

SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.0
Creation Date: July 15, 2019
Revision Date: July 15, 2019

SECTION 1: Identification

1.1 GHS Product identifier

Product name Citric acid

1.2 Other means of identification

Product number -
Other names 3'-hydroxybiphenyl-3-carboxylic acid; 3-hydroxy-3-carboxy-pentanedioic acid; 3'-hydroxy-3-biphenylcarboxylic acid

1.3 Recommended use of the chemical and restrictions on use

Identified uses Industrial and scientific research use.
Uses advised against no data available

1.4 Supplier's details

Company Shanghai Baishun Biotechnology Co., Ltd
Address No. 26, Lane 918, Lianye Road, Zhelin Town, Fengxian District, Shanghai, 201400, China
Telephone +86-21-37581181

1.5 Emergency phone number

Emergency phone number +86-21-37581181
Service hours Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Not classified.

2.2 GHS label elements, including precautionary statements

Pictogram(s) No symbol.
Signal word No signal word
Hazard statement(s) none
Precautionary statement(s)
Prevention none
Response none
Storage none
Disposal none

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Citric acid	Citric acid	77-92-9	201-069-1	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention.

Following skin contact

Rinse skin with plenty of water or shower. Refer for medical attention .

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth. Refer for medical attention .

4.2 Most important symptoms/effects, acute and delayed

Inhalation of dust irritates nose and throat. Contact with eyes causes irritation. (USCG, 1999)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. Organic acids and related compounds

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Extinguish with/ water, foam, dry chem, carbon dioxide.

5.2 Specific hazards arising from the chemical

Behavior in Fire: Melts and decomposes. The reaction is not hazardous. (USCG, 1999)

5.3 Special protective actions for fire-fighters

Use water spray, powder, foam, carbon dioxide.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Wash away remainder with plenty of water.

6.2 Environmental precautions

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Wash away remainder with plenty of water.

6.3 Methods and materials for containment and cleaning up

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Wash away remainder with plenty of water.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO open flames. Closed system, dust explosion-proof electrical equipment and lighting. Prevent deposition of dust. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Separated from strong oxidants, strong bases, metal nitrates and metals. Dry. Crystalline citric acid, anhydrous, can be stored in dry form without difficulty, although conditions of high humidity and elevated temperatures should be avoided to prevent caking. Storage should be in tight containers to prevent exposure to moist air. Several granulations are commercially available with the larger particle sizes having less tendency toward caking.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

MAK: (inhalable fraction): 2 mg/m³; peak limitation category: I(2); pregnancy risk group: C

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear safety goggles.

Skin protection

Protective gloves.

Respiratory protection

Use ventilation (not if powder).

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	Solid. Crystalline.
Colour	White.
Odour	Odorless
Melting point/freezing	Ca. 153 °C.

point	
Boiling point or initial boiling point and boiling range	138°C(lit.)
Flammability	Combustible.
Lower and upper explosion limit/flammability limit	0.28-2.29 KG/CU M (DUST)
Flash point	345 °C.
Auto-ignition temperature	1 010 °C.
Decomposition temperature	175°C
pH	1.8.
Kinematic viscosity	dynamic viscosity (in mPa s) = 6.5. Temperature:25.0°C. Remarks:50% aqueous solution.
Solubility	greater than or equal to 100 mg/mL at 72° F (NTP, 1992)
Partition coefficient n-octanol/water	log Pow = -1.72.
Vapour pressure	0 Pa. Temperature:25 °C. Remarks:Extrapolated.
Density and/or relative density	1.67. Temperature:20 °C.
Relative vapour density	no data available
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Decomposes above 175°C . The solution in water is a medium strong acid. Reacts with oxidants and bases. Attacks metals.

10.2 Chemical stability

no data available

10.3 Possibility of hazardous reactions

Combustible liquidDust explosion possible if in powder or granular form, mixed with air.CITRIC ACID reacts with oxidizing agents, bases, reducing agents and metal nitrates (NTP, 1992). Reactions with metal nitrates are potentially explosive. Heating to the point of decomposition causes emission of acrid smoke and fumes [Lewis].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Potentially explosive reaction with metal nitrates.

10.6 Hazardous decomposition products

When heated to decomposition it emits acrid smoke and fumes.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 - mouse (male/female) - 5 400 mg/kg bw. Remarks:Observation limited to 10 days.
- Inhalation: no data available
- Dermal: LD50 - rat (male/female) - > 2 000 mg/kg bw.

