



## FERRIC CHLORIDE HEXAHYDRATE

GHS Safety Data Sheet

Version No:5

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### Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

#### PRODUCT NAME

FERRIC CHLORIDE, HEXAHYDRATE

#### OTHER NAMES

$\text{FeCl}_3 \cdot 6\text{H}_2\text{O}$ ,  $\text{Fe-Cl}_3\text{-H}_{12}\text{-O}_6$ , "ferric trichloride hexahydrate", "iron trichloride hexahydrate", "iron(3+) chloride hexahydrate", "ferric chloride hexahydrate", "ferric chloride reagent grade"

#### PROPER SHIPPING NAME

CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.  
(contains ferric chloride, hexahydrate)

#### PRODUCT USE

In treatment of sewerage and industrial wastes; etching agent for engraving, photography and printing. A condensation catalyst in Friedel-Crafts reactions; mordant; oxidising, chlorinating and condensing agent. Also a disinfectant; feed additive; and used in water purification.

#### SUPPLIER

Company: S D FINE- CHEM LIMITED

Address:

315- 317, T.V. INDUSTRIAL ESTATE,

248, WORLI,

MUMBAI- 400030.INDIA.

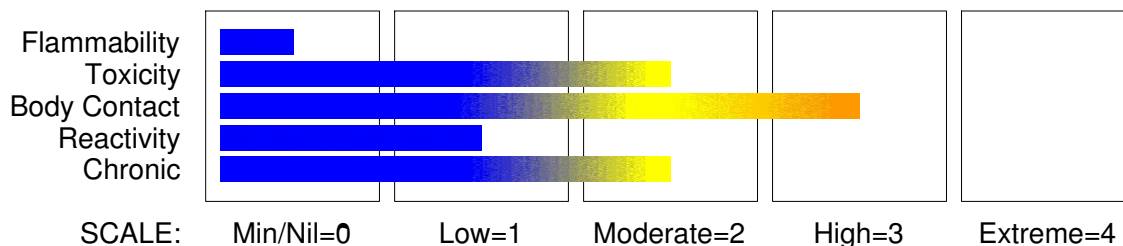
technical@sdfine.com

Telephone: 91- 22- 24959898

Telephone: 91- 22- 24959899

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#### HAZARD RATINGS



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## Section 2 - HAZARDS IDENTIFICATION

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### GHS Classification

Acute Toxicity (Oral) Category 4

Metal Corrosion Category 1

Skin Corrosion/Irritation Category 1C



### EMERGENCY OVERVIEW

#### HAZARD

DANGER

Determined using GHS criteria:

H302 H290 H314

Harmful if swallowed

May be corrosive to metals

Causes severe skin burns and eye damage

#### PRECAUTIONARY STATEMENTS

##### Prevention

Wash hands thoroughly after handling.

Do not eat, drink or smoke when using this product.

Do not breathe dust or mist.

Wear protective gloves/clothing and eye/face protection.

Wash thoroughly after handling.

##### Response

Immediately call a POISON CENTER or doctor/physician.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.

If on skin or hair: remove/take off immediately all contaminated clothing. Rinse with water/shower.

Absorb spillage to prevent material damage.

Wash contaminated clothing before reuse.

Specific treatment: refer to Label or MSDS.

##### Storage

Store in a corrosive resistant container with a resistant liner.

Store locked up.

##### Disposal

Dispose of contents and container in accordance with relevant legislation.

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## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

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| NAME                         | CAS RN     | %    |
|------------------------------|------------|------|
| ferric chloride, hexahydrate | 10025-77-1 | > 99 |

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## Section 4 - FIRST AID MEASURES

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### SWALLOWED

- For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

### EYE

- If this product comes in contact with the eyes:
- Immediately hold eyelids apart and flush the eye continuously with running water.
  - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
  - Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
  - Transport to hospital or doctor without delay.
  - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

- If skin or hair contact occurs:
- Immediately flush body and clothes with large amounts of water, using safety shower if available.
  - Quickly remove all contaminated clothing, including footwear.
  - Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
  - Transport to hospital, or doctor.

### INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor.

### NOTES TO PHYSICIAN

- For acute or short term repeated exposures to iron and its derivatives:
- Always treat symptoms rather than history.

continued...

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## Section 4 - FIRST AID MEASURES

- In general, however, toxic doses exceed 20 mg/kg of ingested material (as elemental iron) with lethal doses exceeding 180 mg/kg.
  - Control of iron stores depend on variation in absorption rather than excretion. Absorption occurs through aspiration, ingestion and burned skin.
  - Hepatic damage may progress to failure with hypoprothrombinaemia and hypoglycaemia. Hepatorenal syndrome may occur.
  - Iron intoxication may also result in decreased cardiac output and increased cardiac pooling which subsequently produces hypotension.
  - Serum iron should be analysed in symptomatic patients. Serum iron levels (2-4 hrs post -ingestion) greater than 100 ug/dL indicate poisoning with levels, in excess of 350 ug/dL, being potentially serious. Emesis or lavage (for obtunded patients with no gag reflex) are the usual means of decontamination.
  - Activated charcoal does not effectively bind iron.
  - Catharsis (using sodium sulfate or magnesium sulfate) may only be used if the patient already has diarrhoea.
  - Deferoxamine is a specific chelator of ferric (3+) iron and is currently the antidote of choice. It should be administered parenterally. [Ellenhorn and Barceloux: Medical Toxicology].
- For acute or short term repeated exposures to strong acids:
- Airway problems may arise from laryngeal edema and inhalation exposure. Treat with 100% oxygen initially.
  - Respiratory distress may require cricothyroidotomy if endotracheal intubation is contraindicated by excessive swelling
  - Intravenous lines should be established immediately in all cases where there is evidence of circulatory compromise.
  - Strong acids produce a coagulation necrosis characterised by formation of a coagulum (eschar) as a result of the dessicating action of the acid on proteins in specific tissues.

### INGESTION:

- Immediate dilution (milk or water) within 30 minutes post ingestion is recommended.
- DO NOT attempt to neutralise the acid since exothermic reaction may extend the corrosive injury.
- Be careful to avoid further vomit since re-exposure of the mucosa to the acid is harmful. Limit fluids to one or two glasses in an adult.
- Charcoal has no place in acid management.
- Some authors suggest the use of lavage within 1 hour of ingestion.

### SKIN:

- Skin lesions require copious saline irrigation. Treat chemical burns as thermal burns with non-adherent gauze and wrapping.
- Deep second-degree burns may benefit from topical silver sulfadiazine.

### EYE:

- Eye injuries require retraction of the eyelids to ensure thorough irrigation of the conjunctival cul-de-sacs. Irrigation should last at least 20-30 minutes. DO NOT use neutralising agents or any other additives. Several litres of saline are required.
  - Cycloplegic drops, (1% cyclopentolate for short-term use or 5% homatropine for longer term use) antibiotic drops, vasoconstrictive agents or artificial tears may be indicated dependent on the severity of the injury.
  - Steroid eye drops should only be administered with the approval of a consulting ophthalmologist).
- [Ellenhorn and Barceloux: Medical Toxicology].

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## Section 5 - FIRE FIGHTING MEASURES

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### EXTINGUISHING MEDIA

- Water spray or fog.
- Foam.
- Dry chemical powder.
- BCF (where regulations permit).
- Carbon dioxide.

### FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.
- Do not approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

### FIRE/EXPLOSION HAZARD

- Non combustible.
  - Not considered to be a significant fire risk.
  - Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
  - Heating may cause expansion or decomposition leading to violent rupture of containers.
  - May emit corrosive, poisonous fumes. May emit acrid smoke.
- Decomposition may produce toxic fumes of: hydrogen chloride, metal oxides.

### FIRE INCOMPATIBILITY

None known.

### Personal Protective Equipment

Breathing apparatus.  
Gas tight chemical resistant suit.  
Limit exposure duration to 1 BA set 30 mins.

