

Syn

allowed

NOSB NATIONAL LIST FILE CHECKLIST

PROCESSING

MATERIAL NAME: Iron sulfate

CATEGORY: Synthetic Allowed

Complete?: 3/16

NOSB Database Form

References

MSDS (or equivalent)

FASP (FDA)

Date file mailed out: 2/6/95

TAP Reviews from: Bob Durst

Steve Taylor

Richard Thauer

Supplemental Information:

For statutory yes - consider also professional recommendation

MISSING INFORMATION: no references

NOSB/NATIONAL LIST COMMENT FORM/BALLOT

Use this page to write down comments and questions regarding the data presented in the file of this National List material. Also record your planned opinion/vote to save time at the meeting on the National List.

Name of Material Iron Sulfate

Type of Use: Crops; Livestock; Processing

TAP Review by:

1. S. Taylor
2. Richard Theuer
3. Bob Durst

Comments/Questions:

My Opinion/Vote is:

Signature _____ Date _____

USDA/TAP REVIEWER COMMENT FORM

Use this page or an equivalent to write down comments and summarize your evaluation regarding the data presented in the file of this potential National List material. Attach additional sheets if you wish.

This file is due back to us within 30 days of: 6 Feb

Name of Material: Iron Sulfate

Reviewer Name: Steve Taylor

Is this substance Natural or Synthetic? Explain (if appropriate)

Synthetic

Please comment on the accuracy of the information in the file:

This material should be added to the National List as:

Synthetic Allowed Prohibited Natural

or, This material does not belong on the National List because:

Are there any restrictions or limitations that should be placed on this material by use or application on the National List?

Any additional comments or references?

*The proper name should be Ferrous Sulfate
Ferric sulfate also exists but is much less useful as food
ingredient*

Signature Steve Taylor Date 3-10-95

USDA/TAP REVIEWER
COMMENT FORM

2.

Original mailing date: 6 Feb 1995.

Material: Iron (Ferrous) Sulfate: dried/monohydrate
heptahydrate

Reviewer: Richard C. Theuer,
Chairman, Steering Committee
International Nutritional Anemia Consultative Group

SYNTHETIC Ferrous sulfate is synthesized by the action of sulfuric acid on iron. Sulfuric acid is synthetic itself, providing two reasons why ferrous sulfate is synthetic.

COMMENTS RE SECTION 2119(m) CRITERIA:

1. Iron is an essential mineral nutrient. Ferrous sulfate is of particular biological benefit because of its very high bioavailability and relatively low cost. Iron deficiency is the most common nutrient deficiency in the world, affecting particularly women and young children in both developed and developing countries.
2. Iron is one of the most common elements in the terrisphere. The amounts of iron sulfate which would find their way into the waste stream from food use would be miniscule.
3. Ferrous sulfate is relatively non-toxic in industrial situations. The concentrations of ferrous sulfate used in food are very dilute so acute iron sulfate poisoning is impossible.
4. Ferrous sulfate is a GRAS substance [21CFR184.1315 and 21CFR182.5315].
5. Ferrous sulfate can be used as the source of iron in enriched flour, pasta, etc. Certain states (New York, California, et al.) require that pasta be enriched to be saleable in the state.

The following substance should be added to the National List of Substances as an allowed synthetic ingredient in Organic Food:

ferrous sulfate - use should be restricted to iron fortification of foods identified by regulation or professional recommendation as appropriate vehicles for iron enrichment.

February 22, 1995

USDA/TAP Reviewer Comment Form

3.

Material: Iron sulfate

Reviewer: Bob Durst

Is this substance Natural or Synthetic? Explain (if appropriate)

It is a synthetic substance. It is used as a nutrient.

Please comment on the accuracy of the information in the file:

The file is accurate.

This material should be added to the National List as:

Synthetic Allowed,

Prohibited Natural, or

This material does not belong on the National List because:

Are there any restriction or limitations that should be placed on this material by use or application on the National List?

Must be listed on the ingredient label if it used used.

Any additional comments or references?

