1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier
Product Name
METAFIX® I-3, I-6A, I-7A Reagent

Synonyms

Recommended use of the chemical and restrictions on use
Recommended Use:
Remediation of contaminated soil and groundwater
Restrictions on Use
Not for direct treatment of potable drinking water.

Manufacturer/Supplier
PeroxyChem LLC
2005 Market Street
Suite 3200
Philadelphia, PA 19103
Phone: +1 267/ 422-2400 (General Information)
E-Mail: sdsinfo@peroxychem.com

Emergency telephone numbers
For leak, fire, spill or accident emergencies, call:
1 800 / 424 9300 (CHEMTREC - U.S.A.)
1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)
1 303/ 389-1409 (Medical - U.S. - Call Collect)

2. HAZARDS IDENTIFICATION

Classification
OSHA Regulatory Status
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200) and the 2015 Workplace Hazardous Materials Information System (WHMIS)

Combustible dust

GHS Label elements, including precautionary statements

EMERGENCY OVERVIEW

Warning
Hazard Statements
May form combustible dust concentrations in air

Precautionary Statements - Prevention
Keep away from all ignition sources including heat, sparks and flame.
Keep container closed and grounded.
Prevent dust accumulations to minimize explosion hazard.

Hazards not otherwise classified (HNOC)
May form combustible dust concentrations in air

Other Information
Supplemental Information
Use non-sparking tools and equipment. CONTAINMENT HAZARD: Any vessel that contains wet product must be vented due to potential pressure build up from gases.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced Iron</td>
<td>7439-89-6</td>
<td>25 - 35</td>
</tr>
<tr>
<td>Iron Sesquioxide</td>
<td>1309-37-1</td>
<td>25 - 35</td>
</tr>
<tr>
<td>Activated carbon</td>
<td>7440-44-0</td>
<td>&lt; 25</td>
</tr>
<tr>
<td>Calcite</td>
<td>1317-65-3</td>
<td>&lt; 25</td>
</tr>
<tr>
<td>Iron sulfide</td>
<td>1309-36-0</td>
<td>&lt; 35</td>
</tr>
</tbody>
</table>

Occupational exposure limits, if available, are listed in section 8 Synonyms are provided in Section 1.

4. FIRST AID MEASURES

Eye Contact
Rinse thoroughly with plenty of water, also under the eyelids. If eye irritation persists, consult a specialist.

Skin Contact
Wash off with soap and water. If skin irritation persists, call a physician.

Inhalation
Remove person to fresh air. If signs/symptoms continue, get medical attention.

Ingestion
Rinse mouth with water and afterwards drink plenty of water or milk. Call a poison control center or doctor immediately for treatment advice.

Most important symptoms and effects, both acute and delayed
May cause skin and eye irritation. May cause respiratory tract irritation.

Indication of immediate medical attention and special treatment needed, if necessary
Treat symptomatically
5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media
Carbon dioxide (CO₂). Dry chemical. Water spray. Foam.

Specific Hazards Arising from the Chemical
Fine dust dispersed in air, in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Flammable properties
Combustible material

Hazardous Combustion Products
Carbon oxides (COx).

Explosion data
Sensitivity to Mechanical Impact
Not sensitive.

Sensitivity to Static Discharge
Fine dust dispersed in air, in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Protective equipment and precautions for firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Avoid dust formation. Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Avoid contact with eyes. Use personal protective equipment. For personal protection see Section 8.

Other
For further clean-up instructions, call PeroxyChem Emergency Hotline number listed in Section 1 “Product and Company Identification” above.

Environmental Precautions
Local authorities should be advised if significant spillages cannot be contained.

Methods for Containment
Maintain good housekeeping practices to avoid accumulation of settled dust, especially on overhead surfaces. Cover powder spill with plastic sheet or tarp to minimize spreading and keep powder dry.

Methods for cleaning up
Pick up and transfer to properly labeled containers. Take precautionary measures against static discharges. Do not dry sweep dust. Wet dust with water before sweeping or use a vacuum to collect dust. Keep in suitable and closed containers for disposal. The waste may be recovered and recycled.

