SAFETY DATA SHEET
SDS00386
CITRIC ACID 50% SOLUTION

Preparation Date: 12/Jan/2018
Version: 4

1. IDENTIFICATION

Product identifier

Product Name CITRIC ACID 50% SOLUTION

Other means of identification

Product Code(s) SDS00386
Synonyms 2-Hydroxy-1,2,3 Propanetricarboxylic Acid

Recommended use of the chemical and restrictions on use

Recommended Use Water treatment.
Restricted Uses No information available

Initial Supplier Identifier
Univar Canada Ltd.
9800 Van Horne Way
Richmond, BC V6X 1W5
Telephone: 1-866-686-4827

Emergency telephone number

24 Hour Emergency Phone Number (CANUTEC): 1-888-226-8832 (1-888-CAN-UTECH)

2. HAZARD IDENTIFICATION

Hazardous Classification of the substance or mixture

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin corrosion/irritation</td>
<td>Category 1</td>
</tr>
<tr>
<td>Sub-category A</td>
<td></td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Category 1</td>
</tr>
</tbody>
</table>

Label elements
Signal Word: Danger

Hazard statements
Causes severe skin burns and eye damage

Prevention
Do not breathe dust/fume/gas/mist/vapors/spray
Wash hands and face thoroughly after handling
Wear protective gloves/protective clothing/eye protection/face protection

Response
Read the label and safety data sheet before use.
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 ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Immediately call a POISON CENTER or doctor
IF SWALLOWED: Rinse mouth. DO NOT induce vomiting

Storage
Store in a well-ventilated place. Keep cool
Store in a closed container

Disposal
Disposal of all wastes must be done in accordance with municipal, provincial and federal regulations

Unknown acute toxicity
No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Substance</th>
<th>Chemical Name</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>Synonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Citric acid</td>
<td>77-92-9</td>
<td>50 - 60%</td>
<td>Citric acid</td>
</tr>
</tbody>
</table>

4. FIRST AID

Description of first aid measures

Inhalation
Remove to fresh air.

Eye contact
Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids. Consult a physician.

**Skin contact**
Wash skin with soap and water.

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

**Most important symptoms and effects, both acute and delayed:**
If large amounts of the product are ingested, symptoms may include gastrointestinal irritation, nausea, vomiting and diarrhea. Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis). May cause irritation with redness, pain, possible eye burns, conjunctivitis, ulceration and permanent cloudiness. May cause mucous membrane irritation with sore throat, coughing and shortness of breath. Causes irritation with discomfort, local redness, and possible swelling.

**Indication of any immediate medical attention and special treatment needed:**

**Note to physicians**
Treatment based on sound judgment of physician and individual reactions of patient.

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**5. FIRE-FIGHTING MEASURES**

**Suitable Extinguishing Media**
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Specific hazards arising from the substance or mixture**
Will not burn or support combustion.

**Hazardous combustion products**
Oxides of carbon.

**Special protective equipment for fire-fighters**
Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear. Use personal protection equipment.

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**6. ACCIDENTAL RELEASE MEASURES**

**Personal precautions, protective equipment and emergency procedures**
Use personal protective equipment as required. Avoid contact with skin and eyes.

**Environmental precautions**
Prevent further leakage or spillage if safe to do so.

**Methods and materials for containment and cleaning up**
Flush area with water to remove trace residue. Observe government regulations.

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**7. HANDLING AND STORAGE**

**Precautions for safe handling**
Avoid contact with eyes, skin and clothing. Avoid breathing vapors or mists. Empty containers may contain hazardous
product residues. Wash thoroughly after handling.

**Conditions for safe storage, including any incompatibilities**

Store in a cool, dry, well ventilated area. Keep containers tightly closed. Avoid storage with incompatible materials. Keep at temperatures between 10 and 60 °C. Store in accordance with good industrial practices.

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Control parameters**

**Exposure Limits**

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Alberta OEL</th>
<th>British Columbia OEL</th>
<th>Ontario</th>
<th>Quebec OEL</th>
<th>Exposure Limit - ACGIH</th>
<th>Immediately Dangerous to Life or Health - IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric acid</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
</tr>
</tbody>
</table>

Consult local authorities for recommended exposure limits

**Appropriate engineering controls**

**Engineering controls**

Use local exhaust or general room/dilution ventilation sufficient to maintain employee exposure below permissible exposure limits.

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

**Eye/face protection**

Safety glasses with side shields or chemical goggles.

**Hand protection**

Appropriate chemical resistant gloves should be worn. Rubber gloves. Vinyl gloves.

**Skin and body protection**

Wear chemical resistant pants and jackets, preferably butyl or nitrile rubber. Skin contact should be prevented through the use of suitable protective clothing, gloves and footwear, selected for conditions of use and exposure potential. Consideration must be given both to durability as well as permeation resistance.

**Respiratory protection**

Not required for normal conditions of use. If exposure to vapor or mist can occur the use of an air purifying respirator with organic vapor cartridge is required.

