

**Citric Acid Anhydrous**

Version 2.1 Revision Date:  
US / EN 10/31/2022

SDS Number:  
100000000123

Date of last issue: 05/03/2022  
Date of first issue: 06/16/2017

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**SECTION 1. IDENTIFICATION**

Product name : Citric Acid Anhydrous  
Substance name : Citric acid  
Molecular formula : C<sub>6</sub>H<sub>8</sub>O<sub>7</sub>  
Chemical identity : 2-hydroxypropane-1,2,3-tricarboxylic acid  
CAS-No. : 77-92-9  
Chemical nature : Solid

**Manufacturer or supplier's details****Details of the supplier of the safety data sheet**

Company : Jungbunzlauer Inc.  
95 Wells Avenue, Suite 150  
Newton, Massachusetts 02459  
USA  
www.jungbunzlauer.com  
  
Telephone : +1 617 969-0900  
Telefax : +1 617 964-2921  
E-mail address : msds@jungbunzlauer.com  
Responsible/issuing person

**Emergency telephone number**

National Chemical Emergency Centre (NCEC)  
+1 202 464 2554

**Recommended use of the chemical and restrictions on use**

Recommended use : Manufacture of substances  
Formulation of preparations  
Formulation into solid matrix  
Industrial use  
Manufacture of chemical products  
Chemical intermediate  
Products such as pH-regulators, flocculants, precipitants,  
neutralization agents  
Washing and cleaning products  
Air care products  
Perfumes, fragrances  
Cosmetics, personal care products  
Manufacture of pulp, paper and paper products  
Manufacture of cement  
Polymer preparations and compounds  
Plastic articles  
Adhesives, sealants  
Manufacture of rubber products  
Extraction of crude petroleum  
Manufacture of textiles, leather, fur

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Leather treatment products  
Polishes and wax blends  
Coatings and paints, thinners, paint removers  
Photo-chemicals  
Water treatment chemicals  
Water softeners  
Metal surface treatment products  
Base metals and alloys  
Laboratory chemicals  
Fertilizers  
Manufacture of basic pharmaceutical products  
Food/ feedstuff additives

Restrictions on use : None known.

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**SECTION 2. HAZARDS IDENTIFICATION****GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)**

Specific target organ toxicity : Category 3 (Respiratory system)  
- single exposure

Eye irritation : Category 2A

Combustible dust

**GHS label elements**

Hazard pictograms :



Signal word : Warning

Hazard statements : H319 Causes serious eye irritation.  
H335 May cause respiratory irritation.  
May form combustible dust concentrations in air.

Precautionary statements : **Prevention:**  
P280 Wear protective gloves/ protective clothing/ eye protection/  
face protection.  
P261 Avoid breathing dust.

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**Response:**

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P337 + P313 If eye irritation persists: Get medical advice/attention.

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P312 Call a POISON CENTER/ doctor if you feel unwell.

**Hazards Not Otherwise Classified**

None known.

**SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Substance / Mixture	:	Pure substance
Chemical nature	:	Solid
Substance name	:	Citric acid
CAS-No.	:	77-92-9

**SECTION 4. FIRST AID MEASURES**

General advice	:	Move out of dangerous area. Show this safety data sheet to the doctor in attendance. Do not leave the victim unattended.
If inhaled	:	If breathed in, move person into fresh air.  If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
In case of skin contact	:	In case of contact, immediately flush skin with plenty of water. Get medical attention if symptoms occur.
In case of eye contact	:	Immediately flush eye(s) with plenty of water. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	:	Keep respiratory tract clear. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
Most important symptoms and effects, both acute and	:	irritant effects Causes serious eye irritation.

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delayed : May cause respiratory irritation.

Protection of first-aiders : Wear personal protective equipment.

Notes to physician : Treat symptomatically.

**SECTION 5. FIREFIGHTING MEASURES**

Suitable extinguishing media : Water spray  
Dry powder  
Foam  
Carbon dioxide (CO<sub>2</sub>)

Unsuitable extinguishing media : High volume water jet

Specific hazards during firefighting : Exposure to decomposition products may be a hazard to health.

