1 Identification of substance:

Product details:

Product name: Nickel sulfamate hydrate

Stock number: 89020

Manufacturer/Supplier:
Alfa Aesar, A Johnson Matthey Company
Johnson Matthey Catalog Company, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Emergency Phone: (978) 521-6300
CHEMTREC: (800) 424-9300
Web Site: www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency information:
During normal hours the Health, Safety and Environmental Department. After normal hours call Chemtrec at (800) 424-9300.

2 Composition/Data on components:

Chemical characterization:

Description: (CAS#)
Nickel sulfamate hydrate (CAS# 13770-89-3), 100%

Identification number(s):
EINECS Number: 237-396-1
Index number: 028-018-00-4

3 Hazards identification

Hazard description:

T Toxic
N Dangerous for the environment

Information pertaining to particular dangers for man and environment

R 49 May cause cancer by inhalation.
R 61 May cause harm to the unborn child
R 42/43 May cause sensitization by inhalation and skin contact.
R 48/23 Also toxic: danger of serious damage to health by prolonged exposure through inhalation.
R 68 Possible risk of irreversible effects.
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Classification system

HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)

<table>
<thead>
<tr>
<th>HEALTH</th>
<th>FIRE</th>
<th>REACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Health (acute effects) = 1
Flammability = 0
Reactivity = 1

GHS label elements

Danger

3.4/1 - May cause allergy or asthma symptoms or breathing difficulties if inhaled.
3.6/1B - May cause cancer.
3.7/1A - May damage fertility or the unborn child.
3.9/1 - Causes damage to organs through prolonged or repeated exposure.
3.4/1 - May cause an allergic skin reaction.
3.5/2 - Suspected of causing genetic defects.

Warning

4.1/1 - Very toxic to aquatic life with long lasting effects.

Prevention:

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust/fume/gas/mist/vapours/spray.

(Contd. on page 2)
**Material Safety Data Sheet**  
acc. to OSHA and ANSI

**Product name:** Nickel sulfamate hydrate

Avoid breathing dust/fume/gas/mist/vapours/spray. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection. Use personal protective equipment as required. In case of inadequate ventilation wear respiratory protection.

**Response:**

IF ON SKIN: Wash with plenty of soap and water. 
IF INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. IF exposed or concerned: Get medical advice/attention. Specific treatment (see label). IF skin irritation or rash occurs: Get medical advice/attention. IF experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician. Wash contaminated clothing before reuse.

**Collect spillage.**

**Storage:**

Store locked up.

**Disposal:**

Dispose of contents/container in accordance with local/regional/national/international regulations.

### 4 First aid measures

**General information** Immediately remove any clothing soiled by the product.

**After inhalation**

Supply fresh air and to be sure call for a doctor. Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice.

**After skin contact**

Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice.

**After eye contact**

Rinse opened eye for several minutes under running water. Then consult a doctor. Wear self-contained respirator. Wear fully protective impervious suit.

**After swallowing** Seek immediate medical advice.

### 5 Fire fighting measures

**Suitable extinguishing agents**

Product is not flammable. Use fire fighting measures that suit the surrounding fire.

**Special hazards caused by the material, its products of combustion or resulting gases:**

In case of fire, the following can be released:

- Nitrogen oxides (NOx)
- Sulfur dioxide (SO2)
- Toxic metal oxide fume

**Protective equipment:**

- Wear self-contained respirator.
- Wear fully protective impervious suit.

### 6 Accidental release measures

**Person-related safety precautions:**

- Wear protective equipment. Keep unprotected persons away.
- Ensure adequate ventilation

**Measures for environmental protection:**

Do not allow material to be released to the environment without proper governmental permits.

**Measures for cleaning/collection:**

- Dispose contaminated material as waste according to item 13.
- Ensure adequate ventilation.

**Additional information:**

See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

### 7 Handling and storage

**Handling**

**Information for safe handling:**

- Keep container tightly sealed.

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**USA**
Material Safety Data Sheet
acc. to OSHA and ANSI

Product name: Nickel sulfamate hydrate

Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Information about protection against explosions and fires:
No special measures required.
The product is not flammable

Storage
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: Not required.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

8 Exposure controls and personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace:

Nickel and inorganic compounds, as Ni

- ACGIH TLV: 1.5, A5-inhalable particulate (metal)
- 0.2, A1-inhalable particulate (insoluble compounds)
- 0.1, A4-inhalable particulate (soluble compounds)

Components with limit values from other countries:

