WHMIS (Classification)  
CLASS D-2B: Toxic material causing other effects

WHMIS (Pictograms)

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Trade Name  Stabilized Sodium Jarosite  
Product Code None  
Supplier Noranda Income Limited Partnership, 860 Gérard Cadieux Boulevard, Salaberry-de-Valleyfield (Quebec) Canada J6T 6L4  
Information Contact Viviane DeQuoy, Industrial Hygienist  
Phone Number (Business hours) 1 (450) 373-9144 Extension 2394  
Phone Number (Emergency) 1 450-373-9144 Extension 2911  
Synonym Jarosite de sodium stabilisée (French)  
Name / Chemical Formula Not applicable  
Chemical Family Metal; Oxides; Salts  
Utilization Solid waste  

SECTION 2. COMPOSITION AND INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS #</th>
<th>Percentage (%)</th>
<th>ACGIH (U.S.A.) 2010</th>
<th>OSHA (U.S.A.)</th>
<th>QUÉBEC (CA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium (Ferric hydroxy sulfate)</td>
<td>-</td>
<td>40 - 45</td>
<td>1 (Fe soluble salts)</td>
<td>Not established</td>
<td>1 (soluble salts)</td>
</tr>
<tr>
<td>Hydronium (Ferric hydroxy sulfate)</td>
<td>-</td>
<td>20 - 25</td>
<td>1 (Fe soluble salts)</td>
<td>Not established</td>
<td>1 (soluble salts)</td>
</tr>
<tr>
<td>‡Cement (Portland)</td>
<td>65997-15-1</td>
<td>12 - 15</td>
<td>1 (respirable)</td>
<td>15 (total dust)</td>
<td>10 (total dust)</td>
</tr>
<tr>
<td>Lead (Ferric hydroxy sulfate)</td>
<td>-</td>
<td>8 - 15</td>
<td>0.05 (Pb, inorganic compds)</td>
<td>0.05 (Pb, Pb compds)</td>
<td>0.05 (Pb, inorganic compds)</td>
</tr>
<tr>
<td>Calcium (sulfate) (gypsum)</td>
<td>13397-24-5</td>
<td>0-15</td>
<td>10 (inhaled fraction)</td>
<td>15 (total dust)</td>
<td>10 (total dust)</td>
</tr>
</tbody>
</table>

ACGIH: American Conference of Governmental Industrial Hygienists. OSHA: Occupational Safety and Health Administration.

**Note:**  
Ferric (hydroxy sulfate) (Sodium; Hydronium) (as Fe soluble salts): ACGIH TLV TWA: 1 mg/m³ (Fe soluble salts). NIOSH REL-TWA (≤10 hours): 5 mg/m³ (Dust, fumes) (Fe); IDLH: 2 500 mg/m³ (Fumes; Fe dust oxides). LD50 and LC50: Not available. (RTECS).

‡Cement (Portland): ACGIH TLV-TWA: 1 mg/m³ (Inhalable fraction); STEL: 5 mg/m³ (Inhalable fraction) (INTENDED CHANGES); NIOSH REL-TWA: 10 mg/m³ (Total); 5 mg/m³ (Respirable); IDLH: 5 000 mg/m³. LD50 and LC50: Not available. (RTECS).

Plomb (Ferric hydroxy sulfate) (as Pb): NIOSH REL-TWA (≤10 hours): 0.05 mg/m³; REL also applies to other lead compounds (as Pb); IDLH: 100 mg/m³ (Metal; Compounds). OSHA PEL-TWA: PEL also applies to other lead compounds (as Pb). QUEBEC TLV TWA: Lead, dust and fumes. ORAL acute (LoLD) : 155 mg/kg (Human) ; 0.2 mg/kg (Rat). INHALATION acute (LoTC): 10 μg/m³ (Human). INTRAPERITONEAL acute (LoLD): 1 g/kg (Rat). (RTECS).

Calcium (Sulfate dihydrate, gypsum): ACGIH TLV-TWA: Total dust containing no asbestos and < 1% crystalline silica. NIOSH REL-TWA (≤10 hours): 5 mg/m³ (Respirable fraction), 10 mg/m³ (Total). QUEBEC TLV-TWAEV: The standard corresponds to dust containing no asbestos and the percentage in crystalline silica is less than 1%. INHALATION acute (LoTC): 194 g/m³/10 year intermittent (Human). (RTECS).

Consult local authorities for acceptable exposure limits.

