

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	Ferric Chloride Solution DWG Grade
Synonyms	Iron (III) Chloride, Iron trichloride, FeCl ₃
UN/ID No.	UN2582
Item #	10244
Revision Date	May-20-2020
Safety Data Sheet	5443
Recommended Use	Water treatment chemical
Uses advised against	Consumer uses: Private households (= general public = consumers).

Company Name

PVS Technologies, Inc.
10900 Harper Ave.
Detroit, MI 48213
(313) 571-1100

24 Hour Emergency Phone Number CHEMTREC 1-800-424-9300

2. HAZARDS IDENTIFICATION

Classification

Acute toxicity - Oral	Category 4
Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1
May be corrosive to metals	Category 1
Carcinogenicity	Category 1A

Emergency Overview

<p>DANGER</p> <p>Hazard statements</p>	<p>Harmful if swallowed Causes severe skin burns and eye damage May cause cancer</p>

Precautionary statements

Prevention

- Obtain special instructions before use
- Do not handle until all safety precautions have been read and understood
- Use personal protective equipment as required
- Wash face, hands and any exposed skin thoroughly after handling
- Do not eat, drink or smoke when using this product
- Do not breathe dust/fume/gas/mist/vapors/spray

Response

- Immediately call a POISON CENTER or doctor/physician
- Specific treatment (see section 4 on this Safety Data Sheet)

Eyes

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing Immediately call a POISON CENTER or doctor/physician

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- Skin IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower Wash contaminated clothing before reuse
- Inhalation IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing Immediately call a POISON CENTER or doctor/physician
- Ingestion IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell Rinse mouth Do NOT induce vomiting

Storage

- Store locked up

Disposal

- Dispose of contents/container to an approved waste disposal plant

Other Information

Other hazards

- Toxic to aquatic life with long lasting effects
- Toxic to aquatic life

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	EC No.	Weight-% *
Water	7732-18-5	231-791-2	55-69
Iron trichloride	7705-08-0	231-729-4	31-45
Hydrogen chloride	7647-01-0	231-595-7	0.0-1.0
Ferrous chloride	7758-94-3	231-843-4	0.0-0.7

4. FIRST AID MEASURES

General advice

- Immediate medical attention is required

Eye contact

- Immediate medical attention is required
- Do not rub affected area
- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes
- Keep eyes wide open while rinsing

Skin contact

- Immediate medical attention is required
- Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes

Inhalation

- Call a physician or poison control center immediately
- Remove to fresh air
- If not breathing, give artificial respiration
- If breathing is labored, administer oxygen

Ingestion

- Do NOT induce vomiting
- Never give anything by mouth to an unconscious person
- Immediate medical attention is required
- Drink plenty of water
- Remove from exposure, lie down
- Clean mouth with water and drink afterwards plenty of water
- Call a physician or poison control center immediately

Note to physician

- Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure
- Treat symptomatically

Self-protection for first aid

- Use personal protective equipment as required

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personnel**

- Avoid contact with skin, eyes or clothing

5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media**
- Dry chemical, CO₂, water spray or alcohol-resistant foam
 - Use extinguishing measures that are appropriate to local circumstances and the surrounding environment
- Unsuitable extinguishing media**
- No information available
- Specific hazards arising from the chemical**
- The product causes burns of eyes, skin and mucous membranes
 - Thermal decomposition can lead to release of irritating and toxic gases and vapors
 - In the event of fire and/or explosion, do not breathe fumes
- Protective equipment and precautions for firefighters**
- Wear a self-contained breathing apparatus and chemical protective clothing
- Flammable properties**
- No information available
- Explosive properties**
- No information available

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions**
- Evacuate personnel to safe areas
 - Use personal protective equipment as required
 - Avoid contact with skin, eyes or clothing
 - Keep people away from and upwind of spill/leak
- Environmental precautions**
- For small spills, absorb material with clay absorbent or other compatible material. Dispose of the waste material according to local, state and governmental requirements.
 - For large spills, contain the material using barriers of absorbent pigs, clay absorbent or earth dams.
 - US regulations require reporting spills of this material that could reach any surface waters. The toll-free phone number for the US Coast Guard National Response Center is 1-800-424-8802
- Methods for cleaning up**
- Take up mechanically, placing in appropriate containers for disposal
 - Clean contaminated surface thoroughly
 - Soak up with inert absorbent material
 - Dike far ahead of liquid spill for later disposal
 - Prevent product from entering drains
 - Dam up
 - After cleaning, flush away traces with water
- Other Information**
- Spills exceeding the Reportable Quantity (RQ) of 1000 pounds or more must be reported to the National Response Center, (800) 424-8802.

