CHEMICAL INDUSTRIES (FAR EAST) LIMITED.

化学工业(远东)有限公司

Title	Doc. No.	TDC-SDS-Lab-F001
SDS – Ferric Chloride Solution	Revision	C
	Date of issue	17 August 2023
	Page	1 of 6

SAFETY DATA SHEET (SDS)

FERRIC CHLORIDE SOLUTION

Preface

Ferric Chloride Solution is a brown to dark brown liquid. Ferric Chloride Solution can cause skin and eye irritation.

1 CHEMICAL PRODUCT & COMPANY IDENTIFICATION

Product name	:	Ferric Chloride Solution
Chemical name	:	Ferric Chloride Solution
Chemical formula	:	$FeCl_3$
Other names	:	Iron (III) Chloride
Company's name & address	:	Chemical industries (Far East) Limited
(head office)	:	3, Jalan Samulun, Jurong Town, Singapore 629127
		Tel: 6265 0411 Fax: 6265 6690 Email: chemical.ind@cil.sg
(manufacturing plant)	:	91, Sakra Avenue, Jurong Island, Singapore 627882
		Tel: 6867 6977 Fax: 6867 6972 Email: sakraplant@cil.sg
Emergency telephone number	:	6265 0411 or 6867 7433 (Manufacturing plant's control room)

2 HAZARD IDENTIFICATION

GHS CLASSIFICATION :

Acute Toxicity :

Oral :	Category 4
Dermal:	Category 5
Inhalation :	Not classified
Skin corrosion/irritation:	Category 1C
Serious eye damage/irritation :	Category 1
Skin sensitization:	Not classified
Carcinogenicity	Not classified
Reproductive toxicity :	Not classified
Specific target organ toxicity (single exposure)	Not classified
Specific target organ toxicity (repeated exposure)	Not classified

GHS label elements
Pictograms:

Corrosive Danger

Signal word:

Hazard Statement(s):

H314: Causes severe skin burns and eye damage

H401: Toxic to aquatic life

Precautionary Statement(s):

Prevention:

P260: Do not breathe mist, vapours, spray

P264: Wash hands thoroughly after handling.

P273: Avoid release to the environment.

P280: Wear protective gloves, eye protection

Response:

P301 + P330 + P331: IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

P303 + P361 + P353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304 + P340: IF INHALED: remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinising.

P310: Immediately call a POISON CENTRE or doctor/physician

3 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredients		CAS No.[1]	EC-No.[2]	EC-Index-No.[3]	Symbol / R-phrase	Content
Ferric Chloride ($FeCl_3$)	:	7705-08-0	231-548-0	017-002-01-X	R22, R34 R 22 = Harmful if swallowed R34 = Causes burns	≤ 38 %

4 FIRST-AID MEASURES

Types of contact…	First aid measures
Eye contact	Wash eyes thoroughly with water for at least 15 minutes with eyelids held widely open. Remove contact lenses, if present and easy to do. Immediately summon for eye doctor / specialist.
Skin contact	Immediately wash off with plenty of water. Any clothing contaminated with ferric chloride should be removed immediately and washed before re-use. Summon medical attention for serious exposure.
Inhalation	Remove to fresh air and give oxygen if necessary. Immediately summon for medical attention.
Ingestion	Do NOT induce vomiting. If victim is conscious give plenty of water then milk of magnesia. Never give anything to an unconscious victim. Immediately summon medical attention.

5 FIRE-FIGHTING MEASURES

Fire-fighting media : Foam. Dry powder. Water spray. Sand.
Do not use a heavy water stream.

Protective equipment for fire-fighting : Fire fighters should use full protective clothing and full-face positive pressure self-contained breathing apparatus.

Special risks : Hazardous combustion gases or vapors will be developed in the event of fire; hydrogen chloride gas and iron oxides. Prevent fire-fighting water contaminated with the substance to enter drains or sewerage systems.

6 ACCIDENTAL RELEASE MEASURES

Personal protective equipment : Avoid contact with skin / eye. Use full protective clothing, rubber gloves, rubber boots, and eye goggles.

Procedure to stop / minimize :
1. Prevent further leakage if it is safe to do so.
2. For minor spill / leak, flush with large amount of water.
3. For the contained spill / leak, render harmless by careful neutralization with alkali/hydrated lime. Assistance can be obtained from licensed waste disposal contractors / supplier.
4. If major spill / leak is not under control, inform SCDF / fire brigade / police./ supplier.
5. Clean up affected area.

Method to clean up : Soak up spills by neutralizing with alkali/hydrated lime. Collect and contain the neutralized material for proper disposal. Flush the affected area with plenty of water.

[1] CAS – Chemical Abstract Service
[2] EC no. – No. given by EC Commission
[3] EC Index No. – as per appendix 1 of the regulation 67/548/EC

Dispose in accordance to current local disposal regulations.
(In Singapore, The Environmental Public Health (Toxic industrial waste) Regulations.)

Environmental precautions : Prevent liquid from entering sewer, surface water, ground water and soil. Advise authorities if substance has entered a watercourse / drain / soil.

