SAFETY DATA SHEET
according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

SECTION 1. Identification
Product identifier
- Product number: 803945
- Product name: Iron(III) chloride anhydrous for synthesis
- CAS-No.: 7705-08-0

Relevant identified uses of the substance or mixture and uses advised against
- Identified uses: Chemical for synthesis

Details of the supplier of the safety data sheet
- Company: EMD Millipore Corporation | 290 Concord Road, Billerica, MA 01821,
  United States of America | General Inquiries: +1-978-715-4321 |
  Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5)

Emergency telephone:
- 800-424-9300 CHEMTREC (USA)
- +1-703-527-3887 CHEMTREC (International)
- 24 Hours/day; 7 Days/week

SECTION 2. Hazards identification
GHS Classification
- Corrosive to Metals, Category 1, H290
- Acute toxicity, Oral, Category 4, H302
- Skin irritation, Category 2, H315
- Serious eye damage, Category 1, H318
- Skin sensitization, Category 1, H317

For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling

Hazard pictograms

Signal Word
Danger

Hazard Statements
H290 May be corrosive to metals.
H302 Harmful if swallowed.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.

Precautionary Statements
P280 Wear protective gloves.
P280 Wear eye protection.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

OSHA Hazards
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS and may deviate from the GHS information.

Other hazards
None known.

SECTION 3. Composition/information on ingredients

| Chemical Name (Concentration) | CAS-No. | Exact percentages are being withheld as a trade secret. |

SECTION 4. First aid measures

Description of first-aid measures

Inhalation
After inhalation: fresh air.

Skin contact
After skin contact: wash off with plenty of water. Remove contaminated clothing. Consult a physician.

Eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist.

Ingestion
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed
irritant effects, Nausea, Vomiting
The following applies to soluble iron compounds: nausea and vomiting after swallowing. The absorption of large quantities is followed by cardiovascular disorders. Toxic effect on liver and kidneys.

Indication of any immediate medical attention and special treatment needed
No information available.

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
Water, Foam

Special hazards arising from the substance or mixture
Not combustible.
Ambient fire may liberate hazardous vapors.
Fire may cause evolution of:
Hydrogen chloride gas
May not get in touch with:
Water
Caution! in contact with water product releases:
hydrochloric acid

Advice for firefighters

Special protective equipment for fire-fighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Avoid substance contact. Avoid inhalation of dusts. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

Environmental precautions
Do not empty into drains.

Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.
SECTION 7. Handling and storage

Precautions for safe handling
Observe label precautions.

Keep workplace dry. Do not allow product to come into contact with water.

Conditions for safe storage, including any incompatibilities
Requirements for storage areas and containers
No metal or light-weight-metal containers.

Tightly closed. Dry.

Store at +15°C to +25°C (+59°F to +77°F).

SECTION 8. Exposure controls/personal protection

Exposure limit(s)

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Basis</th>
<th>Value</th>
<th>Threshold limits</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>iron(III) chloride</td>
<td>ACGIH Time Weighted Average (TWA):</td>
<td>1 mg/m³</td>
<td>Expressed as: as Fe</td>
<td></td>
</tr>
<tr>
<td></td>
<td>NIOSH/GUIDE Recommended exposure limit (REL):</td>
<td>1 mg/m³</td>
<td>Expressed as: as Fe</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Z1A Time Weighted Average (TWA):</td>
<td>1 mg/m³</td>
<td>Expressed as: as Fe</td>
<td></td>
</tr>
</tbody>
</table>

Engineering measures
Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

Individual protection measures
Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

Hygiene measures
Immediately change contaminated clothing. Apply skin-protective barrier cream. Wash hands and face after working with substance.

Eye/face protection
Tightly fitting safety goggles

Hand protection
Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Other protective equipment:
protective clothing

Respiratory protection
required when dusts are generated.
Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

SECTION 9. Physical and chemical properties

Physical state: powder
Color: green to black
Odor: stinging
Odor Threshold: No information available.

pH: 1 at 200 g/l
68 °F (20 °C)

Melting point: 306 °C (decomposition)

Boiling point: No information available.

Flash point: does not flash

Evaporation rate: No information available.

Flammability (solid, gas): The product is not flammable.

Lower explosion limit: not applicable

Upper explosion limit: not applicable

Vapor pressure: 1 hPa at 68 °F (20 °C)

Relative vapor density: No information available.

Density: 2.89 g/cm³ at 77 °F (25 °C)

Relative density: No information available.

Water solubility: 920 g/l at 68 °F (20 °C)

Hydrolysis

Partition coefficient: n-octanol/water: No information available.
Autoignition temperature  No information available.
Decomposition temperature  > 392 °F ( > 200 °C)
Viscosity, dynamic  not applicable
Explosive properties  Not classified as explosive.
Oxidizing properties  Oxidizing potential
Sublimation point  579 °F ( 304 °C)
at  1,000 hPa
Ignition temperature  not combustible
Bulk density  ca. 1,000 kg/m³
Viscosity, kinematic  not applicable
Corrosion  May be corrosive to metals.

SECTION 10. Stability and reactivity

Reactivity
See below

Chemical stability
sublimable
sensitive to moisture

Possibility of hazardous reactions
Risk of explosion with:
Alkali metals, Ethylene oxide
Violent reactions possible with:
ALLYL CHLORIDE
Aluminum, with, Heat.
Generates dangerous gases or fumes in contact with:
Water

Conditions to avoid
Strong heating (decomposition).
Exposure to moisture.

