



# Citric Acid (free acid), ACS Grade

## Safety Data Sheet

Version 1.1

Revision date 01/09/2012/JK-IA

### SECTION 1. Product and company identification

Chemical type	: Substance
Substance name	: Citric Acid (free acid), ACS Grade
CAS No.	: 77-92-9
Product code	: RC-039
Formula	: C <sub>6</sub> H <sub>8</sub> O <sub>7</sub>
Synonyms	: 1,2,3-propanetricarboxylic acid, 2-hydroxy- / 1,2,3-propanetricarboxylic acid, 2-hydroxy-, anhydrous / 2-hydroxy-1,2,3-propanetricarboxylic acid / 2-hydroxy-1,2,3-propanetricarboxylic acid, anhydrous / 2-hydroxypropane-1,2,3-tricarboxylic acid / aciletten / anhydrous citric acid / beta-hydroxytricarballic acid / beta-hydroxytricarballic acid, anhydrous / beta-hydroxytricarboxylic acid / citretten / citric acid anhydrous fine granular 16/40 / citric acid anhydrous granular / citric acid anhydrous granular 5N / citric acid anhydrous medium granular / citric acid anhydrous powder / citro / E 330 / FEMA no 2306 / hydroxytricarballic acid / MC-1,acidic membrane cleaner / NSC 30279
Company identification	: G-Biosciences/ Geno Technology, Inc. 9800 Page Avenue St. Louis, MO 63312-1429, USA Tel.1-800-628-7730 <a href="http://www.GBiosciences.com">http://www.GBiosciences.com</a>
Emergency number	: Chemtrec <b>1-800-424-9300</b> (USA/Canada), <b>+1-703-527-3887</b> (Intl)

### SECTION: 2. Hazards identification

#### 2.1. Emergency Overview

Physical state	: Solid
Appearance	: Crystalline solid. Crystalline powder. Granular powder
Colour	: Colourless to white
Odour	: Odourless

#### Citric Acid (free acid), ACS Grade(77-92-9)

#### 2.2. OSHA Regulatory Status

No additional information available

#### 2.3. Potential health effects

Symptoms/injuries after inhalation	: AFTER INHALATION OF DUST: Dry/sore throat. Coughing. Slight irritation. EXPOSURE TO HIGH CONCENTRATIONS: Irritation of the respiratory tract. Respiratory difficulties.
Symptoms/injuries after skin contact	: Red skin. ON CONTINUOUS EXPOSURE/CONTACT: Tingling/irritation of the skin.
Symptoms/injuries after eye contact	: Irritation of the eye tissue. ON CONTINUOUS EXPOSURE/CONTACT: Inflammation/damage of the eye tissue.
Symptoms/injuries after ingestion	: AFTER ABSORPTION OF HIGH QUANTITIES: Abdominal pain. Vomiting.

#### 2.4. Potential environmental effects

No additional information available

### SECTION: 3. Composition/information on ingredients

Name	CAS No.	%
Citric Acid (free acid), ACS Grade	77-92-9	100

#### 4.1. First aid procedures

First-aid measures general	: Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxia/aspiration pneumonia. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.
First-aid measures after inhalation	: Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.
First-aid measures after skin contact	: Rinse with water. Soap may be used. Do not apply (chemical) neutralizing agents. Take victim to a doctor if irritation persists.
First-aid measures after eye contact	: Rinse immediately with plenty of water. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists.
First-aid measures after ingestion	: Rinse mouth with water. Immediately after ingestion: give lots of water to drink. Do not induce vomiting. Call Poison Information Centre ( <a href="http://www.big.be/antigif.htm">www.big.be/antigif.htm</a> ). Consult a doctor/medical service if you feel unwell. Ingestion of large quantities: immediately to hospital.

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### 4.2. Note to physicians

No additional information available

## SECTION: 5. Firefighting measures

### 5.1. Flammable properties

- Fire hazard : DIRECT FIRE HAZARD. Not easily combustible. In finely divided state: increased fire hazard. INDIRECT FIRE HAZARD. Temperature above flashpoint: higher fire/explosion hazard. Reactions involving a fire hazard: see "Reactivity Hazard".
- Explosion hazard : DIRECT EXPLOSION HAZARD. Its dust is explosive with air. INDIRECT EXPLOSION HAZARD. Dust cloud can be ignited by a spark. Reactions with explosion hazards: see "Reactivity Hazard".
- Reactivity : Upon combustion CO and CO<sub>2</sub> are formed. Reacts violently with (strong) oxidizers: (increased) risk of fire. Reacts with (strong) reducers. Reacts exothermically with (some) bases: (increased) risk of fire.

### 5.1. Extinguishing media

- Suitable extinguishing media : Water spray. Polyvalent foam. Alcohol-resistant foam. Polymer foam. ABC powder. Carbon dioxide.
- Unsuitable extinguishing media : Container may slop over if solid jet (water/foam) is applied.

