



Safety Data Sheet

Revision Date: 16-May-2023

Revision Number: 4

1. Identification

Product Name:

Citric Acid Anhydrous

Product Code:

020410, 020420, 020440

Synonyms:

2-hydroxy-1,2,3-propanetricarboxylic acid, or
2-hydroxypropane-1,2,3-tricarboxylic acid

Use of the Substance / Preparation:

Chemical intermediate, Personal care products, Cleaning/detergent products and other household products, Paper products, Construction products, Polymers and plastics products, Oil industry, Textile industry, Paints and coatings, Photography products, Laboratory reagents, Water treatment, Treatment of metal surfaces, Agricultural applications, Medical devices, Food additive.

Supplier:

Archer Daniels Midland Company
4666 Faries Parkway
Decatur, IL 62526, USA
Telephone Number: (+1) 217-424-5200

Emergency response telephone number:

Chemtrec 1-800-424-9300 (CCN 1635)

2. Hazard(s) identification

Emergency Overview

May form combustible dust concentrations in air (during processing and handling). Causes eye irritation. Contains one or more components which may cause target organ damage upon single exposure.

Appearance

White

Physical State

Solid: Powder / Granular

Odor

Odorless

Classification according to 29 CFR 1910, amended to conform to the United Nations' Globally Harmonized System of Classification and Labelling of Chemicals (GHS):

NOTE: Certain products covered under other Canadian legislation, including but not limited to cosmetics, devices, drugs or food (as defined in the Food and Drugs Act), pest control products (as defined in the Pest Control Products Act), consumer products (as defined in the Canada Consumer Product Safety Act), and Hazardous waste (being a hazardous product that is sold for recycling or recovery and is intended for disposal), are NOT subject to the label and SDS requirements of the Hazardous Products Regulations (SOR/2015-17), also known as WHMIS 2015. As supplied for use in food, an SDS and WHMIS compliant labeling are NOT required for this product. Since Canadian employers must still provide education and training on health effects, safe use, and storage, and in the interest of providing relevant product information to our customers, this SDS is being provided on a voluntary basis.

Serious Eye Damage / Eye Irritation	Category 2
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Specific Target Organ Toxicity (STOT) Single Exposure.	Category 3
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OSHA Defined Hazard(s)	Combustible Dust
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HPR Defined Hazard(s)	Combustible Dust
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Label Elements

Signal Word:	Warning
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GHS Hazard Pictogram(s):	Note: The combustible dust hazard class does not have an assigned pictogram.
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Hazard Statement(s):	May form combustible dust concentrations in air. H319 Causes serious eye irritation H335 May cause respiratory irritation
Prevention Precautionary Statements:	Wash hands and exposed skin thoroughly after handling. Wear eye/face protection. Use only outdoors or in a well-ventilated area. Avoid breathing dust.
Response Precautionary Statements:	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a doctor if you feel unwell.
Storage Precautionary Statements:	Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Disposal Precautionary Statements:	Dispose of contents/container in accordance with all applicable national and local regulations.

3. Composition/information on ingredients

Chemical nature of the preparation Substance

Chemical Family Acids.
Molecular Formula C₆H₈O₇

Hazardous

Chemical Name	CAS-No	Weight %	North American Substance Hazard Class
Citric acid	77-92-9	80 - 100%	Eye Irrit. 2; IDL (1.0%) STOT SE 3. (respiratory)

Where a single SDS is used for similar mixtures or in cases of a batch-to-batch variability, OSHA guidance allows for the use of concentration ranges. [Directive: CPL 02-02-079] Components which are not considered to be health hazards under paragraph (d) of 29 CFR §1910.1200 (HCS 2012) or SOR/2015-17 (WHMIS 2015) are not required to be disclosed.

4. First-aid measures

Description of first aid measures

Eye Contact Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. If symptoms persist, consult a physician. If eye irritation persists, consult a specialist.

Skin Contact Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes.

Inhalation Move to fresh air.

Ingestion Clean mouth with water and afterwards drink plenty of water.

Protection of First-aiders Use personal protective equipment. Avoid contact with skin, eyes and clothing.

General Advice If symptoms persist, call a physician. Show this safety data sheet to the doctor in attendance. Use personal protective equipment. For personal protection see section 8.

Most important symptoms and affects, both acute and delayed

Eyes Contact with eyes may cause mechanical irritation. Contact with eyes may cause irritation.

