



# Safety Data Sheet

Transport Symbol(s)	WHMIS	NFPA	Personal Protective Equipment
Not controlled			

Original Preparation Date: 15-Apr-2009

Revision Date: 13-Jul-2015

Revision Number: 4

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

**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

**Contact Manufacturer:**

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

**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

**Emergency response telephone number:**

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

## 2. HAZARDS IDENTIFICATION

### Emergency Overview

Warning. Irritating to eyes. Corrosive to metals (as aqueous solution). Product dust may cause mild, mechanical irritation. May form combustible dust concentrations in air (during processing and handling).

**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):

Serious Eye Damage / Eye Irritation	Category 2
Hazards Not Otherwise Classified	Combustible Dust

### OSHA / GHS Label Elements

Signal Word:	Warning
GHS Hazard Pictogram(s):	
Hazard Statement(s):	H319 Causes serious eye irritation May form combustible dust concentrations in air.
Prevention Precautionary Statements:	Wash hands and exposed skin thoroughly after handling. Wear eye/face protection.
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.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Chemical nature of the preparation** Substance  
**Chemical Family** Acids  
**Molecular Formula** C<sub>6</sub>H<sub>8</sub>O<sub>7</sub>

The following component(s) in this product are considered hazardous under applicable OSHA (USA), WHMIS (Canada), and/or NOM-002-SCT-2003 (Mexico) regulations

Chemical Name	CAS-No	Weight %	North American Hazard Indicator
Citric acid	77-92-9	99-100	OSHA / GHS: Eye Irrit. 2; WHMIS: E.

### 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, call a physician.

**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** Irritating to eyes. Contact with eyes may cause mechanical 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. Health injuries are not known or expected under normal use.

**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 (CO<sub>2</sub>). 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 (CO<sub>2</sub>).

**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 1  
Flammability 1

Stability and Reactivity 0  
Physical hazard None known



## 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".

**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 23.9 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**

As an airborne dust, exposure limits pertaining to "particulates not otherwise regulated" have been provided below. Specific exposure limits have not been identified for this product. However, as an irritant, it is advisable to limit worker exposure to the greatest extent possible.

Chemical Name	ACGIH TLV	OSHA PEL	Mexico	NIOSH
Particulates not otherwise regulated	TWA: 10 mg/m <sup>3</sup> inhalable particles, recommended TWA: 3 mg/m <sup>3</sup> respirable particles, recommended	TWA: 15 mg/m <sup>3</sup> total dust TWA: 5 mg/m <sup>3</sup> respirable fraction	not listed	not listed

**Appropriate Engineering Controls**  
**General Hygiene Considerations**

Local exhaust ventilation. Ensure adequate ventilation, especially in confined areas.  
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.

**Skin and Body Protection**  
**Respiratory Protection**

Impervious gloves. Long sleeved clothing. Boots.  
Respirator with a dust filter. In case of insufficient ventilation wear suitable respiratory equipment.



## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance</b>	White
<b>Physical State</b>	Solid: Powder / Granular
<b>Odor</b>	Odorless
<b>Odor Threshold</b>	Not applicable
<b>pH</b>	1.8 @ 25°C at 5wt% conc
<b>Dissociation Constants (pKa)</b>	3.13, 4.76, and 6.4 at 25°C
<b>Flash Point</b>	Not applicable (solid)
<b>Autoignition Temperature</b>	Not applicable (No obligation to report where the autoignition temperature is >400°C.)
<b>Boiling point</b>	Not applicable (decomposes before boiling)
<b>Melting/Freezing Point</b>	153 °C / 307 °F (101.3 kPa)
<b>Decomposition temperature</b>	No information available
<b>Oxidizing Properties</b>	Not oxidizing
<b>Flammability Limits in Air</b>	Not flammable
<b>Explosion Limits</b>	Not explosive
<b>Water Solubility</b>	590g/l at 20°C
<b>Solubility(ies)</b>	
<b>Surface Tension</b>	Not applicable. (no surface tension anticipated).
<b>Evaporation Rate</b>	Not applicable (solid)
<b>Vapor Pressure</b>	2.21E-6 Pa at 25°C Not applicable
<b>Vapor Density</b>	Not applicable
<b>Specific Gravity / Relative Density</b>	1.665g/m <sup>3</sup> at 20°C.
<b>Bulk Density</b>	500-950kg/m <sup>3</sup> at 20°C
<b>Viscosity (kinematic)</b>	Not applicable (solid)
<b>Partition Coefficient (n-octanol/water)</b>	-0.2 to -1.8
<b>Explosive Properties</b>	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 (CO<sub>2</sub>).