As with all synthetic inorganic salts, source must be food grade. In addition each lot should be analyzed for toxic element concentrations (mercury, lead, cadmium, arsenic, thallium and antimony) and a near zero tolerance adopted.

Alternatives do exist (ferrous gluconate, ferrous glycerol phosphate, ferric orthophosphate, ferric pyrophosphate, sodium iron pyrophosphate, iron oxide and powdered iron), but they are generally synthetic also, and their nutritional quality is much less than the sulfate.

Signature

Bob Durst

Date

3/4/95

Identification

Common Name	Iron (Ferrous) sulfate	Chemical Name	Dried Ferrous Sulfate
Other Names	Ferrous sulfate		
Code #: CAS	10028-21-4	Code #: Other	
N. L. Category	Synthetic Allowed	MSDS	<input checked="" type="radio"/> yes <input type="radio"/> no

Chemistry

Family	Inorganic
Composition	FeSO ₄ : 89.41% monohydrate; H ₂ O: 10.59% (monohydrate)
Properties	White odorless crystalline powder with slight greenish-yellow tinge.
How Made	Made usually by treatment of iron with sulfuric acid. Hydrated forms do occur in nature as minerals but not usually manufactured from natural form.

Use/Action

Type of Use	Processing
Specific Use(s)	Nutrient supplement in baked goods.
Action	source of dietary iron
Combinations	

Status

OFPA	
N. L. Restriction	
EPA, FDA, etc	FDA-GRAS
Directions	
Safety Guidelines	Dust may irritate skin, eyes, and respiratory tract.
State Differences	
Historical status	Tilth approved.
International status	

NOSB Materials Database

5.

OFPA Criteria

- 2119(m)1: chemical interactions Not Applicable
2119(m)2: toxicity & persistence Not Applicable
2119(m)3: manufacture & disposal consequences
no negative environmental impact

2119(m)4: effect on human health

Iron is an essential mineral nutrient. Lack of use may result in nutritional deficiencies. Ingestion of large quantities can cause gastric disturbances especially in children.

2119(m)5: agroecosystem biology Not Applicable

2119(m)6: alternatives to substance

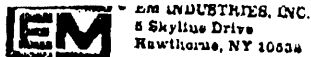
ferrous gluconate, ferrous glycerol phosphate, ferric orthophosphate, iron oxide. All are generally synthetic also and their nutritional quality and bioavailability is much less than the sulfate.

2119(m)7: Is it compatible?

References

SEP-22-93 WED 15:29

P. 03



MATERIAL SAFETY DATA SHEET

EM INDUSTRIES

Ship To:12134

EARTH'S BEST
POND LANE
MIDDLEBURY, VT 05753
Attn: Susan Smiley

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer.....: EM Industries, Inc.
Preparation Date.: 12/07/92
Date MSDS Printed.: Sep 17, 1993
Information Phone Number.: (914)592-4560
Hours: M-F, 9AM-4:30PM EST
Chemtrec Emergency Number: (800)424-9300
Hours: Mon-Sun/ 24 Hrs./Day

Catalog Number(s): 003967

Trade Name.....: Iron(II) Sulfate Hydrate Extra Pure USP FCC Food Grade
Chemical Name.....: Iron(II) Sulfate
Chemical Family...: Inorganic
Formula.....: FeSO.4.*X H2O

Molecular Weight.: Not determined.

2. COMPOSITION / INFORMATION ON INGREDIENTS

Table with 3 columns: Component, CAS #, Appr %
Iron (II) Sulfate Hydrate 10028-21-4 (100)
SULFURIC ACID, IRON(2+) SALT (1:1) 7720-78-7 >99%

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

White crystals, no specific odor Dust may irritate skin, eyes, and respiratory tract. May be harmful if swallowed.

