

According to the UN GHS revision 8

Creation Date: August 13, 2024

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## 1. IDENTIFICATION

### 1.1 GHS Product identifier

Product name: Citric acid

Catalog Number: T5S0636

CAS Number: 77-92-9

### 1.2 Other means of identification

Other names: -

### 1.3 Recommended use of the chemical and restrictions on use

Identified uses: no data available

### 1.4 Supplier's details

Company: Targetmol Chemicals Inc.

Uses advised against: 36 Washington Street, Wellesley Hills, Massachusetts 02481 USA

Tel/Fax: (781) 999-4286

### 1.5 Emergency phone number

Emergency phone number: 781-999-4286

Service hours: Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT -5 hours).

## 2. HAZARD IDENTIFICATION

### 2.1 Classification of the substance or mixture

Not classified.

### 2.2 GHS label elements, including precautionary statements

Pictogram(s):

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

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1 Substances

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

#### 4. FIRST-AID MEASURES

##### 4.1 Description of necessary first-aid measures

###### General advice

no data available

###### If inhaled

Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a doctor immediately. Do not use mouth to mouth resuscitation if the victim ingested or inhaled the chemical.

###### 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

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

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

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

#### 5. FIRE-FIGHTING MEASURES

##### 5.1 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.

#### 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.

#### 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.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 Control parameters

#### Occupational Exposure limit values

MAK: (inhalable fraction): 2 mg/m<sup>3</sup>; 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

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	Solid. Crystalline.
Color	White.
Odour	Odorless
Melting point/ freezing point	Ca. 153 °C.
Boilingpoint 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	H2O: 100 mg/mL (520.5 mM) DMSO: 55 mg/mL (286.28 mM),

<b>N-octanol-water partition coefficient</b>	log Pow = -1.72.
<b>Vapour pressure</b>	0 Pa. Temperature:25 °C. Remarks:Extrapolated.
<b>Density and/ or relative density</b>	1.67. Temperature:20 °C.
<b>Relative vapour density</b>	no data available
<b>Particle characteristics</b>	no data available

### 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 liquid Dust 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.

### 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.

## 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% D°C removal in a coupled units test (sludge in°Culum), 85% D°C removal after 1 day in a Zahn-Wellens test (sludge in°Culum), 100% D°C removal in an AFNOR test (42 days, germs in°Culum simulating polluted river water), 100% D°C removal in a Sturm test (42 days, sewage treatment plant effluent), 100% D°C 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 in°Culum(2). Citric acid, present at 500 mg/L, reached 46% of its theoretical oxygen demand in 12 hours using a phenol acclimated activated sludge in°Culum(3). Citric acid, present at 500 mg/L, reached 98.4% of its theoretical BOD in 22 to 24 hours using an activated sludge in°Culum 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 in°Culums, 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 in°Culums, respectively(6).

### 12.3 Bioaccumulative potential

no data available

### 12.4 Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the K<sup>o</sup>c of citric acid can be estimated to be 10(SRC). According to a classification scheme(2), this estimated K<sup>o</sup>c value suggests that citric acid is expected to have very high mobility in soil. The pK<sub>a</sub> 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 μM 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

## 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.

## 14. TRANSPORT INFORMATION

### 14.1 UN Number

no data available

### 14.2 UN Proper Shipping Name

no data available

### 14.3 Transport hazard class(es)

no data available

**14.4 Packing group, if applicable**

no data available

**14.5 Environmental hazards**

no data available

**14.6 Special precautions for user**

no data available

**14.7 Transport in bulk according to IMO instruments**

no data available

**15. REGULATORY INFORMATION****15.1 Safety, health and environmental regulations specific for the product in question**

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 (NZI <sup>o</sup> C)	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.

**16. OTHER INFORMATION****Information on revision****Creation Date** August 13, 2024**Revision Date** August 13, 2024**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\\_l°Cale=en](http://www.echemportal.org/echemportal/index?pageID=0&request_l°Cale=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/>

### Other Information

no data available

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