



# C.I.F

## SAFETY DATA SHEET

July 2011

FDS 11.07

### 1. Name of substance / preparation and company

#### Product information

Item name :

HEXAHYDRATED FERRIC CHLORIDE Ref : AR37 AR371

#### Identification of the substance or the preparation

Product name : HEXAHYDRATED FERRIC CHLORIDE  
Chemical name : Iron trichloride hexahydrated  
Synonym(s) : Iron chloride III hexahydrated, Iron perchloride hexahydrated  
Commercial Name : FeCl<sub>3</sub> 60%  
Formula : FeCl<sub>3</sub>·6H<sub>2</sub>O  
Molecular Weight : 270,31  
EC Number (EINECS) : 231-729-4

#### Company : CIF

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### 2. Hazards identification

Toxicity effects principally related to its corrosive properties.  
In case of decomposition, releases dangerous products.

### 3. Composition/ information on ingredients

#### • Ferric chloride

CAS Number	10025-77-1
EC Number (EINECS)	231-729-4
Symbols	C
Phrases R	34, 22, 52/53
Concentration	60,00 %

### 4. First-aid measures

#### General recommendations

- Strict hygiene during and at the end of working shifts.
- Personal protective equipment required for rescuers (see section 8).
- In case of product splashing into the eyes and face, treat eyes first. Submerge soiled clothing in a basin of water.

#### Effects

##### Main effects

- Irritating to skin; corrosive to mucous membrane and eyes.
- The seriousness of the lesions and the prognosis of intoxication depend directly on the concentration and duration of exposure.
- Risk of liver effects.
- Fatalities have been observed after a single dose of 30 grams and more taken by an adult weighing 70 kg.
- Chronic exposure to the product can induce iron accumulation in tissues characterized by redbrown deposits,

#### Inhalation

Severe irritation of the nose and the throat,  
Cough and difficulty in breathing.

In case of repeated or prolonged exposure: risk of sore throat, nose bleeds, chronic bronchitis.

In case of repeated or prolonged exposure: risk of brown colouration of teeth,

#### Eyes contact

Severe eye irritation, watering, redness and swelling of the eyelids.

Burns.

Risk of serious or permanent eye lesions.

#### **4. First-aid measures**

##### **Skin contact**

Irritation.

When in contact with bare skin, risk of burns.

In case of repeated contact: risk of allergic dermatitis.

On contact with broken skin, risk of persistent pigmentation

##### **Ingestion**

Low probability of risk (stinging odour). Severe irritation and risk of burns to the mouth, throat, esophagus and stomach.

Nausea, vomiting (bloody), abdominal cramps and diarrhea (bloody).

Risk of shock.

Risk liver and kidney alterations.

Risk of chemical pneumonitis and pulmonary (o)edema resulting from aspiration during vomiting.

By ingestion of large quantities: risk of convulsions, coma.

##### **First aid**

Inhalation

Remove the subject from the contaminated area as soon as possible; transport him/her lying down, with the head higher than the body, to a quiet, uncontaminated and well-ventilated location.

Oxygen or pulmonary resuscitation if necessary.

Keep warm (blanket).

Consult with a physician in all cases.

##### **Eyes contact**

Consult with an ophthalmologist immediately in all cases.

Flush eyes as soon as possible with running water for 15 minutes, while keeping the eyelids wide open.

In the case of difficulty of opening the lids, administer an analgesic eye wash (oxybuprocaine)

##### **Skin contact**

Remove contaminated shoes, socks and clothing under the shower if necessary; wash the affected skin with soap and water.

Clean clothing.

Consult with a physician in case of persistent pain or redness.

##### **Ingestion**

General recommendations

Consult with a physician immediately in all cases.

Take to hospital.

If the subject is completely conscious:

Rinse mouth with fresh water.

Do not induce vomiting.

If the subject presents nervous, respiratory or cardiovascular disorders: administer oxygen.

If the subject is unconscious:

Classical resuscitation measures.

##### **Medical treatment**

Inhalation

Pulmonary resuscitation (oxygen therapy). Prevention or treatment of pulmonary (o)edema and bacterial secondary infection.

##### **Eyes contact**

On the advice of the ophthalmologist.

##### **Skin contact**

Usual treatment for burns.

