# SAFETY DATA SHEET

## Iron(III) chloride solution

Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II, as amended by Commission Regulation (EU) 2015/830

| | | |
|---|---|---|
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| Version | : | 1 |

## SECTION 1: Identification of the substance/mixture and of the company

### 1.1. Product identifier

| | | |
|---|---|---|
| **Product name** | : | Iron(III) chloride solution |
| **Other means of identification** | : | Iron trichloride solution, Trichloroiron solution, Ferric chloride solution |

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

| | | |
|---|---|---|
| **Use of the Sub-stance/Mixture** | : | Water treatment chemical, |
| **Recommended restrictions on use** | : | Do not use for other purposes than the identified uses. |

### 1.3. Details of the supplier of the safety data sheet

| | | |
|---|---|---|
| **Name** | : | GLI-THERM Sp. z o.o. |
| **Address** | : | st. Rozwojowa 11, 44-338 Jastrzębie-Zdrój Poland |
| **Regon** | : | 242850136 |
| **NIP/Tax No** | : | 6423178990 |
| **Telephone** | : | +48 733 525 533 |
| **E-mail** | : | sandra.stachowicz@gli therm.eu |
| **Website address** | : | www.glitherm.eu |

### 1.4. Emergency telephone number

**National advisory body/Poison Center:**

| | | |
|---|---|---|
| Ireland | : | National Poisons Information Centre<br>Emergency number:<br>+353 1 809 2566 (Healthcare professionals-24/7) +353 1 809 2166 (public, 8am - 10pm, 7/7) |
| United Kingdom | : | National Poisons Information Service (Newcastle Centre)<br>Emergency number:<br>0844 892 0111 (UK only, 24/7, healthcare professionals only) |
| Poland | : | Szpital Praski p.w. Przemienienia Pańskiego Sp. z o.o.<br>Emergency number:<br>+48 22 619 66 54<br>+48 22 619 08 97 |
| Germany | : | Vergiftungs-Informations-Zentrale Freiburg<br>Emergency number: +49 (0) 761 19240 |

| | | |
|---|---|---|
| 24 Hour Emergency Telephone | : | +(44)-8708200418 CHEMTREC |

**Supplier**

| | | |
|---|---|---|
| Telephone number | : | +48 733 525 533 |

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

**Product definition** : Mono-constituent substance

**Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]**

| | | |
|---|---|---|
| Corrosive to metals, Category 1 | : | **H290** May be corrosive to metals. |
| Acute toxicity, Category 4 | : | **H302** Harmful if swallowed. |
| Skin irritation, Category 2 | : | **H315** Causes skin irritation. |
| Skin sensitisation, Category 1 | : | **H317** May cause an allergic skin reaction. |
| Serious eye damage, Category 1 | : | **H318** Causes serious eye damage. |

### 2.2. Label elements

**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**

**Prevention** :
**P261** Avoid breathing vapours.
**P280** Wear protective gloves/ protective clothing/ eye protection/ face protection.

**Response** :
**P305 + P351 + P338** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
**P310** Immediately call a POISON CENTER/ doctor.
**P390** Absorb spillage to prevent material damage.

**Hazardous components which must be listed on the label** :
Iron trichloride
Nickel dichloride

### 2.3. Other hazards

**Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII** : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT) at levels of 0.1% or higher.

**Substance meets the criteria for vPvB according to Regulation** : This substance/mixture contains no components considered to be either very persistent and very bioaccumulative (vPvB) at levels of 0.1%

| | | |
|---|---|---|
| **(EC) No. 1907/2006, Annex XIII** | | or higher. |
| **Ecological information** | : | Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher. |
| **Toxicological information** | : | The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher. |
| **Other hazards which do not result in classification** | : | Heating above the decomposition temperature can cause formation of hydrogen chloride. May lower the pH of water and thus be harmful to aquatic organisms. |