SECTION 3. RISKS IDENTIFICATION FOR HUMAN HEALTH

**Routes of Entry:** Ingestion. Inhalation.

**Carcinogenicity**  
Lead (Inorganic compounds): POSSIBLE (Group 2B, IARC) (EPA); CARCINOGEN (Animal, A3, ACGIH).

Sodium (Sulfate): NOT A CARCINOGEN (IARC, OSHA, NTP) ; NOT LISTED (Human, Group A4, ACGIH).

Calcium (Sulfate): NOT A CARCINOGEN (IARC) ; NOT LISTED (Human, Group A4, ACGIH).

Cement (Portland): NOT CLASSIFIABLE (Human, A4, ACGIH).

Iron : NOT LISTED (IARC, ACGIH).

**Mutagenicity:** Not applicable.

**Teratogenicity:** Lead: SUSPECTED (OSHA).

**Acute Effects:**  
Solid form: Not a health hazards. Conditions and work practices which generate dusts or fumes should be avoided or controlled. Inhalation (Iron oxide fumes): Metal fume fever, a delayed, generally benign, transient, reversible flu-like condition.

Ferrous compounds: Acute exposure can cause damage to: Liver, kidneys; Altered respiratory rate, convulsions.

Lead (Sulfate) (Salt): Vague gastrointestinal and CNS complaints. Ingestion (Rapidly absorbed salts): Acute syndrome of hepatic injury, haemolysis, anorexia, vomiting, malaise, seizures due to increased intracranial pressure as well as chronic exposure effects.

Calcium (Sulfate): Cough, redness, pains.

2010  1/5
SECTION 4. FIRST AID MEASURES

Eye Contact
Remove contact lenses if present. Immediately flush eyes with plenty of water, while holding eyelids open for at least 15 minutes. Consult a physician.

Skin Contact
Remove contaminated clothing and immediately flush skin with plenty of water for at least 15 minutes. Call a physician. Always wash skin thoroughly with water and soap after handling lead or lead compounds. Particles: Possibility of skin irritation.

Inhalation
Remove the person from exposure. Possible irritation: Nose, throat. If not breathing: Give artificial respiration.. Difficult breathing: Give oxygen. Get immediate medical attention. Maintain observation of the patient for delayed onset of pulmonary oedema.

Ingestion
Induce vomiting. UNCONSCIOUS person: DO NOT induce vomiting or give any liquid. Consult a physician. Ingestion: will nearly always cause acute gastro-intestinal irritation. Acute exposure: Possibility of other organs and body systems damages.

NOTE: mixture: health effects may be due to a possible synergetic effect between substances, their individual toxicity and their percent content in the mixture.

SECTION 5. FIRE AND EXPLOSION DATA

Flash Point
Not available

Flammable Limits
Not available

Auto-Ignition Temperature
Not available

Products of Combustion
Metal oxides

Fire Hazards
Ferric (Hydroxide): Ignites at 200°C. Powdered oxide may be pyrophoric (Ignites spontaneously on contact with air).

Lead (Ferric hydroxy sulfate) (as Pb): Not flammable. In contact with fire or heat source, it may melt, and then if in contact with water, will cause a violent reaction. Possibility of toxic lead vapours formation.

Explosion Hazards
Not explosive (Mechanical impact; Static discharge).

Instructions (Fire Fighting)
Ferric (Hydroxide): Violent reaction or explosion with: Hydrogen peroxide, carbon monoxide.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Spill
Clean spills first by shovel. Recycle to process. Wash down contaminated area. Collect water for recycling according to regulation.

Personal Protection
Safety glasses. Gloves. Be sure to use a NIOSH approved respirator or equivalent when occupational exposure limits are exceeded.

SECTION 7. HANDLING AND STORAGE

Handling
DO NOT ingest or inhale dust or fumes. Wear appropriate protective clothing. Wear approved respirators if adequate ventilation cannot be provided. Ingestion or inhalation: Seek medical advice immediately and provide medical personnel with a copy of this SDS.

Storage
Away from: Incompatible substances (Acids).

SECTION 8. ENGINEERING CONTROLS AND PERSONAL PROTECTION

Engineering Controls
Ensure that eyewash station and safety shower is proximal to the work-station location.

