Material Safety Data Sheet

Material Name: Citric Acid, Monohydrate ID: COC-23

* * * Section 1 - Chemical Product and Company Identification * * *

Part Number: BP80, BP88, BP92, USP, FCC, Technical
Chemical Name: Citric Acid, Monohydrate
Product Use: For Manufacturing Use
Synonyms: 1,2,3-Propanetricarboxylic acid, 2-hydroxy-; 2-Hydroxy-1,2,3-propanetricarboxylic acid; Propane-1,2,3-tricarboxylic acid, 2-hydroxy-; beta-hydroxytricarballylic acid.

Supplier Information

Chem One Ltd.
8017 Pinemont Drive, Suite 100
Houston, Texas 77040-6519

Phone #: (713) 896-9966
Fax #: (713) 896-7540
Emergency #: (800) 424-9300 or (703) 527-3887

General Comments: FOR COMMERCIAL USE ONLY; NOT TO BE USED AS A PESTICIDE.

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

* * * Section 2 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
5949-29-1	Citric Acid Monohydrate	99.5%

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following:
Citric Acid Anhydrous (77-92-9)

Component Information/Information on Non-Hazardous Components

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

* * * Section 3 - Hazards Identification * * *

Emergency Overview

Product is a white or colorless crystalline solid. Irritating to eyes, skin, and respiratory tract. Slight fire potential when heated. Combustible in liquid form. Use methods suitable for surrounding fire. Firefighters should wear full protective equipment when fighting a fire involving this product.

Hazard Statements

WARNING! PRODUCT CAUSES EYE, SKIN, AND RESPIRATORY TRACT IRRITATION MAY CAUSE ALLERGIC SKIN SENSITIZATION REACTION. Do not breath mists or dusts. Do not allow contact with eyes, skin, or clothing. Keep container closed. Avoid generation of dusts, which can result in a dust explosion. Use only with adequate ventilation. Wash thoroughly after handling.

Potential Health Effects: Eyes

Dusts and solution may cause severe irritation to the eyes, with symptoms that include redness, tearing, and pain. Concentrated solutions may be corrosive to the eyes and cause corneal ulcerations.

Potential Health Effects: Skin

This product may cause moderate irritation of the skin. Citric acid may cause allergic contact dermatitis with prolonged or repeated contact.

Potential Health Effects: Ingestion

Citric acid may cause mild gastrointestinal irritation, with symptoms including nausea, diarrhea, vomiting, abdominal pain. Concentrated solutions may cause necrotic and ulcerative lesions on oral mucous membranes.

Potential Health Effects: Inhalation

Dusts and mists from solutions may cause mild to moderate irritation of the nose and throat. Overexposure could cause coughing, sneezing, and labored breathing.

HMIS Ratings: Health Hazard: 2* **Fire Hazard:** 0 **Physical Hazard:** 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

Immediately flush eyes with large amounts of room temperature water, occasionally lifting the lower and upper lids, for at least 15 minutes. If symptoms persist after 15 minutes of irrigation, seek medical attention.

* * * Section 4 - First Aid Measures (Continued) * * *

First Aid: Skin

Remove all contaminated clothing. For skin contact, wash thoroughly with soap and water for at least 20 minutes. Seek immediate medical attention if irritation develops or persists.

First Aid: Ingestion

DO NOT INDUCE VOMITING, unless directed by medical personnel. Have victim rinse mouth thoroughly with water, if conscious. Never give anything by mouth to a victim who is unconscious or having convulsions. Contact a physician or poison control center immediately.

First Aid: Inhalation

Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get immediate medical attention.

First Aid: Notes to Physician

There is no specific antidote. Care is symptomatic and supportive.

* * * Section 5 - Fire Fighting Measures * * *

Flash Point: Not available.
Method Used: Not applicable.
Upper Flammable Limit (UFL): 2.29 kg/m3
Lower Flammable Limit (LFL): 0.28-2.3 kg/m3 (dust)
Auto Ignition: 1010 deg. C
Flammability Classification: Not applicable.
Rate of Burning: Not applicable.

General Fire Hazards

Slight fire potential when heated. Citric Acid poses a serious dust explosion hazard.

Hazardous Combustion Products

Carbon dioxide and carbon monoxide are normal products of combustion. Incomplete combustion may produce irritating fumes and acrid smoke.