Skin According to GHS hazard classification criteria, the product is not considered as being a skin irritant. Product dust may cause mild, mechanical irritation.

Inhalation May cause irritation of respiratory tract. Based on the low pH, citric acid would be expected to cause irritation to the respiratory tract, resulting in a higher cough response as the inhalation exposure concentration was increased.

Ingestion Oral exposure is not anticipated under normal working conditions. Health injuries are not known or expected under normal use.

Main Symptoms Itching. Redness. Burning sensation.

Indication of any immediate medical attention and special treatment needed

Notes to Physician Treat symptomatically.

5. Fire-fighting measures

Flammable Properties

Fine dust dispersed in air may ignite. Risk of ignition followed by flame propagation or secondary explosions should be prevented by avoiding accumulation of dust, e.g. on floors and ledges.

Extinguishing media

Suitable Extinguishing Media Dry chemical. Carbon dioxide (CO₂). Water spray. Foam. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable Extinguishing Media No information available.

Special hazards arising from the substance or mixture

Hazardous Combustion Products Thermal decomposition can lead to release of irritating gases and vapors, Carbon monoxide (CO), Carbon dioxide (CO₂).

Specific Hazards Arising from the Chemical None known.

Sensitivity to mechanical impact No.

Sensitivity to static discharge Yes. (as dust).

Further information Fine dust dispersed in air may ignite. Dust explosibility class = 1. Weak to moderately explosible.

Advice for fire-fighters

Protective Equipment and Precautions for Firefighters As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

Health 2

Stability and Reactivity 0

Physical hazard None known

Flammability 1



6. Accidental release measures

Personal Precautions, Protective Equipment, and Emergency Procedures

Avoid contact with the skin and the eyes. Use personal protective equipment. For personal protection see section 8. Avoid dust formation.

Environmental Precautions

Prevent further leakage or spillage if safe to do so. Prevent product from entering drains.

Methods and Materials for Containment and Cleaning Up

Pick up and transfer to properly labelled containers. Avoid dust formation. Keep in suitable, closed containers for disposal. Aqueous spillage should be neutralized and treated prior to discharge. For disposal information see section 13.

7. Handling and storage

Handling

Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Handle in accordance with good industrial hygiene and safety practice. Do not breathe vapours/dust. Use only in area provided with appropriate exhaust ventilation. Avoid dust formation in confined areas. Fine dust dispersed in air may ignite. Ensure adequate ventilation. Refer to NFPA 61, "Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities". Avoid contact with skin and eyes.

Storage

Keep containers tightly closed in a cool, well-ventilated place. Keep in properly labelled containers. Keep at temperature not exceeding 23.9°C / 75°F. At 55% relative humidity. Keep away from metals. Corrosive to metals (as aqueous solution). Keep away from oxidizing agents. Keep away from strong bases. Keep away from amines.

8. Exposure controls/Personal protection

Exposure Limits

Where exposure limits have not been established for specific components of this material, please observe the OSHA and ACGIH established limits for particulates not otherwise classified (PNOC). OSHA PEL: [15 mg/m³ (total dust) 8-hr TWA], [5 mg/m³ (respirable) 8-hr TWA]. ACGIH TLV: [10 mg/m³ (inhalable) 8-hr TWA], [3 mg/m³ (respirable) 8-hr TWA].

Biological Limit Values

No biological limit values have been listed for the component(s) of this product.

Appropriate Engineering Controls Local exhaust ventilation. Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.

General Hygiene Considerations When using, do not eat, drink or smoke. Regular cleaning of equipment, work area and clothing.

Personal Protective Equipment

Eye/face Protection.

Safety glasses with side-shields. If airborne dust concentrations are excessive, wear goggles. Tightly fitting safety goggles.

Skin and Body Protection

Impervious gloves. Long sleeved clothing. Boots.

Respiratory Protection

Respirator with a dust filter. In case of insufficient ventilation wear suitable respiratory equipment.

