Safety data sheet

BASF Safety data sheet according to UN GHS 4th rev.
Date / Revised: 15.12.2022 Version: 2.2
Product: **Ferric Chloride Anhydrous**

1. Identification

Product identifier

Ferric Chloride Anhydrous

Chemical name: iron trichloride
CAS Number: 7705-08-0

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: Chemical
Recommended use: Intermediate, process chemical, catalyst

2. Hazards Identification

Classification of the substance or mixture

According to UN GHS criteria

Acute Tox. 4 (oral)
Skin Corr./Irrit. 2
Eye Dam./Irrit. 1
Skin Sens. 1

For the classifications not written out in full in this section the full text can be found in section 16.

Label elements

Globally Harmonized System (GHS)

Pictogram:

Signal Word:
Danger

Hazard Statement:

H318	Causes serious eye damage.
H315	Causes skin irritation.
H302	Harmful if swallowed.
H317	May cause an allergic skin reaction.

Precautionary Statements (Prevention):

P280	Wear protective gloves and eye protection or face protection.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P272	Contaminated work clothing should not be allowed out of the workplace.
P270	Do not eat, drink or smoke when using this product.
P264	Wash contaminated body parts thoroughly after handling.

Precautionary Statements (Response):

P310	Immediately call a POISON CENTER or physician.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P303 + P352	IF ON SKIN (or hair): Wash with plenty of soap and water.
P301	IF SWALLOWED:
P330	Rinse mouth
P332 + P313	If skin irritation occurs: Get medical attention.
P362 + P364	Take off contaminated clothing and wash it before reuse.

Precautionary Statements (Disposal):

P501	Dispose of contents and container to hazardous or special waste collection point.

Labeling of special preparations (GHS):
May produce an allergic reaction. Contains: Nickel dichloride

According to UN GHS criteria

Hazard determining component(s) for labelling: Iron trichloride, Nickel dichloride

Other hazards

According to UN GHS criteria

If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture.

Corrodes metals in the presence of water or moisture.

3. Composition/Information on Ingredients

Substances

Chemical nature

Iron trichloride

CAS Number: 7705-08-0
EC-Number: 231-729-4

FeCl3

technical

Hazardous ingredients (GHS)
According to UN GHS criteria

Iron trichloride

Content (W/W): >= 98 % - <= 100 %	Acute Tox. 4 (oral)
CAS Number: 7705-08-0	Skin Corr./Irrit. 2
EC-Number: 231-729-4	Eye Dam./Irrit. 1
	H318, H315, H302

Chromium trichloride

Content (W/W): >= 0 % - < 0,15 %	Acute Tox. 4 (oral)
CAS Number: 10025-73-7	Skin Sens. 1
EC-Number: 233-038-3	Aquatic Acute 2
	Aquatic Chronic 2
	H302, H317, H401, H411

Zinc chloride

Content (W/W): >= 0 % - < 0,15 %	Acute Tox. 4 (oral)
CAS Number: 7646-85-7	Skin Corr./Irrit. 1B
EC-Number: 231-592-0	Eye Dam./Irrit. 1
INDEX-Number: 030-003-00-2	Aquatic Acute 1
	Aquatic Chronic 1
	M-factor acute: 1
	M-factor chronic: 1
	H302, H314, H400, H410
	Specific concentration limit:
	STOT SE 3, irr. to respiratory syst.: >= 5 %

Nickel dichloride

Content (W/W): >= 0 % - < 0,1 %	Acute Tox. 3 (Inhalation - dust)
CAS Number: 7718-54-9	Acute Tox. 3 (oral)
EC-Number: 231-743-0	Skin Corr./Irrit. 2
	Resp. Sens. 1
	Skin Sens. 1
	Muta. 2
	Carc. 1A (by inhalation)
	Repr. 1B (unborn child)
	STOT RE (Respiratory system) 1 (by inhalation)
	Aquatic Acute 1
	Aquatic Chronic 1
	M-factor acute: 10
	M-factor chronic: 1
	H315, H334, H317, H360, H341, H350, H301 + H331, H372, H400, H410
	Specific concentration limit:
	STOT RE 2: 0,1 - < 1 %
	STOT RE 1: >= 1 %
	Skin Sens. 1: >= 0,01 %
	Skin Corr./Irrit. 2: >= 20 %

For the classifications not written out in full in this section the full text can be found in section 16.

Mixtures

Not applicable

4. First-Aid Measures

Description of first aid measures

If the patient is likely to become unconscious, place and transport in stable sideways position (recovery position). Immediately remove contaminated clothing.

