



# MATERIAL SAFETY DATA SHEET

## 1. Product and Company Identification

**Material name** CITRIC ACID, ANHYDROUS, REAGENT (ACS)  
**Catalog #** 649  
**Version #** 03  
**Revision date** 09-Jun-2010  
**CAS #** 77-92-9  
**Synonym(s)** 2-HYDROXY-1,2,3-PROPANETRICARBOXYLIC ACID  
**Manufacturer information** GFS Chemicals, Inc.  
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Powell, OH 43065 US  
www.gfschemicals.com  
Fax 740-881-5989  
Phone 740-881-5501  
Toll Free 800-858-9682  
Emergency Assistance Chemtrec 800-424-8300

## 2. Hazards Identification

**Emergency overview** Irritating to eyes. Exposure to powder or dusts may be irritating to eyes, nose and throat.  
**OSHA regulatory status** This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).  
**Potential health effects**  
**Routes of exposure** Inhalation. Eye contact.  
**Eyes** Contact may cause eye irritation.  
**Skin** This product may cause irritation to the skin.  
**Inhalation** Inhalation of dusts may cause respiratory irritation. Do not breathe dust.  
**Ingestion** Health injuries are not known or expected under normal use.  
**Potential environmental effects** This material is not expected to be harmful to aquatic life.

## 3. Composition / Information on Ingredients

Components	CAS #	Percent
CITRIC ACID	77-92-9	90 - 100

## 4. First Aid Measures

**First aid procedures**  
**Eye contact** Immediately flush eyes with plenty of water for at least 15 minutes.  
**Skin contact** Rinse skin with water/shower. Get medical attention if irritation develops or persists.  
**Inhalation** If gas/fume/vapor/dust/mist from the material is inhaled, remove the affected person immediately to fresh air. Call a physician if symptoms develop or persist.  
**Ingestion** Rinse mouth. If ingestion of a large amount does occur, call a poison control center immediately.  
**General advice** Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

## 5. Fire Fighting Measures

**Flammable properties** The product is not flammable. Not a fire hazard. Dust may form explosive mixture with air.  
**Extinguishing media**  
**Suitable extinguishing media** Water. Water fog. Foam. Dry chemical powder. Carbon dioxide (CO<sub>2</sub>).

## Protection of firefighters

**Protective equipment and precautions for firefighters** In the event of fire, cool tanks with water spray. Use water spray to cool unopened containers. Cool containers exposed to flames with water until well after the fire is out.

**Specific methods** In the event of fire, cool tanks with water spray. Use water spray to cool unopened containers.

## 6. Accidental Release Measures

**Personal precautions** Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained. Keep upwind. Keep out of low areas. Keep people away from and upwind of spill/leak. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid inhalation of dust from the spilled material. Wear a dust mask if dust is generated above exposure limits.

**Environmental precautions** Prevent further leakage or spillage if safe to do so. Do not contaminate water.

**Methods for containment** If sweeping of a contaminated area is necessary use a dust suppressant agent which does not react with the product. Prevent entry into waterways, sewers, basements or confined areas.

**Methods for cleaning up** Sweep up or vacuum up spillage and collect in suitable container for disposal. Small quantities can be dissolved/diluted in water and flushed to drain. Avoid dust formation. Collect dust or particulates using a vacuum cleaner with a HEPA filter. Following product recovery, flush area with water.

## 7. Handling and Storage

**Handling** Keep formation of airborne dusts to a minimum. Provide appropriate exhaust ventilation at places where dust is formed. Do not breathe dust from this material. Avoid contact with eyes. Wear personal protective equipment. In case of insufficient ventilation, wear suitable respiratory equipment. Wash thoroughly after handling. Avoid release to the environment. Handle and open container with care.

**Storage** Store in a well-ventilated place. Keep container tightly closed. Guard against dust accumulation of this material. Use care in handling/storage.

## 8. Exposure Controls / Personal Protection

**Engineering controls** Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing. If engineering measures are not sufficient to maintain concentrations of dust particulates below the OEL, suitable respiratory protection must be worn. If material is ground, cut, or used in any operation which may generate dusts, use appropriate local exhaust ventilation to keep exposures below the recommended exposure limits. Ensure adequate ventilation, especially in confined areas.

### Personal protective equipment

**Respiratory protection** Wear respirator with dust filter. In case of insufficient ventilation wear suitable respiratory equipment.

**Hand protection** Wear protective gloves.

**Eye / face protection** Avoid contact with eyes. Wear dust goggles.

**Skin protection** Avoid contact with the skin. No special protective equipment required.

**General hygiene considerations** Do not breathe dust. Avoid contact with eyes. Avoid contact with skin. Handle in accordance with good industrial hygiene and safety practice.