Personal Protection
Safety glasses. Gloves. Be sure to use a NIOSH approved respirator or equivalent when occupational exposure limits are exceeded.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State and Appearance</td>
<td>Solid (Slurry)</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>Not applicable</td>
</tr>
<tr>
<td>pH (1% soln/water)</td>
<td>10.5 - 11.5</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Melting Point</td>
<td>Cement (Portland) : 1280°C (2336°F)</td>
</tr>
<tr>
<td>Critical Temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>Not available</td>
</tr>
<tr>
<td>Vapour Pressure</td>
<td>Not available</td>
</tr>
<tr>
<td>Vapour Density</td>
<td>Not available</td>
</tr>
<tr>
<td>Solubility</td>
<td>No (Water)</td>
</tr>
<tr>
<td>Odour</td>
<td>Slight ammonia</td>
</tr>
<tr>
<td>Taste</td>
<td>Not available</td>
</tr>
<tr>
<td>Colour</td>
<td>Brown</td>
</tr>
<tr>
<td>Volatility</td>
<td>Not available</td>
</tr>
<tr>
<td>% Moisture</td>
<td>39% (decrease upon solidification)</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>Not available</td>
</tr>
<tr>
<td>Water/Oil Dist. Coeff.</td>
<td>Not available</td>
</tr>
<tr>
<td>Ionicity (in Water)</td>
<td>Not available</td>
</tr>
<tr>
<td>Dispersion</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
**SECTION 10. STABILITY AND REACTIVITY DATA**

<table>
<thead>
<tr>
<th>Stability</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions of Instability</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Incompatibilities</td>
<td>Ferric (Hydroxy sulfate) (as Fe soluble salts) : Heated, violent reaction with : Aluminum powder (Intense heat production), calcium disilicide, metal acetyliides (Calcium acetylide plus iron (III) chloride, on ignition ; Cesium acetylide (Warning causes incandescent reaction) ; Rubidium acetylide). Possibility of violent reaction with : Aluminum, ethylene oxide.</td>
</tr>
<tr>
<td></td>
<td>Cement (Portland) : No incompatibility or reactivity has been associated with this product.</td>
</tr>
<tr>
<td></td>
<td>Lead (Ferric hydroxy sulfate) (as Pb) : Violent reaction on ignition with : Chlorine trifluoride, concentrated hydrogen peroxide, ammonium nitrate, sodium acetylide. Other incompatibilities : Sodium nitrate, zircconium, disodium acetylide, oxidants.</td>
</tr>
<tr>
<td>Corrosivity</td>
<td>None</td>
</tr>
</tbody>
</table>

**SECTION 11. TOXICOLOGICAL INFORMATION**

**Chronic Effects**
Possibility of toxic effects to : Blood, liver, lungs : Nervous and reproductive systems. Non-controlled repeated or prolonged exposure : Possibility of target organs damages ; Possibility of a general health deterioration by an accumulation in one or many organs. Residue contains a mixture of sodium and lead ferric sulfates in an inert cement matrix. Ferric (hydroxy sulfate) (as Fe soluble salts) : Potentially a serious risk in all industrial settings. Chronic exposure (Hematite dust, solder fumes) : Benign pneumoconiosis (Siderosis). Prolonged or repeated contact : Possibility of permanent ferric eyes coloration. Inhaled particles : May stay in permanence in the lungs. Acute exposure : Possibility of liver and kidney damage, altered respiratory rate, convulsions. Cement (Portland) : Little risk of chronic effects (Solid) . Nuisance dust (ACGIH). Not solidified Portland cement (Dust) : Possibility of irritation (Eyes, skin, respiratory system). Slurry : Extremely alkaline and can cause burns. Chronic exposure : Possibility of benign pneumoconiosis, dermatitis (Allergic or irritative). Lead (Ferric hydroxy sulfate) : Metal lead NOT CLASSIFIED as carcinogen but listed as teratogen and reproductive toxic (European Economic Community Expert Committee on Metal). Lead is a regulated substance in many jurisdictions. Target organs for acute and chronic overexposure (NIOSH 90-117) : Blood, gingival tissues ; gastro-intestinal, central nervous, renal systems. Symptoms of acute overexposure often develop abruptly and resemble those of chronic overexposure : Anaemia, lassitude, weakness, nausea, vomiting, abdominal cramps, constipation, confusion, convulsions, muscular weakness, muscular and joint pains. Acute overexposure is more likely to occur in children than in adults. Target organs (Chronic overexposure) : Blood, kidneys, digestive, nervous and reproductive systems.
Calcium (Sulfate) : Irritating (Dust) : Eyes, skin and mucous membranes. Possibility of : Conjunctivitis, rhinitis, epistaxis. coughing, sneezing, pneumonia, laboured breathing. Ingestion : May result in obstruction, particularly at the pylorus. Chronic overexposure : Possibility of dermatitis.

**Toxicity**
Workers with the following pre-existing conditions warrant particular attention :
Ferric (Hydroxy sulfate) (as Fe) : Eyes and respiratory sensitivities.
Cement (Portland) : Skin and allergies.
Lead (Ferric hydroxy sulfate) : Anaemia, pregnant women, breast feeding women and women of child bearing age. Preferred method for biological monitoring : Blood lead levels (Pb blood) measurement (BEI 30 μg/100 ml) ; Sampling time : Not critical.
Calcium (Sulfate) : Respiratory disorder.