### 5.3. Protection for firefighters

- Firefighting instructions : Cool tanks/drums with water spray/remove them into safety.
- Protection during firefighting : Heat/fire exposure: compressed air/oxygen apparatus.

## SECTION: 6. Accidental release measures

### 6.1. Personal precautions

#### 6.1.1. For non-emergency personnel

- Protective equipment : Gloves. Safety glasses. Protective clothing. Dust cloud production: compressed air/oxygen apparatus. See "Material-Handling" to select protective clothing.
- Emergency procedures : Mark the danger area. Prevent dust cloud formation, e.g. by wetting. No naked flames. Wash contaminated clothes.

#### 6.1.2. For emergency responders

No additional information available

### 6.2. Environmental precautions

No additional information available

### 6.3. Methods for containment

- For containment : Contain released substance, pump into suitable containers. Consult "Material-handling" to select material of containers. Plug the leak, cut off the supply. Knock down/dilute dust cloud with water spray. Powdered form: no compressed air for pumping over spills.

### 6.4. Methods for clean up

- Methods for cleaning up : Prevent dust cloud formation. Scoop solid spill into closing containers. See "Material-handling" for suitable container materials. Powdered: do not use compressed air for pumping over spills. Clean contaminated surfaces with an excess of water. Wash clothing and equipment after handling.

### 6.5. Other information

No additional information available

### 6.6. Spill or leak statements by type of chemical

No additional information available

## SECTION: 7. Handling and storage

### 7.1. Handling

- Precautions for safe handling : Comply with the legal requirements. Remove contaminated clothing immediately. Clean contaminated clothing. Thoroughly clean/dry the installation before use. Powdered form: no compressed air for pumping over. Avoid raising dust. Keep away from naked flames/heat. Finely divided: spark- and explosionproof appliances. Finely divided: keep away from ignition sources/sparks. Observe normal hygiene standards. Keep container tightly closed. Carry operations in the open/under local exhaust/ventilation or with respiratory protection.

### 7.2. Storage

- Storage temperature : 5 - 30 °C
- Heat-ignition : KEEP SUBSTANCE AWAY FROM: heat sources. ignition sources.
- Prohibitions on mixed storage : KEEP SUBSTANCE AWAY FROM: oxidizing agents. reducing agents. (strong) bases. water/moisture.
- Storage area : Store in a dry area. Keep container in a well-ventilated place. Store at ambient temperature. Keep only in the original container. Meet the legal requirements.
- Special rules on packaging : SPECIAL REQUIREMENTS: closing. watertight. dry. clean. correctly labelled. meet the legal requirements. Secure fragile packagings in solid containers.

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Packaging materials : SUITABLE MATERIAL: stainless steel. polyethylene. polypropylene. MATERIAL TO AVOID: aluminium. copper. zinc. bronze. iron.

### SECTION: 8. Exposure controls/personal protection

#### 8.1. Exposure guidelines

No additional information available

#### 8.2. Engineering controls

No additional information available

#### 8.3. Personal protective equipment (PPE)

Materials for protective clothing : GIVE EXCELLENT RESISTANCE: butyl rubber. natural rubber. neoprene. nitrile rubber. PVC. viton. GIVE GOOD RESISTANCE: polyethylene. GIVE POOR RESISTANCE: PVA.

Hand protection : Gloves.

Eye protection : Safety glasses. In case of dust production: protective goggles.

Skin and body protection : Protective clothing.

Respiratory protection : Dust production: dust mask with filter type P1. Dust production: dust mask with filter type P3.

### SECTION: 9. Physical and chemical properties

Physical state : Solid

Appearance : Crystalline solid. Crystalline powder. Granular powder.

Molecular mass : 192.1 g/mol

Colour : Colourless to white.

Odour : Odourless.

Odour threshold : No data available

pH : 2.2

pH solution : 1 %

Melting point : 153 °C

Solidification point : No data available

Boiling point : Not applicable

Flash point : No data available

Relative evaporation rate (butylacetate=1) : No data available

Flammability (solid, gas) : No data available

Explosive limits : No data available

Vapour pressure : < 0.1 hPa (20 °C)

Relative vapour density at 20 °C : No data available

Relative density : 1.7

Density : 1665 kg/m<sup>3</sup>

Solubility : Soluble in water. Soluble in ethanol. Soluble in ethylacetate. Soluble in pentanol. Soluble in pentylacetate.  
Water: 59 g/100ml  
Ethanol: 62 g/100ml

Log Pow : -1.72 (exp.)

Self ignition temperature : No data available

Decomposition temperature : 175 °C

Viscosity : No data available

Explosive properties : No data available

Oxidising properties : No data available

VOC content : 0 %

Other properties : Translucent. Hygroscopic. Substance has acid reaction.