Extinguishing Media

Water, foam, dry chemical, or carbon dioxide.

Fire Fighting Equipment/Instructions

Firefighters should wear full protective clothing including self contained breathing apparatus.

NFPA Ratings: Health: 2 **Fire:** 0 **Reactivity:** 0 **Other:**

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

* * * Section 6 - Accidental Release Measures * * *

Containment Procedures

Stop the flow of material, if this can be done without risk. Contain the discharged material. If sweeping of a contaminated area is necessary use a dust suppressant agent, which does not react with product (see Section 10 for incompatibility information).

Clean-Up Procedures

Prevent material from entering sewers or waterways. Put material in suitable, covered, labeled containers.

Evacuation Procedures

Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. Keep materials which burn away from spilled material. In case of large spills, follow all facility emergency response procedures.

Special Procedures

Wear adequate personal protective equipment. Avoid inhalation of dusts. Ventilate the area.

* * * Section 7 - Handling and Storage * * *

Handling Procedures

Avoid generation of dusts and mists. Use this product only with adequate ventilation. Do not breathe dusts or mists. Do not allow dusts or mists of this material to contact your eyes or skin. Wash thoroughly after handling.

Storage Procedures

Keep the container tightly closed and in a cool, well-ventilated place. Store away from heat and metal nitrates.

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

Exposure Guidelines

A: General Product Information

No exposure guidelines have been established.

B: Component Exposure Limits

ACGIH, OSHA, and NIOSH have not developed exposure limits for any of this product's components.

The exposure limits given are for Particulates Not Otherwise Classified (PNOC).

OSHA: 15 mg/m^3 TWA (Total dust)
5 mg/m^3 TWA (Respirable fraction)
DFG MAKs 4 mg/m^3 TWA (Inhalable fraction)
1.5 mg/m^3 TWA (Respirable fraction)

Engineering Controls

Use general ventilation and use local exhaust, where possible, in confined or enclosed spaces.

PERSONAL PROTECTIVE EQUIPMENT

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132). Please reference applicable regulations and standards for relevant details.

Personal Protective Equipment: Eyes/Face

Wear safety glasses with side shields or chemical goggles. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

Personal Protective Equipment: Skin

Use impervious gloves. Butyl rubber, natural rubber, neoprene, nitrile rubber, polyethylene, or PVC are recommended. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

Personal Protective Equipment: Respiratory

None required where adequate ventilation conditions exist. If airborne concentration is high, use an appropriate respirator or dust mask. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

Personal Protective Equipment: General

Wash hands thoroughly after handling material. Do not eat, drink, or smoke in work areas. Have a safety shower and eye-wash fountain available.

* * * Section 9 - Physical & Chemical Properties * * *

Physical Properties: Additional Information

The data provided in this section are to be used for product safety handling purposes. Please refer to Product Data Sheets, Certificates of Conformity or Certificates of Analysis for chemical and physical data for determinations of quality and for formulation purposes.

Appearance:	Colorless powder.	**Odor:**	None.
Physical State:	Solid.	**pH:**	2.3 (1% solution)
Vapor Pressure:	< 0.1 mbar at 20 deg. C	**Vapor Density:**	Not applicable.
Boiling Point:	Not applicable.	**Freezing/Melting Point:**	140-153 deg. C
Solubility (H2O):	59.2 g/100 ml water at 20 deg. C	**Specific Gravity:**	1.542
Percent Volatile:	Not available	**Particle Size:**	powder or crystals
Softening Point:	Not applicable.	**Evaporation Rate:**	Not applicable.
Viscosity:	Not applicable.	**Bulk Density:**	900-980 kg/m3
Chemical Formula:	$C6H8O7 \bullet H_2O$	**Molecular Weight:**	210.14

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

Stable under normal conditions. Dilute aqueous solutions of Citric Acid may ferment if left standing for long period of time.

Chemical Stability: Conditions to Avoid

Heat, moisture and incompatible materials.

* * * Section 10 - Chemical Stability & Reactivity Information (Continued) * * *

Hazardous Decomposition

Carbon dioxide and carbon monoxide are normal products of combustion. Incomplete combustion may produce irritating fumes and acrid smoke.