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

The substance is irritating to the eyes, skin and respiratory tract.

STOT-repeated exposure

The substance may have effects on the teeth. This may result in erosion.

Aspiration hazard

Evaporation at 20°C is negligible; a nuisance-causing concentration of airborne particles can, however, be reached quickly when dispersed.

SECTION 12: Ecological information**12.1 Toxicity**

- Toxicity to fish: LC50 - *Leuciscus idus melanotus* - 440 mg/L - 48 h.
- Toxicity to daphnia and other aquatic invertebrates: LC50 - *Daphnia magna* - 1 535 mg/L - 24 h.
- Toxicity to algae: Toxicity Threshold - *Scenedesmus quadricauda* - 640 mg/L - 8 d.
- Toxicity to microorganisms: TT - *Pseudomonas putida* - > 10 000 mg/L - 16 h.

12.2 Persistence and degradability

AEROBIC: The biodegradability of citric acid was determined in six different tests and results found it to be well degraded in all tests(1). Citric acid achieved 93% DOC removal in a coupled units test (sludge inoculum), 85% DOC removal after 1 day in a Zahn-Wellens test (sludge inoculum), 100% DOC removal in an AFNOR test (42 days, germs inoculum simulating polluted river water), 100% DOC removal in a Sturm test (42 days, sewage treatment plant effluent), 100% DOC removal in an OECD screening test (19 days, effluent simulating surface water), and 90% BODT in a closed bottle test (30 days, effluent simulating surface water)(1). Citric acid reached 53% of its theoretical BOD in 5 days using a sludge inoculum(2). Citric acid, present at 500 mg/L, reached 46% of its theoretical oxygen demand in 12 hours using a phenol acclimated activated sludge inoculum(3). Citric acid, present at 500 mg/L, reached 98.4% of its theoretical BOD in 22 to 24 hours using an activated sludge inoculum at 2,228 mg/L(4). Citric acid (1% w/v) displayed BOD values of 6,410 and 6,040 mg/L using a defined microbial mixture and sewage inoculums, respectively(5). Citric acid, present at 10 mg/L, reached 66.4% and 67.3% of its theoretical BOD after 5 days using freshwater and seawater inoculums, respectively(6).

12.3 Bioaccumulative potential

An estimated BCF of 3 was calculated for citric acid(SRC), using a log Kow of -1.64(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

12.4 Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc of citric acid can be estimated to be 10(SRC). According to a classification scheme(2), this estimated Koc value suggests that citric acid is expected to have very high mobility in soil.

The pKa of citric acid is 2.79(3), indicating that this compound will exist almost entirely in the anion form in the environment and anions generally do not adsorb more strongly to soils containing organic carbon and clay than their neutral counterparts(4). A 2 uM solution of citric acid in Gulfstream seawater showed equilibrium absorption values of 79% and 94% onto 0.01 and 0.25 g of hydroxyapatite, respectively(5).

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

14.1 UN Number

ADR/RID: Not dangerous goods. (For reference only, please check.)	IMDG: Not dangerous goods. (For reference only, please check.)	IATA: Not dangerous goods. (For reference only, please check.)
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14.2 UN Proper Shipping Name

ADR/RID: Not dangerous goods. (For reference only, please check.)	IMDG: Not dangerous goods. (For reference only, please check.)	IATA: Not dangerous goods. (For reference only, please check.)
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14.3 Transport hazard class(es)

ADR/RID: Not dangerous goods. (For reference only, please check.)	IMDG: Not dangerous goods. (For reference only, please check.)	IATA: Not dangerous goods. (For reference only, please check.)
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14.4 Packing group, if applicable

ADR/RID: Not dangerous goods. (For reference only, please check.)	IMDG: Not dangerous goods. (For reference only, please check.)	IATA: Not dangerous goods. (For reference only, please check.)
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14.5 Environmental hazards

ADR/RID: No	IMDG: No	IATA: No
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14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

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Chemical name	Common names and synonyms	CAS number	EC number
Citric acid	Citric acid	77-92-9	201-069-1
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Not Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.
Korea Existing Chemicals List (KECL)			Listed.

SECTION 16: Other information

Information on revision

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Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Any questions regarding this SDS, Please send your inquiry to sds@xixisys.com

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