Corrosive in presence of aluminum, zinc, copper and their alloys

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principal Routes of Exposure:
Ingestion. Inhalation.

Acute Toxicity

Component Information

Citric Acid, Monohydrate - 5949-29-1
LD50/oral/rat = No information available
LD50/oral/mouse = 5790 mg/kg
LD50/dermal/rabbit = No information available
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
Other LD50 or LC50 information = 375 mg/kg, intraperitoneal, rat;
2700 mg/kg, subcutaneous, mouse;
5500 mg/kg, subcutaneous, rat

Product Information

LD50/oral/rat =
VALUE- Acute Tox Oral = No information available
LD50/oral/mouse =
Value - Acute Tox Oral = 5790mg/kg
LD50/dermal/rabbit
VALUE-Acute Tox Dermal = No information available
LD50/dermal/rat
VALUE -Acute Tox Dermal = No information available
LC50/inhalation/rat
VALUE-Vapor = No information available
VALUE-Gas = No information available
VALUE-Dust/Mist = No information available

Symptoms

Product code: CI132
Product name: CITRIC ACID
MONOHYDRATE, GRANULAR, USP
Skin Contact: Mild skin irritation.

Eye Contact: Causes serious eye irritation. Highly irritating.

Inhalation
Irritating to respiratory system. Symptoms may include coughing.

Ingestion
Causes gastrointestinal (digestive) tract irritation with nausea, vomiting, and diarrhea. May affect behavior/central nervous system (convulsions, somnolence), and respiration. May affect behavior/central nervous system (ataxia). May affect behavior/central nervous system (tremor, convulsions). May affect respiration (respiratory depression). May affect the cardiovascular system (change in heart rate). May affect the cardiovascular system (hypotension). May cause metabolic acidosis. May cause hypocalcemia. May cause lactic acidosis. May cause hyperkalemia.

Aspiration hazard
No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic Toxicity
Frequent intake of citrated beverages may cause erosion of dental enamel and irritation of the mucous membranes

Sensitization:
No information available

Mutagenic Effects:
No information available

Carcinogenic effects:
Not considered carcinogenic

<table>
<thead>
<tr>
<th>Components</th>
<th>ACGIH - Carcinogens</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA HCS - Carcinogens</th>
<th>Australia - Prohibited Carcinogenic Substances</th>
<th>Australia - Notifiable Carcinogenic Substances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric Acid, Monohydrat e</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
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</tr>
</tbody>
</table>

Reproductive toxicity
No data is available

Reproductive Effects:
No information available

Developmental Effects:
No information available

Teratogenic Effects:
No information available

Specific Target Organ Toxicity

STOT - single exposure respiratory system.

STOT - repeated exposure No information available

Target Organs: Respiratory system.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects: No data available.

Persistence and degradability: No information available

Bioaccumulative potential: No information available
13. DISPOSAL CONSIDERATIONS

Disposal Methods

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric Acid, Monohydrate</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

DOT

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Subsidiary Risk: Not applicable
Packing Group: None
ERG No: No information available
Marine Pollutant: No data available
DOT RQ (lbs): No information available

TDG (Canada)

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Subsidiary Risk: No information available
Packing Group: No information available
Description: No information available

ADR

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Packing Group: No information available
Subsidiary Risk: No information available
Classification Code: No information available
Description: No information available
CEFIC Tremcard No: No information available

IMO / IMDG

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Subsidiary Risk: No information available
Packing Group: No information available
Description: No information available
IMDG Page: No information available

Product code: CI132
Product name: CITRIC ACID
MONOHYDRATE, GRANULAR, USP
14. TRANSPORT INFORMATION

Marine Pollutant: No information available
MFAG: No information available
Maximum Quantity: No information available

RID

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Subsidiary Risk: No information available
Packing Group: No information available
Classification Code: No information available
Description: No information available

ICAO

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Subsidiary Risk: No information available
Packing Group: No information available
Description: No information available

IATA

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Subsidiary Risk: No information available
Packing Group: No information available
Description: No information available

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Components</th>
<th>U.S. TSCA</th>
<th>KOREA KECL</th>
<th>Philippines (PICCS)</th>
<th>Japan ENCS</th>
<th>CHINA</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
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</thead>
<tbody>
<tr>
<td>Citric Acid, Monohydrate</td>
<td>Not Listed</td>
<td>Not present</td>
<td>Present</td>
<td>Present (2)-1318</td>
<td>Present[38022</td>
<td>Present</td>
<td>Not present</td>
</tr>
</tbody>
</table>

