SAFETY DATA SHEET

CITRIC ACID MONOHYDRATE

CAS No.: 5949-29-1

This Safety Data Sheet is issued by Suraj Chemicals as the distributor/supplier of record, based on manufacturer and published GHS / regulatory reference data for this substance. Users should also consult the specific manufacturer's SDS where available.

1. IDENTIFICATION

GHS Product identifier

CITRIC ACID MONOHYDRATE
2-Hydroxy-1,2,3-propanetricarboxylic acid monohydrate; E330
CAS: 5949-29-1

Other means of identification

Not relevant

Recommended use of the chemical and restrictions on use

Relevant uses: Food, beverage and pharmaceutical acidulant/preservative/chelating agent (E330); cleaning and descaling formulations; industrial buffering agent. For industrial and food-processing use.

Uses advised against: All uses not specified in this section or in section 7.3.

Supplier's details

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2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

GHS:
Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), based on well-established public data for citric acid monohydrate (CAS 5949-29-1), which shares the hazard profile of anhydrous citric acid.

Eye Irrit. 2	Eye irritation, Category 2, H319

GHS label elements, including precautionary statements

GHS: Warning

Hazard statements

H319: Causes serious eye irritation.

Precautionary statements

P264: Wash exposed skin thoroughly after handling.
P280: Wear eye protection/face protection.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313: If eye irritation persists, get medical advice/attention.
P501: Dispose of contents/container in accordance with local/regional/national regulations.

Other hazards which do not result in classification

Fine dust may form combustible dust clouds under specific conditions. Loses its water of crystallisation above ~75°C. Not a PBT/vPvB substance.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substances

Chemical description: Citric Acid Monohydrate ($C_6H_8O_4 \cdot H_2O$)

In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
CAS: 5949-29-1	Citric Acid Monohydrate – Eye Irrit. 2: H319 – Warning	≥99.5%

To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

Mixtures

Non-applicable (single substance)

4. FIRST AID MEASURES

Description of necessary first-aid measures

Request medical assistance if symptoms are severe or persist, showing the SDS of this product.

By inhalation
Dust may irritate the respiratory tract. Remove to fresh air.

By skin contact
Wash with plenty of water. Remove contaminated clothing.

By eye contact
Rinse eyes thoroughly with water for at least 15 minutes, holding eyelids open. Seek medical attention if irritation persists.

By ingestion/aspiration
Rinse mouth. Give water to drink if the person is conscious. Do not induce vomiting.

Most important symptoms/effects, acute and delayed

Eye irritation is the principal acute effect. Dust may cause transient irritation of the respiratory tract.

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

Treat symptomatically. No specific antidote required.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Suitable: Water spray, foam, dry chemical, CO_2.
Unsuitable: None known.

Specific hazards arising from the chemical	Combustible solid. Fine dust suspended in air may form an explosive dust cloud. Loses water of crystallisation on heating (>75°C); thermal decomposition may release irritant fumes.
Special protective actions for fire-fighters	Wear self-contained breathing apparatus in enclosed or poorly ventilated areas. **Additional provisions** Avoid dispersing spilled dust; use water spray to knock down dust rather than dry sweeping near ignition sources.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	**For non-emergency personnel** Avoid dust generation and inhalation. Use PPE described in section 8. **For emergency responders** Wear appropriate protective equipment; control ignition sources near spilled dust.
Environmental precautions	Avoid large releases to drains or watercourses; may locally lower pH.
Methods and materials for containment and cleaning up	Sweep up or vacuum (using dust-explosion-rated equipment) and place in a suitable, labelled container for reuse or disposal. Avoid generating dust clouds.
Reference to other sections	See sections 8 and 13.

7. HANDLING AND STORAGE

Precautions for safe handling

A. General precautions for safe use
Avoid contact with eyes. Avoid generating and inhaling dust. Use with adequate ventilation.

B. Technical recommendations for the prevention of fires and explosions
Control dust accumulation; eliminate ignition sources; use appropriately rated (dust-explosion) electrical equipment where fine dust may be present.