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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### EMERGENCY PROCEDURES

#### MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact by using protective equipment.
- Use dry clean up procedures and avoid generating dust.
- Place in a suitable labelled container for waste disposal.

#### MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.

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## Section 6 - ACCIDENTAL RELEASE MEASURES

- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation (or protect in place).
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Neutralise/decontaminate residue.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

### EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

ferric chloride, hexahydrate 200 mg/m<sup>3</sup>

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

ferric chloride, hexahydrate 15 mg/m<sup>3</sup>

other than mild, transient adverse effects without perceiving a clearly defined odour is:

ferric chloride, hexahydrate 7.5 mg/m<sup>3</sup>

The threshold concentration below which most people will experience no appreciable risk of health effects:

ferric chloride, hexahydrate 3 mg/m<sup>3</sup>

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

|                 |          |               |         |
|-----------------|----------|---------------|---------|
| Very Toxic (T+) | >= 0.1%  | Toxic (T)     | >= 3.0% |
| R50             | >= 0.25% | Corrosive (C) | >= 5.0% |
| R51             | >= 2.5%  |               |         |
| else            | >= 10%   |               |         |

where percentage is percentage of ingredient found in the mixture

### SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS



+: May be stored together

O: May be stored together with specific precautions

X: Must not be stored together

Personal Protective Equipment advice is contained in Section 8 of the MSDS.

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## Section 7 - HANDLING AND STORAGE

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### PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Avoid contact with moisture.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately. Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

### SUITABLE CONTAINER

DO NOT use aluminium or galvanised containers.

- Lined metal can, lined metal pail/ can.
- Plastic pail.
- Polyliner drum.
- Packing as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
  - Where a can is to be used as an inner package, the can must have a screwed enclosure.
- For materials with a viscosity of at least 2680 cSt. (23 deg. C) and solids (between 15 C deg. and 40 deg C.):

- Removable head packaging;
  - Cans with friction closures and
  - low pressure tubes and cartridges
- may be used.

-

Where combination packages are used, and the inner packages are of glass, porcelain or stoneware, there must be sufficient inert cushioning material in contact with inner and outer packages unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.

### STORAGE INCOMPATIBILITY

Reacts with water or steam to produce toxic and corrosive fumes.

- Inorganic acids are generally soluble in water with the release of hydrogen ions. The resulting solutions have pH's of less than 7.0.
- Inorganic acids neutralise chemical bases (for example: amines and inorganic hydroxides) to form salts.
- Neutralisation can generate dangerously large amounts of heat in small spaces.
- The dissolution of inorganic acids in water or the dilution of their concentrated solutions with additional water may generate significant heat.
- The addition of water to inorganic acids often generates sufficient heat in the small region of mixing to cause some of the water to boil explosively. The resulting "bumping"

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## Section 7 - HANDLING AND STORAGE

can spatter the acid.

- Inorganic acids react with active metals, including such structural metals as aluminum and iron, to release hydrogen, a flammable gas.
  - Inorganic acids can initiate the polymerisation of certain classes of organic compounds.
  - Inorganic acids react with cyanide compounds to release gaseous hydrogen cyanide.
  - Inorganic acids generate flammable and/or toxic gases in contact with dithiocarbamates, isocyanates, mercaptans, nitrides, nitriles, sulfides, and strong reducing agents. Additional gas-generating reactions occur with sulfites, nitrites, thiosulfates (to give H<sub>2</sub>S and SO<sub>3</sub>), dithionites (SO<sub>2</sub>), and even carbonates.
  - Acids often catalyze (increase the rate of) chemical reactions.
- Metals and their oxides or salts may react violently with chlorine trifluoride. Chlorine trifluoride is a hypergolic oxidiser. It ignites on contact (without external source of heat or ignition) with recognised fuels - contact with these materials, following an ambient or slightly elevated temperature, is often violent and may produce ignition. The state of subdivision may affect the results.
- Avoid strong bases.
- Avoid reaction with oxidising agents.
- Avoid contact with metals and their alloys. Forms explosive mixtures with sodium, potassium and allyl chloride

### STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

The following materials had no OELs on our records

- ferric chloride, hexahydrate:

CAS:10025- 77- 1 CAS:7705- 08- 0

### MATERIAL DATA

The recommended TLV is thought to reduce the likelihood of respiratory irritation and skin irritation from exposure to aerosols and mists of soluble iron salts.