Hazardous combustion products : Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

Further information : Standard procedure for chemical fires.  
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

**SECTION 6. ACCIDENTAL RELEASE MEASURES**

Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.  
Avoid dust formation.  
Avoid breathing dust.  
Avoid contact with skin and eyes.

Environmental precautions : Prevent further leakage or spillage if safe to do so.  
If the product contaminates rivers and lakes or drains inform respective authorities.

Methods and materials for containment and cleaning up : Neutralize with chalk, alkali solution or ammonia.  
Keep in suitable, closed containers for disposal.

**SECTION 7. HANDLING AND STORAGE**

Advice on protection against fire and explosion : Avoid dust formation.  
Provide appropriate exhaust ventilation at places where dust is formed.

Advice on safe handling : Avoid formation of respirable particles.  
Do not breathe vapours/dust.  
Avoid exposure - obtain special instructions before use.

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Avoid contact with skin and eyes.  
For personal protection see section 8.  
Smoking, eating and drinking should be prohibited in the application area.  
Provide sufficient air exchange and/or exhaust in work rooms.  
Dispose of rinse water in accordance with local and national regulations.

- Conditions for safe storage : Keep container tightly closed in a dry and well-ventilated place.  
Electrical installations / working materials must comply with the technological safety standards.
- Materials to avoid : Incompatible with strong bases and oxidizing agents.
- Further information on storage stability : Keep in a dry place.  
No decomposition if stored and applied as directed.

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION****Components with workplace control parameters**

Contains no substances with occupational exposure limit values.

**Engineering measures** : Provide adequate ventilation.

**Personal protective equipment**

- Respiratory protection : No personal respiratory protective equipment normally required.  
  
In the case of dust or aerosol formation use respirator with an approved filter.  
Use NIOSH approved respiratory protection.
- Hand protection  
Remarks : Wear suitable gloves.  
  
The suitability for a specific workplace should be discussed with the producers of the protective gloves.
- Eye protection : Eye wash bottle with pure water  
Tightly fitting safety goggles  
Wear face-shield and protective suit for abnormal processing problems.
- Skin and body protection : Dust impervious protective suit  
Choose body protection according to the amount and concentration of the dangerous substance at the work place.
- Hygiene measures : When using do not eat or drink.  
When using do not smoke.  
Wash hands before breaks and at the end of workday.

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Appearance	: crystalline
Colour	: white
Odour	: odourless
Odour Threshold	: Not relevant
pH	: 1.8 (77 °F / 25 °C) Concentration: 5 %
Melting point/freezing point	: ca. 307 °F / 153 °C
Boiling point/boiling range	: Decomposes below the boiling point.
Flash point	: Not applicable
Flammability (solid, gas)	: does not ignite
Upper explosion limit / Upper flammability limit	: No data available
Lower explosion limit / Lower flammability limit	: No data available
Vapour pressure	: 0.0002 hPa (77 °F / 25 °C)
Relative vapour density	: Not applicable
Relative density	: 1.665 (68 °F / 20 °C)
Density	: No data available
Solubility(ies) Water solubility	: ca. 1,450 g/l (68 °F / 20 °C)
Partition coefficient: n-octanol/water	: log Pow: -1.8 - -0.2 Calculation
Auto-ignition temperature	: Not applicable
Decomposition temperature	: Not applicable
Viscosity Viscosity, kinematic	: Not applicable
Explosive properties	: Not explosive
Oxidizing properties	: No oxidising effect.
Molecular weight	: 192.12 g/mol

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Dust explosion class : St1  
Particle size : ca. 0.2 - 1.25 mm

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**SECTION 10. STABILITY AND REACTIVITY**

Reactivity : No decomposition if stored and applied as directed.  
Chemical stability : No decomposition if stored and applied as directed.  
Possibility of hazardous reactions : No decomposition if stored and applied as directed.  
Dust may form explosive mixture in air.  
Conditions to avoid : Avoid dust formation.  
Incompatible materials : Strong bases  
Oxidizing agents  
Hazardous decomposition products : Build-up of dangerous/toxic fumes possible in cases of fire/high temperature.  
Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

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**SECTION 11. TOXICOLOGICAL INFORMATION****Acute toxicity**

Not classified based on available information.