7 HANDLING & STORAGE

Handling : Wear protective equipment for handling. Keep containers closed tightly. Handle containers with care. Container remains hazardous when empty. Continue to observe all precautions until it had been properly washed. Do not breathe in mist, vapours and spray.

Storage : Store in a cool, dry, ventilated area away from heat, sparks, flames and direct sunlight. Store away from strong bases and metals. Store in temperatures between 5^{o}C and 30^{o}C.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls : Provide adequate general and/or local ventilation in areas of storage and use where ferric chloride is present to meet PEL (personal exposure limit) requirements. Provide water supply / emergency eyewash / shower near area of handling. Emergency eye wash and safety showers should be available in the immediate vicinity of any potential exposure. Provide adequate general and local exhaust ventilation.

Safe work practices / industrial hygiene : Wash hands and face and other exposed areas with mild soap after working with the substance, and before eating / drinking.
Immediately remove contaminated clothing. Wash before re-using.

Personal protection

1. Eye protection : Use safety goggle / face shield.
2. Skin protection : Use rubber gloves, protective clothing and rubber boots. Chemical resistance of materials should be ascertained with the vendor.
3. Respiratory protection : Use approved half-face filter respirator suitable for the substance to be worn when dust / mist is present above permissible limits.
4. Other protective equipment : Uniform, long-sleeved lab coat

Occupational exposure standards : TWA 8 hours = 1 ppm
STEL = 1 ppm (Singapore permissible exposure limit)
(TWA – time weighted average, STEL – Short term exposure limit)

9 PHYSICAL & CHEMICAL PROPERTIES

Appearance	:	Dark brown liquid
Boiling point	:	104^{o}C - 117 ^{o}C
Melting point	:	-9 ^{o}C to -6^{o}C
Vapor pressure (at 20^{o}C)	:	40 mm Hg
Specific gravity (at 20^{o}C)	:	1.32 – 1.51
Solubility in water (at 20^{o}C)	:	Very soluble
Evaporation rate	:	Not applicable
Vapor density	:	Not applicable
Odor	:	Pungent odor with sulfur dioxide
pH (at 100 g/l, 20^{o}C)	:	< 2.0

Flash point		:	Not applicable
Explosive limits	lower	:	Not applicable
	upper	:	Not applicable
Auto-ignition temperature		:	Not applicable
Flammability		:	Not applicable
Molecular weight		:	162.2

10 STABILITY & REACTIVITY

Reactivity	:	Corrosive vapours
Stability	:	Stable
Possibility of hazardous reactions	:	No information available
Conditions to avoid instability	:	Light, heat
Incompatible materials	:	Most common metals, aluminum, strong bases, strong oxidizing agents, potassium metal
Hazardous decomposition products	:	Hydrogen chloride

11 TOXICOLOGICAL INFORMATION

Ingestion	:	Harmful if swallowed. Can cause liver and/or kidney damage if swallowed and may even be fatal.
Eye contact	:	Causes serious eye damage.
Skin contact	:	Causes severe skin burns and eye damage.
Inhalation	:	Not available.
Animal Toxicity Data	:	Not available.

12 ECOLOGICAL INFORMATION

Biodegradability	:	Not available.
Environmental Effects	:	Not available.

13 DISPOSAL CONSIDERATIONS

Considerations	:	Do not dispose substance directly to sewerage, ground-water and surface-water system. Consult approved waste collectors for disposal.
Singapore regulations	:	Dispose in accordance to current local disposal regulations. *(In Singapore, The Environmental Public Health (Toxic industrial waste) Regulations.)*

14 TRANSPORT INFORMATION

Proper shipping name (for land / sea / air) : Ferric Chloride Solution

	UN No.[4]	Hazard class	PSA Group[5]
Land [The Environmental Pollution Control (Hazardous substances) Regulations]	2582	8	III

[4] UN No. – No. Issued by United Nations Subcommittee of Experts
[5] PSA Group – Grouping of dangerous goods by Port Of Singapore Authority

Sea (IMDG[6] / IMO[7])	2582	8	III
Air (ICAO[8] /IATA[9])	2582	8	III

15 REGULATORY INFORMATION

In Singapore:

Import & sale of hazardous substances	:	Environmental Protection and Management (Hazardous Substances) Regulations	
Disposal of obsolete / expired chemicals / waste	:	Environmental Public Health (Toxic Industrial Waste) Regulations	
Symbol	:	C	Corrosive
R-phases	:	R 22	Harmful if swallowed.
		R34	Causes burns.
S-phases	:	S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
		S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
		S45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
		S60	This material and its container must be disposed of as hazardous waste.

	Hazard type	Hazard class.	UN No.	Hazchem code
Ferric Chloride	Corrosive	8	2582	2T

NFPA rating[10]	Health	Reactivity	Flammability	Other
	2	0	0	None

16 OTHER INFORMATION

Revision No.	Date of issue	Description of changes
A	29 June 2015	Initial release
B	25 June 2020	Overall reviewed
C	17 August 2023	Overall reviewed

[6] IMDG – International Maritime Dangerous Goods
[7] IMO – International Maritime Organisation
[8] ICAO – International Civil Aviation Organisation
[9] IATA – International Air Transport Association
[10] NFPA rating – rating according to National Fire Protection Agency