### PERSONAL PROTECTION



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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

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### EYE

- Chemical goggles.
- Full face shield may be required for supplementary but never for primary protection of eyes
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

### HANDS/FEET

Suitability and durability of glove type is dependent on usage. Factors such as:

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity,

are important in the selection of gloves.

Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

### OTHER

- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

For further information consult

your

Occupational Health and Safety Advisor.

### ENGINEERING CONTROLS

- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.

- If in spite of local exhaust an adverse concentration of the substance in air could occur, respiratory protection should be considered.

Such protection might consist of:

- (a): particle dust respirators, if necessary, combined with an absorption cartridge;
- (b): filter respirators with absorption cartridge or canister of the right type;
- (c): fresh-air hoods or masks.

Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:

Air Speed:

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)  
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).

1- 2.5 m/s (200- 500 f/min.)

2.5- 10 m/s (500- 2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range

1: Room air currents minimal or favourable to capture

2: Contaminants of low toxicity or of nuisance value only.

3: Intermittent, low production.

4: Large hood or large air mass in motion

Upper end of the range

1: Disturbing room air currents

2: Contaminants of high toxicity

3: High production, heavy use

4: Small hood- local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 4-10 m/s (800-2000 f/min) for extraction of crusher dusts generated 2 metres distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### APPEARANCE

Brownish yellow or orange crystals with a slight odour of hydrogen chloride.

Soluble in water, alcohol, glycerol, methanol, acetone and ether.

Very hygroscopic. In presence of moisture, is corrosive to most metals and alloys.

### PHYSICAL PROPERTIES

Mixes with water.

Corrosive.

Acid.

Contact with water liberates toxic gas.

Molecular Weight: 270.32

Melting Range (°C): 37 approx.

Solubility in water (g/L): Miscible

pH (1% solution): 1- 2 approx.

Volatile Component (%vol): Not available.

Relative Vapour Density (air=1): Not available.

Lower Explosive Limit (%): Not applicable

Autoignition Temp (°C): Not available.

State: DIVIDED SOLID

Boiling Range (°C): 280

Specific Gravity (water=1): 2.80

pH (as supplied): Not applicable

Vapour Pressure (kPa): Not available

Evaporation Rate: Not available

Flash Point (°C): Not applicable

Upper Explosive Limit (%): Not applicable

Decomposition Temp (°C): 160

Viscosity: Not Applicable

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## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

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### CONDITIONS CONTRIBUTING TO INSTABILITY

Contact with alkaline material liberates heat.

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## Section 11 - TOXICOLOGICAL INFORMATION

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### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

##### SWALLOWED

Ingestion of acidic corrosives may produce circumoral burns with a distinct discolouration of the mucous membranes of the mouth, throat and oesophagus. Immediate pain and difficulties in swallowing and speaking may also be evident. Oedema of the epiglottis may produce respiratory distress and possibly, asphyxia. Nausea, vomiting, diarrhoea and a pronounced thirst may occur. More severe exposures may produce a vomitus containing fresh or dark blood and large shreds of mucosa. Shock, with marked hypotension, weak and rapid pulse, shallow respiration and clammy skin may be symptomatic of the exposure. Circulatory collapse may, if left untreated, result in renal failure. Severe cases may show gastric and oesophageal perforation with peritonitis, fever and abdominal rigidity. Stricture of the oesophageal, gastric and pyloric sphincter may occur as within several weeks or may be delayed for years. Death may be rapid and often results from asphyxia, circulatory collapse or aspiration of even minute amounts. Delayed deaths may be due to peritonitis, severe nephritis or pneumonia. Coma and convulsions may be terminal.

Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.

Iron poisoning, although rare, may result in epigastric pain and vomiting followed over 6-8 hours by shock, and in severe case coma and death. The toxicity of iron compounds increases in proportion to their solubility in the gastrointestinal tract. Vomitus frequently contains blood, due in part to capillary dilation and blood loss through gastrointestinal walls (diapedesis). Watery diarrhoea with ribbons of bowel mucosa contribute to cardiovascular collapse from fluid and electrolyte loss. Although a quiescent period may follow some victims relapse within 12 hours into lethal secondary shock. During relapse a profound metabolic acidosis is encountered. This has been attributed to hydrolysis of ferric ions in blood as well as increases in the level of lactic and citric acids. Respiratory changes resulting from acidosis are often evident. Postmortem examination often reveals liver damage consisting of periportal haemorrhagic necrosis. Poisoning may also produce a metallic taste, restlessness, lethargy, hypotonia, coma, pallor or cyanosis, fast, weak pulse, hypotension, hyperventilation (due to acidosis), shock, vasomotor instability and cardiovascular collapse. Pneumonitis, pulmonary oedema and haemorrhage, convulsions, liver impairment with jaundice, hypoglycaemia, multiple coagulation defects, kidney damage with anuria, pancreatic damage, vascular damage, hypovolaemia, haemoconcentration, profound shock and vascular collapse have been reported. Survivors may display gastric scarring or obstruction, pyloric obstruction or stenosis, mild hepatic scirrhosis or neuralgic sequelae.

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## Section 11 - TOXICOLOGICAL INFORMATION

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### EYE

Direct eye contact with acid corrosives may produce pain, lachrymation, photophobia and burns. Mild burns of the epithelia generally recover rapidly and completely. Severe burns produce long-lasting and possible irreversible damage. The appearance of the burn may not be apparent for several weeks after the initial contact. The cornea may ultimately become deeply vascularised and opaque resulting in blindness.

The material can produce chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating.

When applied to the eye(s) of animals, the material produces severe ocular lesions which are present twenty-four hours or more after instillation.

### SKIN

Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue.

The material can produce chemical burns following direct contact with the skin.

Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

Skin contact is not thought to produce harmful health effects (as classified under EC Directives using animal models). Systemic harm, however, has been identified following exposure of animals by at least one other route and the material may still produce health damage following entry through wounds, lesions or abrasions. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

### INHALED

Evidence shows, or practical experience predicts, that the material produces irritation of the respiratory system in a substantial number of individuals following inhalation. Acidic corrosives produce respiratory tract irritation with coughing, choking and mucous membrane damage. Symptoms of exposure may include dizziness, headache, nausea and weakness. In more severe exposures, pulmonary oedema may be evident either immediately or after a latent period of 5-72 hours. Symptoms of pulmonary oedema include a tightness in the chest, dyspnoea, frothy sputum and cyanosis. Examination may reveal hypotension, a weak and rapid pulse and moist rates. Death, due to anoxia, may occur several hours after onset of the pulmonary oedema.

Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

The material is not thought to produce adverse health effects following inhalation (as classified by EC Directives using animal models). Nevertheless, adverse systemic effects have been produced following exposure of animals by at least one other route and good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

Exposure to high concentrations causes bronchitis and is characterised by the onset of haemorrhagic pulmonary oedema.

### CHRONIC HEALTH EFFECTS

Repeated or prolonged exposure to acids may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue.

Gastrointestinal disturbances may also occur. Chronic exposures may result in dermatitis and/or conjunctivitis.

Long term exposure to high dust concentrations may cause changes in lung function (i.e. pneumoconiosis) caused by particles less than 0.5 micron penetrating and remaining in the

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## Section 11 - TOXICOLOGICAL INFORMATION

lung. A prime symptom is breathlessness. Lung shadows show on X-ray. Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. Chronic excessive iron intakes have been associated with haemosiderosis and consequent possible damage to the liver and pancreas.

