

**SAFETY DATA SHEET****Citric Acid**

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Complying with 1907/2006/EEC Regulation of 18 December 2006 ("REACH Regulation")
,REGULATION (EC) No 1272/2008 (CLP) and Regulation EU No 453/2010

Section 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING**1.1 Product identifier****Product name:** Citric acid**Chemical name (e.g. IUPAC name):** 3-hydroxy-3-carboxy-1,5-pentanedioic acid**Synonyms:** 2-hydroxy-1,2,3-propanetricarboxylic acid OR 2-hydroxypropane-1,2,3-tricarboxylic acid**Trade Name:** N/A**Chemical formula:** C₆H₈O₇**Product type:** Solid (crystalline solid)**CAS number:** 77-92-9**EC number:** 201-069-1**REACH registration no(s):** 01-2119457026-42-0002**1.2 Relevant identified uses of the substance or mixture and uses advised against****Use of the substance/preparation:**

Imparts fine tangy flavor and sequesters heavy metal ions in soft drinks.

Preserves flavor, appearance and consistency in canned fruits and vegetables.

Enhances flavor of fruits, promotes sucrose inversion in candies.

Acts as a synergist to antioxidants due to complexation of heavy metal ions.

Helps to create the bubbling and fizzing effect in effervescent tablets.

Used in various creams, ointments and shampoos.

1.3 Details of the supplier of the safety data sheet**Company/undertaking identification****Supplier/Manufacturer:** Gadot Biochemical Industries Ltd

117 Hahistadrut Ave

P.O.B 10636

Haifa Bay 26118

Israel

Tel: +972-4-8461555

Fax: +972-4-8461560

E-mail address of person responsible for this MSDS:

Nissim Guigui - R&D and Quality Manager

nissim@gadotbio.com

1.4 Emergency telephone number**Emergency telephone number (24 hours a day, every day, including weekends and holydays):**

+972-4-8461555

Section 2. HAZARDS IDENTIFICATION**2.1 Classification of the substance or mixture****Classification in accordance to Regulation(EC) No. 1272/2008 (CLP/GHS)**

Product name	GHS Classification
Citric acid	Eye Irrit. Cat 2; H319

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Classification according to Directive 67/548/EEC (DSD) or 1999/45/EC

Product name	EU Classification
Citric acid	Xi; R36

2.2 Label elements

Labeling in accordance with Regulation 1272/2008 (CLP)

Hazard pictograms:



Signal word: Warning

Hazard statements: Causes serious eye irritation.

Precautionary Statements:

P264 + P280 + P305 + P351 + P338 + P337 + P313: Wash hands thoroughly after handling. Wear eye protection. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

2.3 Other hazard

Substance meets the criteria for BBT according to Regulation (EC) No. 1907/2006, Annex XIII:

Not applicable

Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII:

Not applicable

Other hazard which do not result in classification:

Not applicable

Section 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/preparation:

Product/ Ingredient name	Identifiers	%	EU Classification	GHS Classification
Citric acid	CAS number: 77-92-9 EC number: 201-069-1 REACH registration no(s): 01-2119457026-42-0002	100%	Xi; R36	Eye Irrit. Cat 2; H319

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in section 8.

See section 16 for the full text of the H-statements and R-phrases declared above.



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Section 4. FIRST AID MEASURES

4.1 Description of first aid measures

- Eyes contact:** Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately if irritation develops or persists or if visual changes occur.
- Skin contact:** In case of contact, immediately wash with soap and plenty of water. Get medical attention if irritation develops or persists. Remove contaminated clothing and shoes. Clean contaminated clothing and shoes before re-use.
- Inhalation:** If respiratory irritation or distress occurs, remove victim to fresh air. Get medical attention if respiratory irritation or distress continues.
- Ingestion:** If victim conscious and alert, give water to drink. DO NOT INDUCE VOMITING. Do not give anything by mouth to an unconscious person. Get medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eyes contact: Causes serious eye irritation.

Inhalation: There was no available information on respiratory irritation.

Ingestion: May be harmful if swallowed.

Skin contact: Not Irritating.

Over-exposure sign/symptoms:

Prolonged or repeated exposure may cause affection/discoloration of the teeth, irritation of the eye tissue, inflammation/damage of the eye tissue and tingling/irritation of the skin.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician: No specific antidote, medical staff contacts Poisons Information Center. All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Special treatments: No specific treatment

Section 5: Fire-Fighting Measures

5.1 Extinguishing media

Suitable: Water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Not suitable: N/A



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5.2 Special hazards arising from the substance or mixture

Dust is explosive with air. Dust cloud can be ignited by a spark. Under fire emits irritating and toxic fumes.

5.3 Advice for firefighters

Special protective equipment for fire fighters: Fire fighters should wear full protective clothing and self-contained breathing apparatus in positive pressure mode.

Remark: Cool containers exposed to flame with water spray. Move containers from fire area if possible to do so without risk.

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Wear protective clothing. Avoid contact with skin eyes and inhalation of dust. Remove all sources of ignition. Ventilate area of spill. Avoid dust formation.