7. HANDLING AND STORAGE

- Advice on safe handling**
- Use personal protective equipment as required
 - Avoid contact with skin, eyes or clothing
 - Ensure adequate ventilation, especially in confined areas
 - In case of insufficient ventilation, wear suitable respiratory equipment
 - Use only with adequate ventilation and in closed systems
- Storage Conditions**
- Keep container tightly closed in a dry and well-ventilated place
 - Keep out of the reach of children
 - Keep containers tightly closed in a dry, cool and well-ventilated place
 - Keep in properly labeled containers
- Incompatible materials**
- Incompatible with strong acids and bases, oxidizers, steel, and most metals, Incompatible with strong acids and bases, Incompatible with oxidizing agents

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Iron trichloride 7705-08-0	TWA: 1 mg/m ³ Fe		TWA: 1 mg/m ³ Fe
Hydrogen chloride 7647-01-0	Ceiling: 2 ppm	Ceiling: 5 ppm Ceiling: 7 mg/m ³	IDLH: 50 ppm
Ferrous chloride 7758-94-3	TWA: 1 mg/m ³ Fe		TWA: 1 mg/m ³ Fe

Exposure Guidelines

Engineering Controls

Ensure adequate ventilation, especially in confined areas.

Individual protection measures, such as personal protective equipment

Respiratory protection

• A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant the use of a respirator.

Eye/Face protection

- Tight sealing safety goggles
- Face protection shield

Skin and body protection

- Wear suitable protective clothing
- Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact

General Hygiene Considerations

- Wash contaminated clothing before reuse
- When using do not eat, drink or smoke
- Keep away from food, drink and animal feeding stuffs
- Contaminated work clothing should not be allowed out of the workplace
- Regular cleaning of equipment, work area and clothing is recommended
- Avoid contact with skin, eyes or clothing
- Take off all contaminated clothing and wash it before reuse
- Wear suitable gloves and eye/face protection

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state	Liquid
Appearance	Clear to slightly hazy
Color	Red brown
Odor	Slight Iron acidic
Odor threshold	No information available

Property	Values	Remarks • Method
pH	<2	
Melting point/Freezing Point	-26 °C / -15 °F	
Boiling point / boiling range	110 °C / 230 °F	
Flash point	No information available	
Evaporation rate	<1	n-Butyl acetate =1
Flammability (solid, gas)	No information available	
Flammability Limit in Air		Not flammable
Upper flammability limit (%)	No information available	
Lower flammability limit (%):	No information available	
Vapor pressure	No information available	negligible
Vapor density	No information available	
Specific Gravity	1.40	
Water solubility	Miscible in water	
Solubility in other solvents	No information available	
Partition coefficient	No information available	
Autoignition temperature	No information available	
Decomposition temperature	No information available	

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Kinematic viscosity	No information available
Dynamic viscosity	No information available
Explosive properties	No information available
Oxidizing properties	No information available

Other Information

Softening point °C	No information available
Molecular weight	No information available
VOC Content (%)	No information available
Density	No information available
Bulk density	11.7 Pounds per gallon (lb/gal), Typical

10. STABILITY AND REACTIVITY

Stability	• Stable under recommended storage conditions
Conditions to avoid	• Exposure to air or moisture over prolonged periods
Incompatible materials	Incompatible with strong acids and bases, oxidizers, steel, and most metals, Incompatible with strong acids and bases, Incompatible with oxidizing agents
Hazardous Decomposition Products	• Thermal decomposition can lead to release of irritating and toxic gases and vapors
Possibility of Hazardous Reactions	• None under normal processing and storage

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Principle Routes of Exposure	Inhalation, Skin contact, Eye contact
Inhalation	May cause irritation of respiratory tract. Avoid breathing vapors or mists.
Ingestion	May cause adverse kidney effects. May cause adverse liver effects.
Skin contact	Contact causes severe skin irritation and possible burns.
Eye contact	Corrosive to the eyes and may cause severe damage including blindness.

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Water 7732-18-5	> 90 mL/kg (Rat)		
Iron trichloride 7705-08-0	= 316 mg/kg (Rat) = 450 mg/kg (Rat)	>2000 mg/kg (rat)	
Hydrogen chloride 7647-01-0	238 - 277 mg/kg (Rat)	> 5010 mg/kg (Rabbit)	= 1.68 mg/L (Rat) 1 h
Ferrous chloride 7758-94-3	450 mg/kg (Rat)		

Information on toxicological effects

Symptoms	Vomiting, Hypoxemia (reduced O2 in the blood), Metabolic Acidosis
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Delayed and immediate effects as well as chronic effects from short and long-term exposure

Sensitization	No information available.
Germ cell mutagenicity	No information available.
Carcinogenicity	The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Hydrogen chloride 7647-01-0		Group 3		X

IARC (International Agency for Research on Cancer)

Not classifiable as a human carcinogen

OSHA (Occupational Safety and Health Administration of the US Department of Labor)

X - Present

Reproductive toxicity	No information available.
STOT - single exposure	No information available.
STOT - repeated exposure	No information available.

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Chronic toxicity

Chronic exposure to corrosive fumes/gases may cause erosion of the teeth followed by jaw necrosis. Bronchial irritation with chronic cough and frequent attacks of pneumonia are common. Gastrointestinal disturbances may also be seen. Avoid repeated exposure. Possible risk of irreversible effects. May cause adverse liver effects.

Target Organ Effects

Eyes, Gastrointestinal tract (GI), Liver, Respiratory system, Skin.

Aspiration hazard

No information available.

Numerical measures of toxicity - Product Information

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity

The following values are calculated based on chapter 3.1 of the GHS document .