C. Technical recommendations on general occupational hygiene
Do not eat, drink or smoke while handling. Wash hands thoroughly after handling.

D. Technical recommendations to prevent environmental risks
Prevent uncontrolled discharge to drains or watercourses.

Conditions for safe storage, including any incompatibilities

A. Specific storage requirements

Storage condition	Store in tightly closed containers/bags in a cool (below ~30°C to limit efflorescence/caking), dry, well-ventilated place
Incompatible materials	Strong oxidising agents, strong bases, sulfur trioxide, metal nitrates

B. General conditions for storage
Keep away from excessive heat (loses water of crystallisation above ~75°C) and from oxidisers.

Specific end use(s)

Food/beverage acidulant (E330) for use within Good Manufacturing Practice / statutory dosage limits. Except for the instructions already specified, no other special recommendation applies.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

Identification	Occupational Exposure Limit Type	Value
Citric Acid Monohydrate CAS: 5949-29-1	No specific OEL established (treat as particulate not otherwise classified)	General inert-dust limit: 10 mg/m³ (total dust) / 3 mg/m³ (respirable)

Appropriate engineering controls

Provide local exhaust ventilation where dust is generated.

B. Respiratory protection
Not normally required with adequate ventilation; use a particulate filter respirator (FFP2 type) if dust levels are elevated.

C. Specific protection for the hands
Chemical-resistant gloves recommended for prolonged or repeated contact.

D. Eye and face protection
Safety glasses with side shields or chemical goggles.

E. Bodily protection
Standard food-industry/work clothing.

F. Additional emergency measures
Eyewash station and washing facilities should be available.

Environmental exposure controls
Prevent uncontrolled discharge to the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	
Physical state at 20°C	Solid (crystalline powder/granules)
Appearance	White crystalline solid
Odor	Odorless
Odour threshold	Not applicable
Volatility	
Boiling point	Decomposes before boiling
Melting point	Loses water of crystallisation at ~75°C; anhydrous form melts at 153°C
Vapour pressure	Negligible at room temperature
Evaporation rate	Not applicable (solid)
Product Description	
Molecular weight	210.14 g/mol
Density	1.542 g/cm³
pH (1% aqueous solution)	~2.2 (acidic)
Solubility in water at 20°C	~118–133 g/100 mL (freely soluble)
Decomposition temperature	~175°C (anhydrous residue)
Flammability	
Flash Point	Non-applicable (combustible solid, no conventional flash point)
Flammability (solid, gas)	Combustible solid (not readily ignited)
Autoignition temperature	~1010°C
Lower / Upper flammability limit	Not established for dust cloud (treat per combustible-dust precautions)

Other information

Explosive properties	Not explosive as bulk solid; fine dust may form explosible dust cloud
Oxidising properties	Not classified as an oxidiser
Corrosive to metals	Mildly corrosive to some metals in aqueous solution (chelating action)

10. STABILITY AND REACTIVITY

Reactivity
Reacts with strong bases (neutralisation, exothermic) and with strong oxidising agents. Chelates metal ions.

Chemical stability
Chemically stable under the indicated conditions of storage, handling and use. Effloresces (loses water of crystallisation) above ~75°C or under very dry conditions.

Possibility of hazardous reactions
Hazardous polymerisation does not occur. Under specified conditions, hazardous reactions leading to excessive temperature or pressure are not expected.

Conditions to avoid

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Not applicable	Avoid open flame/heat and >75°C (dehydration) – combustible dust	Not applicable	Avoid very low humidity (efflorescence) and very high humidity (caking)

Incompatible materials
Strong oxidising agents, strong bases, sulfur trioxide, metal nitrates.

Hazardous decomposition products
Carbon monoxide and carbon dioxide on thermal decomposition/combustion; water vapour on dehydration.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

In case of exposure that is repetitive, prolonged, or at concentrations higher than the recommended occupational exposure limits, adverse health effects may result depending on the means of exposure:

A. Ingestion (acute effect)
Low acute oral toxicity; a common food acid. Large doses may cause gastrointestinal irritation.

