SAFETY DATA SHEET

Nickel Sulphate

1. Identification of the substance/preparation and of the company/undertaking

Identification of the substance or preparation

Product name : **Nickel Sulphate**

Common / Trade name : Nickel Sulphate Standard Grade ; Nickel Sulphate EN-grade ; Nickel Sulphate Hexahydrate ; Nickel Sulphate Electroless Grade

Chemical formula : NiSO4.6H2O

Use of the substance/preparation : Industrial applications: Production of rechargeable batteries. Electroless plating. Electroplating. Catalysts

Company/undertaking identification

Supplier or representative of supplier : Umicore Specialty Oxides and Chemicals

Rue du Marais 31
1000 Bruxelles
BE Belgium
Phone : +32 2777636

Emergency telephone number : Emergency telephone number IPDS Umicore : +32 2 2277026

2. Composition/information on ingredients

Substance/preparation : Substance

Ingredient name	CAS number	%	EC number	Classification
Nickel Sulphate Hexahydrate **See section 16 for the full text of the R-phrases declared above**	10101-97-0	>98.5	232-104-9	Carc. Cat. 3; R40 Xn; R22 R42/43 N; R50/53

Occupational exposure limits, if available, are listed in section 8.

3. Hazards identification

The substance is classified as dangerous according to Directive 67/548/EEC and its amendments.

Classification : Carc. Cat. 3; R40
Xn; R22
R42/43
N; R50/53

Human health hazards : Harmful if swallowed.
Limited evidence of a carcinogenic effect.
May cause sensitization by inhalation and skin contact.

Environmental hazards : Very toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

See section 11 for more detailed information on health effects and symptoms.

4. First aid measures

Symptoms

Inhalation : Irritating to respiratory system. May cause sensitization by inhalation.

Ingestion : Harmful if swallowed.

Skin contact : May cause sensitization by skin contact.

Eye contact : No known significant effects or critical hazards.

First aid measures

Inhalation : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion : Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If potentially dangerous quantities of this material have been swallowed, call a physician immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention.

Eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

See section 11 for more detailed information on health effects and symptoms.

5. Fire-fighting measures

Extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Special exposure hazards : No specific hazard.

This material is very toxic to aquatic organisms. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

See section 11 for more detailed information on health effects and symptoms.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

Personal precautions : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment.

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up : If emergency personnel are unavailable, vacuum or carefully scoop up spilled material and place in an appropriate container for disposal by incineration. Avoid creating dusty conditions and prevent wind dispersal.

Note: see section 8 for personal protective equipment and section 13 for waste disposal.

7. Handling and storage

Handling : Do not ingest. Avoid prolonged or repeated contact with skin. Keep container closed. Use only with adequate ventilation. Do not breathe dust. Avoid contact of spilled material and runoff with soil and surface waterways. Avoid exposure. Use suitable protective equipment (section 8). Avoid generation of dust.

Storage : Keep container tightly closed. Keep container in a well-ventilated area.

Packaging materials

Recommended : Use original container.

8. Exposure controls/personal protection

Ingredient name	Occupational exposure limits
Nickel Sulphate Hexahydrate	**Lijst Grenswaarden / Valeurs Limites (Belgium, 12/2002).** **Notes: As Ni** TWA: 0,1 mg/m^3 8 hour/hours. Form: All forms

Exposure controls

Occupational exposure controls : Use process enclosures, local exhaust ventilation or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fumes or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Respiratory protection : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
Recommended:
EU : disposable particulate mask or half-face mask type P3 (EN 140-143 or EN 149) .
USA and Canada : Wear NIOSH approved, properly fitted HEPA type respirator.

Skin protection / Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Body: Recommended: Wear suitable gloves. EU : (EN 374) . Canada and USA : Wear appropriate gloves for task. Latex or similar type gloves worn inside the leather or cotton gloves will reduce skin contact.

Eye protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts.
Recommended:
EU : safety glasses with side-shields (EN 166) .
Canada : Wear CSA approved safety glasses with side shields. Mono goggles provide better protection in dusty conditions.
USA : Wear ANSI compliant safety glasses with side shields

Hygiene measures

General information : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems should not be employed in any process in which this preparation is used.

9. Physical and chemical properties

General information

Appearance

Physical state : Solid. (Crystals.)

Color : Green.

Odor : Odorless.

Important health, safety and environmental information

pH : Not available.

Melting point : Decomposition temperature: >700°C (1292°F)

Flash point : Not applicable.

Explosive properties : Non-explosive in the presence of the following materials or conditions: open flames, sparks and static discharge, heat, shocks and mechanical impacts, oxidizing materials, reducing materials, combustible materials, organic materials, metals, acids, alkalis and moisture.

Oxidizing properties : Not available.

9. Physical and chemical properties

Relative density : 2.07 (Water = 1)

Solubility : Easily soluble in cold water.

10. Stability and reactivity

Stability : The product is stable.

11. Toxicological information

Potential acute health effects

Inhalation : Irritating to respiratory system. May cause sensitization by inhalation.

