1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Nickel sulfate hexahydrate
Cat No.: N72-3; N73-100; N73-500
Synonyms: Nickel(II) sulfate hexahydrate (Crystalline/Technical/Certified ACS)
Recommended Use: Laboratory chemicals

Company: Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

2. HAZARDS IDENTIFICATION

WARNING!
Cancer hazard. May cause cancer by inhalation. Harmful by inhalation and if swallowed. Irritating to eyes and skin. May cause allergic respiratory and skin reaction. May cause irritation of respiratory tract. May cause harm to the unborn child. Possible risks of irreversible effects. Danger of serious damage to health by prolonged exposure. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Target Organs: Skin, Eyes, Lungs

Potential Health Effects

Acute Effects

<table>
<thead>
<tr>
<th>Route</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyes</td>
<td>Irritating to eyes.</td>
</tr>
<tr>
<td>Skin</td>
<td>Irritating to skin. May be harmful in contact with skin. May produce an allergic reaction.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Harmful by inhalation. May cause irritation of respiratory tract. May cause allergic respiratory reaction.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.</td>
</tr>
</tbody>
</table>

Appearance: Blue green
Physical State: Solid
Odor: Odorless
Chronic Effects
May cause cancer. May cause harm to the unborn child. Possible risks of irreversible effects. Danger of serious damage to health by prolonged exposure. Repeated contact may cause allergic reactions in very susceptible persons.

See Section 11 for additional Toxicological information.

Aggravated Medical Conditions
No information available.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Haz/Non-haz</th>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haz</td>
<td>Nickel(II) sulfate hexahydrate (1:1:6)</td>
<td>10101-97-0</td>
<td>&gt;95</td>
</tr>
<tr>
<td>Non-haz</td>
<td>Nickel sulfate</td>
<td>7786-81-4</td>
<td>-</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Immediate medical attention is required.

Skin Contact
Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.

Inhalation
Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Immediate medical attention is required.

Ingestion
Do not induce vomiting. Call a physician or Poison Control Center immediately.

Notes to Physician
Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Flash Point
No information available.

Method
No information available.

Autoignition Temperature
No information available.

Explosion Limits
No data available

Upper
No data available

Lower
Suitable Extinguishing Media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable Extinguishing Media
No information available.

Hazardous Combustion Products
No information available.

Sensitivity to mechanical impact
No information available.

Sensitivity to static discharge
No information available.

Specific Hazards Arising from the Chemical
Keep product and empty container away from heat and sources of ignition
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. Thermal decomposition can lead to release of irritating gases and vapors.

NFPA Health Flammability Instability Physical hazards
2 1 0 N/A

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions
Use personal protective equipment. Ensure adequate ventilation. Avoid dust formation.

Environmental Precautions
Should not be released into the environment.

Methods for Containment and Clean Up
Sweep up or vacuum up spillage and collect in suitable container for disposal. Avoid dust formation.

7. HANDLING AND STORAGE

Handling
Use only under a chemical fume hood. Wear personal protective equipment. Avoid dust formation. Do not breathe dust. Do not get in eyes, on skin, or on clothing. Do not ingest.

Storage
Keep containers tightly closed in a dry, cool and well-ventilated place.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Measures
Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location.

Exposure Guidelines

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel(II) sulfate hexahydrate (1:1:6)</td>
<td>TWA: 0.1 mg/m³</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nickel sulfate</td>
<td>TWA: 0.1 mg/m³</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NIOSH IDLH: Immediately Dangerous to Life or Health

Personal Protective Equipment

| Eye/face Protection | Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. |
| Skin and body protection | Wear appropriate protective gloves and clothing to prevent skin exposure. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced. |
| Respiratory Protection |

9. PHYSICAL AND CHEMICAL PROPERTIES

| Physical State | Solid |
| Appearance | Blue green |
| odor | odorless |
| Odor Threshold | No information available. |
| pH | 4-6.5% aq. sol. |
| Vapor Pressure | No information available. |
| Vapor Density | No information available. |
| Viscosity | No information available. |
9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling Point/Range</td>
<td>No information available. °C</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>53°C / 127.4°F</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>&gt; 280°C</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>Specific Gravity</td>
<td>No information available.</td>
</tr>
<tr>
<td>Solubility</td>
<td>Soluble in water</td>
</tr>
<tr>
<td>Log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>262.85</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>Ni O₄ S . 6 H₂ O</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stability</td>
<td>Stable under normal conditions.</td>
</tr>
<tr>
<td>Conditions to Avoid</td>
<td>Incompatible products. Excess heat. Avoid dust formation.</td>
</tr>
<tr>
<td>Incompatible Materials</td>
<td>Strong oxidizing agents</td>
</tr>
<tr>
<td>Hazardous Decomposition Products</td>
<td>Sulfur oxides</td>
</tr>
<tr>
<td>Hazardous Polymerization</td>
<td>Hazardous polymerization does not occur.</td>
</tr>
<tr>
<td>Hazardous Reactions</td>
<td>None under normal processing..</td>
</tr>
</tbody>
</table>

11. TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Acute Toxicity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Information</td>
<td>See actual entry in RTECS for complete information.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component Information</th>
<th>LD50 Oral</th>
<th>LDS50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel(II) sulfate hexahydrate (1:1:6)</td>
<td>264 mg/kg ( Rat )</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
<tr>
<td>Nickel sulfate</td>
<td>275 mg/kg ( Rat )</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

| Irritation                     | Irritating to eyes and skin    |
| Toxically Synergistic Products | No information available.      |

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

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel(II) sulfate hexahydrate (1:1:6)</td>
<td>Not listed</td>
<td>Group 1</td>
<td>Not listed</td>
<td>X</td>
<td>Not listed</td>
</tr>
<tr>
<td>Nickel sulfate</td>
<td>Not listed</td>
<td>Group 1</td>
<td>Not listed</td>
<td>X</td>
<td>Not listed</td>
</tr>
</tbody>
</table>
IARC: (International Agency for Research on Cancer)
Group 1 - Carcinogenic to Humans
Group 2A - Probably Carcinogenic to Humans
Group 2B - Possibly Carcinogenic to Humans

Sensitization
May cause sensitization by inhalation and skin contact

Mutagenic Effects
Possible risk of irreversible effects

Reproductive Effects
May cause harm to the unborn child.

Developmental Effects
No information available.

Teratogenicity
No information available.

Other Adverse Effects
See actual entry in RTECS for complete information.

Endocrine Disruptor Information
No information available

12. ECOLOGICAL INFORMATION

Ecotoxicity
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Do not empty into drains.

<table>
<thead>
<tr>
<th>Component</th>
<th>Freshwater Algae</th>
<th>Freshwater Fish</th>
<th>Microtox</th>
<th>Water Flea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel sulfate</td>
<td>0.75 mg/L EC50 = 72 h</td>
<td>Brachydanio rerio: LC50&gt;100 mg/L 24h</td>
<td>Not listed</td>
<td>1 mg/L EC50 = 48 h</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oncorhynchus mykiss: LC50=1.28 mg/L 96h</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Persistence and Degradability
No information available

Bioaccumulation/ Accumulation
No information available

Mobility
No information available

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods
Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

14. TRANSPORT INFORMATION

DOT
UN-No UN3288
Proper Shipping Name TOXIC SOLID, INORGANIC, N.O.S.
Proper technical name Nickel(II) sulfate hexahydrate (1:1:6)
Hazard Class 6.1
14. TRANSPORT INFORMATION

Packing Group

TDG
UN-No UN3288
Proper Shipping Name TOXIC SOLID, INORGANIC, N.O.S.
Hazard Class 6.1
Packing Group III

IATA
UN-No UN3288
Proper Shipping Name Toxic solid, inorganic, n.o.s
Hazard Class 6.1
Packing Group III

IMDG/IMO
UN-No UN3288
Proper Shipping Name Toxic solid, inorganic, n.o.s
Hazard Class 6.1
Packing Group III

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Component</th>
<th>TSCA</th>
<th>DSL</th>
<th>NSDL</th>
<th>EINECS</th>
<th>ELINCS</th>
<th>NLP</th>
<th>PICCS</th>
<th>ENCS</th>
<th>AICS</th>
<th>CHINA</th>
<th>KECL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel(II) sulfate hexahydrate (1:1:6)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Nickel sulfate</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>232-104-9</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>KE-25867</td>
<td>X</td>
</tr>
</tbody>
</table>

Legend:
X - Listed
E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.
F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.
N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.
P - Indicates a commenced PMN substance
R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.
S - Indicates a substance that is identified in a proposed or final Significant New Use Rule
T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).
Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.
Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

U.S. Federal Regulations
TSCA 12(b)  Not applicable

SARA 313

SARA 311/312 Hazardous Categorization
  Acute Health Hazard        Yes
  Chronic Health Hazard      Yes
  Fire Hazard                No
  Sudden Release of Pressure Hazard  No
  Reactive Hazard            No

Clean Water Act

<table>
<thead>
<tr>
<th>Component</th>
<th>CWA - Hazardous Substances</th>
<th>CWA - Reportable Quantities</th>
<th>CWA - Toxic Pollutants</th>
<th>CWA - Priority Pollutants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel sulfate</td>
<td>X</td>
<td>100 lb</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Clean Air Act
Not applicable

OSHA
Not applicable

CERCLA

<table>
<thead>
<tr>
<th>Component</th>
<th>Hazardous Substances RQs</th>
<th>CERCLA EHS RQs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel sulfate</td>
<td>100 lb</td>
<td>-</td>
</tr>
</tbody>
</table>

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

State Right-to-Know

<table>
<thead>
<tr>
<th>Component</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel(II) sulfate hexahydrate (1:1:6)</td>
<td>-</td>
<td>X</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nickel sulfate</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

U.S. Department of Transportation
Reportable Quantity (RQ): N
DOT Marine Pollutant N
DOT Severe Marine Pollutant N

U.S. Department of Homeland Security
This product does not contain any DHS chemicals.

Other International Regulations

Mexican - Grade No information available

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.
WHMIS Hazard Class
D1B  Toxic materials
D2A Very toxic materials
D2B  Toxic materials

16. OTHER INFORMATION

Prepared By  Regulatory Affairs
Thermo Fisher Scientific
Tel: (412) 490-8929

Creation Date  04-Aug-2009
Print Date  23-Sep-2009

Revision Summary  "***", and red text indicates revision

Disclaimer
The information provided on this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

End of MSDS