B. Inhalation (acute effect)
Dust may cause irritation of the nose, throat and respiratory tract.

C. Contact with skin and eyes (acute effect)
Skin: not classified as irritant under normal handling. Eyes: causes serious eye irritation.

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity)
Not listed as a carcinogen by IARC, NTP or OSHA. Classification criteria for mutagenicity/reproductive toxicity are not met based on available data.

E. Sensitizing effects
Classification criteria for respiratory or skin sensitisation are not met based on available data.

F. Specific target organ toxicity (STOT) – single exposure
Classification criteria are not met based on available data.

G. Specific target organ toxicity (STOT) – repeated exposure
Classification criteria are not met based on available data.

H. Aspiration hazard
Not applicable (solid).

Product-specific toxicological information

Identification	Acute Toxicity	Genus
Citric Acid Monohydrate CAS: 5949-29-1	LD50 oral: ~3000 mg/kg (as citric acid)	Rat
	LD50 dermal: >2000 mg/kg	Rabbit

12. ECOLOGICAL INFORMATION

Readily biodegradable and of low aquatic toxicity; a naturally occurring metabolite.

Toxicity

Acute Toxicity	Species	Genus
LC50: >100 mg/L (96h)	Non-applicable	Fish
EC50: >100 mg/L (48h)	Non-applicable	Daphnia

Persistence and degradability
Readily biodegradable (naturally occurring in the citric acid/Krebs cycle).

Bioaccumulative potential
Not expected to bioaccumulate (log Pow –1.7, low).

Mobility in soil

Koc	Henry	Dry Soil	Moist Soil
Low (highly water soluble)	Negligible	Highly soluble/mobile	

Results of PBT and vPvB assessment: Does not meet PBT/vPvB criteria.

Other adverse effects: None expected under normal use; may transiently lower pH of receiving water at high discharge concentrations.

13. DISPOSAL CONSIDERATIONS

Disposal methods: Not classified as hazardous waste. Dissolve/neutralise and dispose of in accordance with local discharge consent, or via a licensed waste contractor. Refer to national and local regulations on waste management.

14. TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR/RID)

14.1 UN number	Not regulated
14.2 UN proper shipping name	Citric Acid Monohydrate – non-hazardous for transport
14.3 Transport hazard class(es)	N/A
14.4 Packing group	N/A
14.5 Environmental hazard	No
14.6 Special precautions for user	None
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not applicable

Transport of dangerous goods by sea (IMDG)

14.1 UN number	Not regulated
14.2 UN proper shipping name	Citric Acid Monohydrate – non-hazardous for transport
14.3 Transport hazard class(es)	N/A
14.4 Packing group	N/A
14.5 Marine pollutant	No
14.6 Special precautions for user	None
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not applicable

Transport of dangerous goods by air (IATA/ICAO)

14.1 UN number	Not regulated
14.2 UN proper shipping name	Citric Acid Monohydrate – non-hazardous for transport
14.3 Transport hazard class(es)	N/A
14.4 Packing group	N/A
14.5 Environmental hazard	No
14.6 Special precautions for user	None
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not applicable

15. REGULATORY INFORMATION

Safety, health and environmental regulations specific for the product in question: Permitted as a food acidulant/preservative/sequestrant (E330) subject to Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011 and Codex Alimentarius GSFA limits (generally GMP-level use).

Other legislation

Food Safety and Standards Act, 2006 and associated Regulations (India)
Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989
The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)

16. OTHER INFORMATION

Legislation related to safety data sheets

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3

H319: Causes serious eye irritation.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training

Minimal training is recommended to prevent industrial risks for staff using this product, in order to facilitate their comprehension and interpretation of this safety data sheet, as well as the label on the product.

Principal bibliographical sources

Publicly available GHS classification and physicochemical reference data for citric acid monohydrate (CAS 5949-29-1).

Abbreviations and acronyms

LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | Koc: Partition coefficient of organic carbon | Log-POW: Octanol-water partition coefficient | IARC: International Agency for Research on Cancer | GMP: Good Manufacturing Practice

Disclaimer: The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

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