**Components:****citric acid:**

Acute oral toxicity : LD50 Oral (Mouse): 5,400 mg/kg  
Method: OECD Test Guideline 401  
Assessment: The substance or mixture has no acute oral toxicity  
Acute inhalation toxicity : (Guinea pig): ca. 75 mg/l  
Exposure time: 3 min  
Test atmosphere: dust/mist  
Target Organs: Respiratory Tract  
Symptoms: Cough  
Acute dermal toxicity : LD50 Dermal (Rat): > 2,000 mg/kg  
Assessment: The substance or mixture has no acute dermal toxicity

**Skin corrosion/irritation**

Not classified based on available information.

**Components:****citric acid:**

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Species : Rabbit  
Method : OECD Test Guideline 404  
Result : No skin irritation

**Serious eye damage/eye irritation**

Causes serious eye irritation.

**Components:****citric acid:**

Species : Rabbit  
Result : Eye irritation  
Method : OECD Test Guideline 405

**Respiratory or skin sensitisation****Skin sensitisation**

Not classified based on available information.

**Respiratory sensitisation**

Not classified based on available information.

**Components:****citric acid:**

Remarks : No known sensitising effect.

**Germ cell mutagenicity**

Not classified based on available information.

**Components:****citric acid:**

Genotoxicity in vitro : Test Type: reverse mutation assay  
Test system: Salmonella typhimurium  
Concentration: 0 - 5000 µg/plate  
Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)  
Result: negative

Test Type: Micronucleus test  
Test system: Human lymphocytes  
Concentration: 50, 100, 200, 3000 µg/ml  
Method: Mutagenicity (in vitro mammalian cytogenetic test)  
Result: positive

Genotoxicity in vivo : Test Type: Chromosomal aberration  
Species: Rat  
Cell type: Bone marrow  
Application Route: Oral  
Dose: 0,3 mg/kg bw  
Method: OECD Test Guideline 475  
Result: negative



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**Carcinogenicity**

Not classified based on available information.

**Components:****citric acid:**

Carcinogenicity - Assessment : Not classifiable as a human carcinogen.

**IARC** No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**OSHA** No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

**NTP** No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

**Reproductive toxicity**

Not classified based on available information.

**Components:****citric acid:**

Reproductive toxicity - Assessment : No toxicity to reproduction

**STOT - single exposure**

May cause respiratory irritation.

**Components:****citric acid:**

Exposure routes : Inhalation  
Target Organs : Respiratory Tract  
Assessment : The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

**STOT - repeated exposure**

Not classified based on available information.

**Components:****citric acid:**

Remarks : No data available

**Repeated dose toxicity****Components:****citric acid:**

Species : Rat

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NOAEL : 4,000 mg/kg  
LOAEL : 8,000 mg/kg  
Application Route : Oral  
Exposure time : 10 d  
Dose : 2, 4, 8, 16 g/kg bw/day

**Aspiration toxicity**

Not classified based on available information.

**Components:****citric acid:**

No aspiration toxicity classification

**Further information****Product:**

Remarks : No data available

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**SECTION 12. ECOLOGICAL INFORMATION****Ecotoxicity****Components:****citric acid:**

Toxicity to fish : LC50 (Leuciscus idus (Golden orfe)): 440 mg/l  
Exposure time: 48 h  
Test Type: static test  
Method: OECD Test Guideline 203

Toxicity to daphnia and other : LC50 (Daphnia magna (Water flea)): 1,535 mg/l  
aquatic invertebrates Exposure time: 24 h  
Test Type: static test  
Method: OECD Test Guideline 202

Toxicity to algae/aquatic : NOEC (Scenedesmus quadricauda (Green algae)): 425 mg/l  
plants Exposure time: 8 d  
Test Type: static test

Toxicity to microorganisms : TT (Pseudomonas putida): > 10,000 mg/l  
Exposure time: 16 h

**Persistence and degradability****Components:****citric acid:**

Biodegradability : Biodegradation: 97 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B  
Remarks: Readily biodegradable.