If inhaled:
Keep patient calm, remove to fresh air, seek medical attention.

On skin contact:

Immediately wash thoroughly with soap and water, seek medical attention.

On contact with eyes:
Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

On ingestion:
Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

Most important symptoms and effects, both acute and delayed
Symptoms: Information, i.e. additional information on symptoms and effects may be included in the GHS labeling phrases available in Section 2 and in the Toxicological assessments available in Section 11.

irritates the eyes and respiratory tract, skin irritation, allergic symptoms

Hazards: No hazard is expected under intended use and appropriate handling.

Indication of any immediate medical attention and special treatment needed
Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Extinguishing media
Suitable extinguishing media:
dry powder

Unsuitable extinguishing media for safety reasons:
water

Special hazards arising from the substance or mixture
At temperatures of > 200 °C can be emitted: Chlorine
The substances/groups of substances mentioned can be released in case of fire.

Advice for fire-fighters
Special protective equipment:
Wear a self-contained breathing apparatus.

Further information:
Contaminated extinguishing water must be disposed of in accordance with official regulations. Avoid direct contact with water. Product itself is non-combustible; fire extinguishing method of surrounding areas must be considered.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures
Avoid contact with the skin, eyes and clothing. Avoid dust formation.

Environmental precautions

Due to the pH-value of the product, neutralization is generally required before discharging sewage into treatment plants.

Methods and material for containment and cleaning up

For small amounts: Neutralize with lime.
For large amounts: Pick up in dry form. Dispose of contaminated material as prescribed.
For residues: Rinse away with water.

7. Handling and Storage

Precautions for safe handling

Keep container tightly sealed. Processing machines must be fitted with local exhaust ventilation.

Protection against fire and explosion:
The substance/product is non-combustible. Product is not explosive.

Conditions for safe storage, including any incompatibilities

Suitable materials for containers: High density polyethylene (HDPE), Low density polyethylene (LDPE), Polyester resin, glass reinforced (Palatal A410), enamelled, rubberized, Carbon steel (Iron), glass
Further information on storage conditions: Protect against moisture.

Specific end use(s)

See exposure scenario(s) in the attachment to this safety data sheet.

8. Exposure Controls/Personal Protection

Exposure controls

Personal protective equipment

Respiratory protection:
Breathing protection if breathable aerosols/dust are formed. Suitable respiratory protection for lower concentrations or short-term effect: Gas filter for gases/vapours of inorganic compounds (e.g. EN 14387 Type B) Suitable respiratory protection for higher concentrations or long-term effect: Self-contained breathing apparatus.

Hand protection:
Chemical resistant protective gloves (EN ISO 374-1)
Suitable materials also with prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN ISO 374-1):
polyvinylchloride (PVC) - 0.7 mm coating thickness
Supplementary note: The specifications are based on tests, literature data and information of glove manufacturers or are derived from similar substances by analogy. Due to many conditions (e.g. temperature) it must be considered, that the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing.
Manufacturer's directions for use should be observed because of great diversity of types.

Eye protection:
Tightly fitting safety goggles (splash goggles) (e.g. EN 166)

Body protection:
Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

General safety and hygiene measures
Hands and/or face should be washed before breaks and at the end of the shift. Take off immediately all contaminated clothing.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Form:	crystalline, powder	
Colour:	green to black	
Odour:	pungent odour	
Odour threshold:	Not determined due to potential health hazard by inhalation.	
pH value:	1 (200 g/l, 20 °C)	(OECD Guideline 122)
Melting point:	dropped	
Sublimation temperature:	304 °C (1 bar) Literature data.	
Flash point:	not applicable, the product is a solid	
Evaporation rate:	The product is a non-volatile solid.	
Flammability:	not highly flammable	(Directive 92/69/EEC, A.10)
Lower explosion limit:	For solids not relevant for classification and labelling.	
Upper explosion limit:	For solids not relevant for classification and labelling.	
Vapour pressure:	1 mbar (20 °C)	
Density:	2,89 g/cm3 (25 °C) Literature data.	
Relative vapour density (air):	The product is a non-volatile solid.	
Solubility in water:	Literature data. 744 g/l (0 °C)	
Solubility (quantitative) :	480 g/kg (20 °C)	
Partitioning coefficient n-octanol/water (log Kow):	-4 (24 °C)	
Self ignition:	not self-igniting	

