Material Safety Data for: Ferric Chloride, 40% solution

1. PRODUCT IDENTIFICATION

Name: iron trichloride
Synonyms: iron (III) chloride, ferric chloride
CAS#: 7705-08-0
EC#: 231-729-4
Product Uses: -

2. INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>% (as Fe)</th>
<th>LD_{50} (mg/kg)</th>
<th>LC_{50} ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferric Chloride</td>
<td>37-42%</td>
<td>440*</td>
<td>not known</td>
</tr>
<tr>
<td>Water (CAS# 7732-18-5)</td>
<td>58-63%</td>
<td>90,000</td>
<td>not toxic</td>
</tr>
</tbody>
</table>

* See end of Part 3b

3. (a) HAZARDS SUMMARY

Canada, Quick Guide: corrosive to skin and eyes

U.S.A. – HMIS: Health – 3, Fire – 0, Reactivity – 1

3. (b) HAZARDS – TOXICITY

Effects, Acute Exposure
- Skin Contact: acidic solution may cause corrosive burns
- Skin Absorption: slight; no toxic effects likely by this route
- Eye Contact: acidic solution may cause corrosive burns
- Inhalation: acidic solution – inhalation of product mist may cause corrosive burns to respiratory system
- Ingestion: corrosive (possibly permanent) damage to mouth, throat & stomach; absorption may cause low blood pressure, rapid heartbeat and loss of consciousness – not a route of industrial exposure

Effects, Chronic Exposure
- General: delayed liver, spleen & kidney damage may occur following ingestion;
- Sensitising: not a sensitisier in humans or animals; single case of human sensitisation reported
- Carcinogen/Tumorigen: not considered a tumorigen or a carcinogen in humans or animals
- Reproductive Effect: reproductive effects in rodents; no known effect in humans
- Mutagen: no known effect in humans or animals; negative Ames test in bacteria
- Synergistic With: not known
- LD_{50} (oral): 900, 1872 & 2900mg/kg (rat), 440 & 895mg/kg (mouse)*
- LD_{50} (skin): not known – probably not absorbed
- LC_{50} (inhalation): not known; 8hr exposure of rats to a saturated aerosol of 40% FeCl₃ solution caused no mortality

*These data are from the European IUCLID Dataset for FeCl₃. A Fisher Scientific MSDS (April 2003) reports LD₅₀ (oral) = 200 & 316mg/kg (rat).

Please ensure that this MSDS is given to, and explained to people using this product.
4. FIRST AID

SKIN: Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.

EYES: Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.

INHALATION: Remove from contaminated area promptly. CAUTION: Rescuer must not endanger himself! If breathing stops, administer artificial respiration and seek medical aid promptly.

INGESTION: Give plenty of water to dilute product or milk, if available, to neutralise. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim’s head below hips to prevent inhalation of vomited material. Seek medical help promptly.

Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.

NOTE to physician – deferoxamine may be administered as an iron chelating agent.

5. PHYSICAL PROPERTIES

Odour & Appearance clear, odourless, brown liquid
Odour Threshold not known – odourless
Vapour Pressure as for water – FeCl₃ does not volatilise
Evaporation Rate (Butyl Acetate = 1) as for water – FeCl₃ does not volatilise
Vapour Density (air = 1) water vapour only – FeCl₃ does not volatilise
Boiling Range 120°C / 248°F
Freezing Point -10°C / 14°F – precipitate forms
Specific Gravity 1.42 (20/20°C)
Water Solubility complete (solution may be diluted); 740 grams FeCl₃ per litre – (solubility of dry salt @ 0°C)
Also soluble in not known – probably somewhat soluble in polar solvents such as alcohols, glycols
Viscosity not known – mobile liquid
pH 2 (0.1M solution) – strongly acidic
Molecular Weight 162grams per mole