MSDS #003967

Page # 1 (continued on next page)

CHEMICALS & PIGMENTS

EM Industries
5 Skyline Drive
Hawthorne, NY 10632

Rona
4 Rock Road
Beyonne, NJ 07002

O'Leary Road
GA Hwy. 2: & I-95
Savannah, GA 31102

FINE CHEMICALS

EM Industries, Inc.
5 Skyline Drive
Hawthorne, NY 10632

EM SCIENCE

EM Science
480 Democrat Road
Gibbstown, NJ 08027

Appearance.....:
White crystals, no specific odor

POTENTIAL HEALTH EFFECTS (ACUTE AND CHRONIC)

Symptoms of Exposure:
May cause irritation on contact with the eyes or skin. Expected to cause coughing, wheezing, and general respiratory tract irritation after inhalation. Effects unknown, treat as toxic if swallowed.

Medical Cond. Aggravated by Exposure:
Unknown.

Routes of Entry.....:
Eye and skin contact and inhalation are anticipated as possible routes of exposure. Ingestion is not expected.

Carcinogenicity.....:
This material is not known to cause cancer in humans or animals.

14. FIRST AID MEASURES

Emergency First Aid:
Eyes: Flush with copious amounts of water for fifteen minutes. Get medical attention if symptoms persist.
Skin: Remove excess material and wash affected skin with soap and water. Gently dry area with a clean towel.
Inhalation: Remove to uncontaminated area. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Ingestion: Induce vomiting if conscious and as directed by a physician. Never give anything by mouth to an unconscious person. Get medical attention.

Notes EMS.....:
Emergency treatment information is not available for this product.

15. FIRE FIGHTING MEASURES

Flash Point (F).....: Not ignitable. Flash point not applicable.
Flammable Limits LEL (%): Not applicable.
Flammable Limits UEL (%): Not applicable.
Auto Ign.....: Not applicable.
Extinguishing Media.....:

12:18
I have
to go. I'll
send the
rest later!



EM INDUSTRIES, INC.
5 Skyline Drive
Hawthorne, NY 10532

Flood with water or use carbon dioxide, foam, or dry chemical.

Fire Fighting Procedures.:

Self-contained breathing apparatus and full protective clothing as required for other materials present.

Fire & Explosion Hazards.:

Irritating or toxic gases, fumes, smoke, or particulates. Unusual fire or explosion hazards are not expected. Relative hazard is anticipated to be the same as normal combustible materials.

6. ACCIDENTAL RELEASE MEASURES

Spill Response:

Evacuate the area of all unnecessary personnel.
Wear suitable protective equipment listed under Exposure / Personal Protection.
Eliminate any ignition sources until the area is determined to be free from explosion or fire hazards.
Contain the release and eliminate its source, if this can be done without risk.
Take up and containerize for proper disposal as described under Disposal.
Comply with Federal, State, and local regulations on reporting releases. Refer to Regulatory Information for reportable quantity and other regulatory data.
EM Industries recommends SPILL-X neutralizers and absorbent agents for various types of spills.
Additional information on the SPILL-X products can be provided through the EM SCIENCE Technical Service Department (609) 354-9200.

7. HANDLING AND STORAGE

Handling & Storage:

Keep container tightly closed. Store in general chemical storage. Protect against physical damage. Handle carefully. Store away from incompatible materials. Avoid generating dust or vapors.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT:

Ventilation, Respiratory Protection, Protective Clothing, Eye Protection

MSDS #003967

Page # 3 (continued on next page)

EM Industries
5 Skyline Drive
Hawthorne, NY 10532

CHEMICALS & PIGMENTS

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4 Hook Road
Bayonne, NJ 07002

O'Leary Road
GA Hwy 21 & I-90
Savannah, GA 31402

FINE CHEMICALS

EM Industries, Inc.
5 Skyline Drive
Hawthorne, NY 10532

EM SCIENCE

EM Science
480 Democrat Road
Gibbstown, NJ 08027

Safety goggles or safety glasses with side shields are required.
 Impervious gloves made of chemically resistant materials are required. Use of a laboratory coat is also suggested.
 NIOSH or MSHA approved and properly fit tested dust respirator. High Efficiency Particulate Absolute (HEPA) type is recommended for use with this material.
 Respirators must be worn when the applicable Threshold Limit Value (TLV) or Permissible Exposure Limit (PEL) is exceeded.
 Provide adequate general mechanical ventilation and local exhaust ventilation (75-100 cfm).