##### **Ingestion**

Gastric lavage with a saline solution

In case of intense pain: inject an I.M. morphomimetic analgesic drug (pirtamide) before taking to hospital.

Prevention or treatment for shock.

I.V. perfusion of desferrioxamine (40 mg/kg every 3 hrs) associated with hemodialysis in the case of renal failure.

Surveillance of hepatic and renal functions.

Surveillance of the glycaemia and coagulation tests.

Treatment of gastrointestinal tract burns and resulting effects.

## 5. Fire-fighting measures

### Common extinguishing means

- In case of fire in close proximity, all means of extinguishing are acceptable.

### Inappropriate extinguishing means

- No restriction.

### Specific hazards

- Non-combustible
- Formation of dangerous gas/vapours in case of decomposition (see section 10).
- Formation of flammable gas on contact with certain metals (see 10).
- Exothermic reaction on contact with water.

### Protective measures in case of intervention

- Evacuate all non-essential personnel.
- Intervention only by capable personnel who are trained and aware of the hazards of the product.
- Wear self contained breathing apparatus when in close proximity or in confined spaces.
- When intervention in close proximity wear acid resistant over suit.
- After intervention, proceed to clean the equipment (take a shower, remove clothing carefully, clean and check),

### Other precautions

- Disperse gas/vapours with water spray.
- After the fire, proceed rapidly to clean the surfaces exposed to the fumes in order to limit the damage to the equipment.
- As for any fire, ventilate and clean the rooms before re-entry.

## 6. Accidental release measures

### Precautions

Follow the protective measures given in section 8

Disperse gas/vapours with water spray.

### Cleanup methods

- Collect the product with suitable means avoiding dust formation.
- Place everything into a closed, labelled container compatible with the product.
- For disposal methods, refer to section 13.
- Clean the area with large quantities of water.

### Precautions for protection of the environment

- Do not discharge into the environment (sewers, rivers, soils, ...).
- Immediately notify the appropriate authorities in case of significant discharge.

## 7. Handling and storage

### Handling

- Keep away from reactive products (see section 10).
- Use only equipment and materials which are compatible with the product.

### Storage

- Keep in original packaging, closed.
- Keep away from reactive products (see section 10).
- Keep away from heat sources.

### Other precautions

- Follow the protective measures given in section 8.
- Warn people about the dangers of the product.

### Packaging

- Carton + PE.

## 8. Exposure controls/personal protection

### Engineering controls

- Provide local ventilation suitable for the product decomposition risk (see section 10),
- Follow the protective measures given in section 7.
- Maintain employee exposures to levels below the applicable exposure limits.

### Authorized limit values Ferric chloride

Ferric chloride

TLV (ACGIH-USA)

TWA = 1 mg/m<sup>3</sup>

Remark: In Iron, soluble components as Fe

## 8. Exposure controls/personal protection

### Respiratory protection

- In case of emissions and dust clouds/fog/fumes, face mask with combined type B-P2 cartridge.
  - Self-contained breathing apparatus in medium confinement/insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.
- Use only respiratory protection that conforms to international / national standards.

### Hand protection

- Protective gloves - chemical resistant:
- Recommended materials: PVC, neoprene, rubber

### Eye protection

Chemical proof goggles/face shield obligatory.

### Skin protection

- Protective clothing suitable for the handling of chemicals.
- Apron/boots of PVC in case of dusts.

### Other precautions

- Shower and eye wash stations.

Consult the industrial hygienist or the safety manager for the selection of personal protective equipment suitable for the working conditions.

## 9. Physical and chemical properties

**Appearance :** Hygroscopic crystals

**Color/Colour :** Yellow-brown-orange

**Odor/Odour :** odorless

### Change of state

- Melting point/range:  
37 °C
- Boiling point/range  
(1013 mbars):  
from 280 - 285 °C

### Flash point

- Not applicable

### Density

- Specific gravity 1,66

### Solubility

- Water 920 g/l (20°C)
- Remark : Dissolution with heat release
- Soluble in common organic solvents pH2
- Concentration 27 g/l

### Partition coefficient $P$ (n-octanol/water)

- Not applicable

### Decomposition temperature

- 160° Cel

### Danger of explosion

- Non-explosive
- Remark: See also section 10

## 10. stability and reactivity

### Stability

- Stable under certain conditions (see below).
- Formation of dangerous products in case of decomposition.