U.S. Regulations


Chemicals Known to the State of California to Cause Cancer:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

<table>
<thead>
<tr>
<th>Components</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
<th>Male Reproductive Toxicity</th>
<th>Female Reproductive Toxicity</th>
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<tbody>
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<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

CERCLA/SARA

Product code: CI132
Product name: CITRIC ACID MONOHYDRATE, GRANULAR, USP
U.S. TSCA

<table>
<thead>
<tr>
<th>Components</th>
<th>TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)</th>
<th>TSCA 8(d) - Health and Safety Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric Acid, Monohydrate</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Canada

WHMIS hazard class:
E  Corrosive material

Citric Acid, Monohydrate
E

Canada Controlled Products Regulation:
This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Inventory

<table>
<thead>
<tr>
<th>Components</th>
<th>Canada (DSL)</th>
<th>Canada (NDSL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric Acid, Monohydrate</td>
<td>Present</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

EU Classification

R-phrase(s)
R36 - Irritating to eyes.
R37 - Irritating to respiratory system.
R38 - Irritating to skin.

S-phrase(s)
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37 - Wear suitable gloves.
S39 - Wear eye/face protection.

<table>
<thead>
<tr>
<th>Components</th>
<th>Classification</th>
<th>Concentration Limits:</th>
<th>Safety Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric Acid, Monohydrate</td>
<td></td>
<td>No information</td>
<td></td>
</tr>
</tbody>
</table>

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:
Xi - Irritant.
16. OTHER INFORMATION

Preparation Date: 2/12/2015
Revision Date: 02/12/2015
Prepared by: Sonia Owen

Disclaimer:
All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Safety Data Sheet

Product code: CI132
Product name: CITRIC ACID MONOHYDRATE, GRANULAR, USP
Material Safety Data Sheet

Section 1. Chemical Product and Company Identification

**Common Name/Trade Name**
Citric acid, monohydrate

**Manufacturer**
SPECTRUM CHEMICAL MFG. CORP.
14422 S. SAN PEDRO STREET
GARDENA, CA 90248

**Commercial Name(s)**
Not available.

**Synonym**
2-Hydroxy-1,2,3-propanetricarboxylic acid monohydrate

**Chemical Name**
Not available.

**Chemical Family**
Aliphatic carboxylic acid. (Acid.)

**Chemical Formula**
C₆H₈O₇

**Supplier**
SPECTRUM CHEMICAL MFG. CORP.
14422 S. SAN PEDRO STREET
GARDENA, CA 90248

**Catalog Number(s).**
YY1403, C1283, C1285, C1296, C1343, C132

**CAS#**
5949-29-1

**RTECS**
GE7350000

**TSCA**
TSCA 8(b) inventory: no products found

**C1#**
Not applicable.

**Contact Information**
CHEMTREC (24hr) 800-424-9300
CALL (310) 516-8000

Section 2. Composition and Information on Ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS #</th>
<th>TWA (mg/m³)</th>
<th>STEL (mg/m³)</th>
<th>CEIL (mg/m³)</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Citric acid, monohydrate</td>
<td>5949-29-1</td>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Toxicological Data on Ingredients

- **ORAL (LD50):** Acute: 6730 mg/kg [Rat.]

Section 3. Hazards Identification

**Potential Acute Health Effects**
Hazardous in case of eye contact (irritant), of inhalation (lung irritant). Slightly hazardous in case of skin contact (irritant, sensitizer), of ingestion. The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Severe over-exposure can produce lung damage, choking, unconsciousness or death.

Continued on Next Page
## Potential Chronic Health Effects

- Slightly hazardous in case of skin contact (sensitizer).
- **CARCINOGENIC EFFECTS:** Not available.
- **MUTAGENIC EFFECTS:** Not available.
- **TERATOGENIC EFFECTS:** Not available.
- **DEVELOPMENTAL TOXICITY:** Not available.

The substance may be toxic to teeth. 
Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage.

## Section 4. First Aid Measures

### Eye Contact

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

### Skin Contact

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

### Serious Skin Contact

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

### Inhalation

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

### Serious Inhalation

Not available.