## SECTION 3: Composition/information on ingredients

**3.1. Substance**

Has no use

**3.2. Mixture**

| Substance | Identifiers<br>CAS-No.<br>EC-No.<br>Index-No.<br>Registration number | Classification<br>Regulation (EC) No. 1272/2008<br>[CLP/GHS] | [ % w/w ] |
|---|---|---|---|
| Iron trichloride | 7705-08-0<br>231-729-4<br>01-2119497998-05 | Acute Tox. 4; H302<br>Eye Dam. 1; H318<br>Skin Irrit. 2; H315<br>Met. Corr. 1; H290<br>Acute toxicity estimate<br>Acute oral toxicity: 500 mg/kg | 35 - 45 |
| Hydrochloric acid | 7647-01-0<br>231-595-7<br>01-2119484862-27 | Met. Corr. 1; H290<br>Skin Corr. 1A; H314<br>Eye Dam. 1; H318<br>STOT SE 3; H335<br>(Lungs)<br>specific concentration limit<br>Skin Corr. 1B; H314 >= 25 %<br>Skin Irrit. 2; H315 10 - < 25 %<br>Eye Irrit. 2; H319 10 - < 25 %<br>STOT SE 3; H335 >= 10 % | 1 - 2 |
| Copper dichloride | 7447-39-4<br>231-210-2 | Acute Tox. 4; H302<br>Acute Tox. 4; H312<br>Skin Irrit. 2; H315<br>Eye Dam. 1; H318<br>Aquatic Acute 1; H400<br>Aquatic Chronic 2; H410<br>M-Factor (Acute aquatic toxicity): 10<br>Acute toxicity estimate<br>Acute oral toxicity: 584 mg/kg<br>Acute dermal toxicity: 1 224 mg/kg | < 0.1 |

| | | | |
|---|---|---|---|
| Nickel dichloride | 7718-54-9<br>231-743-0<br>028-011-00-6 | Acute Tox. 3; H301<br>Skin Irrit. 2; H315<br>Skin Sens. 1; H317<br>Acute Tox. 3; H331<br>Resp. Sens. 1; H334<br>Muta. 2; H341<br>STOT RE 1; H372<br>Carc. 1A; H350i<br>Repr. 1B; H360D<br>Aquatic Acute 1; H400<br>Aquatic Chronic 1; H410<br>M-Factor (Chronic aquatic toxicity): 1<br>specific concentration limit<br>STOT RE 1; H372 >= 1 %<br>STOT RE 2; H373 0,1 - < 1 %<br>Skin Irrit. 2; H315 >= 20 %<br>Skin Sens. 1; H317 >= 0,01 %<br>Acute toxicity estimate<br>Acute oral toxicity: 175 mg/kg<br>Acute inhalation toxicity: 0,59 mg/l | 100-500 ppm |

For explanation of abbreviations see section 16.
Occupational exposure limits, if available, are listed in Section 8.

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

**General advice** : Show this safety data sheet to the doctor in attendance.
First aider needs to protect himself.

**Protection of first-aiders** : First Aid responders should pay attention to self-protection and use the recommended protective clothing.

**Eye contact** : Rinse immediately with plenty of water, also under the eyelids, for at least 30 minutes. Prevent rinsing water from flowing into the other eye. Continue rinsing eyes during transport to hospital.

**Inhalation** : Move to fresh air. Keep warm. If symptoms persist, seek medical advice.

**Skin contact** : Take off contaminated clothing and shoes immediately. Rinse with plenty of water. If symptoms persist, seek medical advice.

**Ingestion** : Rinse mouth with water. Do NOT induce vomiting. If symptoms persist, call a physician.

### 4.2. Most important symptoms and effects, both acute and delayed

**Symptoms** : corrosive effects

### 4.3. Indication of any immediate medical attention and special treatment needed

**Notes to physician** : Symptomatic treatment. Rinse with plenty of water.

**Specific treatments** : No additional information

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

**Suitable extinguishing media** : Not combustible. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Unsuitable extinguishing media** : No special requirements.

### 5.2. Special hazards arising from the substance or mixture

**Specific hazards during fire-fighting** : Heating above the decomposition temperature can cause formation of hydrogen chloride.

### 5.3 Advice for firefighters

**Special protective equipment for fire-fighters** : Exposure to decomposition products may be a hazard to health. In the event of fire, wear self-contained breathing apparatus.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

**Personal precautions** : For personal protection see section 8. Avoid contact with skin, eyes and clothing.

### 6.2. Environmental precautions

**Environmental precautions** : Do not allow uncontrolled discharge of product into the environment.

### 6.3. Methods and materials for containment and cleaning up

**Methods for cleaning up** : Clean-up methods - small spillage

Dilute residues with water and then neutralize with lime or limestone powder to a solid consistency.
Shovel or sweep up.
Must be disposed of in accordance with local and national regulations.

Clean-up methods - large spillage

Remove spill using a vacuum truck.
Dilute residues with water and then neutralize with lime or limestone powder to a solid consistency.
Shovel or sweep up remaining material.
Must be disposed of in accordance with local and national regulations.

### 6.4. Reference to other sections

See Sections 7 and 8 for proper handling and protective measures and Section 13 for proper waste disposal measures.

## SECTION 7: Handling and storage

The information in this section contains generic advice and guidance.

### 7.1. Precautions for safe handling

**Technical measures** : Install appropriate equipment and wear appropriate personal protective equipment (see "8. Exposure control/personal protection").

**Advice on safe handling** : The work place and work methods shall be organized in such a way that direct contact with the product is prevented or minimized.
Danger for slipping.
For personal protection see section 8.
Keep away from incompatible materials.
Contact with certain metals, e.g. aluminium and zinc, may form hydrogen gas, which in turn may form explosive mixtures of gases with air.

