Zinc Citrate

Version	Revision Date:	SDS Number:	Date of last issue: 11/07/2019
1.1	08/24/2020	100000000483	Date of first issue: 11/07/2019
US / EN			

SECTION 1. IDENTIFICATION

Product name	:	Zinc Citrate
Substance name	:	Zinc Citrate
Trade name	:	Zinc Citrate Dihydrate / Zinc Citrate Trihydrate
Molecular formula	:	(C6H5O7)2 * Zn3
Chemical identity	:	Trizinc 2-hydroxy-1,2,3-propane tricarboxylate dihydrate / Trizinc 2-hydroxy-1,2,3-propane tricarboxylate trihydrate
CAS-No.	:	546-46-3
Chemical nature	:	Solid

Manufacturer or supplier's details

Details of the supplier of the safety data sheet

Company	:	Jungbunzlauer Inc. 95 Wells Avenue, Suite 150 Newton, Massachusetts 02459 USA www.jungbunzlauer.com
Telephone	:	+1 617 969-0900
Telefax	:	+1 617 964-2921
E-mail address Responsible/issuing person	:	msds@jungbunzlauer.com

Emergency telephone number

Emergency telephone number	:	National Chemical Emergency Centre (NCEC) +1 202 464 2554

Recommended use of the chemical and restrictions on use

Recommended use	:	Cosmetic additive Personal care Food additive Pharmaceutical substance
Restrictions on use	:	None known.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200

Short-term (acute) aquatic hazard	:	Category 1
Long-term (chronic) aquatic	:	Category 2

hazard

Eye irritation : Category 2

GHS label elements

Hazard pictograms :

Signal word : Warning

Hazard statements :
H319 Causes serious eye irritation.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements :

Prevention:

P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

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.
P391 Collect spillage.

Disposal:

P501 Dispose of contents/ container to an approved facility in accordance with local, regional, national and international regulations.

Hazards Not Otherwise Classified

May form combustible dust concentrations in air (during processing).

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Pure substance

Chemical nature : Solid

Substance name : Zinc Citrate

CAS-No. : 546-46-3

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
Zinc Citrate	546-46-3	100

SECTION 4. FIRST AID MEASURES

General advice	:	Get medical advice/ attention if you feel unwell. Show this safety data sheet to the doctor in attendance. First aider needs to protect himself.
If inhaled	:	If breathed in, move person into fresh air. If symptoms persist, call a physician.
In case of skin contact	:	Immediately flush skin with large amounts of water. Get medical attention if symptoms occur.
In case of eye contact	:	If easy to do, remove contact lens, if worn. In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
If swallowed	:	Rinse mouth thoroughly with water. Drink plenty of water.
Most important symptoms and effects, both acute and delayed	:	Severe eye irritation Causes serious eye irritation.
Notes to physician	:	Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Water spray Dry powder Foam Carbon dioxide (CO2) Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	High volume water jet
Specific hazards during fire-fighting	:	Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Do not use a solid water stream as it may scatter and spread fire. Do not allow run-off from fire fighting to enter drains or water courses. Exposure to decomposition products may be a hazard to health.
Hazardous combustion products	:	Carbon dioxide (CO2) Carbon monoxide
Further information	:	Standard procedure for chemical fires. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

In the event of fire and/or explosion do not breathe fumes.
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.
Wear fire resistant or flame retardant clothing.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Avoid dust formation.
Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration.
Avoid breathing dust.
Ensure adequate ventilation, especially in confined areas.
Wear personal protective equipment.
Avoid contact with skin and eyes.
Refer to protective measures listed in sections 7 and 8.

Environmental precautions : Try to prevent the material from entering drains or water courses.
Do not contaminate water.
If the product contaminates rivers and lakes or drains inform respective authorities.
Do not flush into surface water or sanitary sewer system.

Methods and materials for containment and cleaning up : Use mechanical handling equipment.
Non-sparking tools should be used.
Pick up and arrange disposal without creating dust.
Keep in suitable, closed containers for disposal.
Clean contaminated floors and objects thoroughly while observing environmental regulations.