### Conditions to avoid

- Heating the product to its decomposition temperature (see section 9).

Moisture

### Materials to avoid

- Metals
- Strong bases
- Oxidizing agents
- Water

#### Hazardous decomposition products

- Chlorine
- Hydrogen
- Hydrochloric acid.

#### Other information

- Corrosive action with many metals.
- In presence of humidity, contact with metals releases hydrogen
- Contact with strong bases or alkaline materials may cause violent reactions or explosions.
- Contact with water releases heat.

### **11. Toxicological / information**

#### Acute toxicity

- Oral route, LD 50, rat, 1.872 mg/kg

#### Irritation

- Rabbit, irritant (skin)(Anhydrous ferric chloride)
- Rabbit, serious damage (eyes)(Anhydrous ferric chloride)

#### Chronic toxicity

- Oral route (water), after prolonged exposure, rat, Target organ: gastro-intestinal system / hematology system / liver, 10 mg/l (in iron)
- No mutagenic effect

#### Comments

Toxic effect linked with corrosive properties

### **12. Ecological information**

#### Acute ecotoxicity

- (Anhydrous form)
- Fishes, *Gambusia affinis*, LC 50, 96 h, 75,6 mg/l
- Crustaceans, *Daphnia magna*, EC 50, 48 h, 27,9 mg/l

#### Chronic ecotoxicity

- (Anhydrous form)
- Fishes, *Gasterosteus aculeatus*, LC 100, 10 d, 2,9 mg/l
- Crustaceans, *Daphnia magna*, EC 50, reproduction, 21 d, 15,1 mg/l
- Algae, *Chlorella vulgaris*, NOEC, growth, 120 d, 2,7 mg/l

#### Mobility

- Water  
Result: considerable solubility and mobility
- Soil/sediments  
Result: absorption on mineral and organic soil constituents

#### Abiotic degradation

- Water  
Result: significant hydrolysis  
Conditions: surface water  
Degradation's products: ferric iron (pH < 3) / ferric hydroxide (pH > 3)
- Water, reduction  
Conditions: groundwater Degradation's products: iron (II)
- Water/soil  
Result: complexation/precipitation of inorganic and organic materials

#### Biotic degradation

- Result: not applicable (inorganic compound)
- Effects on biological treatment plants, inhibition  $\geq 100$  mg/l  
Result as iron.

## 12. Ecological information

### Potential for bioaccumulation

Bioconcentration: Molluscs, *Mytilus edulis*, BCF from 2.756 - 9.622 , 42 day(s)

Conditions: test concentration: 0,01 ppm

Result as iron.

### Comments

- Harmful for aquatic organisms.
- Fe II/Fe III ionic pair is responsible for heavy metals (traces) attenuation by complexation/precipitation processes depending on pH.
- Product fate is highly depending on environmental conditions: pH, temperature, oxidoreductive potential, mineral and organic content of the medium ....

## 13. Disposal considerations

### Waste treatment

Dispose in compliance with local/federal and national regulations

Contact waste exchanges for recycling.

Or

Dissolve in water.

Neutralise the product with a base (sodium carbonate, lime, ...).

Filtrate the product and send the cake to a landfill for industrial waste.

### Packaging treatment

To avoid treatments, as far as possible, use dedicated containers.

If not,

Rinse the empty containers with plenty of water and treat the effluent in the same way as waste.

Or

Dispose of the containers by dispatching them to an approved industrial incineration facility.

The empty and clean containers are to be reused in conformity with regulations.

## 14. Transport information

- Not subject

## 15. Regulatory information

### EEC Labelling

- Name of dangerous product(s) (to indicate on the label):

Hexahydrated iron trichloride

- Labelling according to Article 6 of Dir. 92/32/EEC.

Symbols	C	Corrosive
Phrases R	22	Harmful if swallowed.
	34	Causes burns.
	52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Phrases S	26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
	27	Take off immediately all contaminated clothing.
	36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
	45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
	56	Dispose of this material and its container at hazardous or special waste collection point.
	64	If swallowed, rinse mouth with water (only if the person is conscious).

## 16. Other information

### Reason for update

- Update:
- sections 13 - 16.

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