**Advice on general occupational hygiene** : Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Wash hands before breaks and at the end of workday.

### 7.2. Conditions for safe storage, including any incompatibilities.

**Requirements for storage rooms and tanks** : Keep away from incompatible materials.
For quality reasons: Keep at temperatures above 0 °C. Keep at temperatures below 30 °C.

**Packaging material** : Suitable material: plastic (PE, PP, PVC), fiberglass-reinforced polyester, rubber-coated steel Unsuitable material: Avoid contact with unalloyed steel or galvanized surfaces., stainless steel (AISI 304), materials not resistant to acid, Copper, Aluminium, Iron, Zinc, brass, titanium

### 7.3. Specific end use(s)

**Specific use(s)** : Do not use for other purposes than the identified uses.

## SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance.

### 8.1. Control parameters

**Occupational exposure limits**

| Substance name | End Use | Exposure routes | Potential health effects | Value |
|---|---|---|---|---|
| Iron trichloride | Workers | dermal | Long term, systemic effects | 8,15 mg/kg/day |
| Hydrochloric acid | Workers | inhalative, short term local | | 15 mg/m$^3$ |
| | Workers | inhalative, long term local | | 8 mg/m$^3$ |

### 8.2. Exposure controls

| | | |
|---|---|---|
| **Appropriate engineering controls** | : | Ensure adequate ventilation. |
| Individual protection measures | | |
| **Protective measures** | : | Eye wash bottle or emergency eye-wash fountain must be found in the work place. Handle in accordance with good industrial hygiene and safety practice. |
| **Eye/face protection** | : | Tightly fitting safety goggles and face-shield. (EN 166) |
| **Hand protection** | | |
| Material | : | PVC |
| Glove thickness | : | 0,5 mm |
| Material | : | Nitrile rubber |
| Glove thickness | : | 0,35 mm |
| Material | : | Natural Rubber |
| Glove thickness | : | 0,5 mm |
| Remarks | : | Protective gloves complying with EN 374. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time. Gloves should be removed and replaced immediately if there is any indication of degradation or chemical breakthrough. |
| **Skin and body protection** | : | Wear protective clothing if necessary. Use rubber boots. |
| **Respiratory protection** | : | Respiratory protection is not required under normal handling conditions. If aerosols or mist are formed, eg. when cleaning containers with a high pressure washer, use half mask with filter B2. |
| **Environmental exposure controls** | | |
| **Soil** | : | Prevent product from entering the environment. Restrict the spread of the spillage by using inert absorbent material (sand, gravel). Cover the drains. Must be disposed of in accordance with local and national regulations. |
| **Water** | : | If the product contaminates rivers and lakes or drains inform respective authorities. |

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

| | | |
|---|---|---|
| Physical state | : | Liquid |
| Color | : | dark brown |
| Odor | : | slightly acidic |
| Odor threshold | : | No data available |
| pH | : | ca. 1 Concentration: 100 % |
| Crystallisation point/range | : | -20 °C |
| Initial boiling point and boiling range | : | 100 - 105 °C |

| | | |
|---|---|---|
| Flash point | : | Not applicable, inorganic compound (In accordance with column 2 of REACH Annex VII, the study does not need to be conducted.) |
| Upper/lower flammability or explosive limits | : | Not applicable |
| Density | : | 1,38 - 1,46 g/cm3 |
| Relative vapour density | : | No data available |
| Solubility in water at room temperature (20 °Cl) | : | completely soluble, At dilution to less than 1% of FeCl3, precipitation of iron hydroxide occurs. |
| Partition coefficient: n-octanol/water | : | Not applicable inorganic compound |
| Auto-ignition temperature | : | No data available |
| Decomposition temperature | : | 315 °C |
| Viscosity, dynamic | : | 5 - 15 mPa.s (20 °C) |

**9.2. Other information**

| | | |
|---|---|---|
| Evaporation rate | : | No data available |
| Oxidizing properties | : | No data available |
| Surface tension | : | No data available |

## SECTION 10: Stability and reactivity

**10.1. Reactivity**

Corrosive to metals.

**10.2 Chemical stability**

Stable under normal conditions.

**10.3. Possibility of hazardous reactions**

| | | |
|---|---|---|
| Hazardous reactions | : | Bases cause exothermic reactions. Contact with certain metals may form hydrogen gas, which in turn may form explosive mixtures of gases with air. |

**10.4. Conditions to avoid**

| | | |
|---|---|---|
| Conditions to avoid | : | Avoid freezing. Avoid storage at high temperatures. |

**10.5. Incompatible materials**

| | | |
|---|---|---|
| Materials to avoid | : | Metals<br>Bases<br>Alkaline materials<br>Oxidizing agents<br>Reducing agents<br>Sulphites<br>Sulphides. |

**10.6 Hazardous decomposition products**

Heating above the decomposition temperature can cause formation of hydrogen chloride.