6. FLAMMABILITY & FIRE FIGHTING

Flash Point cannot burn
Autoignition Temperature cannot burn
Flammable Limits cannot burn
Combustion Products chlorine gas may form at high temperature; hydrogen chloride release also reported from heated solutions
Firefighting Precautions not combustible – as for substances sustaining fire; firefighters must wear SCBA
Static Charge Accumulation cannot accumulate a static charge

7. STABILITY / REACTIVITY

Dangerously Reactive With potassium or sodium metal
Also Reactive With alkalis – acidic solution will neutralise alkalis; corrosive to some metals
Stability stable; will not polymerize
Decomposes in Presence of fire heat
Decomposition Products chlorine gas
Sensitive to Mechanical Impact no

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8. PROTECTIVE EQUIPMENT / EXPOSURE CONTROL

TWAEV / TLV  1mg/m³ (as Fe)
STEL      not listed
Ventilation mechanical ventilation is probably not required unless a product mist is generated
Hands     rubber, PVC, nitrile gloves – other types may also protect; consult supplier to confirm suitability
Eyes      safety glasses with side shields; add a face shield if splashing is possible – always protect the eyes
Clothing  wear impermeable (above) apron, boots, & long sleeves if there is any danger of splashing

9. HANDLING & STORAGE

Store away from alkalis.
Avoid breathing product mist. Use with adequate ventilation if a mist is generated in processing.
Never cut, drill, weld or grind on or near this container. Avoid contact with skin and wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

10. SPILL PROCEDURES

Leak Precaution dyke to control spillage and prevent environmental contamination
Handling Spill ventilate contaminated area; recover free liquid with suitable corrosion-resistant pumps; absorb residue on an inert sorbent, sweep, shovel, & store in closed containers for recycling or disposal

11. DISPOSAL

Waste Disposal  do not flush to sewer, if local regulations permit, may be put in sanitary landfill
Containers      Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use.
Pails           must be vented and thoroughly dried prior to crushing and recycling.
IBCs            (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years.

Never cut, drill, weld or grind on or near this container, even if empty

12. ENVIRONMENTAL INFORMATION

Bioaccumulation this substance is not a bioaccumulator
Biodegradation this inorganic substance cannot biodegrade
Abiotic Degradation this product is highly stable and will not degrade abiotically; small quantities of iron salts are taken up by plants
Mobility in soil, water this product is water soluble and will move readily in soil and water
Aquatic Toxicity
LC50 (Fish)  92.8mg/litre (brachydaniio rerio, 48hr), 75.6mg/litre (gambusia affinis, 96hr),
              117mg/litre (poecilia reticulata, 48hr), 23mg/litre (oryzias latipes 48hr)
EC50 (Crustacea, 96hr)  313-418mg/litre (ascellus sp.), 296-424mg/litre (crangon sp.), 9.6mg/litre (daphnia magna), & others

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13. TRANSPORT REGULATIONS

**Canada TDG**
- PIN: UN-2582
- Shipping Name: ferric chloride solution
- Class: 8 (9.2)
- Packing Group: III

**U.S.A. 49 CFR**
- PIN: UN-2582
- Shipping Name: ferric chloride solution
- Class: 8
- Packing Group: III

Marine Pollutant: not a marine pollutant

14. EMERGENCY INFORMATION

**Canada**
- Call CANUTEC (collect) (613) 996-6666

**U.S.A.**
- Call CHEMTREC (800) 424-9300

15. REGULATIONS

- **Canada DSL**: on inventory
- **U.S.A. TSCA**: on inventory
- **Europe EINECS**: on inventory

**Europe Risk Phrases**: R:36/38 irritating to eyes and skin.
**Europe Safety Phrases**: S:26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S:28 After contact with skin, wash immediately

16. PREPARATION INFORMATION

Prepared for Thames River Chemical by Peter Bursztyn, (705) 734-1577
With data from RTECS, Haz. Substance Data Base, Cheminfo (CCOHS), IUCLID Datasheets (European Chem. Substance Info. System), & others, as available

**Preparation Date**: August 2009   **Revision Date**: -

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