Oral LD50

832 mg/kg

LC50 (Dust/Mist)

100.2 mg/l

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity

Toxic to aquatic life with long lasting effects

0% of the mixture consists of component(s) of unknown hazards to the aquatic environment

Chemical Name	Algae/aquatic plants	Fish	Crustacea
Iron trichloride 7705-08-0		20.95 - 22.56: 96 h Pimephales promelas mg/L LC50 semi-static 20.26: 96 h Lepomis macrochirus mg/L LC50 semi-static 75.6: 96 h Gambusia affinis mg/L LC50 static	27.9: 48 h Daphnia magna mg/L EC50 9.6: 48 h Daphnia magna mg/L EC50 Static
Hydrogen chloride 7647-01-0		282: 96 h Gambusia affinis mg/L LC50 static	
Ferrous chloride 7758-94-3		4: 96 h Morone saxatilis mg/L LC50 static	

Persistence and degradability

No information available

Bioaccumulation

No information available

Chemical Name	Partition coefficient
Iron trichloride 7705-08-0	-4

Other adverse effects

No information available

13. DISPOSAL CONSIDERATIONS

Disposal of wastes

• This material, as supplied, is a hazardous waste according to federal regulations (40 CFR 261)

Contaminated packaging

• Do not reuse container

US EPA Waste Number

• D002

This product contains one or more substances that are listed with the State of California as a hazardous waste.

Chemical Name	California Hazardous Waste Status
Iron trichloride 7705-08-0	Toxic Corrosive

14. TRANSPORT INFORMATION

DOT

Proper shipping name

Ferric chloride, solution

Hazard Class

8

UN/ID No.

UN2582

Packing Group

III

RQ (lbs)(dry)

Ferric chloride: RQ kg= 454.00, Ferrous chloride: RQ kg= 45.40

RQ as is (lbs)(wet)

2222 (45% Ferric Chloride)

Description

UN2582, Ferric chloride, solution, 8, III, RQ

Special Provisions

B15, IB3, T4, TP1

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Emergency Response Guide Number 154

Transport Canada

UN/ID No. UN2582
Proper shipping name FERRIC CHLORIDE SOLUTION
Hazard Class 8
Packing Group III
Description UN2582, Ferric chloride solution, 8, III

IATA

UN/ID No. UN2582
Proper shipping name FERRIC CHLORIDE SOLUTION
Hazard Class 8
Packing Group III
ERG Code 8L
Special Provisions A3, A803

IMDG

UN/ID No. UN2582
Proper shipping name FERRIC CHLORIDE SOLUTION
Hazard Class 8
Packing Group III
EmS-No. F-A, S-B
Special Provisions 223

15. REGULATORY INFORMATION

US Federal Regulations

SARA 311/312 Hazard Categories

Acute health hazard Yes
Chronic Health Hazard Yes
Fire hazard No
Sudden release of pressure hazard No
Reactive Hazard No

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

U.S. - TSCA (Toxic Substances Control Act) - Section 5(a)(2) - Chemicals with Significant New Use Rules (SNURs)

CWA (Clean Water Act)

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Iron trichloride 7705-08-0	1000 lb			X
Hydrogen chloride 7647-01-0	5000 lb			X
Ferrous chloride 7758-94-3	100 lb			X

CERCLA

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	RQ (lbs)(dry)
Iron trichloride 7705-08-0	1000 lb		RQ 1000 lb final RQ RQ 454 kg final RQ
Hydrogen chloride 7647-01-0	5000 lb	5000 lb	RQ 5000 lb final RQ RQ 2270 kg final RQ
Ferrous chloride 7758-94-3	100 lb		RQ 100 lb final RQ RQ 45.4 kg final RQ

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Canada

WHMIS Classification 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

WHMIS Classification Non-controlled

US State Regulations

California Proposition 65 This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Water 7732-18-5			X
Iron trichloride 7705-08-0	X	X	X
Hydrogen chloride 7647-01-0	X	X	X
Ferrous chloride 7758-94-3	X	X	X

DEA List I, List II

Chemical Name	U.S. - DEA - List I or Precursor Chemicals	U.S.- DEA - List II or Essential Chemicals
Hydrogen chloride 7647-01-0	-	0.0 kg, Domestic Sales Weight 50 gallon, Export Volume 27 kg, Export Weight

International Inventories

TSCA Complies

DSL/NDSL Complies

EINECS/ELINCS Complies

ENCS Complies

IECSC Complies

KECL Complies

PICCS Complies

AICS Complies

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory

DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List

EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

ENCS - Japan Existing and New Chemical Substances

IECSC - China Inventory of Existing Chemical Substances

KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances

AICS - Australian Inventory of Chemical Substances

16. OTHER INFORMATION

NFPA Health hazards 3 Flammability 0 Instability 0 Physical and Chemical Properties

HMIS Health hazards 3 Flammability 0 Physical hazards 0 Personal protection D

Item # 10244

Safety Data Sheet 5443

Revision Date May-20-2020

Issue Date Jun-02-2020

Version 4

Revision Note *** Updated value on SDS.

Disclaimer

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End of Safety Data Sheet