

TECHNICAL DATA SHEET

Citric Acid Monohydrate - USP Food Grade

USP Food Grade

CAS NUMBER

5949-29-1

ALLIANCE CODE

citric-acid-monohydrate-
usp-food-grade

GENERATED

2026-08-31

REVISION

1.2

REVIEWED

2026-07-17 · Andre Taki

IDENTITY & COMPOSITION

PRODUCT NAME

Citric Acid Monohydrate - USP Food Grade

ALLIANCE CODE

citric-acid-monohydrate-usp-food-grade

GRADE

USP Food Grade

CONCENTRATION

—

CAS NUMBER

5949-29-1 [PubChem](#)

FORMULA

C6H10O8 [PubChem](#)

MOLECULAR WEIGHT

210.14 [PubChem](#)

PRODUCT TYPE

pure_substance

SPECIFICATIONS

TEST	SPECIFICATION	TYPICAL	METHOD	SOURCE
Assay (C6H8O7, anhydrous basis)	99.5%–100.5% on the anhydrous basis	100.0 %	Titration with 1 N sodium hydroxide VS to phenolphthalein; 1 mL = 64.03 mg C6H8O7	USP monograph

TEST	SPECIFICATION	TYPICAL	METHOD	SOURCE
Clarity of Solution	The Sample solution shows the same clarity as that of water or its opalescence is not more pronounced than Standard suspension A	Passes test	200 mg/mL in water, compared with water and Standard suspension A	USP monograph
Description	Colorless, translucent crystals or a white, granular to fine, crystalline powder	Passes test	—	FCC
Heavy Metals	NMT 10 µg/g	0.3	Heavy Metals <231>	USP monograph
Lead	Not more than 0.5 mg/kg	0.05 mg/kg	—	FCC
Oxalic Acid	≤ 0.036 %	0.0014 %	—	USP monograph
Residue on Ignition (USP)	NMT 0.1%	0.007 %	Residue on Ignition <281>, 1.0 g	USP monograph
Readily Carbonizable Substances	Not darker than Matching Fluid K	Passes test	1.0 g in 10 mL sulfuric acid, 90 ± 1 °C for 60 ± 0.5 min	USP monograph
Sulfate (SO ₄)	≤ 0.015 %	0.003 %	—	USP monograph
Tridodecylamine (solvent-extracted material only)	Not more than 0.1 mg/kg	0.01 mg/kg	—	FCC

TEST	SPECIFICATION	TYPICAL	METHOD	SOURCE
Water	7.5%–9.0%	8.6 %	Water Determination, Method I <921> (Karl Fischer), 0.5 g sample	USP monograph
Identification	Meets USP/FCC requirements	Passes test	USP citrate identification test / FTIR vs. reference standard	Interpreted
Arsenic (as As)	Not more than 1 mg/kg	0.05 mg/kg	ICP-MS / FCC arsenic limit test	Interpreted

Specification values are guaranteed limits. Typical values are representative of production lots and are not guaranteed. Lot-specific certificates of analysis ship with every order.

AVAILABLE GRADES SAME CAS, ALTERNATE GRADES AND CONCENTRATIONS

GRADE	CONCENTRATION	TYPICAL ASSAY	SKU
THIS GRADE USP Food Grade	—	—	current
ACS Reagent	—	—	citric-acid-monohydrate-acs-reagent-grade

Typical assay shown is the rolling-window mean from the sibling product's most recent lots. Grade selection drives downstream end-use — verify the sibling grade matches your specification before substitution.

PHYSICAL & CHEMICAL PROPERTIES

PROPERTY	VALUE	SOURCE
Appearance	Passes	Vendor COA
Form	Crystal	Published reference
Color	The Sample solution is not more intensely colored than water; if more intensely colored, not more intensely colored than Standard solutions A, B, and C	USP monograph
Density	1.5 g/cm ³	Published reference
Boiling Point	175	Published reference
Melting Point	135 °C	Published reference
Flash Point	385	Published reference
Solubility (water)	Solubility in water, g/100ml at 20 °C: 59.2	Published reference

MATERIALS OF CONSTRUCTION

MATERIAL	RATING	MAX T (°C)	NOTES	SOURCE
Buna-N (NBR) Elastomer	Good	60	Acceptable	Cole-Parmer Chemical Compatibility
EPDM Elastomer	Excellent	100	Standard for brine gaskets.	Parker O-ring Chemical Compatibility
Viton (FKM) Elastomer	Excellent	100	Preferred elastomer	Cole-Parmer Chemical Compatibility

MATERIAL	RATING	MAX T (°C)	NOTES	SOURCE
Borosilicate Glass Glass Ceramic	Excellent	100	Universally inert to salt solutions.	Cole-Parmer Chemical Compatibility
Concrete (sealed) Glass Ceramic	Good	—	Acceptable with epoxy coating	Cole-Parmer Chemical Compatibility
304 stainless steel Metal	Fair	25	Pitting in chloride-rich service	Cole-Parmer Chemical Compatibility
316L Stainless Steel Metal	Good	60	Watch for chloride pitting above 60 °C in chloride salts.	NACE Chloride Pitting Guidelines
Aluminium Metal	Poor	—	Pitting; not recommended for brine	Cole-Parmer Chemical Compatibility
Carbon steel Metal	Poor	—	Rapid rust in brine	Cole-Parmer Chemical Compatibility
FRP Thermoplastic	Excellent	60	Common bulk-storage	Cole-Parmer Chemical Compatibility
HDPE Thermoplastic	Excellent	60	Universal salt brine compatibility.	Cole-Parmer Chemical Compatibility
PP Thermoplastic	Excellent	80	Acceptable for hot brine	Cole-Parmer Chemical Compatibility
PVC Thermoplastic	Excellent	60	Standard for brine piping.	Cole-Parmer Chemical Compatibility

Ratings reflect the service envelope (concentration × temperature) shown. Always confirm against your specific duty cycle and contact-time before equipment selection. The most cautious rating across overlapping references is shown.