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Advice on safe handling : Risk of dust explosion.
Avoid creating dust.
Do not breathe dust.
For personal protection see section 8.

Conditions for safe storage : Keep containers tightly closed in a dry, cool and well-ventilated place.

Materials to avoid : Never allow product to get in contact with water during storage.

Further information on storage stability : No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Contains no substances with occupational exposure limit values.

Engineering measures : Provide sufficient air exchange and/or exhaust in work rooms.
Ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment).

Personal protective equipment

Respiratory protection : In the case of dust or aerosol formation use respirator with an approved filter.
In case of insufficient ventilation, wear suitable respiratory equipment.
Use NIOSH approved respiratory protection.

Hand protection

Remarks : Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific to place of work. For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer.

Eye protection : Safety glasses
Ensure that eyewash stations and safety showers are close to the workstation location.

Skin and body protection : Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Protective measures : Handle in accordance with good industrial hygiene and safety practice.
Do not breathe dust.
Wear suitable protective equipment.

Hygiene measures : General industrial hygiene practice.
Avoid contact with skin, eyes and clothing.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : powder

Colour	:	white
Odour	:	odourless
Odour Threshold	:	Not relevant
pH	:	4.0 - 7.0
Melting point/range	:	563 °F / 295 °C Decomposition
Boiling point/boiling range	:	Not applicable
Flash point	:	does not flash
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	does not ignite
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapour pressure	:	Not applicable
Relative vapour density	:	Not applicable
Relative density	:	1.7 - 2.0 (68 °F / 20 °C)
Density	:	1.7 - 2.0 g/cm3 (68 °F / 20 °C)
Bulk density	:	400 - 700 kg/m3
Solubility(ies)		
Water solubility	:	3 g/l (68 °F / 20 °C)
Solubility in other solvents	:	No data available
Partition coefficient: n-octanol/water	:	log Pow: -1.8 - -0.2
Auto-ignition temperature	:	Not applicable
Decomposition temperature	:	No data available
Viscosity		
Viscosity, dynamic	:	Not applicable
Viscosity, kinematic	:	Not applicable
Oxidizing properties	:	No oxidising effect.

Dust explosion class	:	St1

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No decomposition if stored and applied as directed.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No dangerous reaction known under conditions of normal use.
Conditions to avoid	:	Avoid dust formation.
Incompatible materials	:	Water
Hazardous decomposition products	:	Build-up of dangerous/toxic fumes possible in cases of fire/high temperature. Carbon dioxide (CO_2) Carbon monoxide

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Components:

Zinc Citrate:

Acute oral toxicity	:	LD50 (Rat, male and female): > 2.000 mg/kg body weight Method: OECD Test Guideline 401
Acute inhalation toxicity	:	Remarks: Not relevant
Acute dermal toxicity	:	LD50 (Rat, male and female): > 2.000 mg/kg body weight Method: OECD Test Guideline 402 Remarks: The toxicological data has been taken from products of similar composition.

Skin corrosion/irritation

Components:

Zinc Citrate:

Species	:	Rabbit
Method	:	OECD Test Guideline 404
Result	:	No skin irritation

Serious eye damage/eye irritation

Components:

Zinc Citrate:

Species	:	human keratinocytes
Result	:	Eye irritation
Method	:	OECD Test Guideline 492

Respiratory or skin sensitisation

Components:

Zinc Citrate:

Test Type	:	Maximisation Test
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	Does not cause skin sensitisation.
Remarks	:	The toxicological data has been taken from products of similar composition.

Germ cell mutagenicity

Components:

Zinc Citrate:

Genotoxicity in vitro	:	Result: negative Remarks: Expert judgement
Genotoxicity in vivo	:	Result: negative Remarks: Expert judgement
Germ cell mutagenicity - Assessment	:	Weight of evidence does not support classification as a germ cell mutagen.

