

# Iron(III) citrate hydrate

sc-286019

Material Safety Data Sheet



The Power is Question

Hazard Alert Code Key: **EXTREME** **HIGH** **MODERATE** **LOW**

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

Iron(III) citrate hydrate

### STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

### NFPA



### SUPPLIER

Santa Cruz Biotechnology, Inc.  
2145 Delaware Avenue  
Santa Cruz, California 95060  
800.457.3801 or 831.457.3800

### EMERGENCY

ChemWatch  
Within the US & Canada: 877-715-9305  
Outside the US & Canada: +800 2436 2255  
(1-800-CHEMCALL) or call +613 9573 3112

### SYNONYMS

C<sub>6</sub>H<sub>5</sub>FeO<sub>7</sub>·xH<sub>2</sub>O, "iron (III) citrate", "citric acid ferric salt", "iron citrate", "iron (III) citrate hydrate (CAS RBN: 207399-12-0)", "iron (III) citrate monohydrate", "1, 2, 3, -propanetricarboxylic acid, 2-hydroxy, iron salt"

## Section 2 - HAZARDS IDENTIFICATION

### CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability:	1	
Toxicity:	2	
Body Contact:	0	
Reactivity:	1	
Chronic:	2	

Min/Nil=0  
Low=1  
Moderate=2  
High=3  
Extreme=4

### CANADIAN WHMIS SYMBOLS



## EMERGENCY OVERVIEW

### RISK

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

- Accidental ingestion of the material may be damaging to the health of the individual.
- Iron poisoning results in pain in the upper abdomen and vomiting, and is followed hours later by shock, in severe cases coma and death. Iron toxicity increases in proportion to their solubility in the gastrointestinal tract.

##### EYE

- Although the material is not thought to be an irritant, direct contact with the eye may cause transient discomfort characterized by tearing or conjunctival redness (as with windburn). Slight abrasive damage may also result.

##### SKIN

- The material is not thought to produce adverse health effects or skin irritation following contact (as classified using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.
- Solution of material in moisture on the skin, or perspiration, may increase irritant effects.
- Open cuts, abraded or irritated skin should not be exposed to this material.
- Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

##### INHALED

- The material is not thought to produce either adverse health effects or irritation of the respiratory tract following inhalation (as classified using animal models). Nevertheless, adverse effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.
- Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.
- Not normally a hazard due to non-volatile nature of product.

#### CHRONIC HEALTH EFFECTS

- Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung. Chronic excessive intake of iron have been associated with damage to the liver and pancreas. People with a genetic disposition to poor control over iron are at an increased risk.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
ferric citrate	207399-12-0	> 98

## Section 4 - FIRST AID MEASURES

##### SWALLOWED

· If swallowed do NOT induce vomiting. · If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

##### EYE

■ If this product comes in contact with the eyes: · Wash out immediately with fresh running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

##### SKIN

■ If skin or hair contact occurs: · Flush skin and hair with running water (and soap if available). · Seek medical attention in event of irritation.

##### INHALED

· If dust is inhaled, remove from contaminated area. · Encourage patient to blow nose to ensure clear passage of breathing. · If irritation or discomfort persists seek medical attention.

#### NOTES TO PHYSICIAN

- For acute or short term repeated exposures to iron and its derivatives:
  - Always treat symptoms rather than history.
  - In general, however, toxic doses exceed 20mg/kg of ingested material (as elemental iron) with lethal doses exceeding 180 mg/kg.

## Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Negligible
Upper Explosive Limit (%):	Not Available

Specific Gravity (water=1):	> 1.0
Lower Explosive Limit (%):	Not Available

**EXTINGUISHING MEDIA**

- Water spray or fog.
- Foam.

**FIRE FIGHTING**

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.

**GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS**

- Combustible solid which burns but propagates flame with difficulty.
  - Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.
- Combustion products include: carbon monoxide (CO), carbon dioxide (CO2), metal oxides, other pyrolysis products typical of burning organic material.  
 May emit poisonous fumes.

**FIRE INCOMPATIBILITY**

- Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

**PERSONAL PROTECTION**

- Glasses:  
 Chemical goggles.  
 Gloves:  
 Respirator:  
 Particulate

**Section 6 - ACCIDENTAL RELEASE MEASURES**

**MINOR SPILLS**

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact by using protective equipment.
- Use dry clean up procedures and avoid generating dust.
- Place in a suitable, labelled container for waste disposal.

**MAJOR SPILLS**

- Moderate hazard.
- CAUTION: Advise personnel in area.
- Alert Emergency Responders and tell them location and nature of hazard.

**Section 7 - HANDLING AND STORAGE**

**PROCEDURE FOR HANDLING**

- Avoid all personal contact, including inhalation.
  - Wear protective clothing when risk of exposure occurs.
- Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.
- Do NOT cut, drill, grind or weld such containers.
  - In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

**RECOMMENDED STORAGE METHODS**

- Glass container.
- Polyethylene or polypropylene container.
- Check all containers are clearly labelled and free from leaks.

**STORAGE REQUIREMENTS**

- Store in original containers.
- Keep containers securely sealed.

**Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION**

**EXPOSURE CONTROLS**

Source	Material	TWA ppm	TWA mg/m³	STEL ppm	STEL mg/m³	Peak ppm	Peak mg/m³	TWA F/CC	Notes

Canada - Alberta Occupational Exposure Limits	ferric citrate (Iron salts, soluble, as Fe)	1		
Canada - British Columbia Occupational Exposure Limits	ferric citrate (Iron salts - soluble, as Fe)	1	2	
US NIOSH Recommended Exposure Limits (RELs)	ferric citrate (Iron salts (soluble, as Fe))	1		
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	ferric citrate (Iron salts, soluble (as Fe))	1		
US ACGIH Threshold Limit Values (TLV)	ferric citrate (Iron salts - soluble (as Fe))	1		TLV Basis: upper respiratory tract & skin irritation
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	ferric citrate (Iron salts (soluble) (as Fe))	1		
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	ferric citrate (Iron salts (soluble) (as Fe))	1		
US - Minnesota Permissible Exposure Limits (PELs)	ferric citrate (Iron salts (soluble)(as Fe))	1		
US - California Permissible Exposure Limits for Chemical Contaminants	ferric citrate (Iron salts, soluble, as Fe)	1		
US - Hawaii Air Contaminant Limits	ferric citrate (Iron salts (soluble) (as Fe))	1	2	(CAS (Varies with compound))
US - Alaska Limits for Air Contaminants	ferric citrate (Iron salts (soluble) (as Fe))	1		
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	ferric citrate (Iron salts, soluble, (as Fe))	1	3	
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	ferric citrate (Iron salts, soluble (as Fe))	1	2	
US - Washington Permissible exposure limits of air contaminants	ferric citrate (Iron salts, soluble (as Fe))	1	3	

Canada - Nova Scotia Occupational Exposure Limits	ferric citrate (Iron salts - soluble (as Fe))	1		TLV Basis: upper respiratory tract & skin irritation
Canada - Prince Edward Island Occupational Exposure Limits	ferric citrate (Iron salts - soluble (as Fe))	1		TLV Basis: upper respiratory tract & skin irritation
Canada - Northwest Territories Occupational Exposure Limits (English)	ferric citrate (Iron salts, soluble (as Fe))	1	2	
US - Michigan Exposure Limits for Air Contaminants	ferric citrate (Iron salts (soluble) (as Fe))	1		
US - Oregon Permissible Exposure Limits (Z-1)	ferric citrate (Iron salts, soluble, as Fe)	-	1	Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits.

ENDOELTABLE

## PERSONAL PROTECTION



### RESPIRATOR

- particulate.

### EYE

- Safety glasses with side shields
- Chemical goggles.

### HANDS/FEET

■ Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.

- polychloroprene
- nitrile rubber
- butyl rubber
- fluorocautchouc
- polyvinyl chloride

Gloves should be examined for wear and/ or degradation constantly.

### OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

### ENGINEERING CONTROLS

- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
- Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Solid.

Mixes with water.

State	Divided solid	Molecular Weight	244.95 (anhydrous)
Melting Range (°F)	Not available	Viscosity	Not Applicable
Boiling Range (°F)	Not applicable	Solubility in water (g/L)	Miscible
Flash Point (°F)	Not Available	pH (1% solution)	Not available
Decomposition Temp (°F)	Not available	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not Available	Vapour Pressure (mmHG)	Negligible
Upper Explosive Limit (%)	Not Available	Specific Gravity (water=1)	> 1.0
Lower Explosive Limit (%)	Not Available	Relative Vapor Density (air=1)	Not applicable
Volatile Component (%vol)	Negligible	Evaporation Rate	Not applicable

### APPEARANCE

Red brown crystals, soluble in water. No odour. Decomposed by light. Insoluble in alcohol. BP grade needs an assay of 18% Fe min.

## Section 10 - CHEMICAL STABILITY

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

### STORAGE INCOMPATIBILITY

- Avoid reaction with oxidizing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

## Section 11 - TOXICOLOGICAL INFORMATION

ferric citrate

### TOXICITY AND IRRITATION

#### FERRIC CITRATE:

- No significant acute toxicological data identified in literature search.

### CARCINOGEN

US - Rhode Island Hazardous Substance List

IARC

## Section 12 - ECOLOGICAL INFORMATION

No data

### Ecotoxicity

Ingredient	Persistence: Water/Soil	Persistence: Air	Bioaccumulation	Mobility
ferric citrate	LOW	No Data Available	LOW	HIGH

## Section 13 - DISPOSAL CONSIDERATIONS

### Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

‡ Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in

their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

## Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: DOT, IATA, IMDG

## Section 15 - REGULATORY INFORMATION

**ferric citrate (CAS: 2338-05-8,3522-50-7,207399-12-0) is found on the following regulatory lists;**  
"Canada Domestic Substances List (DSL)", "US Food Additive Database", "US Toxic Substances Control Act (TSCA) - Inventory"

## Section 16 - OTHER INFORMATION

### Ingredients with multiple CAS Nos

Ingredient Name CAS ferric citrate 2338-05-8, 3522-50-7, 207399-12-0

*Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.*

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:  
[www.chemwatch.net/references](http://www.chemwatch.net/references).

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

*This document is copyright. Apart from any fair dealing for the purposes of private study, research, review or criticism, as permitted under the Copyright Act, no part may be reproduced by any process without written permission from CHEMWATCH. TEL (+61 3) 9572 4700.*

Issue Date: Jun-29-2010

Print Date: Apr-13-2011