

Citric Acid

Safety data sheet in the 16-section GHS format · CAS 5949-29-1

Velora Chemicals Private Limited
Ahmedabad, Gujarat, India
+91 99255 22674 · info@velorachemicals.com

1. Identification of the substance and of the supplier

Product name	Citric Acid
Synonyms	citric acid monohydrate, citric acid anhydrous, nimbu sat, E330
C.A.S. number	5949-29-1 (citric acid MONOHYDRATE - the grade most commonly traded). ANHYDROUS citric acid is CAS 77-92-9. Both share EC number 201-069-1.
Molecular formula	C ₆ H ₈ O ₇ .H ₂ O (monohydrate); C ₆ H ₈ O ₇ (anhydrous) - HOOC-CH ₂ -C(OH)(COOH)-CH ₂ -COOH
Grade supplied	Monohydrate & anhydrous
Product group	Mineral & Organic Acids
Identified uses	Food & beverage, Detergents & cleaners, Pharmaceuticals, Water treatment, Metal & construction
Supplier	Velora Chemicals Private Limited
Emergency contact	Medical, fire or spill emergency — call the emergency services first: 112 (all-India), 101 fire, 108 ambulance. Velora Chemicals Private Limited does not at present operate a 24-hour chemical emergency advice line, and this sheet does not pretend otherwise. Every consignment despatched by road carries an emergency information panel under rule 134 of the Central Motor Vehicles Rules 1989 bearing a number from which expert advice on this material can be obtained, and the producer's safety data sheet issued with the consignment carries the producer's own 24-hour number where one is operated. For product, grade and documentation queries in business hours: +91 99255 22674.

2. Hazards identification

GHS signal word	Warning
Hazard classification	Supplier/registrant SELF-CLASSIFICATION - there is no harmonised CLP Annex VI entry for citric acid, so no EU harmonised classification exists and suppliers differ. The most widely used producer classification is: Eye Irrit. 2 - H319; STOT SE 3 - H335 (respiratory irritation from dust). Some sheets classify Eye Irrit. 2 - H319 only, and a few add Skin Irrit. 2 - H315. Because there is no harmonised entry, state on your own SDS which classification you have adopted and keep the label consistent with it.

3. Composition / information on ingredients

Substance	Citric Acid
C.A.S. number	5949-29-1 (citric acid MONOHYDRATE - the grade most commonly traded). ANHYDROUS citric acid is CAS 77-92-9. Both share EC number 201-069-1.
Molecular weight	210.14 (monohydrate); 192.1 (anhydrous, ILO ICSC 0855). The 9.4% difference matters for dosing and for stoichiometric calculations - a formula written for anhydrous will be under-strength if monohydrate is substituted weight-for-weight.
Composition	Monohydrate & anhydrous

4. First-aid measures

Eye contact	Rinse immediately with plenty of running water for at least 15 minutes, holding the eyelids apart; remove contact lenses if easily possible and continue rinsing. Refer for medical attention - citric acid dust and solutions cause serious eye irritation (H319), and concentrated solutions can injure the cornea.
Skin contact	Remove contaminated clothing. Rinse and then wash the affected skin with plenty of water and soap. Refer for medical attention if irritation persists. Prolonged contact with concentrated solutions can cause irritation and, on damaged skin, stinging and delayed healing.
Inhalation	Move the casualty to fresh air and keep them at rest. Rinse the mouth and nose with water. Dust inhalation irritates the nose, throat and airways (H335) and can trigger coughing or wheeze in sensitive or asthmatic workers. Refer for medical attention if coughing or breathing difficulty persists.
Ingestion	Rinse the mouth with water and, if the casualty is conscious and able to swallow, give one or two glasses of water to drink. Do NOT induce vomiting. Small ingestions of a food-grade product are of low concern, but a large ingestion or ingestion of concentrated solution can burn the mouth, throat and stomach - refer for medical attention if a significant quantity has been swallowed or if symptoms develop.