**General** Ensure that eyewash stations and safety showers are close to the workstation location.

## 9. Physical & Chemical Properties

**Appearance** Crystalline.  
**Color** White.  
**Odor** Characteristic.  
**Odor threshold** Not available.  
**Physical state** Solid.  
**Form** Crystalline powder.  
**pH** 2.2 0.1 M solution  
**Melting point** 307.4 °F (153 °C) estimated  
**Freezing point** 307.4 °F (153 °C)  
**Boiling point** Not available.

<b>Flash point</b>	Not available.
<b>Evaporation rate</b>	Not available.
<b>Flammability</b>	Not available.
<b>Flammability limits in air, upper, % by volume</b>	Not available.
<b>Flammability limits in air, lower, % by volume</b>	Not available.
<b>Vapor pressure</b>	Not available.
<b>Vapor density</b>	Not available.
<b>Specific gravity</b>	1.665
<b>Relative density</b>	1.6648 g/cm <sup>3</sup> estimated
<b>Solubility (water)</b>	Not available.
<b>Partition coefficient (n-octanol/water)</b>	Not available.
<b>Auto-ignition temperature</b>	1850 °F (1010 °C) estimated
<b>Decomposition temperature</b>	Not available.
<b>Percent volatile</b>	0 % estimated
<b>Molecular weight</b>	192.1200 g/mol
<b>Molecular formula</b>	C <sub>6</sub> H <sub>8</sub> O <sub>7</sub>

## 10. Chemical Stability & Reactivity Information

<b>Chemical stability</b>	Stable at normal conditions.
<b>Conditions to avoid</b>	This product may react with oxidizing agents.
<b>Incompatible materials</b>	Alkaline metals. Oxidizing materials. Will corrode copper, zinc, and aluminum.
<b>Hazardous decomposition products</b>	May include oxides of carbon.
<b>Possibility of hazardous reactions</b>	Hazardous polymerization does not occur.

## 11. Toxicological Information

### Acute effects

#### Acute Oral: LD 50

CITRIC ACID	77-92-9	Mouse 5040 mg/kg
CITRIC ACID	77-92-9	Rat 6730 mg/kg

#### Acute Toxicity other routes: LD 50

CITRIC ACID	77-92-9	Mouse 903 mg/kg Intraperitoneal
CITRIC ACID	77-92-9	Rat 5500 mg/kg Subcutaneous
CITRIC ACID	77-92-9	Rat 883 mg/kg Intraperitoneal
CITRIC ACID	77-92-9	Rat 975 mg/kg Intraperitoneal
CITRIC ACID	77-92-9	Rabbit 330 mg/kg Intravenous
CITRIC ACID	77-92-9	Mouse 42 mg/kg Intravenous
CITRIC ACID	77-92-9	Mouse 2700 mg/kg Subcutaneous

### Toxicology data for the preparation

Acute LD50: 2700 mg/kg, Mouse, Other  
 Acute LD50: 42 mg/kg, Mouse, Other  
 Acute LD50: 903 mg/kg, Mouse, Other  
 Acute LD50: 330 mg/kg, Rabbit, Other  
 Acute LD50: 5500 mg/kg, Rat, Other  
 Acute LD50: 883 mg/kg, Rat, Other  
 Acute LD50: 975 mg/kg, Rat, Other  
 Acute LD50: 5040 mg/kg, Mouse, Oral  
 Acute LD50: 6730 mg/kg, Rat, Oral

<b>Local effects</b>	Irritating to eyes. Inhalation of dusts may cause respiratory irritation.
<b>Carcinogenicity</b>	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

## 12. Ecological Information

<b>Ecotoxicity</b>	Components of this product have been identified as having potential environmental concerns.
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Catalog # Version #: 03 Revision date: 06-09-2010 Print date: 06-09-2010

**Environmental effects** An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

**Persistence and degradability** Not available.

### 13. Disposal Considerations

**Disposal instructions** Do not allow this material to drain into sewers/water supplies. This product, in its present state, when discarded or disposed of, is not a hazardous waste according to Federal regulations (40 CFR 261.4 (b)(4)). Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. Dispose in accordance with all applicable regulations.

**Waste from residues / unused products** Not applicable.

### 14. Transport Information

#### DOT

Not regulated as dangerous goods.

### 15. Regulatory Information

**US federal regulations** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.  
All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.

#### CERCLA (Superfund) reportable quantity

None

#### Superfund Amendments and Reauthorization Act of 1986 (SARA)

**Hazard categories** Immediate Hazard - Yes  
Delayed Hazard - No  
Fire Hazard - No  
Pressure Hazard - No  
Reactivity Hazard - No

**Section 302 extremely hazardous substance** No

**Section 311 hazardous chemical** Yes

#### Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of New and Existing Chemicals (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

**State regulations** This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

### 16. Other Information

**Further information** HMIS® is a registered trade and service mark of the NPCA.

**HMIS® ratings**

Health: 2  
Flammability: 0  
Physical hazard: 0

**NFPA ratings**

Health: 2  
Flammability: 0  
Instability: 0

**Disclaimer**

The information in the sheet was written based on the best knowledge and experience currently available. 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.

**Issue date**

09-Jun-2010