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Biodegradation: 100 %  
Exposure time: 19 d  
Method: OECD Test Guideline 301E  
Remarks: Readily biodegradable.

Physico-chemical  
removability : Readily biodegradable.

**Bioaccumulative potential****Components:****citric acid:**

Bioaccumulation : Remarks: The product is miscible in water and readily biodegradable in both water and soil. Accumulation is not expected.

Partition coefficient: n-  
octanol/water : log Pow: -1.8 - -0.2

**Mobility in soil****Components:****citric acid:**

Stability in soil : Remarks: Readily biodegradable.

**Other adverse effects****Product:**

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82  
Protection of Stratospheric Ozone - CAA Section 602 Class I  
Substances  
Remarks: This product neither contains, nor was  
manufactured with a Class I or Class II ODS as defined by the  
U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A +  
B).

Additional ecological  
information : No data available

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**SECTION 13. DISPOSAL CONSIDERATIONS****Disposal methods**

Waste from residues : In accordance with local and national regulations.

Do not dispose of waste into sewer.  
Do not contaminate ponds, waterways or ditches with  
chemical or used container.  
Send to a licensed waste management company.

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Contaminated packaging : Empty remaining contents.  
Dispose of as unused product.  
Do not re-use empty containers.

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**SECTION 14. TRANSPORT INFORMATION****International Regulations****IATA-DGR**

Not regulated as a dangerous good

**IMDG-Code**

Not regulated as a dangerous good

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Not applicable for product as supplied.

**National Regulations****DOT**

Not regulated as a hazardous material

**TDG**

Not regulated as a dangerous good

**Special precautions for user**

Not applicable

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**SECTION 15. REGULATORY INFORMATION****CERCLA Reportable Quantity**

This material does not contain any components with a CERCLA RQ.

**SARA 304 Extremely Hazardous Substances Reportable Quantity**

This material does not contain any components with a section 304 EHS RQ.

**SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

This material does not contain any components with a section 302 EHS TPQ.

**SARA 311/312 Hazards**

: Combustible dust  
Serious eye damage or eye irritation  
Specific target organ toxicity (single or repeated exposure)

**SARA 313**

: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**Clean Air Act**

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).  
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

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This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM Intermediate or Final VOC's (40 CFR 60.489).

**Clean Water Act**

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

This product does not contain any priority pollutants related to the U.S. Clean Water Act

**US State Regulations****Massachusetts Right To Know**

No components are subject to the Massachusetts Right to Know Act.

**Pennsylvania Right To Know**

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**Maine Chemicals of High Concern**

Product does not contain any listed chemicals

**Vermont Chemicals of High Concern**

Product does not contain any listed chemicals

**Washington Chemicals of High Concern**

Product does not contain any listed chemicals

**California Prop. 65**

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

**The components of this product are reported in the following inventories:**

REACH	:	This substance has been registered according to Regulation (EC) No. 1907/2006 (REACH).
TSCA	:	All substances listed as active on the TSCA inventory
AIC	:	On the inventory, or in compliance with the inventory
DSL	:	All components of this product are on the Canadian DSL
ENCS	:	On the inventory, or in compliance with the inventory
ISHL	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	On the inventory, or in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
NZIoC	:	On the inventory, or in compliance with the inventory
TCSI	:	On the inventory, or in compliance with the inventory

**TSCA list**

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

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**SECTION 16. OTHER INFORMATION****Full text of other abbreviations**

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Items where relevant changes have been made to the previous version are highlighted in the body of this document by two vertical lines, red letters and grey shading.

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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.

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