SAFETY DATA SHEET

1. Identification

Product Name
Nickel(II) sulfate hexahydrate

Cat No. : 12514

CAS-No 10101-97-0
Synonyms Single Nickel Salt; Nickeous Sulfate Crystal; Sulfuric Acid Nickel (II) Salt.

Recommended Use Laboratory chemicals.
Uses advised against Food, drug, pesticide or biocidal product use.

Details of the supplier of the safety data sheet

Company
Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com

Emergency Telephone Number
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660.
After normal business hours, call Carechem 24 at (866) 928-0789.

2. Hazard(s) identification

Classification
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Acute oral toxicity Category 4
Acute Inhalation Toxicity - Dusts and Mists Category 4
Skin Corrosion/Irritation Category 2
Serious Eye Damage/Eye Irritation Category 2
Respiratory Sensitization Category 1
Skin Sensitization Category 1
Germ Cell Mutagenicity Category 2
Carcinogenicity Category 1A
Reproductive Toxicity Category 1B
Specific target organ toxicity (single exposure) Category 3
Target Organs - Respiratory system.
Specific target organ toxicity - (repeated exposure) Category 1
Target Organs - Respiratory system.
Signal Word
Danger

Hazard Statements
Harmful if swallowed
Causes skin irritation
Causes serious eye irritation
May cause an allergic skin reaction
Harmful if inhaled
May cause allergy or asthma symptoms or breathing difficulties if inhaled
May cause respiratory irritation
Suspected of causing genetic defects
May cause cancer by inhalation
May damage the unborn child
Causes damage to organs through prolonged or repeated exposure

Precautionary Statements
Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Use only outdoors or in a well-ventilated area
In case of inadequate ventilation wear respiratory protection
Contaminated work clothing should not be allowed out of the workplace
Do not breathe dust/fume/gas/mist/vapors/spray
Wear protective gloves/protective clothing/eye protection/face protection
Response
IF exposed or concerned: Get medical attention/advice
Inhalation
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician
Skin
IF ON SKIN: Wash with plenty of soap and water
Take off contaminated clothing and wash before reuse
If skin irritation or rash occurs: Get medical advice/attention
Eyes
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
Ingestion
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
Rinse mouth
Storage
Store locked up
Store in a well-ventilated place. Keep container tightly closed
Disposal
Dispose of contents/container to an approved waste disposal plant
Hazards not otherwise classified (HNOC)
Very toxic to aquatic life with long lasting effects
WARNING. Cancer - https://www.p65warnings.ca.gov/
3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel(II) sulfate hexahydrate (1:1:6)</td>
<td>10101-97-0</td>
<td>&gt;95</td>
</tr>
<tr>
<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. Get medical attention.

**Inhalation**
Remove to fresh air. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required. If not breathing, give artificial respiration.

**Ingestion**
Do NOT induce vomiting. Call a physician or poison control center immediately.

Most important symptoms and effects
May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause allergic skin reaction. Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing

**Notes to Physician**
Treat symptomatically

5. Fire-fighting measures

**Suitable Extinguishing Media**
Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.

**Unsuitable Extinguishing Media**
No information available

**Flash Point Method**
No information available

**Autoignition Temperature**
No information available

**Explosion Limits**
No data available

**Hazardous Combustion Products**
Sulfur oxides. Nickel oxides.

**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.

NFPA

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
<th>Physical hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0</td>
<td>0</td>
<td>N/A</td>
</tr>
</tbody>
</table>

6. Accidental release measures

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Page 3 / 8
Nickel(II) sulfate hexahydrate

Revision Date 14-Feb-2020

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

Environmental Precautions
Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained. Should not be released into the environment.

Methods for Containment and Clean Up
Sweep up and shovel into suitable containers for disposal. Avoid dust formation.

7. Handling and storage

Handling
Use only under a chemical fume hood. Wear personal protective equipment/face protection. Avoid dust formation. Do not get in eyes, on skin, or on clothing. Do not ingest. If swallowed then seek immediate medical assistance.

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

8. Exposure controls / personal protection

Exposure Guidelines

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
<th>Mexico OEL (TWA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel(II) sulfate hexahydrate (1:1:6)</td>
<td>TWA: 0.1 mg/m$^3$, (Vacated) TWA: 0.1 mg/m$^3$</td>
<td>IDLH: 10 mg/m$^3$, TWA: 0.015 mg/m$^3$</td>
<td>TWA: 0.1 mg/m$^3$</td>
<td></td>
</tr>
<tr>
<td>Nickel sulfate</td>
<td>TWA: 0.1 mg/m$^3$, (Vacated) TWA: 0.1 mg/m$^3$</td>
<td>IDLH: 10 mg/m$^3$, TWA: 0.015 mg/m$^3$</td>
<td>TWA: 0.1 mg/m$^3$</td>
<td></td>
</tr>
</tbody>
</table>

Legend
ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration
NIOSH IDLH: NIOSH - National Institute for Occupational Safety and Health

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

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.