## SECTION 11: Toxicological information

### 11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

**Acute toxicity**

**Product**

| | | |
|---|---|---|
| Acute oral toxicity | : | Acute toxicity estimate: 950 - 1 700 mg/kg<br>Remarks: Harmful if swallowed. |

**Components**

**Iron trichloride**

| | | |
|---|---|---|
| Acute oral toxicity | : | LD50 (Rat): 500 mg/kg<br>Method: OECD Test Guideline 423<br>GLP: yes<br>Remarks: Read-across (Analogy)<br>CAS-No. 7758-94-3<br>LD50 (Rat): 220 mg/kg<br>Method: OECD Test Guideline 423<br>Remarks: Calculated as Fe<br>Acute toxicity estimate: 500 mg/kg |
| Acute inhalation toxicity | : | No observed adverse effect level: 1,1 mg/l<br>Method: EPA OPP 81-3 |
| Acute dermal toxicity | : | LD50 (Rat): > 2 000 mg/kg<br>Method: OECD Test Guideline 402<br>Remarks: Read-across (Analogy)<br>CAS-No. 7758-94-3<br>LD50 (Rat): > 881 mg/kg<br>Method: OECD Test Guideline 402<br>Remarks: Calculated as Fe |

**Hydrochloric acid**

| | | |
|---|---|---|
| Acute inhalation toxicity | : | LC50 (Rat): 4701 ppm<br>Exposure time: 30 min<br>Remarks: gas<br>LC50 (Rat): 8,3 mg/l<br>Exposure time: 30 min<br>Remarks: aerosol |
| Acute dermal toxicity | : | Remarks: No data available |

**Copper dichloride**

| | | |
|---|---|---|
| Acute oral toxicity | : | LD50 (Rat): 584 mg/kg<br>Acute toxicity estimate: 584 mg/kg |
| Acute inhalation toxicity | : | LD50 (Rat): 1 224 mg/l |
| Acute dermal toxicity | : | LD50 (Rat, female): 1 224 mg/kg<br>Acute toxicity estimate: 1 224 mg/kg |

**Nickel dichloride**

| | | |
|---|---|---|
| Acute oral toxicity | : | LD50 (Rat): 175 mg/kg<br>Method: OECD Test Guideline 401<br>Acute toxicity estimate: 175 mg/kg |
| Acute inhalation toxicity | : | LC50 (Rat): 0,59 mg/l<br>Acute toxicity estimate: 0,59 mg/l |

**Skin corrosion/irritation**

**Product**

| | | |
|---|---|---|
| Remarks | : | Irritation |

**Components**

**Iron trichloride**

| | | |
|---|---|---|
| Species | : | Rabbit |
| Method | : | OECD Test Guideline 404 |
| Result | : | irritating |
| GLP | : | yes |
| Test substance | : | ferrous sulfate heptahydrate |

**Hydrochloric acid**

| | | |
|---|---|---|
| Species | : | EPISKIN Human Skin Model Test |
| Exposure time | : | 1h |
| Method | : | OECD Test Guideline 431 |
| Result | : | Corrosive |
| GLP | : | yes |

**Nickel dichloride**

| | | |
|---|---|---|
| Assessment | : | Causes skin irritation. |

**Serious eye damage/eye irritation**

**Product**

| | | |
|---|---|---|
| Assessment | : | Corrosive |

**Components**

**Iron trichloride**

| | | |
|---|---|---|
| Species | : | Rabbit |
| Method | : | OECD Test Guideline 405 |
| Result | : | Causes serious eye damage. |
| GLP | : | yes |
| Remarks | : | Read-across (Analogy) 7758-94-3 dry substance |

**Hydrochloric acid:**

| | | |
|---|---|---|
| Species | : | Rabbit |
| Method | : | OECD Test Guideline 405 |
| Result | : | Risk of serious damage to eyes. |
| GLP | : | yes |
| Remarks | : | 0,1 ml, conc. 10 % |

**Respiratory or skin sensitisation**

**Product**

| | | |
|---|---|---|
| Assessment | : | May cause sensitisation by skin contact. |

**Components**

**Iron trichloride**

| | | |
|---|---|---|
| Test Type | : | Local lymph node assay (LLNA) |
| Species | : | Mouse |
| Method | : | OECD Test Guideline 429 |
| Result | : | Not sensitizing. |
| Test substance | : | ferrous sulfate |
| Assessment | : | May cause sensitisation by skin contact. |