## 11. TOXICOLOGICAL INFORMATION

### Information on toxicological effects

<b>Acute toxicity</b>	Based on available data, the classification criteria are not met.			
<b>Chemical Name</b>	<b>Weight %</b>	<b>LD50 Oral</b>	<b>LD50 Dermal</b>	<b>LC50 Inhalation</b>
Citric acid	99-100	5400 mg/kg Mouse 11700 mg/kg Rat	>2000 mg/kg bw Rat	
<b>Skin corrosion/irritation</b>	Based on available data, not, or only slightly irritating.			
<b>Serious eye damage/eye irritation</b>	Irritant, causes serious eye irritation.			
<b>Method</b>	OECD Guideline 405 (Acute Eye Irritation / Corrosion)			
<b>Species</b>	Rabbit (New Zealand White)			
<b>Results</b>	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)			
<b>Respiratory or skin sensitisation</b>	Based on available data, not expected to be a skin or respiratory sensitiser.			
<b>Germ cell mutagenicity</b>	Based on available data, negative to test/non-mutagenic.			
<b>Carcinogenicity</b>	Based on available data, no evidence of carcinogenicity.			
<b>Reproductive toxicity</b>	Based on available data, no evidence of reproductive toxicity			
<b>STOT - single exposure</b>	No evidence of toxicity.			

<b>STOT - repeated exposure</b>	Based on available data, no toxicity identified at highest exposure levels [NOAEL(rats) 4000mg/kg bw/d].
<b>Aspiration hazard</b>	Based on available data, no known aspiration hazard.

**Potential health effects**

<b>Eyes</b>	Irritating to eyes. Contact with eyes may cause mechanical irritation.
<b>Skin</b>	According to GHS hazard classification criteria, the product is not considered as being a skin irritant. Product dust may cause mild, mechanical irritation. Health injuries are not known or expected under normal use.
<b>Inhalation</b>	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.
<b>Ingestion</b>	Oral exposure is not anticipated under normal working conditions. Health injuries are not known or expected under normal use.
<b>Main Symptoms</b>	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.

Chemical Name	Fresh Water Algae	Acute Fish Toxicity	Daphnia (Water flea)	Effects on micro-organisms	Other
Citric acid	NOEC(8d): 425mg/l (nominal)*	LC50(48h):440mg/L (Leuciscus idus)(nominal)	EC50(24h): 1535mg/L (Daphnia magna)(nominal)		

\*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**

Chemical Name	Aqua (fresh water)	Aqua (marine)	Sewage Treatment Plant	Sediment (fresh water)	Sediment (marine)	Soil
Citric acid	0.44mg/l	0.044mg/l	>1000mg/l	34.6mg/kg sediment dw	3.46mg/kg sediment dw	33.1mg/kg

**BCF**

Bioaccumulation is unlikely. [LogKow < 0].

Chemical Name	log Kow	BCF
Citric acid	-0.2 to -1.8	BCF ~ 3.2 (estimated)

**Persistence/Degradability**

Readily biodegradable. Inherently biodegradable. 97% and 100% biodegradability in 28d and 19d, respectively (protocols OECD 301E and OECD 301A, respectively).

**Mobility**

Soluble in water.