### SECTION: 10. Stability and reactivity

#### 10.1. Chemical stability

Upon combustion CO and CO<sub>2</sub> are formed. Reacts violently with (strong) oxidizers: (increased) risk of fire. Reacts with (strong) reducers. Reacts exothermically with (some) bases: (increased) risk of fire.

Hygroscopic.

#### 10.2. Conditions to avoid

No additional information available

#### 10.3. Incompatible materials

No additional information available

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### 10.4. Hazardous decomposition products

No additional information available

### 10.5. Possibility of hazardous reactions

No additional information available

## SECTION: 11. Toxicological information

### Information on toxicological effects

Acute toxicity : Not classified

Citric Acid (free acid), ACS Grade (77-92-9)	
LD50 oral rat	3000 mg/kg
Skin corrosion/irritation	: Not classified pH: 2.2
Serious eye damage/irritation	: Causes serious eye irritation. pH: 2.2
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity (single exposure)	: Not classified
Specific target organ toxicity (repeated exposure)	: Not classified
Aspiration hazard	: Not classified

## SECTION: 12. Ecological information

### 12.1 Ecotoxicity

Ecology - general : Classification concerning the environment: not applicable.  
Ecology - air : Not dangerous for the ozone layer (Council Regulation (EC) no 1005/2009). Germany: TA-Luft Klasse 5.2.1.

Citric Acid (free acid), ACS Grade(77-92-9)	
LC50 fishes 1	2600 mg/l (48 Hours; LEUCISCUS IDUS; PH = 7)
LC50 other aquatic organisms 1	< 894 mg/l (DAPHNIA MAGNA; HARD WATER)
EC50 Daphnia 1	120 mg/l (72 Hours; DAPHNIA MAGNA)
LC50 fishes 2	1516 mg/l (96 Hours; LEPOMIS MACROCHIRUS)
LC50 other aquatic organisms 2	> 625 mg/l (DAPHNIA MAGNA; HARD WATER)
EC50 Daphnia 2	85 mg/l (DAPHNIA MAGNA; PH < 7)

### 12.2. 12.2. Persistence and degradability

Citric Acid (free acid), ACS Grade(77-92-9)	
Persistence and degradability	Nitrification isn't inhibited at 100 mg/l . Readily biodegradable in water. test: 81 %, OECD 302B Zahn- Well.
Biochemical oxygen demand (BOD)	0.420 g O <sub>2</sub> /g substance
Chemical oxygen demand (COD)	0.728 g O <sub>2</sub> /g substance
ThOD	0.686 g O <sub>2</sub> /g substance
BOD (% of ThOD)	61 % ThOD

### 12.3. Bioaccumulation/Accumulation

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Log Pow	-1.72 (exp.)
Bioaccumulative potential	Bioaccumulation: not applicable.

### 12.4. Mobility in environmental media

No additional information available

### 12.6. Other adverse effects

No additional information available

## SECTION: 13. Disposal considerations

### 13.1. Waste treatment methods

Waste disposal recommendations : Remove waste in accordance with local and/or national regulations. Recycle/reuse. Dissolve or mix with a combustible solvent. Remove to an authorized incinerator equipped with an afterburner and a flue gas scrubber with energy recovery. Treat using the best available techniques before discharge into drains or the aquatic environment.

Additional information : LWCA (the Netherlands); KGA category 03. Hazardous waste (91/689/EEC).

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### SECTION: 14. Transport information

#### 14.1. Basic shipping description

No additional information available

#### 14.2 Additional information

Other information : No supplementary information available.

State during transport (ADR-RID) : Rail and road transport: not subject to ADR-RID.

#### Overland transport

No additional information available

#### Transport by sea

No additional information available

#### Air transport

No additional information available

### SECTION: 15. Regulatory information

#### 15.1. US Federal regulations

No additional information available

#### 15.2. International regulations

##### CANADA

No additional information available

##### EU-Regulations

No additional information available

#### Classification according to Regulation (EC) No. 1272/2008 [CLP]

Eye Irrit. 2 H319

Full text of H-phrases: see section 16.

#### Classification according to Directive 67/548/EEC or 1999/45/EC

Xi; R36

Full text of R-phrases: see section 16.

#### 15.2.2. National regulations

No additional information available

#### 15.3. US State regulations

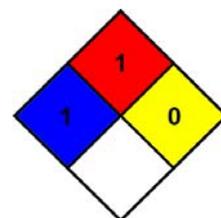
No additional information available

### SECTION: 16. Other information

NFPA health hazard : 1 - Exposure could cause irritation but only minor residual injury even if no treatment is given.

NFPA fire hazard : 1 - Must be preheated before ignition can occur.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



#### HMIS III Rating

No additional information available

SDS US (ANSI) GBiosciences