Incompatibility

Potentially explosive reaction with metal nitrates, strong bases, and oxidizers. Citric Acid is incompatible with reducing agents. Citric Acid when wet or in solution is corrosive to brass, copper, zinc, aluminum and their alloys, lead, cast iron and steel (not stainless steel).

Hazardous Polymerization

Hazardous polymerization will not occur.

* * * Section 11 - Toxicological Information * * *

Acute and Chronic Toxicity

A: General Product Information

Citric acid has been reported to have allergenic properties, and might cause allergic contact dermatitis. Irritation of the skin, eyes, and gastrointestinal tract may occur, but should not require extensive therapy beyond dilution/irrigation. Dusts and solution may cause severe irritation to the eyes, with symptoms that include redness, tearing, and pain. Concentrated solutions may be corrosive to the eyes and cause corneal ulcerations. This product may cause moderate irritation of the skin. Citric acid may cause mild gastrointestinal irritation, with symptoms including nausea, diarrhea, vomiting, abdominal pain. Concentrated solutions may cause necrotic and ulcerative lesions on oral mucous membranes. Dusts and mists from solutions may cause mild to moderate irritation to the nose and throat. Increased concentrations could cause coughing, sneezing, and labored breathing.

B: Component Analysis - LD50/LC50

Citric Acid (77-92-9)

Oral LD50 Rat: 3 gm/kg; Oral LD50 Mouse: 5040 mg/kg

Carcinogenicity

A: General Product Information

No information identified.

B: Component Carcinogenicity

None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Epidemiology

No information available.

Neurotoxicity

Has not been identified.

Mutagenicity

Citric acid would not be expected to be genotoxic at physiological concentrations because it is a normal metabolite. It was not mutagenic in Salmonella typhimurium, and did not induce chromosome aberrations in cultured Chinese hamster fibroblast cells.

Teratogenicity

Citric acid did not cause reproductive effects when tested in experimental animals. The sodium salt did not cause birth defects in rats. When given to rats at 1.2% in the diet over 2 generations, it did not affect reproduction. It did not affect litter size or survival of mice with prenatal exposure to up to 5% in the diet.

Other Toxicological Information

Persons with pre-existing eye, skin, respiratory, or allergic conditions may be more sensitive.

* * * Section 12 - Ecological Information * * *

Ecotoxicity

A: General Product Information

No additional information.

B: Ecotoxicity

No ecotoxicity data are available for this product's components.

Environmental Fate

Citric acid is a naturally occurring chemical and is biodegradable. Octanol/Water Partition Coefficient Log P (oct): -1.72

* * * Section 13 - Disposal Considerations * * *

US EPA Waste Number & Descriptions

A: General Product Information

Concentrated solutions may be considered DOO2 wastes (corrosive) by RCRA. Wastes should be tested prior to disposal to determine classification.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Disposal Instructions

Review federal, provincial, and local government requirements prior to disposal. Disposal by controlled incineration or secure landfill may be acceptable.

* * * Section 14 - Transportation Information * * *

NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under I.M.O., I.C.A.O. (I.A.T.A.) and 49 CFR to assure regulatory compliance.

US DOT Information

Shipping Name: Non-regulated.
Hazard Class: Not Applicable
UN/NA #: Not Applicable
Packing Group: Not Applicable
Required Label(s): None
Additional Info.: None.

International Air Transport Association (IATA)

For Shipments by Air transport: We classify this product as hazardous (Class 9) when shipped by air because 49 CFR 173.140 (a). "For the purposes of this subchapter, miscellaneous hazardous material (Class 9) means a material which presents a hazard during transportation, but which does not meet the definition of any other hazard class. This class includes: (a) Any material which has an anesthetic, noxious, or other similar property which could cause extreme annoyance or discomfort to a flight crew member so as to prevent the correct performance of assigned duties."

UN: UN 3077
Proper Shipping Name: Environmentally hazardous substance, solid, n.o.s. (citric acid)
Hazard Class: 9
Packing Group: III
Passenger & Cargo Aircraft Packing Instruction: 911
Passenger & Cargo Aircraft Maximum Net Quantity: 400 kg
Limited Quantity Packing Instruction (Passenger & Cargo Aircraft): Y911
Limited Quantity Maximum Net Quantity (Passenger & Cargo Aircraft): 30 kg
Special Provisions: A97 A149
ERG Code: 9L

International Maritime Organization (I.M.O.) Classification

Citric Acid is not regulated under I.M.O.