5. Fire-fighting measures

Flash point	Not flammable as supplied. Producer sheets state 'not applicable / non-flammable'. ILO ICSC 0855 does record a flash point of 100 °C for anhydrous citric acid, which reflects the combustibility of the dry solid rather than a flammable vapour. The dust is combustible and can form an explosible dust cloud, so treat grinding, sieving, conveying and bagging as dust-explosion duties.
Suitable extinguishing media	Water, foam, dry chemical powder or carbon dioxide — ICSC 0855 and CAMEO Chemicals agree and no source prohibits an agent for this material. Use water spray or fog on a large fire and to cool surrounding packaging. Confirm the medium against the producer's safety data sheet for the grade supplied.
Unsuitable extinguishing media	Do not use a high-pressure or solid water jet: finely divided citric acid forms explosive mixtures in air (ICSC 0855) and a jet raises a dust cloud from burning and adjacent material. Keep metal nitrates, oxidising acids and chlorine bleaches out of the fire area and off the same racking — the reaction with metal nitrates is potentially explosive, and contamination with an oxidiser can itself cause ignition.
Special hazards arising from the substance	Citric acid is combustible, and finely dispersed particles form explosive mixtures in air (ICSC 0855) — so a dust cloud in a bagging, milling or silo-discharge area is the real hazard, not the bulk solid. It melts at about 153 °C and decomposes above about 175 °C, emitting acrid smoke and fumes, so it melts away rather than sustaining a glowing bed. Packaging and pallets are themselves a substantial fire load. No dust explosion class, K_{st} or minimum ignition energy has been determined for the grade supplied — these values depend on particle size and must be measured on the actual material, not borrowed.
Advice for fire-fighters	Fire-fighters must wear self-contained breathing apparatus and full protective clothing. Keep unnecessary personnel away and upwind. A deep-seated smouldering bed is not expected in pure citric acid, which melts and decomposes; overhaul and cool a large bulk pile anyway, because a bed contaminated with packaging, oxidiser or combustible debris behaves differently. Prevent firefighting run-off from entering drains, surface water or groundwater.

6. Accidental release measures

Keep unnecessary personnel away and upwind, and ventilate. Wear the protective equipment in section 8, including respiratory protection, before approaching. Eliminate ignition sources and prohibit smoking before approaching. Avoid raising dust, and never blow a spilled powder down with compressed air. Dry-collect — vacuum with a HEPA-filtered unit, or sweep

gently without raising dust — into labelled, closable containers for disposal under section 13. A spill inside a vessel, tank, silo, container or pit is a confined-space job: test the atmosphere and work under permit. A fine powder makes a floor slippery, especially once wet, so treat every wetted surface as slippery until it has been washed and dried. Prevent entry to drains, surface water and groundwater. Do not return spilled material to the original container; a damaged bag should be overpacked into a labelled outer rather than decanted into an unmarked one.

7. Handling and storage

- Both forms cake if exposed to humidity or temperature swings — keep bags sealed in a dry store.
- Not classified as dangerous goods for transport. The dust irritates eyes; use goggles and a dust mask when emptying bags.
- Solutions are acidic and will corrode mild steel over time; use plastic or stainless equipment.

Storage: Store in closed original bags or containers in a dry, cool (about 10-30 C), well-ventilated place away from moisture, heat and direct sunlight. The monohydrate is slightly deliquescent and will cake in a humid store; the anhydrous grade will pick up moisture and convert. Keep off damp floors and do not stack where bags can absorb condensation. Segregate from strong bases, strong oxidisers, metal nitrates and reactive metals. Use stainless steel, plastic or lined handling equipment. Keep away from strong-smelling materials - the crystals pick up odour.