### Ingestion

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

### Serious Ingestion

Not available.

## Section 5. Fire and Explosion Data

### Flammability of the Product

May be combustible at high temperature.

### Auto-Ignition Temperature

Not available.

### Flash Points

Not available.

### Flammable Limits

**LOWER:** 8%

### Products of Combustion

These products are carbon oxides (CO, CO2).

### Fire Hazards in Presence of Various Substances

Flammable in presence of open flames and sparks, of oxidizing materials, of reducing materials. Slightly flammable to flammable in presence of heat, of combustible materials.

### Explosion Hazards in Presence of Various Substances

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

### Fire Fighting Media and Instructions

**SMALL FIRE:** Use DRY chemical powder.
**LARGE FIRE:** Use water spray, fog or foam. Do not use water jet.

### Special Remarks on Fire Hazards

Material in powder form, capable of creating a dust explosion. As with most organic solids, fire is possible at elevated temperatures.

### Special Remarks on Explosion Hazards

Not available.
## Section 6. Accidental Release Measures

**Small Spill**
Use appropriate tools to put the spilled solid in a convenient waste disposal container. If necessary: **Neutralize the residue with a dilute solution of sodium carbonate.** Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

**Large Spill**
Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. **Neutralize the residue with a dilute solution of sodium carbonate.** Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

## Section 7. Handling and Storage

### Precautions
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, alkalis.

### Storage
Keep container tightly closed. Keep container in a cool, well-ventilated area.

## Section 8. Exposure Controls / Personal Protection

### Engineering Controls
Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

### Personal Protection
Safety glasses. Lab coat. Gloves (impervious). Dust respirator. Be sure to use an approved/certified respirator or equivalent. The dust respirator should be used for conditions where exposure has exceeded recommended exposure limits, dust is apparent, and engineering controls (adequate ventilation) are not feasible.

### Personal Protection in Case of a Large Spill
Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

### Exposure Limits
Not available.

## Section 9. Physical and Chemical Properties

### Physical state and appearance
Solid. (Solid crystalline powder, Granular solid, Fine Crystals solid.)

### Molecular Weight
210.14 g/mole

### pH (1% soln/water)
3 [Acidic.]

### Boiling Point
Not available.

### Melting Point
Decomposes. (45°C or 113°F)

### Critical Temperature
Not available.

### Specific Gravity
1.54 (Water = 1)

### Vapor Pressure
Not applicable.

### Vapor Density
Not available.

### Volatility
Not available.

### Odor Threshold
Not available.

### Water/Oil Dist. Coeff.
Not available.

### Ionicity (in Water)
Not available.

### Dispersion Properties
See solubility in water, methanol, diethyl ether.

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### Citric acid, monohydrate

<table>
<thead>
<tr>
<th>Solubility</th>
<th>Easily soluble in cold water, hot water. Partially soluble in methanol, diethyl ether. Insoluble in n-octanol.</th>
</tr>
</thead>
</table>

### Section 10. Stability and Reactivity Data

<table>
<thead>
<tr>
<th>Stability</th>
<th>The product is stable.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instability Temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Conditions of Instability</td>
<td>Excess heat, incompatible materials, moisture/moisture air. Slightly deliquescent in moist air</td>
</tr>
<tr>
<td>Incompatibility with various substances</td>
<td>Reactive with oxidizing agents, reducing agents, metals, alkalis.</td>
</tr>
<tr>
<td>Corrosivity</td>
<td>Not available.</td>
</tr>
<tr>
<td>Special Remarks on Reactivity</td>
<td>Incompatible with oxidizing agents, potassium tartrate, alkali, alkaline earth carbonates and bicarbonates, acetates, and sulfides, metal nitrates</td>
</tr>
<tr>
<td>Special Remarks on Corrosivity</td>
<td>Not available.</td>
</tr>
<tr>
<td>Polymerization</td>
<td>Will not occur.</td>
</tr>
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</table>