* * * Section 15 - Regulatory Information * * *

US Federal Regulations

A: General Product Information

Components of this product have been checked against the non-confidential TSCA inventory by CAS Registry Number. Components not identified on this non-confidential inventory are either exempt from listing (i.e. polymers, hydrates) or are listed on the confidential inventory as declared by the supplier.

B: Component Analysis

None of this product's components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

* * * Section 15 - Regulatory Information (Continued) * * *

C: Sara 311/312 Tier II Hazard Ratings:

Component	CAS #	Fire Hazard	Reactivity Hazard	Pressure Hazard	Immediate Health Hazard	Chronic Health Hazard
Citric Acid	77-92-9	No	No	No	Yes	Yes

State Regulations

A: General Product Information

Other state regulations may apply.

B: Component Analysis - State

California Proposition 65

Citric Acid is not on the California Proposition 65 chemical lists.

None of this product's components are listed on the state lists from CA, FL, MA, MN, NJ, or PA.

Component	CAS #	CA	FL	MA	MN	NJ	PA
Citric Acid Monohydrate	5949-29-1	No	No	No	No	No	No

Other Regulations

A: General Product Information

Components

B: Component Analysis – Inventory

Component	CAS #	TSCA	DSL	EINECS
Citric Acid Monohydrate	5949-29-1	No	No	Yes

C: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Citric Acid Monohydrate	5949-29-1	No disclosure limit

ANSI Labeling (Z129.1):

WARNING! CAUSES EYE, SKIN, AND RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC SKIN SENSITIZATION REACTION. Do not taste or swallow. Do not get on skin or in eyes. Avoid breathing dusts or particulates. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Keep from contact with clothing. Wear gloves, goggles, faceshields, suitable body protection, and NIOSH/MSHA-approved respiratory protection, as appropriate. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention. **IN CASE OF FIRE:** Use water fog, dry chemical, CO_2, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with inert material. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.

* * * Section 16 - Other Information * * *

Other Information

Chem One Ltd. ("Chem One") shall not be responsible for the use of any information, product, method, or apparatus herein presented ("Information"), and you must make your own determination as to its suitability and completeness for your own use, for the protection of the environment, and for health and safety purposes. You assume the entire risk of relying on this Information. In no event shall Chem One be responsible for damages of any nature whatsoever resulting from the use of this product or products, or reliance upon this Information. By providing this Information, Chem One neither can nor intends to control the method or manner by which you use, handle, store, or transport Chem One products. If any materials are mentioned that are not Chem One products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed. Chem One makes no representations or warranties, either express or implied of merchantability, fitness for a particular purpose or of any other nature regarding this information, and nothing herein waives any of Chem One's conditions of sale. This information could include technical inaccuracies or typographical errors. Chem One may make improvements and/or changes in the product (s) and/or the program (s) described in this information at any time. If you have any questions, please contact us at Tel. 713-896-9966 or E-mail us at Safety@chemone.com

Key/Legend

NA = Not available or not applicable g = grams; kg = kilograms GRAS = Generally regarded as safe

Contact: Sue Palmer-Koleman, PhD **Contact Phone:** (713)-896-9966

Revision log

07/24/00 4:21 PM SEP Changed company name, Sect 1 and 16, from Corporation to Ltd.
05/14/01 9:31 AM HDF Checked exposure limits; made changes to Sect 9; overall review, add SARA 311/312 Haz Ratings.
07/24/01 3:02 PM CLJ Add Shipments by Air information to Section 14, Changed contact to Sue, non-800 Chemtrec Num.
5/21/03: 4:30 PM HDF General review and up-date of entire MSDS. Up-graded Section 8 to include PNOC exposure limits. Up-date of HMIS categories. Up-date of Section 8. Up-date of Section 14.
6/22/05 12:54 PM SEP Update IATA Section 14.
6/07/06 7: 18 AM HDF Addition of Proposition 65 statement in Section 15
10/17/07 4:02 PM SEP Update IATA Section 14

This is the end of MSDS # COC-23