6.2 Environmental precautions

Prevent entry into waterways, sewers, basements or confined areas.

6.3 Methods and materials for containment and cleaning up

Small spill: Mark danger area. Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. In case of dust production: keep upwind. Clean contaminated surfaces with an excess of water.

Large spill: As for small spill.

Personal Protection in Case of Large Spill: Safety glasses. Full suit. Suitable respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product.

6.4 Reference to other sections

See Sections 1 for emergency contact information

See Section 8 for information on a appropriate personal protective equipment

See Section 13 for additional waste treatment information

Section 7: Handling and Storage

7.1 Precautions for safe handling

Handling: Avoid contact with eyes, skin and clothing. Do not permit eating/drinking/smoking near the material. Keep away from heat, sparks and open flame. Avoid raising dust. Remove and clean contaminated clothing immediately.

Hygiene Measures: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also section 8 for additional information measures.

7.2 Conditions for safe storage, including any incompatibilities

Storage: Keep containers tightly closed, in dry, cool and well-ventilated place. Do not store together with strong oxidizing agents, bases, strong reducing agents and metals and their compounds. Protect from moisture.



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7.3 Specific end use(s): N/A

Section 8: Exposure Control / Personal Protection

8.1 Control parameters

Occupational exposure limit values: N/A

Derived effects levels:

Recommended occupational and consumer exposure limit values (following from the preformed CSA): N/A

8.2 Exposure controls

Engineering Measures

Use process enclosures, local exhaust ventilation, or others engineering controls to keep airborne levels below recommend exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Person Protective measures

Occupational exposure controls:

Respiratory protection: Dust mask with filter type P2. Be sure to use an approved/certified or equivalent. Wear appropriate respirator when ventilation is inadequate.

Eye/face protection: Wear protective safety goggles.

Skin protection:

Hand protection: Chemically rubber, butyl rubber, neoprene, nitrile rubber, PVC, viton or polyethylene gloves.

Other: Wear appropriate long-sleeved clothing to minimize skin contact.

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance: Solid (crystalline solid), white

Odour: Odorless

Odour threshold: N/A

pH: 2

Melting point/Freezing point: app. 153°C at 1,013 hPa

Initial boiling point/boiling range: Decomposes before boiling

Flash point: Not relevant

Evaporation rate: N/A (butyl acetate=1)

Flammability: Not Flammable

Upper/lower flammability or explosive limits: N/A

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Vapor pressure: 2.21×10^{-6} Pa at 25°C
Vapor density: N/A
Relative Density: 1.665 at 20°C
Solubility(ies): Water solubility- 590 g/L at 20°C; In water 59%; In ethanol 62%
Partition coefficient Octanol/Water: Log K_{ow} : -0.2 to -1.8
Auto-ignition temperature: 1011°C
Decomposition temperature: 175°C
Viscosity: Not relevant
Explosive properties: Not Explosive
Oxidizing properties: Not Oxidising

9.2 Other information:

Molecular weight: 192.13
Specific gravity: 1665 kg/m³

Section 10: Stability and Reactivity**10.1 Reactivity**

No specific test data related to reactivity available for this product or its ingredients

10.2 Chemical stability

The product is unstable on exposure to moisture.

10.3 Possibility of hazardous reactions

Hazard polymerization: Will not occur.

10.4 Conditions to avoid

Protect from moisture. Keep away from heat, sparks and open flame.

10.5 Incompatible materials

Strong oxidizing agents, bases, strong reducing agents and metals and their compounds.

10.6 Hazardous Decomposition products:

Under fire- carbon oxides.

Section 11: Toxicological Information**11.1 Information on toxicological effects****Acute toxicity:**

Product/ingredient name	Test	Species	Dose
Citric acid	LD50, Oral	Rat	11,700 mg/kg
	LD50, Oral	Mouse	5400/5790 mg/kg
	LD50, Dermal	Rat	>2000 mg/kg

Irritation and corrosivity:

Inhalation: There was no available information on respiratory irritation.



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Ingestion: May be harmful if swallowed.

Skin contact: Not Irritating.

Eyes contact: Causes serious eye irritation.

Sensitization: No data are available which suggest that citric acid should be classified as a skin or respiratory sensitiser.

Toxicokinetics, metabolism and distribution: No data available Citric acid is ubiquitous in the animal kingdom. No study which meets current OECD guidelines is available. However, sufficient information exists on the substance as it is part of the metabolic processed in animals and plants. Therefore pathways for adsorption, distribution and excretion as well as its metabolism are well established, and even essential to all living organisms.

Chronic toxicity:

Carcinogenicity: In a rat feeding study, animals dosed with 5% citric acid in the diet did show an excess of tumours in comparison with control animals when tested over a period of 2 years. However, there was some evidence that high doses of citrate salts potentiated the incidence of tumours produced by co-administration of known bladder carcinogens. Where citric acid or citrate salts were administered alone during these studies, no dose-related tumours were noted.