9. Physical and chemical properties

Appearance	White
Physical State	Solid: Powder / Granular
Odor	Odorless
Odor Threshold	Not applicable
pH	1.8 @ 25°C (5 wt% conc)
Dissociation Constants (pKa)	3.13, 4.76, and 6.4 at 25°C
Flash Point	Not applicable (solid)
Autoignition Temperature	Not applicable (No obligation to report when the autoignition temperature is >400°C.)
Boiling point	Not applicable (decomposes before boiling)
Melting/Freezing Point	153 °C / 307 °F (101.3 kPa)
Decomposition temperature	No information available
Oxidizing Properties	Not oxidizing
Flammability Limits in Air	Not flammable
Explosion Limits	Not explosive
Water Solubility	590g/l at 20°C
Solubility(ies)	
Surface Tension	Not applicable. (no surface tension anticipated).
Evaporation Rate	Not applicable (solid)
Vapor Pressure	2.21E-6 Pa at 25°C
Vapor Density	Not applicable
Specific Gravity / Relative Density	No information available
Bulk Density	500-950kg/m ³ at 20°C
Viscosity (kinematic)	Not applicable (solid)
Partition Coefficient (n-octanol/water)	-0.2 to -1.8
Explosive Properties	Not explosive

10. Stability and reactivity

Reactivity Reactions with metal nitrates may be potentially explosive. Aqueous form is corrosive to copper, zinc, aluminum and their alloys.

Stability Not applicable. Stable under normal conditions.

Possibility of Hazardous Reactions None under normal processing.

Conditions to Avoid Avoid dust formation. Heat, flames and sparks.

Incompatible Materials Amines. Heavy metals. Strong oxidizing agents. Strong bases.

Hazardous Decomposition Products Thermal decomposition can lead to release of irritating gases and vapors. Carbon monoxide (CO). Carbon dioxide (CO₂).

11. Toxicological information

Information on toxicological effects

Acute toxicity	Based on available data, the classification criteria are not met.			
Chemical Name	Weight %	LD50 Oral	LD50 Dermal	LC50 Inhalation
Citric acid	99-100	5400 mg/kg Mouse 11700 mg/kg Rat	>2000 mg/kg bw Rat	
Skin corrosion/irritation	Based on available data, not, or only slightly irritating.			
Serious eye damage/eye irritation	Irritant, causes serious eye irritation. Cat. 2 H319: Causes serious eye irritation. (Classification is based on available literature data for the significant mixture components).			
Method	OECD Guideline 405 (Acute Eye Irritation / Corrosion)			
Species	Rabbit (New Zealand White)			
Results	Irritating: Overall irritation score for 10% solution: 9.3 of max. 110 (mean (of 3 animals)) (Time point: at 1, 24, 48 or 72 h) (fully reversible within: 7 days) (score achieved at 1 h) Overall irritation score for 30% solution: 16 of max. 110 (mean (of 3 animals)) (Time point: at 1, 24, 48 or 72 h) (not fully reversible within: 14 days) (fully reversible in 14-21 days) (expert opinion) (score achieved at 1 h)			
Respiratory or skin sensitisation	Based on available data, not expected to be a skin or respiratory sensitiser.			
Germ cell mutagenicity	Based on available data, negative to test/non-mutagenic.			
Carcinogenicity	Based on available data, no evidence of carcinogenicity.			
Reproductive toxicity	Based on available data, no evidence of reproductive toxicity.			
STOT - single exposure	STOT SE, Cat. 3: May cause respiratory irritation. (Classification is based on available literature data for the significant mixture components).			
STOT - repeated exposure	Based on available data, no toxicity identified at highest exposure levels [NOAEL(rats) 4000mg/kg bw/d].			
Aspiration hazard	Based on available data, no known aspiration hazard.			

Potential health effects

Eyes	Contact with eyes may cause mechanical irritation. Contact with eyes may cause irritation.
Skin	According to GHS hazard classification criteria, the product is not considered as being a skin irritant. Product dust may cause mild, mechanical irritation.
Inhalation	May cause irritation of respiratory tract. Based on the low pH, citric acid would be expected to cause irritation to the respiratory tract, resulting in a higher cough response as the inhalation exposure concentration was increased.
Ingestion	Oral exposure is not anticipated under normal working conditions. Health injuries are not known or expected under normal use.
Main Symptoms	Itching. Redness. Burning sensation.

12. Ecological information

Ecotoxicity

Not classified for aquatic toxicity. Contains no substances known to be hazardous to the environment. Contains no substances known to be not degradable in waste water treatment plants.

**Determined by extrapolation (testing of intrinsic toxicity to algae impractical due to nutrient complexing behaviour of citric acid)*

Predicted No Effect Concentrations (PNEC) - Determined by extrapolation

BCF	Bioaccumulation is unlikely. [LogKow < 0].
Persistence/Degradability	Readily biodegradable
Mobility	Soluble in water.
PBT and vPvB assessment	This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).
Other adverse effects	Nothing specific known.