Ingestion : Harmful if swallowed.

Skin contact : May cause sensitization by skin contact.

Eye contact : No known significant effects or critical hazards.

Acute toxicity

Ingredient name	Test	Result	Route	Species
Nickel Sulphate Hexahydrate	LD50	264 mg/kg	Oral	Rat

Potential chronic health effects

Ingredient name	Carcinogenic effects	Mutagenic effects	Developmental toxicity	Impairs fertility
Nickel Sulphate Hexahydrate	Carc. Cat. 3; R40	-	-	-

Carcinogenicity : Contains material which may cause cancer, based on animal data. Risk of cancer depends on duration and level of exposure.

Classified 1 (Proven for humans.) by IARC, + (Proven.) by NIOSH [Nickel Sulphate Hexahydrate]. Classified 3 (Possible for humans.) by European Union [Nickel Sulphate Hexahydrate]. Classified A4 (Not classifiable for humans or animals.) by ACGIH [Nickel Sulphate Hexahydrate]. Carc. Cat. 3; R40

Mutagenicity : No known significant effects or critical hazards.

Reproductive toxicity : No known significant effects or critical hazards.

Additional information : **Nickel Sulphate Hexahydrate**: Inhalation of this material may cause sensitive individuals to develop eczema and/or asthma.

Inhalation : Irritating to respiratory system.

Skin : May cause sensitization by skin contact.

12. Ecological information

Ecotoxicity data

Ingredient name	Species	Period	Result
Nickel Sulphate Hexahydrate	Oncorhynchus mykiss (LC50)	96 hour/hours	1.28 mg/l
	Daphnia magna (LC50)	96 hour/hours	2.58 mg/l
	Oncorhynchus mykiss (LC50)	96 hour/hours	3.2 mg/l
	Cyprinus carpio (LC50)	96 hour/hours	6.16 mg/l
	Oncorhynchus mykiss (LC50)	96 hour/hours	11.1 mg/l
	Oncorhynchus mykiss (LC50)	96 hour/hours	11.3 mg/l

Other adverse effects : Very toxic to aquatic organisms. May cause long-term adverse effects in the aquatic environment.

13. Disposal considerations

Methods of disposal : The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.
This product is recyclable. Consideration of disposal via this route should be given.

European waste catalogue (EWC) : Not available.

Hazardous waste : The classification of the product may meet the criteria for a hazardous waste.

14. Transport information

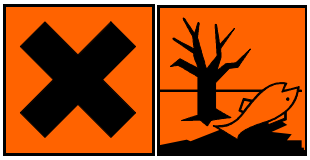
International transport regulations

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
ADR/RID Classification	UN3077	Environmentally hazardous substance, solid, n.o.s. (Nickel Sulphate Hexahydrate)	9	III		Hazard identification number 90 Limited quantity LQ27 CEFIC Tremcard 90GM7-III
ADNR Classification	UN3077	Environmentally hazardous substance, solid, n.o.s. (Nickel Sulphate Hexahydrate)	9	III		-
IMO/IMDG Classification	Not regulated.	-	-	-		-
IATA Class	Not regulated.	-	-	-		-

15. Regulatory information

EU regulations

Hazard symbol/symbols :



Harmful, Dangerous for the environment.

Risk Phrases : R40- Limited evidence of a carcinogenic effect.
R22- Harmful if swallowed.
R42/43- May cause sensitization by inhalation and skin contact.
R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety phrases : S22- Do not breathe dust.
S36/37- Wear suitable protective clothing and gloves.
S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S61- Avoid release to the environment. Refer to special instructions/Safety data sheets.

Contains : Nickel Sulphate Hexahydrate 232-104-9

Product use : Classification and labeling have been performed according to EU Directives 67/548/EEC and 1999/45/EC (including amendments) and the intended use.
- Industrial applications.

Conforms to EU Directive 91/155/EEC, as amended by 2001/58/EC - Belgium

16. Other information

Full text of R-phrases referred to in sections 2 and 3 - Belgium : R40- Limited evidence of a carcinogenic effect.
R22- Harmful if swallowed.
R42/43- May cause sensitization by inhalation and skin contact.
R50/53- Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Full text of classifications referred to in sections 2 and 3 - Belgium : Carc. Cat.3 - Carcinogen Category 3
Xn - Harmful
N - Dangerous for the environment.

History

Date of issue : **7/02/2007.**

Date of previous issue : **30/11/2005.**

Version : **3**

Indicates information that has changed from previously issued version.

Notice to reader

To the best of our knowledge, the information contained in this Material Safety Data Sheet is accurate and reliable on presently available resources. However, neither the seller nor any of its subsidiaries assumes any responsibility or liability whatsoever for the accuracy or completeness of the information contained herein.
This Material Safety Data Sheet shall not constitute a guarantee for any specific product features. Final determination of suitability of this material is the sole responsibility of the user.
All materials may present unknown hazards and should be used and handled with caution and following reasonable safety procedures. Consequently the buyer assumes all risks in connection with the use and handling of this material.