**Hydrochloric acid**

| | | |
|---|---|---|
| Test Type | : | Maximisation Test |
| Exposure routes | : | Skin contact |
| Species | : | Guinea pig |
| Result | : | Not sensitizing. |

**Nickel dichloride**

| | | |
|---|---|---|
| Assessment | : | May cause sensitisation by inhalation and skin contact. |

**Germ cell mutagenicity**

**Product**

| | | |
|---|---|---|
| Genotoxicity in vitro | : | Remarks: Based on available data, the classification criteria are not met. |

**Components**

**Iron trichloride**

| | | |
|---|---|---|
| Genotoxicity in vitro | : | Test Type: Ames test<br>Test system: Salmonella typhimurium<br>Metabolic activation: with and without<br>Method: OECD Test Guideline 471<br>Result: negative<br>Test substance: ferric chloride |

**Hydrochloric acid:**

| | | |
|---|---|---|
| Genotoxicity in vitro | : | Test Type: In vitro mitotic recombination<br>Test system: Saccharomyces cerevisiae<br>Metabolic activation: with and without<br>Result: negative |

**Nickel dichloride**

| | | |
|---|---|---|
| Genotoxicity in vitro | : | Test Type: Chromosomal aberration test<br>Test system: Mouse<br>Result: positive |

**Carcinogenic**

**Product**

| | | |
|---|---|---|
| Remarks | : | Based on available data, the classification criteria are not met. |

**Components**

**Iron trichloride**

| | | |
|---|---|---|
| Species | : | Rat |
| Application Route | : | Oral |
| Exposure time | : | 2 years |
| NOAEL | : | > 0,5 % |
| Test substance | : | ferric chloride |

**Hydrochloric acid**

| | | |
|---|---|---|
| Species | : | Rat |
| Application Route | : | Inhalation |
| | : | 15 mg/m3 |
| Method | : | OECD Test Guideline 451 |

**Reproductive toxicity**

**Product**

| | | |
|---|---|---|
| Effects on fertility | : | Based on available data, the classification criteria are not met. |

**Components**

**Iron trichloride**

| | | |
|---|---|---|
| Effects on fertility | : | Test Type: Reproductive effects<br>Species: Rat<br>Application Route: Oral<br>General Toxicity - Parent: NOAEL: > 500 mg/kg bw/day<br>Method: OECD Test Guideline 422 |
| Effects on foetal development | : | Species: Rat<br>Application Route: Oral<br>Teratogenicity: NOAEL: > 1 000 mg/kg bw/day<br>Method: OECD Test Guideline 422 |

**Hydrochloric acid**

| | | |
|---|---|---|
| Effects on fertility | : | No data available |
| Effects on foetal development | : | No data available |

**Nickel dichloride**

| | | |
|---|---|---|
| Effects on fertility | : | Test Type: Two-generation study<br>Species: Rat<br>Application Route: Oral<br>General Toxicity - Parent: NOAEL: 10 mg/kg bw/day<br>General Toxicity F1: NOAEL: 10 mg/kg bw/day<br>Method: OECD Test Guideline 416<br>Application Route: Inhalation<br>General Toxicity - Parent: 1,8 mg/kg bw/day |
| Effects on foetal development | : | Species: Rat<br>Application Route: Oral<br>General Toxicity Maternal:<br>NOAEL: 10 mg/kg bw/day |

**Specific target organ toxicity - single exposure**

**Product**

| | | |
|---|---|---|
| Remarks | : | Based on available data, the classification criteria are not met. |

**Components**

**Iron trichloride**

| | | |
|---|---|---|
| Assessment | : | The substance or mixture is not classified as specific target organ toxicant, single exposure. |

**Hydrochloric acid**

| | | |
|---|---|---|
| Assessment | : | May cause respiratory irritation. |

**Specific target organ toxicity - repeated exposure**

**Product**

| | | |
|---|---|---|
| Remarks | : | Based on available data, the classification criteria are not met. |

**Components**

**Iron trichloride**

| | | |
|---|---|---|
| Assessment | : | The substance or mixture is not classified as specific target organ toxicant, repeated exposure. |

**Hydrochloric acid**

| | | |
|---|---|---|
| Assessment | : | The substance or mixture is not classified as specific target organ toxicant, repeated exposure. |

**Nickel dichloride**

| | | |
|---|---|---|
| Exposure routes | : | Inhalation |
| Target Organs | : | Lungs |
| Assessment | : | Causes damage to organs through prolonged or repeated exposure. |

**Repeated dose toxicity**

**Product**

| | | |
|---|---|---|
| Remarks | : | Based on available data, the classification criteria are not met. |