8. Exposure controls / personal protection

Engineering controls. Enclose every transfer, tipping, bag-slitting and sampling point and fit local exhaust extraction at each, and keep airborne concentrations below the limit in force at the place of use. Provide an eyewash within reach of the working position, and a safety shower wherever the material is classified corrosive or irritant or is handled in quantity. Do not eat, drink or smoke in the handling area; wash before breaks. Where no limit is stated above, occupational exposure limits vary by jurisdiction: check the limit in force at the place of use and the producer's sheet for the grade supplied, and record which value your assessment adopted. Select eye, skin and respiratory protection on the strength of a measured or modelled exposure assessment, not on this sheet alone.

9. Physical and chemical properties

Appearance	Colourless to white, odourless translucent crystals, granules or crystalline powder with a strongly acidic taste. The monohydrate is slightly deliquescent; the anhydrous grade is the more hygroscopic in use.
Physical state	Solid
Melting / freezing point	Monohydrate 135 C (ILO ICSC 0704); anhydrous 153 C (ILO ICSC 0855). Note that some producer sheets quote 153 C for the monohydrate as well, because on heating it first loses its water of crystallisation (from about 70-75 C) and then melts as the anhydrous acid - see notes.
Boiling point	Not applicable - decomposes before boiling. Decomposition above 175 C (ILO ICSC 0855 and producer data).
Relative density	1.54 g/cm ³ (monohydrate, producer data); ILO ICSC 0704 gives 1.5 g/cm ³ . Bulk density depends on granulation and is typically quoted per grade by the producer. Anhydrous density: Not available from the sources consulted.
Solubility in water	Very soluble. Monohydrate 59.2 g/100 mL at 20 C (ILO ICSC 0704); anhydrous 59 g/100 mL at 20 C (ILO ICSC 0855); producer data 776 g/L at 25 C. Also soluble in ethanol, sparingly in diethyl ether.
pH	1.8 in a 50 g/L (5% w/v) aqueous solution at 20-25 C (producer data). A 1% w/v solution is about pH 2.2. The solid has no pH. Quote the concentration whenever this figure is published - an unqualified 'pH 1.8' is meaningless.
Flash point	Not flammable as supplied. Producer sheets state 'not applicable / non-flammable'. ILO ICSC 0855 does record a flash point of 100 C for anhydrous citric acid, which reflects the combustibility of the dry solid rather than a flammable vapour. The dust is combustible and can form an explosible dust cloud, so treat grinding, sieving, conveying and bagging as dust-explosion duties.

Auto-ignition / ignition temperature	Not available
Explosive / dust-explosion properties	Not available
Vapour pressure	Not available
Vapour density	Not available
Partition coefficient (log Pow)	Not available
Particle characteristics	Not available
Molecular weight	210.14 (monohydrate); 192.1 (anhydrous, ILO ICSC 0855). The 9.4% difference matters for dosing and for stoichiometric calculations - a formula written for anhydrous will be under-strength if monohydrate is substituted weight-for-weight.

10. Stability and reactivity

Incompatible materials	Strong bases and alkalis - vigorous exothermic neutralisation. Strong oxidising agents; reducing agents; metal nitrates. Carbonates and bicarbonates - rapid effervescence and carbon dioxide pressure in closed vessels. Attacks copper, zinc, aluminium and their alloys (ILO ICSC 0704) and attacks mild steel; use stainless steel, plastic or lined equipment for solutions. Chelates and mobilises metal ions, so it can strip protective scale and leach metals from unsuitable plant.
Conditions to avoid	Store in closed original bags or containers in a dry, cool (about 10-30 C), well-ventilated place away from moisture, heat and direct sunlight. The monohydrate is slightly deliquescent and will cake in a humid store; the anhydrous grade will pick up moisture and convert. Keep off damp floors and do not stack where bags can absorb condensation. Segregate from strong bases, strong oxidisers, metal nitrates and reactive metals. Use stainless steel, plastic or lined handling equipment. Keep away from strong-smelling materials - the crystals pick up odour.