7. HANDLING AND STORAGE

Handling
Minimize dust generation and accumulation. Avoid contact with eyes. Avoid breathing dust. Keep away from open flames, hot surfaces and sources of ignition. Wear personal protective equipment. Refer to Section 8.

Storage
Store in a well-ventilated place. Keep cool. Keep away from open flames, hot surfaces and sources of ignition. Any vessel that contains wet product must be vented due to potential pressure build up from gases.

Incompatible products

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
Exposure Guidelines

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron Sesquioxide 1309-37-1</td>
<td>TWA: 5 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>IDLH: 2500 mg/m³</td>
<td>Mexico: TWA 5 mg/m³</td>
</tr>
<tr>
<td></td>
<td>TWA: 15 mg/m³</td>
<td>TWA: 5 mg/m³</td>
<td></td>
<td>Mexico: STEL 10 mg/m³</td>
</tr>
</tbody>
</table>
### Appropriate engineering controls

Provide appropriate exhaust ventilation at places where dust is formed.

### Individual protection measures, such as personal protective equipment

#### Eye/Face Protection
Whenever airborne dust concentrations are high, appropriate protective eyewear, such as mono-goggles, should be worn to prevent eye contact.

#### Skin and Body Protection
Wear suitable protective clothing. Protective shoes or boots.

#### Hand Protection
Protective gloves

#### Respiratory Protection
Whenever dust in the worker's breathing zone cannot be controlled with ventilation or other engineering means, workers should wear respirators or dust masks approved by NIOSH/MSHA, EU CEN or comparable organization to protect against airborne dust.

#### Hygiene measures
Clean water should be available for washing in case of eye or skin contamination. Remove and wash contaminated clothing before re-use. Do not eat, drink or smoke when using this product.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

#### Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Powder, dark brown to black</td>
</tr>
<tr>
<td>Physical State</td>
<td>Solid</td>
</tr>
<tr>
<td>Color</td>
<td>dark brown to black</td>
</tr>
<tr>
<td>Odor</td>
<td>No information available</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>6 - 8 (as aqueous solution)</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>No information available</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>No information available</td>
</tr>
<tr>
<td>Flash point</td>
<td>No information available</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>No information available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Some of these materials will burn with intense heat</td>
</tr>
<tr>
<td>Flammability Limit in Air</td>
<td>No information available</td>
</tr>
<tr>
<td>Upper flammability limit:</td>
<td>No information available</td>
</tr>
<tr>
<td>Lower flammability limit:</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No information available</td>
</tr>
<tr>
<td>Density</td>
<td>No information available</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1.50 - 1.75 g/cm³ @ 20°C</td>
</tr>
<tr>
<td>Water solubility</td>
<td>50 % w/w</td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Partition coefficient</strong></td>
<td>No information available</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td><strong>Autoignition temperature</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Decomposition temperature</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Viscosity, kinematic</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Viscosity, dynamic</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Explosive properties</strong></td>
<td>Low level dust explosion hazard</td>
</tr>
<tr>
<td><strong>Oxidizing properties</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Molecular weight</strong></td>
<td>No information available</td>
</tr>
<tr>
<td><strong>Bulk density</strong></td>
<td>No information available</td>
</tr>
</tbody>
</table>

## 10. STABILITY AND REACTIVITY

### Reactivity
None under normal use conditions.

### Chemical Stability
Stable under recommended storage conditions.

### Possibility of Hazardous Reactions
Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

### Hazardous polymerization
Hazardous polymerization does not occur.

### Conditions to avoid
Heat, flames and sparks.

### Incompatible materials

### Hazardous Decomposition Products
Reacts with acids to release carbon dioxide gas and heat

## 11. TOXICOLOGICAL INFORMATION

### Product Information
No acute toxicity information is available for this product. Data is for major component in product.

