



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-038 |
| Formula | : C ₆ H ₈ O ₇ |
| 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 / 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 http://www.GBiosciences.com |
| Emergency number | : Chemtrec 1-800-424-9300 (USA/Canada), +1-703-527-3887 (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 |

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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 (www.big.be/antigif.htm). 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 CO₂ 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/m³

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 CO₂ 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 ₂ /g substance |
| Chemical oxygen demand (COD) | 0.728 g O ₂ /g substance |
| ThOD | 0.686 g O ₂ /g substance |
| BOD (% of ThOD) | 61 % ThOD |

12.3. Bioaccumulation/Accumulation

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

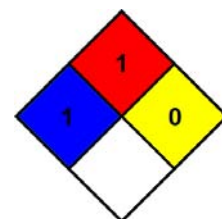
No additional information available

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