Mutagenicity: Citric acid has been tested in a number of bacterial assays, all of which gave negative results. There is information from a lower reliability study that citric acid and sodium dihydrogen citrate do not cause chromosome aberrations in vitro: this result does not agree with a recently published study. Evidence for genetic toxicity has been described in a recent publication of results from an in vitro. An in vivo chromosome aberration study does not support the conclusion of the recently reported in vitro studies in mammalian cells, and an in vivo rodent dominant lethal assay also showed no evidence of chromosome damage, so it is considered that the in vitro results do not reflect a potential for genetic toxicity.

Citric acid is negative in in vivo genotoxicity testing, although effects have been observed in some in vitro studies. Moreover, it has been used as a food additive over a long period. In addition, citrate plays a central role in cellular metabolism, so it is considered that classification for mutagenicity is not required.

Information available in the public domain on tests carried out on other salts of sodium, calcium, potassium and magnesium indicates that the metal ions are not expected to contribute to the genetic toxicity of their corresponding salts. Therefore, information from citric acid may be read-across to the other citrate salts in this category, and information may be read-across between the citrate salts, and classification of the citrate salts in the category for mutagenicity is not required.

Reproductive toxicity: Various studies on rats, mice and guinea pigs using a number of different conditions and protocols: prior to mating, during pregnancy and also a two-generation study were summarised in the OECD report. In some the doses were defined and in others the regimen was ad libitum feeding of a defined concentration of citric acid in the diet, with or without measurement of food uptake. No adverse effects on females or foetuses were reported except slight dental attrition of the females in some of the studies. The NOEL values reported were often meaningless as it was the only dose used, and that gave no adverse effects. In the same report described above, Wright and Hughes (1976c) showed the same dose (5%) of citric acid in the diet of female mice and rats had no effect on the reproductive performance as measured by pregnancy rate, number of live births, still births and pup

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survival rate.

Specific target organ toxicity (single exposure): N/A

Specific target organ toxicity (repeated exposure): N/A

Aspiration hazard: N/A

Other effects

Over exposure signs/symptoms: Prolonged or repeated exposure may cause affection/discoloration of the teeth, irritation of the eye tissue, inflammation/damage of the eye tissue and tingling/irritation of the skin.

Section 12: Ecological Information**12.1 Toxicity**

Substance name	Toxicity to fish	Toxicity to crustaceans	Toxicity to algae	Toxicity to other aquatic plants	Other toxicity data (birds, bees, plants etc.)
Citric acid	LC50/96h (Fish) >100 / 1516 mg/l LC50 (48h): 440 mg/l	LC50 (24h): 1535 mg/l	NOEC (8d): 425 mg/l	-	-

12.2 Persistence and Degradability

Readily biodegradable in water.

12.3 Bioaccumulative potential

N/A

12.4 Mobility in soil

Soil/water partition coefficient (Koc) : N/A

12.5 Results of PBT and vPvB assessment

The substance does not meet the criteria for PBT or vPvB.

12.6 Other adverse effects

Substances which have an unfavorable influence on the oxygen balance and can be measured using parameters such as BOD, COD, etc.: N/A

Substances, which contribute to eutrophication: N/A



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Section 13: Disposal Considerations

13.1 Waste treatment methods

Methods of disposal: Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Hazardous waste: N/A

Section 14: Transport Information

International transport regulations

14.1 Un number:

ADR/RID: -

IMDG: -

IATA: -

14.2 Proper shipping name:

ADR/RID: Not regulated

IMDG: Not regulated

IATA: Not regulated

14.3 Transport hazard class(es)

ADR/RID: -

IMDG: -

IATA: -

14.4 Packing group

ADR/RID: -

IMDG: -

IATA: -

14.5 Environmental hazard

Marine Pollutant: This product contains a chemical which is listed as a severe marine pollutant according to IMDG/IMO (P) (4-nonylphenol)

14.6 Special precautions for user

Not available

14.7 Transport to bulk according to Annex II of MARPOL 79/78 and the IBC Code

Not applicable

Section 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

EU Directives 67/548/EEC and 1999/45/EC (including amendments) and take into account the intended product use

EU Regulation(EC) No.1907/2006 (REACH), No 1272/2008 (CLP)

15.2 Chemical safety assessment

In accordance with REACH article 14, a Chemical Safety Assessment has been carried out for this substance.



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Section 16: Other Information

Full text of R-phrases referred to in sections 2 and 3:

R36: Irritating to eyes.

Safety phrases:

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Full text of Hazards Statements referred to in sections 2 and 3:

H319: Causes serious eye irritation.

Precautionary Statements:

P264 + P280 + P305 + P351 + P338 + P337 + P313: Wash hands thoroughly after handling. Wear eye protection. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Training advice: Before using/handling the product one must read carefully present MSDS.

Recommended restriction: N/A

Key Legend Information:

ACGIH- American Conference of Governmental Industrial Hygienists

OSHA- Occupational Safety and Health Administration

NTP- National Toxicology program

IARC- International Agency for Research on Cancer

ND- Not Determined

N/A- Not available

R-phrases- Risk phrases

S-phrases- Safety phrases

Date of issue: 23th November 2010

Date of revision: 10th August 2014 (update section 14)

Version no. 5

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