1. Product and Company Identification

Material name: ZINC SULFATE HEPTAHYDRATE

Version #: 02

Revision date: 08-30-2011

CAS #: 7446-20-0

Product Codes: J.T.Baker: 4382, 4383, 4384
Macron: 8872, 8880

Synonym(s): Sulfuric acid, zinc salt (1:1), heptahydrate

Manufacturer: Avantor Performance Materials, Inc.

Address: 3477 Corporate Parkway
Suite #200
Center Valley, PA 18034
US

Customer Service: 855-282-6867

24 Hour Emergency: 908-859-2151

Chemtrec: 800-424-9300

2. Hazards Identification

Emergency overview: DANGER

Harmful if inhaled or swallowed. Causes eye burns. Causes skin irritation. Dust or vapor irritating to the eyes and respiratory tract.

OSHA regulatory status: This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

Potential health effects

Routes of exposure: Ingestion. Inhalation. Skin contact. Eye contact.

Eyes: Causes eye burns. Dust or splashes from the mixture may cause permanent eye damage.

Skin: Causes skin irritation. Prolonged or repeated contact with skin may cause redness, itching, irritation and eczema/chapping.

Inhalation: Harmful if inhaled. Dust may irritate throat and respiratory system and cause coughing.

Ingestion: Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.


Chronic effects: Prolonged or repeated exposure may cause liver and kidney damage. These effects have not been observed in humans.

Potential environmental effects: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

3. Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS #</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZINC SULFATE HEPTAHYDRATE</td>
<td>7446-20-0</td>
<td>100</td>
</tr>
</tbody>
</table>

Composition comments: CAS # 7446-20-0 can be described by the CAS # 7733-02-0.

4. First Aid Measures

First aid procedures

Eye contact: Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention. In case of irritation from airborne exposure, move to fresh air. Get medical attention if irritation develops and persists.
Skin contact: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing separately before reuse. Destroy or thoroughly clean contaminated shoes.

Inhalation: Move to fresh air. If breathing stops, provide artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Call a physician or poison control center immediately. Only induce vomiting at the instruction of medical personnel. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Notes to physician: Keep victim under observation. Treat symptomatically.

General advice: In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Show this safety data sheet to the doctor in attendance. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Flammable properties: The product is not flammable. No unusual fire or explosion hazards noted.

Extinguishing media:
- Unsuitable extinguishing media: None known.

Protection of firefighters:
- Specific hazards arising from the chemical: Fire may produce irritating, corrosive and/or toxic gases.
- Protective equipment and precautions for firefighters: Use water spray to cool unopened containers. Self-contained breathing apparatus and full protective clothing must be worn in case of fire. Cool containers exposed to flames with water until well after the fire is out.

Special protective equipment for fire-fighters: Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Wear self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode when fighting fires.

Specific methods: In the event of fire and/or explosion do not breathe fumes.

6. Accidental Release Measures

Personal precautions: Keep unnecessary personnel away. Wear appropriate protective equipment and clothing during clean-up. Keep upwind. Keep out of low areas. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained.

Environmental precautions: Do not allow to enter drains, sewers or watercourses. Prevent further leakage or spillage if safe to do so.

Methods for containment: Prevent entry into waterways, sewers, basements or confined areas. Stop leak if you can do so without risk. Dike the spilled material, where this is possible.

Methods for cleaning up:
- Large Spills: Sweep up or vacuum up spillage and collect in suitable container for disposal.
- Small Spills: Sweep up and place in a clearly labeled container for chemical waste. Clean surface thoroughly to remove residual contamination.
- Never return spills in original containers for re-use. Clean up in accordance with all applicable regulations. Collect in a non-combustible container for prompt disposal.

7. Handling and Storage

Handling: Wear appropriate personal protective equipment. Avoid breathing dust. Do not get in eyes and avoid contact with skin and clothing. Do not taste or swallow. Wash thoroughly after handling. Do not eat, drink or smoke when using the product. See Section 8 of the MSDS for Personal Protective Equipment.
8. Exposure Controls / Personal Protection

Engineering controls
Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal protective equipment

Eye / face protection
Chemical goggles and face shield are recommended.

Skin protection
Wear appropriate chemical resistant clothing. Wear appropriate chemical resistant gloves.

Respiratory protection
If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Respirator type: High-efficiency particulate respirator with full facepiece.

General hygiene considerations
Provide eyewash station and safety shower. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

General
Wear chemical protective equipment that is specifically recommended by the manufacturer. Launder contaminated clothing before reuse.

9. Physical & Chemical Properties

Appearance
Crystalline. Granular.

Color
Colorless.

Odor
Odorless.

Odor threshold
Not available.

Physical state
Solid.

Form
Solid.

pH
4.5 aqueous solution

Melting point
212 °F (100 °C)

Freezing point
212 °F (100 °C)

Boiling point
> 932 °F (> 500 °C) Decomposes.

Flash point
Not available.

Evaporation rate
Not available.

Flammability limits in air, upper, % by volume
Not available.

Flammability limits in air, lower, % by volume
Not available.

Vapor density
Not available.

Specific gravity
1.97

Relative density
Not available.

Solubility (water)
960 g/l

Partition coefficient (n-octanol/water)
Not available

Auto-ignition temperature
Not available.

Molecular weight
287.56 g/mol

Molecular formula
O4-S-Zn.7H2O

10. Chemical Stability & Reactivity Information

Chemical stability
Stable under normal temperature conditions.

Conditions to avoid
Excessive heat. Water, moisture.
Incompatible materials
- Strong oxidizing agents. Inorganic salts.
- Zinc oxide. Sulfur oxides.
- Hazardous polymerization does not occur.