Work / Hygenic Practices:

When handling quantities of material, be sure to wear appropriate protective equipment as described. Respirators must be worn when Permissible Exposure Limit (PEL) or Threshold Limit Value (TLV) is exceeded. Eye wash and safety shower should be readily available.
 Wash thoroughly after handling. Do not take internally. Avoid breathing dust or vapor when generated. Persons with sensitive existing medical conditions should not be employed in tasks involving exposure to this material.
 Mechanical ventilation of work areas should be provided where the material is being used. A minimum velocity of 75 to 100 CFM (cubic feet per minute) is recommended.

EXPOSURE GUIDELINES

OSHA - PEL:

Component	TWA		STEL		CL		Skin
	PPM	MG/M ³	PPM	MG/M ³	PPM	MG/M ³	

Iron (II) Sulfate Hydrate							
SULFURIC ACID, IRON(2+) SALT (1:1)							

ACGIH - TLV:

Component	TWA		STEL		CL		Skin
	PPM	MG/M ³	PPM	MG/M ³	PPM	MG/M ³	

Iron (II) Sulfate Hydrate							
SULFURIC ACID, IRON(2+) SALT (1:1)							

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point (C 760 mmHg): Not applicable.
Melting Point (C): Not applicable.
Specific Gravity (H2O = 1): Not applicable.
Bulk Density: N/A
Vapor Pressure (mm Hg): Not applicable.
Percent Volatile by Vol (%): Not applicable.
Vapor Density (Air = 1): Not applicable.
Evaporation Rate (Eua0 = 1): Not applicable.
pH Aqueous Solution: Not determined.
Solubility in Water (%): Soluble.
Appearance: White crystals, no specific odor

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions of storage or use.

Hazardous Polymerization:

Will not occur under normal conditions of storage or use.

Hazardous Decomposition:

Toxic metal fumes and SO₄.

Conditions To Avoid:

Extreme heat.

Materials To Avoid:

- () Water
- (X) Acids
- (X) Bases
- () Corrosives
- (X) Oxidizers
- () Other :

11. TOXICOLOGICAL INFORMATION

Toxicity Data:

Toxicity data is either unknown or not available for this material.

Toxicological Findings:

An evaluation of toxicological data on this material is currently unavailable. See Section 3 of this MSDS for an overview of known or anticipated health effects.

12. DISPOSAL CONSIDERATIONS

MSDS #003967

Page # 5 (continued on next page)

EM Industries
5 Skyline Drive
Hawthorne, NY 10532

CHEMICALS & PIGMENTS

Rout 4
Hook Road
Bayonne, NJ 07002

O Leary Road
GA Hwy 21 & 1-26
Savannah, GA 31402

FINE CHEMICALS

EM Industries, Inc.
5 Skyline Drive
Hawthorne, NY 10532

EM SCIENCE

EM Science
480 Democrat Road
Gibbstown, NJ 08027

EPA Waste Numbers: N/A

Treatment:

Not applicable; material is a non-hazardous and non-regulated solid waste. Send bulk or containerized wastes of this material to a secure industrial landfill or thermal oxidation facility. Incineration is not recommended for inorganics. These methods are drawn from 40 CFR, Protection of Environment, and are to be applied only after thorough review of all applicable Methods of Treatment or Treatment Standards. The waste generator is advised to contract with a licensed Treatment, Storage, and Disposal facility when arranging for final disposal and to consult state and local authorities to determine whether any additional regulatory requirements need to be met.

13. TRANSPORT INFORMATION

DOT Proper Shipping Name...:
Not regulated.

DOT Technical Name.....:

Technical name not required.

DOT ID Number.....: Not applicable.

DOT Hazard Class.....: Not applicable.

DOT Subsidiary Risk.....: Not applicable.

DOT Packing Group.....: N/A

DOT Label(s) Required.....: Not applicable.

DOT Other.....:

Not applicable.

IATA Proper Shipping Name...:

Not regulated.

IATA ID Number.....: Not applicable.