**Components**

**Iron trichloride**

| | | |
|---|---|---|
| Species | : | Rat, males |
| NOAEL | : | 277 mg/kg |
| LOAEL | : | 554 mg/kg |
| Application Route | : | Oral |
| Method | : | OECD Test Guideline 408 |
| Remarks | : | bw/day 90-day |
| Species | : | Rat, females |
| NOAEL | : | 314 mg/kg |
| Application Route | : | Oral |

| | | |
|---|---|---|
| Method | : | OECD Test Guideline 408 |
| Remarks | : | bw/day 90-day |

**Hydrochloric acid**

| | | |
|---|---|---|
| Species | : | Rat |
| | : | 30 mg/m3 |
| NOAEL | : | 0,03 mg/l |
| Application Route | : | Inhalation |
| Test atmosphere | : | gas |
| Exposure time | : | 90 d |
| Method | : | OECD Test Guideline 413 |
| GLP | : | yes |
| Target Organs | : | Systemic toxicity |
| Species | : | Rat |
| | : | 15 mg/m3 |
| NOAEL | : | 0,03 mg/l |
| Application Route | : | Inhalation |
| Test atmosphere | : | gas |
| Exposure time | : | 90 d |
| Method | : | OECD Test Guideline 413 |
| GLP | : | yes |
| Target Organs | : | Respiratory system |
| Remarks | : | May cause respiratory irritation. |

**Nickel dichloride**

| | | |
|---|---|---|
| | : | 0,12 mg/m3 |
| Application Route | : | Inhalation |
| Test substance | : | Nickel sulphate hexahydrate |

**Aspiration toxicity**

| | | |
|---|---|---|
| **Product** | : | No aspiration toxicity classification |

**Components**

| | | |
|---|---|---|
| Iron trichloride | : | No aspiration toxicity classification |
| Hydrochloric acid | : | No aspiration toxicity classification |

**11.2 Information on other hazards**

**Endocrine disrupting properties**

| | | |
|---|---|---|
| **Product** | : | The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher. |

**Experience with human exposure**

**Product**

| | | |
|---|---|---|
| Inhalation | : | Symptoms: Inhalation may provoke the following symptoms:, cough and difficulties in breathing |
| Skin contact | : | Symptoms: Skin contact may provoke the following symptoms:, irritation, burns |
| Eye contact | : | Symptoms: Contact with eyes may provoke the following symptoms:, |

| | | |
|---|---|---|
| | | Contact with eyes causes a smarting pain and a flood of tears., Causes burns. |
| Ingestion | : | Symptoms: Ingestion may provoke the following symptoms:, May cause irritation of the mucous membranes., burns in upper digestive organs |

**Further information**

**Product**

| | | |
|---|---|---|
| Test Type | : | Aspiration toxicity |
| Remarks | : | Based on available data, the classification criteria are not met. |

## SECTION 12: Ecological information

### 12.1. Toxicity

**Product**

| | | |
|---|---|---|
| Toxicity to fish | : | Remarks: Under standard test conditions, ferric iron salts have a high rate of conversion to insoluble ferric hydroxide, in consequence, Fe3+ is to a great extent removed from the test system. Furthermore, iron plays an important role in biological processes, with iron homeostasis being under strict control. In conclusion, iron is not considered to be toxic to the aquatic environment under normal conditions. The derivation of a realistic PNEC for the aquatic compartment is therefore not considered feasible. |
| Toxicity to terrestrial organisms | : | Remarks: No data is available on the product itself. |

**Components**

**Iron trichloride**

| | | |
|---|---|---|
| Toxicity to fish | : | Remarks: The compound is considered to have no long term effects in aquatic systems due to the rapid formation of insoluble hydroxides. |
| Toxicity to terrestrial organisms | : | Remarks: No data available |

**Hydrochloric acid**

| | | |
|---|---|---|
| Toxicity to fish | : | LC50 (Lepomis macrochirus (Bluegill sunfish)): 20,5 mg/l<br>Exposure time: 96 h<br>Test Type: semi-static test<br>GLP: no<br>Remarks: fresh water |
| Toxicity to daphnia and other aquatic invertebrates | : | EC50 (Daphnia magna (Water flea)): 0,45 mg/l<br>Exposure time: 48 h<br>Test Type: static test<br>Method: OECD Test Guideline 202 |

| | | |
|---|---|---|
| Toxicity to algae/aquatic plants | : | EC50 (Chlorella vulgaris (Fresh water algae)): 0,73 mg/l<br>Test Type: static test<br>Method: OECD Test Guideline 201<br>Remarks: Fresh water |