Thermal decomposition:	> 200 °C Chlorine	
Viscosity, dynamic:	not applicable, the product is a solid	
Viscosity, kinematic:	not applicable, the product is a solid	
Explosion hazard:	Based on the chemical structure there is no indication of explosive properties.	
Fire promoting properties:	not fire-propagating	(UN Test O.1 (oxidizing solids))

Other information

Self heating ability:	It is not a substance capable of spontaneous heating.	
Bulk density:	approx. 1.000 kg/m3	
pKA:	Study scientifically not justified.	
Hygroscopy:	hygroscopic	
Adsorption/water - soil:	Study scientifically not justified.	
Surface tension:	Based on chemical structure, surface activity is not to be expected.	
Grain size distribution	3,3 µm	(D10, ISO 13320-1;; particle size by laser diffraction)
	35,3 µm	(D90, ISO 13320-1;; particle size by laser diffraction)
	11,7 µm	(D50, ISO 13320-1;; particle size by laser diffraction)
Angle of repose:	64 °	(trickle test (lab for material testing))

10. Stability and Reactivity

Reactivity

Corrosion to metals: Corrodes metals in the presence of water or moisture.

Possibility of hazardous reactions

Develops hydrochloric acid (HCL) on contact with water.

Conditions to avoid

Avoid moisture.

Incompatible materials

Substances to avoid:
water, strong bases

Hazardous decomposition products

Hazardous decomposition products:
Hydrogen chloride
metal compounds, Acid fumes, chlorides

11. Toxicological Information

Information on toxicological effects

Acute toxicity

Assessment of acute toxicity:
Harmful if swallowed.

Experimental/calculated data:
LD50 mouse (oral): > 300 - < 630 mg/kg

(by inhalation):Study does not need to be conducted.

LD50 rat (dermal): > 2.000 mg/kg (OECD Guideline 402)
No mortality was observed. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Irritation

Assessment of irritating effects:
Irritating to skin. Risk of serious damage to eyes.

Experimental/calculated data:
Skin corrosion/irritation rabbit: Irritant. (BASF-Test)
Data refer to a diluted aqueous solution of the substance.

Serious eye damage/irritation rabbit: irreversible damage (BASF-Test)
Data refer to a diluted aqueous solution of the substance.

Respiratory/Skin sensitization

Information on: Nickel dichloride
Assessment of sensitization:
The substance may cause sensitization of the respiratory tract. Sensitization after skin contact possible.

Germ cell mutagenicity

Assessment of mutagenicity:
The substance was not mutagenic in bacteria. The substance was not mutagenic in mammalian cell culture. The substance was not mutagenic in studies with mammals.

Carcinogenicity

Assessment of carcinogenicity:
The whole of the information assessable provides no indication of a carcinogenic effect.

Reproductive toxicity

Assessment of reproduction toxicity:
No reliable data are available concerning reproduction toxicity. The chemical structure does not suggest a specific alert for such an effect.

Developmental toxicity

Assessment of teratogenicity:
No indications of a developmental toxic / teratogenic effect were seen in animal studies.

Repeated dose toxicity and Specific target organ toxicity (repeated exposure)

Assessment of repeated dose toxicity:
The substance may cause damage to the kidney after repeated ingestion of high doses, as shown in animal studies. The substance may cause damage to the liver after repeated ingestion of high doses, as shown in animal studies.

Aspiration hazard

Study does not need to be conducted.

12. Ecological Information

Toxicity

Assessment of aquatic toxicity:
At the present state of knowledge, no negative ecological effects are expected. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.
The product gives rise to pH shifts.

Toxicity to fish:
Study scientifically not justified.

Aquatic invertebrates:
Study scientifically not justified.

Microorganisms/Effect on activated sludge:
EC50 (5 min) 500 mg/l, activated sludge (other, aquatic)

Chronic toxicity to fish:
Study scientifically not justified.

Chronic toxicity to aquatic invertebrates:
Study scientifically not justified.

Assessment of terrestrial toxicity:
No data available.

Persistence and degradability

Assessment biodegradation and elimination (H2O):
Not applicable for inorganic substances.

Elimination information:
not applicable

Assessment of stability in water:
In contact with water the substance will hydrolyse rapidly.
Information on Stability in Water (Hydrolysis):
$t_{1/2}$ 4,15 - 34 min, (calculated, pH 7)
The product has not been fully tested. The statements have been derived in parts from products of a similar structure or composition.

Bioaccumulative potential

Assessment bioaccumulation potential:
Does not significantly accumulate in organisms.