Respiratory Protection
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.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Solid Crystalline</td>
</tr>
<tr>
<td>Appearance</td>
<td>Blue green</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>4-6 5% aq. sol</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>53 °C / 127.4 °F</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>
</tbody>
</table>
Nickel(II) sulfate hexahydrate

Evaporation Rate: Not applicable
Flammability (solid, gas): No information available
Flammability or explosive limits:
- Upper: No data available
- Lower: No data available
Vapor Pressure: No information available
Vapor Density: Not applicable
Specific Gravity: 2.07 g/cm³
Solubility: Soluble in water
Partition coefficient; n-octanol/water: No data available
Autoignition Temperature: No information available
Decomposition Temperature: > 280°C
Viscosity: Not applicable
Molecular Formula: Ni O₄ S . 6 H₂ O
Molecular Weight: 262.85

10. Stability and reactivity

Reactive Hazard: None known, based on information available
Stability: Stable under normal conditions.
Incompatible Materials: Strong oxidizing agents.
Hazardous Decomposition Products: Sulfur oxides, Nickel oxides
Hazardous Polymerization: Hazardous polymerization does not occur.
Hazardous Reactions: None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information
Component Information

<table>
<thead>
<tr>
<th>Component</th>
<th>LD₅₀ Oral</th>
<th>LD₅₀ Dermal</th>
<th>LC₅₀ Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel(II) sulfate hexahydrate (1:1:6)</td>
<td>LD₅₀ = 361.9 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>2.48 mg/l (4h) (Rat)</td>
</tr>
</tbody>
</table>

Toxicologically Synergistic Products: No information available
Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation: Irritating to eyes and skin
Sensitization: May cause sensitization by skin contact
Carcinogenicity: The table below indicates whether each agency has listed any ingredient as a carcinogen.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>IARC</th>
<th>NTP</th>
<th>ACGIH</th>
<th>OSHA</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel(II) sulfate hexahydrate (1:1:6)</td>
<td>10101-97-0</td>
<td>Group 1</td>
<td>Known</td>
<td>Not listed</td>
<td>X</td>
<td>Not listed</td>
</tr>
<tr>
<td>Nickel sulfate</td>
<td>7786-81-4</td>
<td>Group 1</td>
<td>Known</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

NTP: (National Toxicity Program)
- NTP: (National Toxicity Program)
Nickel(II) sulfate hexahydrate

**Known - Known Carcinogen**

**Reasonably Anticipated - Reasonably Anticipated to be a Human Carcinogen**

<table>
<thead>
<tr>
<th>Mutagenic Effects</th>
<th>Possible risk of irreversible effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reproductive Effects</td>
<td>May cause harm to the unborn child.</td>
</tr>
<tr>
<td>Developmental Effects</td>
<td>No information available.</td>
</tr>
<tr>
<td>Teratogenicity</td>
<td>No information available.</td>
</tr>
<tr>
<td>STOT - single exposure</td>
<td>Respiratory system</td>
</tr>
<tr>
<td>STOT - repeated exposure</td>
<td>Respiratory system</td>
</tr>
<tr>
<td>Aspiration hazard</td>
<td>No information available</td>
</tr>
<tr>
<td>Symptoms / effects, both acute and delayed</td>
<td>Symptoms of allergic reaction may include rash, itching, swelling, trouble breathing, tingling of the hands and feet, dizziness, lightheadedness, chest pain, muscle pain or flushing</td>
</tr>
<tr>
<td>Endocrine Disruptor Information</td>
<td>No information available</td>
</tr>
<tr>
<td>Other Adverse Effects</td>
<td>The toxicological properties have not been fully investigated.</td>
</tr>
</tbody>
</table>

**12. Ecological information**

**Ecotoxicity**

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The product contains following substances which are hazardous for the environment. May cause long-term adverse effects in the environment. Do not allow material to contaminate ground water system.

<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>EC50: = 0.75 mg/L, 72h (Pseudokirchneriella subcapitata)</td>
<td>Brachydanio rerio: LC50&gt;100 mg/L 24h Oncorhynchus mykiss: LC50=1.28 mg/L 96h</td>
<td>Not listed</td>
<td>EC50: = 1 mg/L, 48h (Daphnia magna)</td>
</tr>
</tbody>
</table>

**Persistence and Degradability**

May persist based on information available.