**General hygiene considerations**

Handle in accordance with good industrial hygiene and safety practice.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Information on basic physical and chemical properties**

**Appearance**

- **Physical state**: Liquid
- **Color**: White - Off white
- **Odor**: Odorless
Odor threshold

No information available

<table>
<thead>
<tr>
<th>PROPERTIES</th>
<th>Values</th>
<th>Remarks • Method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>pH</strong></td>
<td>2.2 (1%), 1.8 (5%), 1.7 (10%), 0.8 (50%)</td>
<td></td>
</tr>
<tr>
<td>Melting point / freezing point</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Initial boiling point/boiling range</td>
<td>104 °C / 219 °F</td>
<td></td>
</tr>
<tr>
<td>Flash point</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Flammability Limit in Air</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper flammability limit</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Lower flammability limit</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>16 mmHg @ 68°F</td>
<td>None known</td>
</tr>
<tr>
<td>Relative vapor density</td>
<td>0.62</td>
<td>None known</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.24 @ 15°C</td>
<td>None known</td>
</tr>
<tr>
<td>Water solubility</td>
<td>Soluble in water Soluble in methanol.</td>
<td></td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Autoignition temperature</td>
<td>No data available</td>
<td></td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Kinematic viscosity</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Dynamic viscosity</td>
<td>No data available</td>
<td>None known</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No information available</td>
<td></td>
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<tr>
<td>Oxidizing properties</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Molecular weight</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>VOC Percentage Volatility</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Liquid Density</td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td>Bulk density</td>
<td>No information available</td>
<td></td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

Reactivity/Chemical Stability
Stable under normal conditions

Possibility of hazardous reactions
None under normal processing.

Conditions to avoid
Avoid excessive heat, open flames and all ignition sources.

Incompatible materials
Strong oxidizers. Strong acids.

Hazardous decomposition products
Oxides of carbon.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Inhalation
May cause mucous membrane irritation with sore throat, coughing and shortness of breath.
Eye contact
May cause irritation with redness, pain, possible eye burns, conjunctivitis, ulceration and permanent cloudiness.

Skin contact
Causes irritation with discomfort, local redness, and possible swelling. Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis).

Ingestion
If large amounts of the product are ingested, symptoms may include gastrointestinal irritation, nausea, vomiting and diarrhea.

Information on toxicological effects

Symptoms
Pre-existing eye and skin disorders may be aggravated by exposure to this product. Long term oral overexposure may cause damage to tooth enamel.

Numerical measures of toxicity

Acute toxicity
The following values are calculated based on chapter 3.1 of the GHS document.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
<th>Inhalation LC50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric acid</td>
<td>= 3 g/kg (Rat)</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>77-92-9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Unknown acute toxicity
No information available.

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

Skin corrosion/irritation
Frequent or prolonged contact may irritate the skin and cause a skin rash (dermatitis). Causes irritation with discomfort, local redness, and possible swelling.

Serious eye damage/eye irritation
May cause irritation with redness, pain, possible eye burns, conjunctivitis, ulceration and permanent cloudiness.

Respiratory or skin sensitization
No information available.

Germ cell mutagenicity
No information available.

Carcinogenicity
No information available.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric acid</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
<td>Not available</td>
</tr>
<tr>
<td>77-92-9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reproductive toxicity
No information available.

Specific target organ systemic toxicity - single exposure
No information available.

Specific target organ systemic toxicity - repeated exposure
No information available.

**Aspiration hazard**
No information available.

### 12. ECOLOGICAL INFORMATION

#### Ecotoxicity

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Ecotoxicity - Freshwater Algae Data</th>
<th>Ecotoxicity - Fish Species Data</th>
<th>Toxicity to microorganisms</th>
<th>Crustacea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric acid 77-92-9</td>
<td>Not available</td>
<td>1516 mg/L LC50 (Lepomis macrochirus) 96 h static</td>
<td>Not available</td>
<td>Not available</td>
</tr>
</tbody>
</table>

**Persistence and degradability** No information available.

**Bioaccumulation** No information available.

#### Component Information

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Partition coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric acid 77-92-9</td>
<td>-1.72</td>
</tr>
</tbody>
</table>

**Other adverse effects** No information available.

### 13. DISPOSAL CONSIDERATIONS

**Waste treatment methods**
Dispose of in accordance with local regulations. Dispose of waste in accordance with environmental legislation.
Do not reuse empty containers.

### 14. TRANSPORT INFORMATION

**TDG (Canada):**
- **UN Number** UN3265
- **Shipping name** CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (CITRIC ACID)
- **Class** 8
- **Packing Group** III
- **Marine pollutant** No.

**DOT (U.S.):**
- **UN Number** UN3265
- **Shipping name** CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (CITRIC ACID)
- **Class** 8
- **Packing Group** III
- **Marine pollutant** No.

### 15. REGULATORY INFORMATION
Safety, health and environmental regulations/legislation specific for the substance or mixture

NSF International

Certified to NSF/ANSI 80

Additional information
Maximum use for potable water 100 mg/L. (pH Adjustment) Only products bearing the NSF Mark on the product, product packaging, and/or documentation shipped with the product are Certified.

U.S. Regulatory Rules

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CERCLA/SARA - Section 302:</th>
<th>SARA (311, 312) Hazard Class:</th>
<th>CERCLA/SARA - Section 313:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric acid - 77-92-9</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

International Inventories

<table>
<thead>
<tr>
<th>Inventory</th>
<th>Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSCA</td>
<td>Complies</td>
</tr>
<tr>
<td>DSL/NDSL</td>
<td>Complies</td>
</tr>
</tbody>
</table>

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

16. OTHER INFORMATION, INCLUDING DATE OF PREPARATION OF THE LAST REVISION

<table>
<thead>
<tr>
<th>NFPA:</th>
<th>Health hazards 0</th>
<th>Flammability 0</th>
<th>Instability 0</th>
<th>Physical and chemical properties -</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMIS Health Rating:</td>
<td>Health hazards 1</td>
<td>Flammability 0</td>
<td>Physical hazards 0</td>
<td>Personal protection X</td>
</tr>
</tbody>
</table>

Legend: Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

- TWA (time-weighted average)
- STEL (Short Term Exposure Limit)
- Skin designation

Prepared By: The Environment, Health and Safety Department of Univar Canada Ltd.

Preparation Date: 12/Jan/2018
Revision Date: 12/Jan/2018

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End of Safety Data Sheet