Hazardous decomposition products

Possibility of hazardous reactions

11. Toxicological Information

<table>
<thead>
<tr>
<th>Toxicological data</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product</strong></td>
<td><strong>Acute Dermal LD50 Rat: &gt; 2000 mg/kg</strong></td>
</tr>
<tr>
<td>ZINC SULFATE HEPTAHYDRATE (7446-20-0)</td>
<td><strong>Acute Oral LD50 Rat: 623 mg/kg</strong></td>
</tr>
</tbody>
</table>

Sensitization
- Not a skin sensitizer.

Acute effects
- Harmful if inhaled or swallowed.

Local effects
- Causes eye burns. Causes skin irritation. Inhalation of dusts may cause respiratory irritation.

Chronic effects
- Prolonged or repeated exposure may cause liver and kidney damage. These effects have not been observed in humans.

Carcinogenicity
- This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

Skin corrosion/irritation
- Causes skin irritation.

Epidemiology
- No epidemiological data is available for this product.

Mutagenicity
- No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Neurological effects
- No data available for this product.

Reproductive effects
- Contains no ingredient listed as toxic to reproduction

Teratogenicity
- No data available to indicate product or any components present at greater than 0.1% may cause birth defects.

Symptoms and target organs
- Severe eye irritation. Moderate skin irritation. Upper respiratory tract irritation.

12. Ecological Information

<table>
<thead>
<tr>
<th>Ecotoxicological data</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product</strong></td>
<td><strong>EC50 Water flea (Ceriodaphnia dubia): 0.06 mg/l 48.00 hours</strong></td>
</tr>
<tr>
<td>ZINC SULFATE HEPTAHYDRATE (7446-20-0)</td>
<td><strong>LC50 Rainbow trout, donaldson trout (Oncorhynchus mykiss): 0.103 mg/l 96.00 hours</strong></td>
</tr>
</tbody>
</table>

Ecotoxicity
- Expected to be very toxic to aquatic organisms. May cause long-term adverse effects in the environment. The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

Persistence and degradability
- The product is not readily biodegradable.

Partition coefficient (n-octanol/water)
- Not available

13. Disposal Considerations

Disposal instructions
- Dispose of this material and its container to hazardous or special waste collection point. Incinerate the material under controlled conditions in an approved incinerator. All wastes must be handled in accordance with local, state and federal regulations.

Contaminated packaging
- Since emptied containers retain product residue, follow label warnings even after container is emptied. Offer rinsed packaging material to local recycling facilities.
14. Transport Information

DOT
Not regulated as dangerous goods.

IATA
Not regulated as dangerous goods.

IMDG
Not regulated as dangerous goods.

15. Regulatory Information

US federal regulations
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

This product is not listed on the U.S. EPA TSCA Inventory. Under TSCA, hydrates are considered mixtures of their anhydrous salt and water. Accordingly, the anhydrous form is subject to TSCA reporting requirements.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration
ZINC SULFATE HEPTAHYDRATE (CAS 7446-20-0) 1.0 % N982

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance
ZINC SULFATE HEPTAHYDRATE (CAS 7446-20-0) Listed. N982

CERCLA (Superfund) reportable quantity
ZINC SULFATE HEPTAHYDRATE: 1000.0000

Superfund Amendments and Reauthorization Act of 1986 (SARA)

<table>
<thead>
<tr>
<th>Hazard categories</th>
<th>Immediate Hazard - Yes</th>
<th>Delayed Hazard - No</th>
<th>Fire Hazard - No</th>
<th>Pressure Hazard - No</th>
<th>Reactivity Hazard - No</th>
</tr>
</thead>
</table>

Section 311 hazardous chemical
Yes

Clean Water Act (CWA)
Hazardous substance
Priority pollutant
Toxic pollutant

Inventory status

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
</tr>
<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>No</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>No</td>
</tr>
</tbody>
</table>

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations
This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.
<table>
<thead>
<tr>
<th>Saf-T-Data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Health: 1 - Slight</td>
<td></td>
</tr>
<tr>
<td>Flammability: 0 - None</td>
<td></td>
</tr>
<tr>
<td>Reactivity: 1 - Slight</td>
<td></td>
</tr>
<tr>
<td>Contact: 3 - Severe</td>
<td></td>
</tr>
<tr>
<td>Lab Protective Equip: D - GOGGLES &amp; SHIELD; LAB COAT &amp; APRON; VENT HOOD; PROPER GLOVES</td>
<td></td>
</tr>
<tr>
<td>Storage Color Code: G - Green (General Storage)</td>
<td></td>
</tr>
</tbody>
</table>

### 16. Labeling Info

<table>
<thead>
<tr>
<th>Label Hazard Warning</th>
<th>DANGER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harmful if inhaled or swallowed. Causes eye burns. Causes skin irritation. Dust is irritating to the eyes and respiratory tract.</td>
<td></td>
</tr>
</tbody>
</table>

| Label Precautions | Avoid breathing dust. Do not get in eyes and avoid contact with skin and clothing. Do not taste or swallow. Use only with adequate ventilation. Keep container closed. Wash thoroughly after handling. |  |

| Label First Aid | Immediately flush eyes with plenty of water for at least 15 minutes. Immediately flush skin with plenty of water. If gas/fume/vapor/dust/mist from the material is inhaled, remove the affected person immediately to fresh air. Get medical attention immediately. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth method if victim ingested the substance. |  |

### 17. Other Information

<table>
<thead>
<tr>
<th>NFPA ratings</th>
<th>Health: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability: 0</td>
<td></td>
</tr>
<tr>
<td>Instability: 0</td>
<td></td>
</tr>
</tbody>
</table>

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**Issue date**

08-30-2011