MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**CITRIC ACID, MONOHYDRATE, REAGENT (ACS)**
Catalog #	894
Version #	03
Revision date	09-Jun-2010
CAS #	5949-29-1
Manufacturer information	GFS Chemicals, Inc. P.O. Box 245 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, MONOHYDRATE	5949-29-1	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_2).

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 hygeine 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	Solid.
pH	2.2 (0.1 M in water)
Melting point	212 °F (100 °C)
Freezing point	Not available.
Boiling point	Not available.

Flash point	Not available.
Evaporation rate	Not available.
Flammability	Not available.
Flammability limits in air, upper, % by volume	Not available.
Flammability limits in air, lower, % by volume	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Specific gravity	1.5
Relative density	1.5 g/cm3
Solubility (water)	Very soluble.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	1850 °F (1010 °C)
Decomposition temperature	Not available.
Molecular weight	210.1400
Molecular formula	C6H8O7.H2O

10. Chemical Stability & Reactivity Information

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

11. Toxicological Information

Acute effects

Acute Oral: LD 50

CITRIC ACID, MONOHYDRATE	5949-29-1	Mouse 5040 mg/kg
CITRIC ACID, MONOHYDRATE	5949-29-1	Rat 6730 mg/kg

Acute Toxicity other routes: LD 50

CITRIC ACID, MONOHYDRATE	5949-29-1	Mouse 903 mg/kg Intraperitoneal
CITRIC ACID, MONOHYDRATE	5949-29-1	Rat 5500 mg/kg Subcutaneous
CITRIC ACID, MONOHYDRATE	5949-29-1	Rat 883 mg/kg Intraperitoneal
CITRIC ACID, MONOHYDRATE	5949-29-1	Rat 975 mg/kg Intraperitoneal
CITRIC ACID, MONOHYDRATE	5949-29-1	Rabbit 330 mg/kg Intravenous
CITRIC ACID, MONOHYDRATE	5949-29-1	Mouse 42 mg/kg Intravenous
CITRIC ACID, MONOHYDRATE	5949-29-1	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

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

12. Ecological Information

Ecotoxicity	Components of this product have been identified as having potential environmental concerns.

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
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