REGULATORY & TRANSPORT

DOT / 49 CFR

UN NUMBER

Not regulated **Adjudicated**

PACKING GROUP

Not regulated **Adjudicated**

HAZARD CLASS

Not regulated **Adjudicated**

PROPER SHIPPING NAME

Not regulated **Adjudicated**

GHS / OSHA HAZCOM 2012

SIGNAL WORD

Warning **Adjudicated**

H-CODES (HAZARD STATEMENTS)

H315, H319, H335 **Adjudicated**

P-CODES (PRECAUTIONARY STATEMENTS)

P261, P264, P271, P280, P302+P352,
P304+P340, P305+P351+P338, P314, P321,
P332+P313, P337+P313, P362, P403+P233,
P405, P501

Adjudicated

OCCUPATIONAL EXPOSURE LIMITS

OSHA PEL (29 CFR 1910.1000)

— **no canonical**

ACGIH TLV

— **no canonical**

NIOSH REL

— **no canonical**

NIOSH IDLH

— **no canonical**

Transport descriptions reflect 49 CFR 172.101 lookup at time of publication. Sourced data: ECHA CLP Annex VI for harmonised classifications, NIOSH Pocket Guide for REL/IDLH, OSHA Z-Tables for PEL. Always verify against the latest regulatory text before shipment-critical decisions.

APPLICATIONS

Bulk pharmaceutical chemical (GMP manufactured) for manufacturing, processing or repackaging, with further processing required for injectable dosage forms

assets.thermofisher.com

USP monohydrate intended for use in dialysis solutions or, after further processing, injectable dosage forms

mubychem.com

FCC food-grade functions: sequestrant, dispersing agent, acidifier and flavoring agent

mubychem.com

Industrial use in the manufacture of ecologically compatible detergents, chemical cleaning, concrete admixtures and plasticizers

ingredi.com

Used as a hydraulic fracturing / well stimulation chemical in oil and shale gas production

mubychem.com

Used in the preparation of injectable dosage forms after further processing. assets.thermofisher.com

Applications are drawn from published manufacturer and supplier documentation; each is sourced. Suitability for a specific use is the buyer's to confirm.

STORAGE & HANDLING

RECOMMENDED STORAGE

Preserve in Tight Containers

assets.thermofisher.com

INCOMPATIBILITIES

Specific incompatibilities depend on the salt — consult the SDS. Many salts react with strong acids to release gases.

Class-level guidance — not product-specific; the SDS controls.

For full hazard, PPE, and emergency response guidance, refer to the Safety Data Sheet (SDS) for this product. The SDS controls in all cases where guidance differs.

HANDLING PRECAUTIONS

Standard chemical PPE — dust mask and goggles for handling of fine grades. Avoid generating airborne dust.

Class-level guidance — not product-specific; the SDS controls.

SHELF LIFE

Consult Technical Services for product-specific shelf life

PACKAGING & LOGISTICS

SHIPPING DESCRIPTION (US DOT)

Not regulated for transport.

Confirm against shipping documents and carrier requirements before tender.

NMFC CLASS
70

REVISION HISTORY

Last reviewed 2026-07-17 by Andre Taki, DOT Hazmat Specialist.

VERSION	DATE	CHANGE	TRIGGER
1.2	2026-07-22	Canonical data updated: 1 field changed via the provenance/adjudication pipeline. ghsClassification · canonical change (coa.data_provenance / adjudication)	canonical_change
1.1	2026-07-17	Canonical data re-verified: 7 fields updated against independent vendor SDSs, CLP Annex VI, 49 CFR, and OSHA HazCom 2024 (GHS classification, hazard/precautionary codes, signal word, physical properties as applicable). - appearance · canonical adjudication / reground (coa.data_provenance) - countryOfOrigin · canonical adjudication / reground (coa.data_provenance) - dotSubsidiaryHazardClass · canonical adjudication / reground (coa.data_provenance) - ghsClassification · canonical adjudication / reground (coa.data_provenance) - hazard_h_codes · canonical adjudication / reground (coa.data_provenance) - hazard_p_codes · canonical adjudication / reground (coa.data_provenance) - hsCode · canonical adjudication / reground (coa.data_provenance)	canonical_change
1.0	2026-05-20	Initial URL—first TDS published from canonical chemistry registry.	initial

This Technical Data Sheet is provided for technical reference. The Safety Data Sheet (SDS) controls in all cases where guidance differs. Values reflect Alliance Chemical canonical data at time of generation; subsequent revisions are recorded in the Revision History above.