High levels of iron may raise the risk of cancer. This concern stems from the theory that iron causes oxidative damage to tissues and organs by generating highly reactive chemicals, called free radicals, which subsequently react with DNA. Cells may be disrupted and may become cancerous. People whose genetic disposition prevents them from keeping tight control over iron (e.g. those with the inherited disorder, haemochromatosis) may be at increased risk.

Iron overload in men may lead to diabetes, arthritis, liver cancer, heart irregularities and problems with other organs as iron builds up.

[K. Schmidt, New Scientist, No. 1919 pp.11-12, 2nd April, 1994].

### TOXICITY AND IRRITATION

#### TOXICITY

Oral (rat) LD50: 1872 mg/kg

Oral (rat) LD50: 900 mg/kg

Oral (Rat) LD: 900 mg/kg

Intraperitoneal (Mouse) LD50: 260 mg/kg

#### IRRITATION

Nil Reported

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

## Section 12 - ECOLOGICAL INFORMATION

Marine Pollutant:Not Determined

Prevent, by any means available, spillage from entering drains or water courses.

DO NOT discharge into sewer or waterways.

## Section 13 - DISPOSAL CONSIDERATIONS

Recycle wherever possible.

· Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility

continued...

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## Section 13 - DISPOSAL CONSIDERATIONS

can be identified.

- Treat and neutralise at an approved treatment plant. Treatment should involve:  
: Mixing or slurring in water; Neutralisation with soda-lime or soda-ash followed by: Burial in a licenced land-fill or Incineration in a licenced apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers with 5% aqueous sodium hydroxide or soda ash, followed by water. Observe all label safeguards until containers are cleaned and destroyed.
- Containers may still present a chemical hazard/ danger when empty.
- Return to supplier for reuse/ recycling if possible.

Otherwise:

- If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.
- Where possible retain label warnings and MSDS and observe all notices pertaining to the product.

## Section 14 - TRANSPORTATION INFORMATION



Labels Required: CORROSIVE

HAZCHEM: 2X

### UNDG:

|                                                                                                      |      |                |      |
|------------------------------------------------------------------------------------------------------|------|----------------|------|
| Dangerous Goods Class:                                                                               | 8    | Subrisk:       | None |
| UN Number:                                                                                           | 3260 | Packing Group: | III  |
| Shipping Name: CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.<br>(contains ferric chloride, hexahydrate) |      |                |      |

### Air Transport IATA:

|                                                                                                      |      |                    |      |
|------------------------------------------------------------------------------------------------------|------|--------------------|------|
| ICAO/IATA Class:                                                                                     | 8    | ICAO/IATA Subrisk: | None |
| UN/ID Number:                                                                                        | 3260 | Packing Group:     | III  |
| ERG Code:                                                                                            | 8L   |                    |      |
| Shipping name: CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.<br>(contains ferric chloride, hexahydrate) |      |                    |      |

### Maritime Transport IMDG:

|                                                                                                      |            |                   |                |
|------------------------------------------------------------------------------------------------------|------------|-------------------|----------------|
| IMDG Class:                                                                                          | 8          | IMDG Subrisk:     | None           |
| UN Number:                                                                                           | 3260       | Packing Group:    | III            |
| EMS Number:                                                                                          | F- A, S- B | Marine Pollutant: | Not Determined |
| Shipping name: CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S.<br>(contains ferric chloride, hexahydrate) |            |                   |                |

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## Section 15 - REGULATORY INFORMATION

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### REGULATIONS

ferric chloride, hexahydrate (CAS: 10025-77-1) is found on the following regulatory lists  
;  
IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk  
International Council of Chemical Associations (ICCA) - High Production Volume List  
OECD Representative List of High Production Volume (HPV) Chemicals  
WHO Guidelines for Drinking-water Quality - Chemicals for which guideline values have  
not been established

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## Section 16 - OTHER INFORMATION

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The above information is believed to be accurate and represent the best information currently available to us, but does not represent any warranty expressed or implied of the properties of the product. User should make their own investigation to determine the suitability of the information for their particular purpose.

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