**Bioaccumulation/ Accumulation**

No information available.

**Mobility**

Will likely be mobile in the environment due to its water solubility.

**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**: UN3077
- **Proper Shipping Name**: Environmentally hazardous substances, solid, n.o.s.
- **Technical Name**: Nickel(II) sulfate hexahydrate (1:1:6)
- **Hazard Class**: 9
- **Packing Group**: III

**TDG**

- **UN-No**: UN3077
- **Proper Shipping Name**: Environmentally hazardous substances, solid, n.o.s.
- **Hazard Class**: 9
- **Packing Group**: III

**IATA**

- **UN-No**: UN3077
15. Regulatory information

United States of America Inventory

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>TSCA</th>
<th>TSCA Inventory notification - Active/Inactive</th>
<th>TSCA - EPA Regulatory Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel(II) sulfate hexahydrate</td>
<td>10101-97-0</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(1:1:6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nickel sulfate</td>
<td>7786-81-4</td>
<td>X</td>
<td>ACTIVE</td>
<td>-</td>
</tr>
</tbody>
</table>

Legend:

TSCA - Toxic Substances Control Act, (40 CFR Part 710)
X - Listed
'-' - Not Listed

TSCA 12(b) - Notices of Export Not applicable

International Inventories
Canada (DSL/NDSL), Europe (EINECS/ELINCS/NLP), Philippines (PICCS), Japan (ENCS), Australia (AICS), China (IECSC), Korea (ECL).

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>DSL</th>
<th>NDSL</th>
<th>EINECS</th>
<th>PICCS</th>
<th>ENCS</th>
<th>AICS</th>
<th>IECSC</th>
<th>KECL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel(II) sulfate hexahydrate</td>
<td>10101-97-0</td>
<td>-</td>
<td>-</td>
<td></td>
<td>X</td>
<td>X</td>
<td>-</td>
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<td>(1:1:6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nickel sulfate</td>
<td>7786-81-4</td>
<td>X</td>
<td>-</td>
<td>232-104-9</td>
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<td>X</td>
<td>X</td>
<td>X</td>
<td>KECL</td>
</tr>
</tbody>
</table>

U.S. Federal Regulations

SARA 313

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>SARA 313 - Threshold Values %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel(II) sulfate hexahydrate</td>
<td>10101-97-0</td>
<td>&gt;95</td>
<td>0.1</td>
</tr>
<tr>
<td>(1:1:6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nickel sulfate</td>
<td>7786-81-4</td>
<td></td>
<td>0.1</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazard Categories See section 2 for more information

CWA (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(II) sulfate hexahydrate</td>
<td>-</td>
<td>-</td>
<td>X</td>
<td>-</td>
</tr>
<tr>
<td>(1:1:6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nickel sulfate</td>
<td>X</td>
<td>100 lb</td>
<td>X</td>
<td>-</td>
</tr>
</tbody>
</table>

Clean Air Act

<table>
<thead>
<tr>
<th>Component</th>
<th>HAPS Data</th>
<th>Class 1 Ozone Depleters</th>
<th>Class 2 Ozone Depleters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel(II) sulfate hexahydrate</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1:1:6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nickel sulfate</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OSHA - Occupational Safety and Health Administration Not applicable

CERCLA
Nickel(II) sulfate hexahydrate

Component | Hazardous Substances RQs | CERCLA EHS RQs
--- | --- | ---
Nickel sulfate | 100 lb | -

California Proposition 65
This product contains the following Proposition 65 chemicals.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>California Prop. 65</th>
<th>Prop 65 NSRL</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nickel(II) sulfate hexahydrate (1:1:6)</td>
<td>10101-97-0</td>
<td>Carcinogen</td>
<td>Developmental Male Reproductive</td>
<td>-</td>
</tr>
<tr>
<td>Nickel sulfate</td>
<td>7786-81-4</td>
<td>Carcinogen</td>
<td>Developmental Male Reproductive</td>
<td>-</td>
</tr>
</tbody>
</table>

U.S. State Right-to-Know Regulations

<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>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Nickel sulfate</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</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
Mexico - Grade
No information available

16. Other information

Prepared By
Health, Safety and Environmental Department
Email: tech@alfa.com
www.alfa.com

Creation Date
04-Aug-2009
Revision Date
14-Feb-2020
Print Date
14-Feb-2020
Revision Summary
SDS authoring systems update, replaces ChemGes SDS No. 10101-97-0/2.

Disclaimer
The information provided in 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 guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered 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 materials or in any process, unless specified in the text.

End of SDS