**Copper dichloride**

| | | |
|---|---|---|
| M-Factor (Acute aquatic toxicity) | : | 10 |

**Nickel dichloride**

| | | |
|---|---|---|
| Toxicity to fish | : | LC50 (Oncorhynchus mykiss (rainbow trout)): 15,3 mg/l<br>Exposure time: 96 h<br>Test Type: Short-term (acute) aquatic hazard<br>Test substance: Nickel<br>NOEC (Danio rerio (zebra fish)): 0,04 mg/l<br>Exposure time: 16 d<br>Test Type: Chronic toxicity<br>Test substance: Nickel |
| Toxicity to daphnia and other aquatic invertebrates | : | LC50 (Ceriodaphnia dubia (water flea)): 0,013 mg/l<br>Exposure time: 48 h |
| M-Factor (Chronic aquatic toxicity) | : | 1 |

### 12.2 Persistence and degradability

**Product**

| | | |
|---|---|---|
| Biodegradability | : | Remarks: The methods for determining the biological degradability are not applicable to inorganic substances. |

**Components**

**Iron trichloride**

| | | |
|---|---|---|
| Biodegradability | : | Remarks: The methods for determining the biological degradability are not applicable to inorganic substances. |

**Hydrochloric acid**

| | | |
|---|---|---|
| Biodegradability | : | Remarks: The methods for determining the biological degradability are not applicable to inorganic substances. |

**Nickel dichloride**

| | | |
|---|---|---|
| Biodegradability | : | Remarks: The methods for determining the biological degradability are not applicable to inorganic substances. |

### 12.3 Bioaccumulative potential

**Components**

**Iron trichloride**

| | | |
|---|---|---|
| Partition coefficient: n-octanol/water | : | Remarks: Not applicable inorganic compound |

**Hydrochloric acid**

| | | |
|---|---|---|
| Partition coefficient: n-octanol/water | : | Remarks: Not applicable inorganic compound |

### 12.4 Mobility in soil

| | | |
|---|---|---|
| **Soil/water partition coefficient (KOC)** | : | No data available |
| **Mobility** | : | No data available |

### 12.5 Results of PBT and vPvB assessment

| | | |
|---|---|---|
| **Product** Assessment | : | This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher. |
| **Components** **Hydrochloric acid** Assessment | : | This substance is not considered to be a PBT (Persistent, Bioaccumulation, Toxic). This substance is not considered to be vPvB (very Persistent nor very Bioaccumulating) |

### 12.6 Endocrine disrupting properties

| | | |
|---|---|---|
| **Product** Assessment | : | The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher. |

### 12.7 Other adverse effects

| | | |
|---|---|---|
| **Product** Additional ecological information | : | May lower the pH of water and thus be harmful to aquatic organisms. |

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

| | | |
|---|---|---|
| **Product** | : | Classified as hazardous waste.<br>Must be disposed of in accordance with local and national regulations.<br>Dilute residues with water and then neutralize with lime or limestone powder.<br>Do not dispose of waste into sewer. |
| **Contaminated packaging** | : | Classified as hazardous waste.<br>Must be disposed of in accordance with local and national regulations. |

## SECTION 14: Transport information

| | ADR/RID | IMDG | IATA |
|---|---|---|---|
| **14.1. UN Number** | UN 2582 | UN 2582 | UN 2582 |
| **14.2. UN Proper Shipping Name** | FERRIC CHLORIDE SOLUTION<br>(Ferric chloride) | FERRIC CHLORIDE SOLUTION<br>(Ferric chloride) | Ferric chloride solution<br>(Ferric chloride) |
| **14.3. Transport Hazard Class(es)** | 8 | 8 | 8 |
| **14.4. Packing Group** | Packing group : III<br>Classification Code : C1<br>Hazard Identification Number : 80<br>Labels : 8<br>Tunnel restriction code : (E) | Packing group : III<br>Labels : 8<br>EmS Code : F-A, S-B | Packing instruction (cargo aircraft) : 856<br>Packing instruction (LQ) : Y841<br>Packing group : III<br>Labels : Corrosive |
| **14.5. Environmental Hazards** | No | No | |
| **14.6. Special Precautions for users** | The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations. | | |

**14.7 Maritime transport in bulk according to IMO instruments.**

Not applicable for product as supplied.

## SECTION 15: Regulatory information

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

**REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII):**
Conditions of restriction for the following entries should be considered: Number on list 3
**Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals:**
Not applicable.

**Other regulations:**
No restrictions identified other than those already covered in regulations.

**The components of this product are reported in the following inventories:**

**IECSC** : This product's Chinese Chemical Inventory status has not been determined.

**TCSI** : This product's Taiwan Toxic Chemical Substances Control Act Inventory status has NOT been determined.

**KECI** : This product's Korean (ECL) inventory status has NOT been determined.

| | | |
|---|---|---|
| **ENCS** | : | This product's Japanese (ENCS) inventory status has NOT been determined. |
| **AIIC** | : | This product's Australian Inventory of Industrial Chemicals (AIIC) status has not been determined. |
| **NZIoC** | : | This product's New Zealand Inventory of Chemical Substances (NZIoC) status has NOT been determined. |
| **PICCS** | : | This product's Philippine (PICCS) inventory status has NOT been determined. |

**15.2 Chemical Safety Assessment:**

A Chemical Safety Assessment has been carried out for the main component.