### Section 11. Toxicological Information

<table>
<thead>
<tr>
<th>Routes of Entry</th>
<th>Inhalation. Ingestion.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to Animals</td>
<td>Acute oral toxicity (LD50): 6730 mg/kg [Rat.].</td>
</tr>
<tr>
<td>Chronic Effects on Humans</td>
<td>May cause damage to the following organs: teeth.</td>
</tr>
<tr>
<td>Other Toxic Effects on Humans</td>
<td>Hazardous in case of inhalation (lung irritant). Slightly hazardous in case of skin contact (irritant, sensitizer), of ingestion.</td>
</tr>
<tr>
<td>Special Remarks on Toxicity to Animals</td>
<td>Not available.</td>
</tr>
<tr>
<td>Special Remarks on Chronic Effects on Humans</td>
<td>Not available.</td>
</tr>
<tr>
<td>Special Remarks on other Toxic Effects on Humans</td>
<td>Acute Potential Health Effects: Skin: Causes mild to moderate skin irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material. Eyes: Causes moderate to severe eye irritation and possible injury. Ingestion: May cause gastrointestinal (digestive) tract irritation with nausea, vomiting, diarrhea. Excessive intake may cause erosion of teeth and hypocalcemia (calcium deficiency in blood). May affect behavior/central nervous system (tremor, convulsions, muscle contraction or spasticity). Inhalation: Causes moderate respiratory tract and mucous membrane irritation. Chronic Potential Health Effects: Frequent intake of citrated beverages may cause erosion of dental enamel and irritation of mucous membranes.</td>
</tr>
</tbody>
</table>

### Section 12. Ecological Information

<table>
<thead>
<tr>
<th>Ecotoxicity</th>
<th>Not available.</th>
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</thead>
<tbody>
<tr>
<td>BOD5 and COD</td>
<td>Not available.</td>
</tr>
<tr>
<td>Products of Biodegradation</td>
<td>Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.</td>
</tr>
<tr>
<td>Toxicity of the Products of Biodegradation</td>
<td>The product itself and its products of degradation are not toxic.</td>
</tr>
</tbody>
</table>

Continued on Next Page
### Section 13. Disposal Considerations

**Waste Disposal**
Waste must be disposed of in accordance with federal, state and local environmental control regulations.

### Section 14. Transport Information

**DOT Classification**
Not a DOT controlled material (United States).

**Identification**
Not applicable.

**Special Provisions for Transport**
Not applicable.

**DOT (Pictograms)**

### Section 15. Other Regulatory Information and Pictograms

**Federal and State Regulations**
California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: No products were found.
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: No products were found.

**California Proposition 65 Warnings**
EINECS: This product is not listed on the European Inventory of Existing Commercial Chemical Substances.
Canada: Not listed on Canadian Domestic Substance List (DSL) or Canadian Non-Domestic Substances List (NDSL).
China: Listed on National Inventory.
Japan: Not listed on National Inventory (ENCS).
Korea: Not listed on National Inventory (KECI).
Philippines: Listed on National Inventory (PICCS).
Australia: Listed on AICS.

**Other Regulations**

**Other Classifications**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHMIS (Canada)</td>
<td>CLASS E: Corrosive solid.</td>
<td></td>
</tr>
<tr>
<td>DSCL (EEC)</td>
<td>R36/37/38- Irritating to eyes, respiratory system and skin.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S37/39- Wear suitable gloves and eye/face protection.</td>
<td></td>
</tr>
</tbody>
</table>

**HMIS (U.S.A.)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Hazard</td>
<td>2</td>
<td>National Fire Protection Association (U.S.A.)</td>
</tr>
<tr>
<td>Fire Hazard</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Reactivity</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Personal Protection</td>
<td>E</td>
<td></td>
</tr>
</tbody>
</table>

**WHMIS (Canada) (Pictograms)**

*Continued on Next Page*
### Protective Equipment

- Gloves (impervious).
- Lab coat.
- Dust respirator. Be sure to use an approved/certified respirator or equivalent.
- Wear appropriate respirator when ventilation is inadequate.
- Safety glasses.

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### Section 16. Other Information

<table>
<thead>
<tr>
<th>MSDS Code</th>
<th>C4380</th>
</tr>
</thead>
</table>
- The Sigma-Aldrich Library of Chemical Safety Data, Edition II. |
| Other Special Considerations | Not available. |

**Validated by Sonia Owen on 5/30/2008.**

**Verified by Sonia Owen.**

**Printed 6/26/2008.**

**CALL (310) 516-8000**

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Contact Distributor
www.qualityexcipients.com
info@qualityexcipients.com