_Eating, drinking and smoking must be prohibited in areas where this material is handled and processed. Wash hands and face before eating, drinking and smoking._

**SECTION 12. ECOTOXICOLOGICAL INFORMATION**

<table>
<thead>
<tr>
<th>Ecotoxicity</th>
<th>Heavy metals : Harmful to aquatic life.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicty to Animals</td>
<td>Calcium (Sulfate dihydrate, gypsum) : INHALATION acute (LoTC) : 194 g/m3/10 year-intermittent (Human). (RTECS).</td>
</tr>
<tr>
<td>Biodegradation Products</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Biodegradation Products (Toxicity)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Remarks on Environment</td>
<td>No additional remark</td>
</tr>
<tr>
<td>BOD5 and COD</td>
<td>Not available</td>
</tr>
</tbody>
</table>

**SECTION 13. DISPOSAL ARRANGEMENTS**

Waste Disposal
Recycle to process, if possible. Discard in full compliance with Federal, Provincial and local regulations.
SECTION 14. TRANSPORT INFORMATION

TDG (Pictograms) Not regulated (Canada)
PIN Not applicable
Special Provisions (Transport) Not applicable

SECTION 15. OTHER REGULATIONS

Iron (Hydroxide) : EU Consolidated Inventories : EC Number 215-166-1
Iron (Sulfate) : EU Consolidated Inventories : EC Number 231-753-5
Cement (Portland) : EU Consolidated Inventories : EC Number 266-043-4
Lead (Sulfate) : EU Consolidated Inventories : EC Number 231-198-9
Calcium (Sulfate) : EU Consolidated Inventories : EC Number 231-900-3
Not listed in the Annex I of Council Regulation No (EC) 304/2003
Not listed in a priority list (as foreseen under Council Regulation (EEC) No 793/93

Risk Phrases (EEC) None
Safety Phrases None

CEPA DSL (CANADA) LOI CANADIENNE SUR LA PROTECTION DE L’ENVIRONNEMENT (LCPE) : sur la Liste des Substances Domestiques (DSL) : peut être utilisé selon les spécifications de cette législation.

Regulation (U.S.A.) CERCLA Section 103 Hazardous substances (40 CFR 302.4) : Listed.
Iron (Sulfate) (RQ) : 1000 pounds (454 kg)
CERCLA Section 103 Hazardous substances (40 CFR 302.4) ; SARA Section 313, Toxic Chemicals (40 CFR 372.65) : Listed.
Lead (Compounds) : no RQ is assigned to this generic or broad class, although the class is a CERCLA hazardous substance. See 50 Federal Register 13456 (April 4, 1985).
TSCA (EPA, Toxic Substance Control Act) Chemical Inventory (40 CFR710) : Listed.
Ferric (Hydroxide) ; Ferric (Sulfate) ; Lead (Hydroxide) ; Cement (Portland) ; Calcium (Sulfate).

Classifications HCS (U.S.A.) Not regulated

NFPA (National Fire Protection Association) (U.S.A.)

SPECIAL HAZARD

DOT (U.S.A.) (Pictograms)

DOT (U.S.A.) (Pictograms)

SECTION 16. OTHER INFORMATION

References
- North American Emergency Response Guidebook Documents (2004), Developed by the U.S. Department of Transportation, Transport Canada, and the Secretariat of Communications and Transportation of Mexico
- Patty's Industrial Hygiene and Toxicology, 3rd Revised Edition
- Règlement sur les produits contrôlés (Canada)
- RTECS (2007). Registry of Toxic Effects of Chemical Substances, NIOSH, CDC
- Toxicologie industrielle & intoxication professionnelle, 3e édition, Lauwerys

Glossary
- CSST : Commission de la Santé et de la Sécurité du Travail (Québec).
- HSDB : Hazardous Substances Data Bank.
- NTP : U.S. National Toxicology Program.
- RTECS : Registry of Toxic Effects of Chemical Substances

Note
No specific studies have been performed on this mixture. For your protection, we suggest that you test it before using in your process.

Written by: Groupe STEM Consultants / Noranda Income Limited Partnership
Complete revision: 2010-11-11 Partial review: None Previous complete revision: 2007-11-11
STABILIZED SODIUM JAROSITE

Request
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The SDS are available at the Noranda Income Fund website: http://www.norandaincomefund.com/about/msds.html

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