## SECTION 16: Other information

The data is confirmed based on the state of our knowledge, but does not determine how the production properties and cannot be used to justify legally binding contracts.

Abbreviations; acronyms and full text of H-Statements

| | | |
|---|---|---|
| **H290** | : | May be corrosive to metals. |
| **H301** | : | Toxic if swallowed. |
| **H302** | : | Harmful if swallowed. |
| **H312** | : | Harmful in contact with skin. |
| **H314** | : | Causes severe skin burns and eye damage. |
| **H315** | : | Causes skin irritation. |
| **H317** | : | May cause an allergic skin reaction. |
| **H318** | : | Causes serious eye damage. |
| **H331** | : | Toxic if inhaled. |
| **H334** | : | May cause allergy or asthma symptoms or breathing difficulties if inhaled. |
| **H335** | : | May cause respiratory irritation. |
| **H341** | : | Suspected of causing genetic defects. |
| **H350i** | : | May cause cancer by inhalation. |
| **H360D** | : | May damage the unborn child. |
| **H372** | : | Causes damage to organs through prolonged or repeated exposure. |
| **H400** | : | Very toxic to aquatic life. |
| **H410** | : | Very toxic to aquatic life with long lasting effects. |
| **REACH** | : | Registration, Evaluation, Authorisation and Restriction of Chemical |
| **MARPOL** | : | (from Marine Pollutant) International Convention for the Prevention of Marine Pollution from Ships |
| **N/A** | : | Not applicable |
| **N/D** | : | Not determined |
| **NE** | : | Not established |
| **VOC** | : | Volatile Organic Compound |
| **AICS** | : | Australian Inventory of Chemical Substances |

| | | |
|---|---|---|
| **AIHA WEEL** | : | American Industrial Hygiene Association Workplace Environmental Exposure Limits |
| **DSL** | : | Domestic Substance List (Canada) |
| **ELINCS** | : | European List of Notified Chemical Substances |
| **ENCS** | : | Existing and new Chemical Substances (Japanese inventory) |
| **IECSC** | : | Inventory of Existing Chemical Substances in China |
| **KECI** | : | Korean Existing Chemicals Inventory |
| **NDSL** | : | Non-Domestic Substances List (Canada) |
| **NZIoC** | : | New Zealand Inventory of Chemicals |
| **PICCS** | : | Philippine Inventory of Chemicals and Chemical Substances |
| **TLV** | : | Threshold Limit Value (American Conference of Governmental Industrial Hygienists) |
| **TSCA** | : | Toxic Substances Control Act (U.S. inventory) |
| **UVCB** | : | Substances of Unknown or Variable composition, Complex reaction products or Biological materials |
| **IBC Code** | : | International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk |
| **UN** | : | United Nations (also UNO: United Nations Organization) |
| **NOEC** | : | No Observed Effect Concentration |
| **NOELR** | : | No Observable Effect Loading Rate |
| **OECD** | : | Organization for Economic Co-operation and Development |
| **ASTM** | : | American Society for Testing and Materials |
| **WAF** | : | Water Accommodated Fraction |
| **ADR** | : | Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road) |
| **IMDG** | : | International Maritime Code for Dangerous Goods |
| **IATA** | : | International Air Transport Association |
| **GHS** | : | Globally Harmonised System of Classification and Labeling of Chemicals |
| **EINECS** | : | European Inventory of Existing Commercial Chemical Substances |
| **CAS** | : | Chemical Abstracts Service (division of the American Chemical Society) |
| **DNEL** | : | Derived No-Effect Level (REACH) |
| **PNEC** | : | Predicted No-Effect Concentration (REACH) |
| **LC** | : | Lethal Concentration |
| **LD** | : | Lethal Dose |
| **LL** | : | Lethal Loading |
| **EC** | : | Effective Concentration |
| **EL** | : | Effective Loading |
| **LC50** | : | Lethal concentration, 50 percent |
| **LD50** | : | Lethal dose, 50 percent |
| **PBT** | : | Persistent, Bioaccumulative and Toxic |
| **vPvB** | : | very Persistent and very Bioaccumulative |
| **Acute Tox, 4** | : | Acute toxicity - Category 4 |

| | | |
|---|---|---|
| **Notice to reader** | : | The information contained herein is accurate to the latest knowledge and describes the product from the point of view of help and environmental protection as well as safe handling. The information presented in this SDS refers to the technical product only and will not apply to any processed product. Final determination of the suitability of any materials for the chosen application(s) is the sole responsibility of the user" |