11. Toxicological information

The health hazards classified for this substance are listed in section 2, and the corresponding first-aid measures in section 4. Numerical toxicological endpoints are not reproduced here: refer to the producer's safety data sheet for the grade supplied, and to the ECHA and PubChem entries for the substance.

12. Ecological information

Where section 2 or section 14 classifies this substance as hazardous to the aquatic environment, prevent any release to drains, surface water or groundwater and treat aqueous effluent before discharge. Otherwise, refer to the producer's sheet.

13. Disposal considerations

Dispose of the substance and its container through an authorised facility under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 where the waste is scheduled under those Rules, and otherwise as non-hazardous industrial waste, in each case under the conditions of the State Pollution Control Board consent in force at the site. Whether a particular waste stream is scheduled depends on the substance and on what it has been mixed with, so classify the waste before consigning it. Do not reuse empty containers for any other purpose.

14. Transport information

UN number	Not regulated for transport
Class	Not applicable - not a dangerous good under ADR, IMDG or IATA
Packing group	Not applicable
Proper shipping name	Not applicable - not regulated for transport

15. Regulatory information

Supply in India is subject to the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 where the substance is scheduled, and to any product-specific licensing named on the product page. Classification and labelling follow the GHS as adopted in the jurisdiction of use.

Note: MONOHYDRATE AND ANHYDROUS ARE DIFFERENT PRODUCTS AND MUST BE LABELLED AS SUCH. Monohydrate: CAS 5949-29-1, C₆H₈O₇.H₂O, MW 210.14, melting 135 C. Anhydrous: CAS 77-92-9, C₆H₈O₇, MW 192.1, melting 153 C. They share EC number 201-069-1, which is why they are so often conflated. The monohydrate contains about 8.6% water of crystallisation, so 1.094 kg of monohydrate supplies the same citric acid as 1.000 kg of anhydrous - substituting one for the other weight-for-weight changes the acid delivered by about 9%. The melting-point discrepancy in the literature is not an error in one source or the other: the monohydrate dehydrates before it melts, so a sheet that reports 153 C is reporting the melt of the anhydrous acid formed in situ. Publish both figures with the form named. Citric acid has no harmonised CLP classification, so any statement of the form 'classified as' is a supplier position, not an EU legal one. It is not a dangerous good for transport in any mode, but it is a combustible dust. In food and pharmaceutical supply the relevant quality references are the FCC, USP-NF, Ph. Eur. and BP/IP monographs, not the safety classification.

16. Other information

Version	1.0
Date of issue	07 October 2026
Supersedes	No previous version
Regulatory basis as at the date of issue	EU CLP Regulation 1272/2008 as amended, including Annex VI harmonised classifications; UN Model Regulations and the IMDG Code Amendment 42-24, mandatory from 1 January 2026; ADR 2025; and, in India, the Manufacture, Storage and Import of Hazardous Chemical Rules 1989 and the Central Motor Vehicles Rules 1989.

How this sheet was compiled and what governs. This sheet was prepared by Velora Chemicals Private Limited as the supplier, from PubChem, the ECHA CLP inventory including Annex VI harmonised classifications, ILO International Chemical Safety Cards and published producer safety data sheets. Values that could not be confirmed from those sources are shown as "Not available" rather than estimated. **The producer's safety data sheet for the specific grade and lot supplied is the governing document** and is issued with the consignment; where the two differ, the producer's sheet prevails. This sheet carries no warranty of the properties of any particular batch. Velora Chemicals Private Limited is a bulk supplier and trader, not a manufacturer.

Sources consulted: https://chemicalsafety.ilo.org/dyn/icsc/showcard.display?p_card_id=0704;
https://chemicalsafety.ilo.org/dyn/icsc/showcard.display?p_version=2&p_card_id=0855;
https://www.citribel.com/wp-content/uploads/2022/07/EN_CAM_2022.pdf