Incompatible materials
Copper, Light metals

Hazardous decomposition products
in the event of fire: See section 5.
SECTI0N 11. Toxicological information

Information on toxicological effects

Likely route of exposure
Inhalation, Eye contact, Skin contact, Ingestion

Target Organs
Eyes
Skin
Respiratory system
Liver
gastrointestinal tract

Acute oral toxicity
LD50 rat: 316 mg/kg (RTECS)

absorption
Symptoms: Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract., Nausea, Vomiting

Acute inhalation toxicity
Symptoms: Possible damages:, mucosal irritations

Acute dermal toxicity
LD50 Dermal rat: > 2,000 mg/kg
(External MSDS)

Skin irritation
rabbit
Result: irritating
(IUCLID)
Causes skin irritation.

Eye irritation
rabbit
Result: Severe irritations
OECD Test Guideline 405
Causes serious eye damage.

Sensitization
May cause an allergic skin reaction.

Genotoxicity in vivo
In vivo micronucleus test
mouse
Result: negative
(External MSDS)

Genotoxicity in vitro
Ames test
Result: negative
Method: OECD Test Guideline 471
Mutagenicity (mammal cell test): micronucleus.
Result: negative
Method: OECD Test Guideline 405

Specific target organ systemic toxicity - single exposure
The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific target organ systemic toxicity - repeated exposure
The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard
Regarding the available data the classification criteria are not fulfilled.

Carcinogenicity

IARC
No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA
No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

NTP
No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

ACGIH
No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

Further information
Decomposition of the substance with tissue moisture.
The following applies to soluble iron compounds: nausea and vomiting after swallowing. The absorption of large quantities is followed by cardiovascular disorders. Toxic effect on liver and kidneys.
Other dangerous properties can not be excluded.
Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

Ecotoxicity
Toxicity to fish
LC50 Lepomis macrochirus (Bluegill sunfish): 20.3 mg/l; 96 h (External MSDS)

Toxicity to daphnia and other aquatic invertebrates
Immobilization EC50 Daphnia magna (Water flea): 9.6 mg/l; 48 h
OECD Test Guideline 202

Toxicity to algae
ErC50 Pseudokirchneriella subcapitata (green algae): 6.9 mg/l; 72 h
OECD Test Guideline 201
NOEC Pseudokirchneriella subcapitata (green algae): 2.4 mg/l; 72 h
OECD Test Guideline 201
Toxicity to fish (Chronic toxicity)

NOEC Pimephales promelas (fathead minnow): 0.33 mg/l; 33 d
(External MSDS)

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)

NOEC Daphnia magna (Water flea): 0.7 mg/l; 21 d
(External MSDS)

Persistence and degradability

No information available.

Bioaccumulative potential

No information available.

Mobility in soil

No information available.

Additional ecological information

Discharge into the environment must be avoided.

SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14. Transport information

Land transport (DOT)

UN number UN 1773
Proper shipping name FERRIC CHLORIDE, ANHYDROUS
Class 8
Packing group III
Environmentally hazardous --

Air transport (IATA)

UN number UN 1773
Proper shipping name FERRIC CHLORIDE, ANHYDROUS
Class 8
Packing group III
Environmentally hazardous --
Special precautions for user no

Sea transport (IMDG)

UN number UN 1773
Proper shipping name FERRIC CHLORIDE, ANHYDROUS
Class 8
Packing group III
Environmentally hazardous --
SAFETY DATA SHEET
according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number  803945  Version 1.3
Product name    Iron(III) chloride anhydrous for synthesis

Special precautions for user  yes
EmS                  F-A  S-B

SECTION  15. Regulatory information

United States of America

OSHA Hazards
Toxic by ingestion
Corrosive to eyes
Corrosive to skin
Target organ effects

This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS, and may deviate from the GHS information on the label and in section 2.

SARA 311/312 Hazards
Acute Health Hazard
Chronic Health Hazard

SARA 313
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 302
The following components are subject to reporting levels established by SARA Title III, Section 302:

Ingredients
chromium(III) chloride  10025-73-7

Clean Water Act
The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

Ingredients
iron(III) chloride
zinc chloride
nickel(II) chloride

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

Ingredients
iron(III) chloride
zinc chloride
nickel(II) chloride

DEA List I
Not listed

DEA List II
Not listed

US State Regulations

Massachusetts Right To Know

Ingredients
iron(III) chloride
chromium(III) chloride

Pennsylvania Right To Know
SAFETY DATA SHEET
according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number 803945  Version 1.3
Product name Iron(III) chloride anhydrous for synthesis

Ingredients
iron(III) chloride

New Jersey Right To Know
Ingredients
iron(III) chloride

California Prop 65 Components
WARNING: this product contains a chemical known in the State of California to cause cancer.
Ingredients
nickel(II) chloride

Notification status
TSCA: All components of the product are listed in the TSCA-inventory.

DSL: All components of this product are on the Canadian DSL.

SECTION 16. Other information

Training advice
Provide adequate information, instruction and training for operators.

Full text of H-Statements referred to under sections 2 and 3.
H290 May be corrosive to metals.
H302 Harmful if swallowed.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.

Key or legend to abbreviations and acronyms used in the safety data sheet
Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Revision Date08/12/2014

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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