IATA Hazard Class.....: Not applicable.

IATA Subsidiary Risk.....: Not applicable.

IATA Packing Group.....: N/A

IATA Label(s) Required.....: Not applicable.

IATA Other.....:

Not applicable.

IMDG Proper Shipping Name...:

Not regulated.

IMDG ID Number.....: Not applicable.

IMDG Hazard Class.....: Not applicable.

IMDG Subsidiary Risk.....: Not applicable.

IMDG Packing Group.....: N/A

IMDG Label(s) Required.....: Not applicable.



IMDG Other.....: Not applicable.

14. REGULATORY INFORMATION

TSCA Inventory.....: NA

TSCA Statement: The components of this material appear in the Toxic Substances Control Act (TSCA) Chemical Substances Inventory and are available for commercial use.

OSHA Specifically Regulated: This material is not regulated by OSHA.

TSCA Memo.....: No additional information is available on the TSCA status of this product.

SARA Title III Hazard Categories:

- Acute Health
- Chronic Health
- Flammability
- Sudden Release of Pressure
- Reactivity

Component	SARA EHS (302)	SARA EHS TPQ (lbs)	RCRA RO (lbs)
Iron (II) Sulfate Hydrate			
SULFURIC ACID, IRON(2+) SALT (1:1)			1000

Component	OSHA Floor List	SARA 313	DeMinimis for SARA 313 (%)
Iron (II) Sulfate Hydrate			
SULFURIC ACID, IRON(2+) SALT (1:1)			

15. OTHER INFORMATION

Comments:

MSDS #002967

Page # 7 (continued on next page)

EM Industries
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Savannah, GA 31404

FINE CHEMICALS

EM Industries, Inc.
5 Skyline Drive
Hawthorne, NY 10533

EM SCIENCE

EM Science
490 Democrat Road
Gibbstown, NJ 08027

None. NA = Not applicable. Y = Yes N = No D = Decomposes
HMIS Hazard Ratings:
 Health : 1
 Flammability : 0
 Reactivity : 0
 Protective Equipment: B
 Special Hazards : NA

Revision History:
 12/20/91
 | = Revised Section
 N/A = Not Available
 N/E = None Established

The information published in this Material Safety Data Sheet has been compiled from our experience and data presented in various technical publications. It is the user's responsibility to determine the suitability of this information for the adoption of necessary safety precautions. EM Industries reserves the right to revise Material Safety Data Sheets periodically as new information becomes available. While EM Industries believes the data set forth herein are accurate as of the date hereof, EM Industries disclaims all liability for reliance thereon. Such data are offered solely for your consideration, investigation, and verification.

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U.S. FOOD AND DRUG ADMINISTRATION
FOOD ADDITIVE SAFETY PROFILE

FERRIC SULFATE

AS#:	010028225	HUMAN CONSUMPTION:	0.001412	MG/KG BW/DAY/PERSON
ASP#:	2102	MARKET DISAPPEARANCE:	1666.666	LBS/YR
CFE#:	EAF	MARKET SURVEY:	87	
AS#:	1011	JECFA:		
EMA#:		JECFA ADI:		
QAS#:		JECFA ESTABLISHED:		MG/KG BW/DAY/PERSON
		LAST UPDATE:		

4: DENSITY: LOGP:

STRUCTURE CATEGORIES: B4

COMPONENTS:

SYNONYMS:

- COQUIMBITE MINERAL
- FERRIC PERSULFATE
- FERRIC SESQUISULFATE
- FERRIC TERSULFATE
- IRON(3+) SULFATE
- FERRIC SULFATE
- SULFURIC ACID, IRON(3+) SALT (3:2)
- IRON(3+) SULFATE, (2:3)
- IRON SULFATE (FE2(SO4)3)
- IRON SESQUISULFATE

CHEMICAL FUNCTION: G

TECHNICAL EFFECT: MALTING OR FERMENTING AID
FLAVORING AGENT OR ADJUVANT

FR REG NUMBERS: 582.80 182.99 184.1307

MINIMUM TESTING LEVEL: 2

COMMENTS:

