MATERIAL SAFETY DATA SHEET

Ferric Chloride

Section 01 - Chemical And Product And Company Information

Product Identifier ………………………… Ferric chloride

Product Use ……………………………….. Wastewater treatent, purifying factory effluents and deodorizing sewage, mordant in dyeing and printing textiles; pigments and inks; photoengraving.

Supplier Name…………………………. ClearTech Industries Inc.  
2302 Hanselman Avenue  
Saskatoon, SK. Canada  
S7L 5Z3

Prepared By………………………….. ClearTech Industries Inc. Technical Department  
Phone: (306)664-2522

Preparation Date………………… March 25, 2011

24-Hour Emergency Phone……….. 306-664-2522

Section 02 - Composition / Information on Ingredients

Hazardous Ingredients……………….. Ferric Chloride 30-47%  
Hydrochloric Acid 1-5%

CAS Number…………………………. Ferric Chloride 7705-08-0  
Hydrochloric Acid 7641-01-0

Synonym (s)…………………………... Iron(III) chloride
Section 03 - Hazard Identification

Inhalation
Inhalation of spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Repeated exposure may produce respiratory tract irritation leading to frequent attacks of bronchial infection.

Skin Contact / Absorption
Skin contact may produce burns. Skin inflammation is characterized by itching, scaling, reddening, or occasionally blistering.

Eye Contact
Irritating to eyes; possible burns to eyes.

Ingestion
Irritation of the mouth and stomach. Symptoms of severe poisoning include stomach pain, vomiting, diarrhea, dehydration, shock, pallor, weak pulse, drowsiness, dilated pupils, and coma.

Exposure Limits
ACGIH/TLV-TWA: 1mg/m³ (ferric chloride)
OSHA/TWA: 1mg/m³ (ferric chloride)
ACGIH: 2ppm ceiling (hydrogen chloride gas)
OSHA: 5ppm ceiling (hydrogen chloride gas)

Section 04 - First Aid Measures

Inhalation
Remove victim to fresh air. Give artificial respiration only if breathing has stopped. If breathing is difficult, give oxygen. Seek immediate medical attention.

Skin Contact / Absorption
Remove contaminated clothing. Wash affected area with soap and water. Seek medical attention if irritation occurs or persists.

Eye Contact
Flush immediately with water for at least 20 minutes. Forcibly hold eyelids apart to ensure complete irrigation of eye tissue. Seek immediate medical attention.

Ingestion
Do not induce vomiting. If vomiting occurs, lean victim forward to prevent breathing in vomit. Give large amounts of water. Do not give anything by mouth to an unconscious or convulsing person. Seek immediate medical attention.

Additional Information
Note to physician: for inhalation, consider oxygen. Avoid gastric lavage or emesis.

Section 05 - Fire Fighting

Conditions of Flammability
Non-flammable
### Means of Extinction

Product does not burn. Where fire is involved, use any fire fighting agent (water spray, fog, foam), appropriate for surrounding material; use water spray to cool fire-exposed surfaces.

<table>
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<tr>
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<th>Details</th>
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<tbody>
<tr>
<td>Flash Point</td>
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</tr>
<tr>
<td>Auto-ignition Temperature</td>
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</tr>
<tr>
<td>Upper Flammable Limit</td>
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<tr>
<td>Lower Flammable Limit</td>
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</table>

**Hazardous Combustible Products**

- Hydrogen chloride, phosgene

**Special Fire Fighting Procedures**

Wear NIOSH-approved self-contained breathing apparatus and protective clothing.

**Explosion Hazards**

Not sensitive to mechanical impact or static discharge. Ferric chloride reacts with most metals to give flammable, potentially explosive hydrogen gas. Latent fire and explosion hazard when in contact with metals due to hydrogen gas.

### Section 06 - Accidental Release Measures

**Leak / Spill**

Wear appropriate personal protective equipment. Ventilate area. Stop or reduce leak if safe to do so. Prevent material from entering sewers.

**Deactivating Materials**

Neutralize waste with lime, limestone, or soda ash. Generation of CO₂ requires ventilation.

### Section 07 - Handling and Storage

**Handling Procedures**

Use proper equipment for lifting and transporting all containers. Use sensible industrial hygiene and housekeeping practices. Wash thoroughly after handling. Avoid all situations that could lead to harmful exposure.
Storage Requirements

Keep container tightly closed. Do not store in metal containers. Aluminium, copper and stainless steel are readily attacked. Provide venting for rubber lined steel to avoid pressure buildup. Materials of construction to be used can include polyethylene, polypropylene, rubber-lined steel and FRP designated as appropriate for use with this product. Storage tanks should be vented to scrubber or exterior atmosphere. Storage facilities should have secondary containment as required by law or regulation. Storage tanks, piping and offloading points should be labeled with appropriate signage to avoid accidents. Some concentrations of this product will freeze or crystallize at low temperatures. Insulate and heat-trace storage tanks, pumps, pipes and ancillary equipment as necessary. Product should be used within one year.

Section 08 - Personal Protection and Exposure Controls

Protective Equipment

Eyes

Chemical goggles, full-face shield, or a full-face respirator is to be worn at all times when product is handled. Contact lenses should not be worn; they may contribute to severe eye injury.

Respiratory

Use NIOSH-approved acid gas respirator or a self-contained breathing apparatus if airborne concentrations may exceed exposure limits.

Gloves

Impervious gloves of chemically resistant material (rubber, neoprene or PVC) should be worn at all times. Wash contaminated clothing with soap and water, dry thoroughly before reuse.

Clothing

Body suits, aprons, and/or coveralls of chemical resistant material should be worn at all times. Wash contaminated clothing with soap and water, dry thoroughly before reuse.

Footwear

Impervious boots of chemically resistant material should be worn at all times.

Engineering Controls

Ventilation Requirements

Mechanical ventilation (dilution or local exhaust), process or personnel enclosure, and control of process conditions should be provided. Supply sufficient replacement air to make up for air removed by exhaust systems.

Other

Emergency shower and eyewash should be in close proximity.

Section 09 - Physical and Chemical Properties

Physical State

Liquid
Odor and Appearance: Reddish, brown liquid with a slight pungent odour.

Odor Threshold: Not available

Specific Gravity (Water=1): 1.26-1.48

Vapor Pressure (mm Hg, 20°C): 40

Vapor Density (Air=1): Not available

Evaporation Rate: Not available

Boiling Point: 106°C

Freeze/Melting Point: Not available

pH: <1.0

Water/Oil Distribution Coefficient: Not available

Bulk Density: Not available

% Volatiles by Volume: Not available

Solubility in Water: Completely miscible

Molecular Formula: FeCl₃

Molecular Weight: 162.20

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Section 10 - Stability and Reactivity

Stability: Stable under normal conditions. Decomposes to yield hydrochloric gas on exposure to light.

Incompatibility: Highly reactive with oxidizing, bases, acids and reducing agents. Reactive with metals and combustible materials.

Hazardous Products of Decomposition: Decomposes to yield hydrochloric gas on exposure to light

Polymerization: Will not occur
Section 11 - Toxicological Information

Irritancy........................................... Irritant

Sensitization........................................... Not available

Chronic/Acute Effects................................. Not available

Synergistic Materials.................................. Not available

Animal Toxicity Data................................. 
LD_{50}(Oral, Rat): 895 mg/kg
LD_{50}(Dermal, Rabbit): >2000 mg/kg

Carcinogenicity.......................................... Not considered carcinogenic by NTP, IARC, or ACGIH

Reproductive Toxicity................................. Not available

Teratogenicity........................................... Not available

Mutagenicity............................................. Tests on lab animals indicate material may produce adverse affects.

Section 12 - Ecological Information

Fish Toxicity........................................... Ferric Chloride:
LC_{50}(96 hr, Striped bass, 96): 6 mg/L
LC_{50}(96 hr, Mosquitofish): 75.6 mg/L

Hydrochloric acid:
LC_{50}(96 hrs, Mosquitofish): 282 mg/L
LC_{50}(96 hrs, Bluegill sunfish): 3.6 mg/L

Biodegradability........................................ Not available

Environmental Effects................................ Not available

Section 13 - Disposal Consideration

Waste Disposal........................................... Dispose in accordance with all federal, provincial, and/or local regulations including the Canadian Environmental Protection Act.
Section 14 - Transportation Information

TDG Classification

Class ........................................ 8
Group ........................................ III

PIN Number .................................. UN 2582

Other ........................................ Secure containers (full and/or empty) with suitable hold down devices during shipment.

Section 15 - Regulatory Information

WHMIS Classification .......................... E

NOTE: THE PRODUCT LISTED ON THIS MSDS HAS BEEN CLASSIFIED IN ACCORDANCE WITH THE HAZARD CRITERIA OF THE CANADIAN CONTROLLED PRODUCTS REGULATIONS. THIS MSDS CONTAINS ALL INFORMATION REQUIRED BY THOSE REGULATIONS.

NSF Certification ............................. Product is certified under NSF/ANSI Standard 60 for coagulation and flocculation at a maximum dosage of 250mg/L.

Section 16 - Other Information

Note: The responsibility to provide a safe workplace remains with the user. The user should consider the health hazards and safety information contained herein as a guide and should take those precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment. The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material. It is the responsibility of the user to comply with all applicable laws and regulations.

Attention: Receiver of the chemical goods / MSDS coordinator

As part of our commitment to the Canadian Association of Chemical Distributors (CACD) Responsible Distribution® initiative, ClearTech Industries Inc. and its associated companies require, as a condition of sale, that you forward the attached Material Safety Data Sheet(s) to all affected employees, customers, and end-users. ClearTech will send any available supplementary handling, health, and safety information to you at your request.

If you have any questions or concerns please call our customer service or technical service department.
ClearTech Industries Inc. - Locations

Corporate Head Office: 2302 Hanselman Avenue, Saskatoon, SK, S7L 5Z3
Phone: 306-664-2522
Fax: 306-665-6216

www.ClearTech.ca

<table>
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<td>Richmond, B.C.</td>
<td>12431 Horseshoe Way</td>
<td>V7A 4X6</td>
<td>604-272-4000</td>
<td>604-272-4596</td>
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<tr>
<td>Calgary, AB.</td>
<td>5516E - 40th St. S.E.</td>
<td>T2C 2A1</td>
<td>403-279-1096</td>
<td>403-236-0989</td>
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<tr>
<td>Edmonton, AB.</td>
<td>11750 - 180th Street</td>
<td>T5S 1N7</td>
<td>780-452-6000</td>
<td>780-452-4600</td>
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<tr>
<td>Saskatoon, SK.</td>
<td>2302 Hanselman Avenue</td>
<td>S7L 5Z3</td>
<td>306-933-0177</td>
<td>306-933-3282</td>
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<tr>
<td>Regina, SK.</td>
<td>555 Henderson Drive</td>
<td>S4Z 4X2</td>
<td>306-721-7737</td>
<td>306-721-8611</td>
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<tr>
<td>Winnipeg, MB.</td>
<td>340 Saulteaux Crescent</td>
<td>R3J 3T2</td>
<td>204-987-9777</td>
<td>204-987-9770</td>
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<tr>
<td>Mississauga, ON.</td>
<td>7480 Bath Road</td>
<td>L4T 1L2</td>
<td>905-612-0566</td>
<td>905-612-0575</td>
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</table>

24 Hour Emergency Number - All Locations - 306-664-2522