### LD50 Oral
Iron: 98.6 g/kg bw (rat)

### LD50 Dermal
No information available

### LC50 Inhalation
No information available

### Serious eye damage/eye irritation
Irritating to eyes.

### Skin corrosion/irritation
Minimally irritating.

### Sensitization
Not expected to be sensitizing based on the components.

### Component Information

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
<th>NOAEL Oral Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced Iron (7439-89-6)</td>
<td>98.6 g/kg (Rat)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron Sesquioxide (1309-37-1)</td>
<td>&gt; 10000 mg/kg (Rat)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activated carbon (7440-44-0)</td>
<td>&gt; 10000 mg/kg (Rat)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Information on toxicological effects

#### Symptoms
Dust is irritating eyes, nose, throat, and lungs.

#### Delayed and immediate effects as well as chronic effects from short and long-term exposure

### Chronic toxicity
Chronic exposure to dust at concentrations exceeding occupational exposure limits may cause pneumoconiosis (lung disease).

### Carcinogenicity
The table below indicates whether each agency has listed any ingredient as a carcinogen.

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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METAFIX® I-3, I-6A, I-7A Reagent

Iron Sesquioxide
1309-37-1

Group 3

IARC (International Agency for Research on Cancer)  Group 3 - Not classifiable as to its carcinogenicity to humans

Mutagenicity  This product is not recognized as mutagenic by Research Agencies

Reproductive toxicity  This product is not recognized as reprotox by Research Agencies.

STOT - single exposure  No information available.
STOT - repeated exposure  No information available.

Aspiration hazard  Not applicable.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects  Ecotoxicity effects of component substances

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Toxicity to algae</th>
<th>Toxicity to fish</th>
<th>Toxicity to Microorganisms</th>
<th>Toxicity to daphnia and other aquatic invertebrates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced Iron</td>
<td></td>
<td>96 h LC50: = 13.6 mg/L (Morone saxatilis) static</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Persistence and degradability  Biodegradability does not pertain to inorganic substances.

Bioaccumulation  Bioaccumulation is unlikely.

Mobility  No information available.

Other Adverse Effects  None known.

13. DISPOSAL CONSIDERATIONS

Waste disposal methods  Recovery/recycling recommended. Dispose of in accordance with local regulations.

Contaminated Packaging  Dispose of in accordance with local regulations.

14. TRANSPORT INFORMATION

DOT  NOT REGULATED

TDG  NOT REGULATED

15. REGULATORY INFORMATION

U.S. Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

**SARA 311/312 Hazard Categories**
This product is not subject to reporting under the Emergency Planning and Community Right-to-Know rule.

**Clean Water Act**
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

**CERCLA/EPCRA**
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

**US State Regulations**

**U.S. State Right-to-Know Regulations**
This product contains the following substances regulated under state Right-to-Know laws:

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron Sesquioxide</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Calcite</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

**California Proposition 65**
This product does not contain any Proposition 65 chemicals

**CANADA**

**Environmental Emergencies**
This product contains no substances listed under Canada's Environmental Emergency regulations.

**Canadian National Pollutant Release Inventory**
This product contains no substances reportable under Canada's National Pollutant Release Inventory regulations.

**International Inventories**

<table>
<thead>
<tr>
<th>Component</th>
<th>TSCA (United States)</th>
<th>DSL (Canada)</th>
<th>EINECS/EL INCS (Europe)</th>
<th>ENCS (Japan)</th>
<th>China (IECSC)</th>
<th>KECL (Korea)</th>
<th>PICCS (Philippines)</th>
<th>AICS (Australia)</th>
<th>NZIoC (New Zealand)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron Sesquioxide 1309-37-1 (&lt;50)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Reduced Iron 7439-89-6 (&lt;50)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Ferrous Sulfate Heptahydrate 7782-63-0 (&lt;50)</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Activated carbon 7440-44-0 (&lt;25)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Calcite 1317-65-3 (&lt;25)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Iron sulfide 1309-36-0 (&lt;35)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tr>
</tbody>
</table>

**Mexico**

**Mexico - Grade**
Slight risk, Grade 1
16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health Hazards</th>
<th>Flammability</th>
<th>Stability</th>
<th>Special Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HMIS</th>
<th>Health Hazards</th>
<th>Flammability</th>
<th>Physical hazard</th>
<th>Personal Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>-</td>
</tr>
</tbody>
</table>

Revision date: 2016-12-05
Revision note: Initial Release
Issuing Date: 2017-04-13

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Prepared By:

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End of Safety Data Sheet