Bioaccumulation potential:
Bioconcentration factor: < 20 (28 d), Cyprinus carpio (OECD-Guideline 305)
The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Mobility in soil

Assessment transport between environmental compartments:
Volatility: The substance will not evaporate into the atmosphere from the water surface.
Adsorption in soil: No data available. Study scientifically not justified.

Results of PBT and vPvB assessment

According to Annex XIII of Regulation (EC) No.1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): The product does not fulfill the criteria for PBT (Persistent/bioaccumulative/toxic) and vPvB (very persistent/very bioaccumulative). Self classification

Other adverse effects

The substance is not listed in Regulation (EC) 1005/2009 on substances that deplete the ozone layer.

Additional information

Adsorbable organically-bound halogen (AOX):
The Substance/product may have a halogenizing effect and therefore contribute to the OBH.

Other ecotoxicological advice:
Inhibition of degradation activity in activated sludge is not to be anticipated during correct introduction of low concentrations. Due to the pH-value of the product, neutralization is generally required before discharging sewage into treatment plants.

13. Disposal Considerations

Waste treatment methods

May be fed into a biological purification plant.

The local regulations on waste-water treatment must be followed.

Contaminated packaging:
Contaminated packaging should be emptied as far as possible; then it can be passed on for recycling after being thoroughly cleaned.

14. Transport Information

Land transport

ADR

UN number or ID number:	UN1773
UN proper shipping name:	FERRIC CHLORIDE, ANHYDROUS
Transport hazard class(es):	8
Packing group:	III
Environmental hazards:	no
Special precautions for user:	Tunnel code: E

RID

UN number or ID number:	UN1773
UN proper shipping name:	FERRIC CHLORIDE, ANHYDROUS
Transport hazard class(es):	8
Packing group:	III
Environmental hazards:	no
Special precautions for user:	None known

Inland waterway transport

ADN

UN number or ID number:	UN1773
UN proper shipping name:	FERRIC CHLORIDE, ANHYDROUS
Transport hazard class(es):	8
Packing group:	III
Environmental hazards:	no
Special precautions for user:	None known

Transport in inland waterway vessel
Not evaluated

Sea transport

IMDG

UN number or ID number:	UN 1773
UN proper shipping name:	FERRIC CHLORIDE, ANHYDROUS
Transport hazard class(es):	8
Packing group:	III
Environmental hazards:	no Marine pollutant: NO
Special precautions for user:	EmS: F-A; S-B

Air transport

IATA/ICAO

UN number or ID number:	UN 1773
UN proper shipping name:	FERRIC CHLORIDE, ANHYDROUS
Transport hazard class(es):	8
Packing group:	III
Environmental hazards:	No Mark as dangerous for the environment is needed
Special precautions for user:	None known

Maritime transport in bulk according to IMO instruments

Maritime transport in bulk is not intended.

15. Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

If other regulatory information applies that is not already provided elsewhere in this safety data sheet, then it is described in this subsection.

16. Other Information

Full text of classifications, hazard symbols and hazard statements, if mentioned in section 2 or 3:

Acute Tox.	Acute toxicity
Skin Corr./Irrit.	Skin corrosion/irritation
Eye Dam./Irrit.	Serious eye damage/eye irritation
Skin Sens.	Skin sensitization
Aquatic Acute	Hazardous to the aquatic environment - acute
Aquatic Chronic	Hazardous to the aquatic environment - chronic
Resp. Sens.	Respiratory sensitization
Muta.	Germ cell mutagenicity
Carc.	Carcinogenicity

Repr.	Reproductive toxicity
STOT RE	Specific target organ toxicity — repeated exposure
STOT SE	Specific target organ toxicity — single exposure
H318	Causes serious eye damage.
H315	Causes skin irritation.
H302	Harmful if swallowed.
H317	May cause an allergic skin reaction.
H401	Toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.
H314	Causes severe skin burns and eye damage.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H360	May damage the unborn child.
H341	Suspected of causing genetic defects.
H350	May cause cancer by inhalation.
H301 + H331	Toxic if swallowed or if inhaled
H372	Causes damage to organs (Respiratory system) through prolonged or repeated exposure (inhalation).

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. This safety data sheet is neither a Certificate of Analysis (CoA) nor technical data sheet and shall not be mistaken for a specification agreement. Identified uses in this safety data sheet do neither represent an agreement on the corresponding contractual quality of the substance/mixture nor a contractually designated use. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.