Carcinogenicity

Components:

Zinc Citrate:

Result	:	negative
Remarks	:	Expert judgement
Carcinogenicity - Assessment	:	Weight of evidence does not support classification as a carcinogen

Reproductive toxicity

Components:

Zinc Citrate:

Reproductive toxicity - Assessment	:	Weight of evidence does not support classification for reproductive toxicity

STOT - single exposure

Components:

Zinc Citrate:

Remarks : No data available

STOT - repeated exposure

Components:

Zinc Citrate:

Remarks : No data available

Repeated dose toxicity

Components:

Zinc Citrate:

Species	:	Rat, male
NOAEL	:	155 mg/kg
Application Route	:	Oral
Method	:	OECD Test Guideline 408
Remarks	:	Subchronic toxicity Information taken from reference works and the literature.

Aspiration toxicity

Components:

Zinc Citrate:

No aspiration toxicity classification

Experience with human exposure

Components:

Zinc Citrate:

Inhalation	:	Remarks: No data available
Skin contact	:	Remarks: No data available
Eye contact	:	Remarks: No data available
Ingestion	:	Remarks: No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Zinc Citrate:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 0.4 mg/l Exposure time: 96 h Test Type: flow-through test Remarks: Information given is based on data on the components and the ecotoxicology of similar products.
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0.2 mg/l Exposure time: 48 h Test Type: static test Remarks: Information given is based on data on the components and the ecotoxicology of similar products.
Toxicity to algae	:	NOEC (Pseudokirchneriella subcapitata (microalgae)): 0.015 mg/l Exposure time: 72 h Test Type: static test Remarks: Information given is based on data obtained from similar substances.
M-Factor (Acute aquatic toxicity)	:	1
Toxicity to microorganisms	:	EC50: 15 mg/l Exposure time: 3 h Test Type: Respiration inhibition of activated sludge Remarks: Information given is based on data on the components and the ecotoxicology of similar products.

Persistence and degradability

Components:

Zinc Citrate:

Biodegradability	:	Remarks: Readily biodegradable.

Bioaccumulative potential

Components:

Zinc Citrate:

Bioaccumulation	:	Remarks: Bioaccumulation is unlikely.

Mobility in soil

No data available

Other adverse effects

Product:

Results of PBT and vPvB assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).
Additional ecological information	:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Components:

Zinc Citrate:

Results of PBT and vPvB assessment	:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).
Additional ecological information	:	The product should not be allowed to enter drains, water courses or the soil.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	It must undergo special treatment, e.g. at suitable disposal site, to comply with local regulations. In accordance with local and national regulations. The product should not be allowed to enter drains, water courses or the soil. Do not dispose of with domestic refuse.
Contaminated packaging	:	Empty containers should be taken to an approved waste handling site for recycling or disposal. Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No.	:	UN 3077
Proper shipping name	:	Environmentally hazardous substance, solid, n.o.s. (Zinc citrate)
Class	:	9
Packing group	:	III
Labels	:	Class 9 - Miscellaneous dangerous substances and articles
Packing instruction (cargo aircraft)	:	956

Packing instruction (passenger aircraft) : 956

IMDG-Code

UN number	:	UN 3077
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc citrate)
Class	:	9
Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F
Marine pollutant	:	yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

DOT

Not regulated as a hazardous material

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Zinc Citrate	Not Assigned	100 %

Clean Water Act

This product contains the following toxic pollutants listed under the U.S. Clean Water Act Section 307

Zinc	Not Assigned	32 %

California Prop. 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

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

EINECS	:	On the inventory, or in compliance with the inventory
TSCA	:	All substances listed as active on the TSCA inventory
TSCA_12b	:	Not applicable
NDSL	:	On the inventory, or in compliance with the inventory

REACH : This substance has been registered according to Regulation (EC) No. 1907/2006 (REACH).

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Revision Date : 08/24/2020

The information provided in this Safety Data Sheet 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 guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered 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 materials or in any process, unless specified in the text.

US / EN