**PBT and vPvB assessment**

This substance is not considered to be persistent, bioaccumulating nor toxic (PBT).

## 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	EINECS	ELINCS	AICS	ENCS ISHL	CHINA	PICCS	KECL	NZIoC
Citric acid	Yes	Yes	No	Yes 201-069-1	No	Yes	Yes (2)-1318	Yes	Yes	Yes KE-20831	No

**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**

Acute Health Hazard	Yes
Chronic Health Hazard	No
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

**Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 63)**

This product is not known to contain any HAPS.

**State Regulations****State Right-to-Know**

No known components subject to "Right-To-Know" legislation in the following States. Massachusetts. Minnesota. New Jersey. Pennsylvania.

**Canada****WHMIS Product Classification**

Class E: Corrosive Material.

**WHMIS Ingredient Disclosure List IDL**

Component Information

Chemical Name	Weight %	WHMIS IDL	WHMIS Threshold limits
---------------	----------	-----------	------------------------

Citric acid	99-100	Listed	1%
-------------	--------	--------	----

**(NPRI) Canadian National Pollutant Release Inventory**

No known component is listed on NPRI.

**This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all the information required by the CPR.**

**Mexico**

Mexico - Grade

Moderate risk, Grade 2

<b>16. OTHER INFORMATION</b>
------------------------------

**Prepared By:** ADM Specialty Food, Corn  
**Original Preparation Date:** 15-Apr-2009  
**Revision Date:** 13-Jul-2015  
**Revision Number:** 4  
**Reason for revision:** This data sheet contains changes from the previous version in section(s) Header (document title). This version replaces all previous versions.

**Abbreviations and acronyms**

AICS - Australian Inventory of Chemical Substances (Australia)  
CAS - Chemical Abstract Service  
CHINA - Chinese Inventory of Existing Chemical Substances (China)  
DNEL - Derived No Effect Level  
DOT - U.S. Department of Transportation  
DSL - Domestic Substance List (Canada)  
EC50 - Half maximal effective concentration  
EINECS - European Inventory of Existing Commercial Chemical Substances (EU)  
ELINCS - European List of Notified Chemical Substances (EU)  
ENCS - Existing and New Chemical Substances (Japan) / ISHL - Industrial Health and Safety Law (Japan)  
GHS - Globally Harmonized System of Classification and Labelling of Chemicals  
IATA - International Air Transport Association Dangerous Goods Regulations  
ICAO - International Civil Aviation Organisation  
IMDG - International Maritime Dangerous Goods Code  
IMO - International Maritime Organization  
KECL - Korean Existing and Evaluated Chemical Substances (Korea)  
LC50 - Lethal concentration that produces fatalities in 50% of a given test population  
LD50 - Median lethal dose of a given test population  
MEX - NOM-002-SCT/2003 List of Hazardous Substances and Materials Most Commonly Transported  
MEXICO - Mexico Occupational Exposure Limits  
NDSL - Non Domestic Substances List (Canada)  
NFPA - National Fire Protection Association  
NIOSH - National Institute of Occupational Safety and Health  
NZIoC - New Zealand Inventory of Chemicals (New Zealand)  
OECD - Organisation for Economic Co-operation and Development  
OSHA - Occupational Safety & Health Administration  
OSHA PEL - Occupational Safety and Health Administration Permissible Exposure Limits  
PICCS - Inventory of Chemicals and Chemical Substances (Philippines)  
PNEC - Predicted No-Effect Concentration  
STOT - Specific Target Organ Toxicity  
TSCA - Toxic Substances Control Act, Section 8(b) Inventory (USA)  
TWA - Time Weighted Average: Average concentration that should not be exceeded during a work day (usually 8-hours)  
vPvB - Very Persistent and Very Bioaccumulative  
WGK - Wassergefährdungsklasse (German: Water Hazard Class)  
WHMIS - Workplace Hazardous Materials Information System

**The information provided on this (M)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