13. Disposal considerations

Whenever possible, as rules and regulations allow, please recycle or manage materials to minimize waste.

Waste Disposal Methods	Dispose of in compliance with the laws and regulations pertaining to this product in your jurisdiction. Rinsewater resulting from cleanup should be collected for treatment before disposal. Solutions with low pH-value should be neutralized before discharge.
Contaminated Packaging	Empty containers should be decontaminated and taken for local recycling, recovery or waste disposal.

14. Transport information

Domestic transport regulations (USA)

DOT Not regulated

Domestic transport regulations (Canada)

TDG Not regulated

Domestic transport regulations (Mexico)

MEX Not regulated

International transport regulations

ICAO Not regulated

IATA Not regulated

IMDG/IMO Not regulated

15. Regulatory information

International Inventories

The components of this product are reported in the following inventories:

Chemical Name	TSCA	DSL	NDSL	ICL	EINECS	ELINCS	AICS
Citric acid	Yes ACTIVE	Yes	No	No	Yes 201-069-1	No	Yes

Chemical Name	ENCS ISHL	CHINA	PICCS	KECL	Taiwan	Turkey	NZIoC
Citric acid	Yes (2)-1318	Yes	Yes	Yes Annex 1 (KE-20831)	Yes	Yes 201-069-1	Yes

USA

Federal Regulations

Ozone Depleting Substances:

No Class I or Class II material is known to be used in the manufacture of, or contained in, this product.

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product is not known to contain any chemicals which are subject to the reporting requirements of the Act or regulations contained in 40 CFR 372.

CERCLA/SARA 103-302

Sections 103-302 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product is not known to contain any chemicals which are subject to the reporting requirements of the Act or regulations contained in 40 CFR 103-302.

SARA 311/312 Hazardous Categorization

Refer to the OSHA hazard classification(s) provided in section 2 of this SDS.

State Regulations

State Right-to-Know

No known components subject to "Right-To-Know" legislation.

Canada

(NPRI) Canadian National Pollutant Release Inventory

No known component is listed on NPRI.

16. Other information

Prepared By:	ADM - Product Regulatory Affairs
Revision Date:	16-May-2023
Revision Number:	4
Reason for revision:	This data sheet contains changes from the previous version in section(s) 2, 3, 11. This version replaces all previous versions.

Abbreviations and acronyms

Ceiling - Ceiling Limit Value: Concentrations that should never be exceeded at any given time (instantaneous)

CAS - Chemical Abstract Service

DNEL - Derived No Effect Level

ACGIH TLV - American Conference of Governmental Industrial Hygienists Threshold Limit Values

DOT - U.S. Department of Transportation

A1 - Known Human Carcinogen

A2 - Suspected Human Carcinogen

A3 - Animal Carcinogen

Delisted - Substances Delisted from Report on Carcinogens

IARC - International Agency for Research on Cancer

GHS - Globally Harmonized System of Classification and Labelling of Chemicals

Group 1 - Carcinogenic to Humans

Group 2A - Probably Carcinogenic to Humans

Group 2B - Possibly Carcinogenic to Humans

Known - Known Carcinogen

IDLH - Immediately Dangerous to Life or Health

Skin notation - Potential for cutaneous absorption

OECD - Organisation for Economic Co-operation and Development

PNEC - Predicted No-Effect Concentration

NTP - National Toxicology Program

LD50 - Median lethal dose of a given test population

LC50 - Lethal concentration that produces fatalities in 50% of a given test population

NFPA - National Fire Protection Association

OSHA - Occupational Safety & Health Administration

OSHA PEL - Occupational Safety and Health Administration Permissible Exposure Limits

NIOSH - National Institute of Occupational Safety and Health

Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen

Present - Carcinogen or potential carcinogen to be identified under OSHA's Hazard Communication Standard

NOAEL - No Observed Adverse Effect Level

TWA - Time Weighted Average: Average concentration that should not be exceeded during a work day (usually 8-hours)

STEL - Short Term Exposure Limit: Concentrations that should not be exceeded except for short periods of time (usually 15-minutes)

TSCA - Toxic Substances Control Act, Section 8(b) Inventory (USA)

STOT - Specific Target Organ Toxicity

STV - Short Term Value (same as STEL)

Under Consideration - Under Consideration by the National Toxicology Program

The information provided on this SDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of sheet