- Austria: Carcinogen
- Denmark TWA: 0.5
- Finland TWA: 0.1 (skin) Carcinogen
- France VME: 1; C3-Carcinogen
- Germany: Carcinogen
- Hungary: 0.005-STEL; Carcinogen (insoluble compounds)
- Japan: 1; 2B-Carcinogen
- Korea TLV: 0.5
- Netherlands MAC-TGG: 1; Carcinogen
- Poland TWA: 0.25
- Russia: 0.05-STEL
- Sweden NGV: 0.5 (dust)
- Switzerland MAK-W: 0.5; Carcinogen
- United Kingdom TWA: 0.1
- USA PEL: 1

Additional information: No data

Personal protective equipment

General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Breathing equipment: Use suitable respirator when high concentrations are present.
Protection of hands: Impervious gloves
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties:

General Information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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</thead>
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<tr>
<td>Form</td>
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</tr>
<tr>
<td>Color</td>
<td>Blue</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
</tbody>
</table>

Change in condition

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting point/Melting range</td>
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</tr>
<tr>
<td>Boiling point/Boiling range</td>
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</tr>
<tr>
<td>Sublimation temperature / start</td>
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</tr>
<tr>
<td>Flash point</td>
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</tr>
<tr>
<td>Ignition temperature</td>
<td>Not determined</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not determined</td>
</tr>
</tbody>
</table>
10 Stability and reactivity

**Thermal decomposition / conditions to be avoided:**
Decomposition will not occur if used and stored according to specifications.

**Materials to be avoided:**
- Alkali metals
- Bases

**Dangerous reactions:** No dangerous reactions known

**DANGEROUS PRODUCTS OF DECOMPOSITION:**
- Nitrogen oxides
- Sulfur dioxide
- Toxic metal oxide fumes

11 Toxicological information

**Acute toxicity:**
- **Primary irritant effect:**
  - on the skin: May cause irritation
  - on the eye: May cause irritation

**Sensitization:**
- Sensitization possible through inhalation.
- Sensitization possible through skin contact.

**Subacute to chronic toxicity:**
Nickel and nickel compounds may cause a form of dermatitis known as nickel itch. They may also cause intestinal disorders, convulsions and asphyxia. Airborne nickel contaminated dusts are regarded as carcinogenic to the respiratory tract.

**Additional toxicological information:**
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
- May cause harm to the unborn child.
- NTP-1: Known to be carcinogenic: sufficient evidence from human studies.

12 Ecological information:

**Ecotoxicological effects:**
- **Remark:** Very toxic for fish

**General notes:**
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- Also poisonous for fish and plankton in water bodies.
- Do not allow material to be released to the environment without proper governmental permits.
- Very toxic for aquatic organisms

13 Disposal considerations

**Product:**
- **Recommendation:** Consult state, local or national regulations to ensure proper disposal.

**Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

**Recommended cleansing agent:** Water, if necessary with cleansing agents.
14 Transport information

DOT regulations:

Hazard class: 9
Identification number: UN3077
Packing group: III
Proper shipping name (technical name): ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Nickel sulfamate hydrate)
Label: 9

Land transport ADR/RID (cross-border)

ADR/RID class: 9 (M7) Miscellaneous dangerous substances and articles
Danger code (Kemler): 90
UN-Number: 3077
Packaging group: III
Description of goods: 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Nickel sulfamate hydrate)

Maritime transport IMDG:

IMDG Class: 9
UN Number: 3077
Label: 9
Packaging group: III
EMS Number: F-A,S-F
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Nickel sulfamate hydrate)

Air transport ICAO-TI and IATA-DGR:

ICAO/IATA Class: 9
UN/ID Number: 3077
Label: 9
Packaging group: III
Proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Nickel sulfamate hydrate)

UN "Model Regulation": UN3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., 9, III
Environmental hazards: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID

15 Regulations

Product related hazard informations:

Hazard symbols:
T Toxic
N Dangerous for the environment

Risk phrases:
49 May cause cancer by inhalation.
61 May cause harm to the unborn child
42/43 May cause sensitization by inhalation and skin contact.
48/23 Also toxic: danger of serious damage to health by prolonged exposure through inhalation.
Product name: Nickel sulfamate hydrate

68 Possible risk of irreversible effects.
50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

Safety phrases:
53 Avoid exposure - obtain special instructions before use.
45 In case of accident or if you feel unwell, seek medical advice immediately.
60 This material and its container must be disposed of as hazardous waste.
61 Avoid release to the environment. Refer to special instructions/Safety data sheets

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
This product contains a chemical known to the state of California to cause cancer or reproductive toxicity.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

Information about limitation of use:
For use only by technically qualified individuals.
This product contains nickel and is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know act of 1986 and 40CFR372.

16 Other information:
Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing MSDS: Health, Safety and Environmental Department.
Contact: Zachariah Holt

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
ICAO: International Civil Aviation Organization
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)