Infosafe No™ 1CH4O Issue Date :December 2022 RE-ISSUED by CHEMSUPP

Product Name **NICKEL SULFATE Hexahydrate**

Classified as hazardous

1. Identification

GHS Product Identifier NICKEL SULFATE Hexahydrate

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Recommended use of the chemical and restrictions on use For organometallic compounds synthesizing, chemical intermediate for other nickel compounds; manufacture of dyes and painting; used in plating baths and as intermediate in production of nickel ammonium sulfate and nickel carbonate, which are also used in nickel plating; used as an intermediate for depositing nickel carbonate on catalyst substances and as the principal intermediate for manufacture of organic nickel salts; metal salt in electrodeless nickel plating; catalyst for oxygen generation from peroxides; as a nickel strike solution; coatings; ceramics; used as an electrolyte for the metal finishing application of nickel electroplating; electrolyte for nickel electrorefining and laboratory reagent.

Other Names

Name	Product Code
NICKEL SULFATE Hexahydrate LR	NL016
NICKEL SULFATE Hexahydrate AR	NA016

Other Information

ChemSupply Australia Pty Ltd does not warrant that this product is suitable for any use or purpose. The user must ascertain the suitability of the product before use or application intended purpose. Preliminary testing of the product before use or application is recommended. Any reliance or purported reliance upon ChemSupply Australia Pty Ltd with respect to any skill or judgement or advice in relation to the suitability of this product of any purpose is disclaimed. Except to the extent prohibited at law, any condition implied by any statute as to the merchantable quality of this product or fitness for any purpose is hereby excluded. This product is not sold by description. Where the provisions of Part V, Division 2 of the Trade Practices Act apply, the liability of ChemSupply Australia Pty Ltd is limited to the replacement of supply of equivalent goods or payment of the cost of replacing the goods or acquiring equivalent goods.

2. Hazard Identification

GHS classification of the substance/mixture

Hazardous to the Aquatic Environment - Acute Hazard: Category 1
Hazardous to the Aquatic Environment - Long-Term Hazard: Category 1
Carcinogenicity - Inhalation: Category 1
Germ Cell Mutagenicity: Category 2
Acute Toxicity - Inhalation: Category 4
Acute Toxicity - Oral: Category 4
Specific target organ toxicity - Repeated Exposure Category 1
Sensitization - Respiratory: Category 1
Skin Corrosion/Irritation: Category 2
Sensitization - Skin: Category 1
Toxic to Reproduction: Category 1

Signal Word (s) DANGER

Hazard Statement (s)

H302 Harmful if swallowed.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H332 Harmful if inhaled.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H341 Suspected of causing genetic defects.
H350 May cause cancer.

H360 May damage fertility or the unborn child.
H372 Causes damage to organs through prolonged or repeated exposure.
H410 Very toxic to aquatic life with long lasting effects.

Pictogram (s) Health hazard, Exclamation mark, Environment

Precautionary statement – Prevention

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P264 Wash thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P281 Use personal protective equipment as required.

Precautionary statement – Response

P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P342+P311 If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313 IF exposed or concerned: Get medical advice/attention.

Precautionary statement – Storage

P405 Store locked up.

Precautionary statement – Disposal

P501 Dispose of contents/container according to local, state and federal regulations.

3. Composition/information on ingredients

Ingredients

Name	CAS	Proportion
Nickel sulfate hexahydrate	10101-97-0	100 %

4. First-aid measures

Inhalation If inhaled, remove from contaminated area to fresh air immediately, avoid becoming a casualty. Make patient comfortable, keep warm and at rest until fully recovered. If breathing is difficult (or develops a bluish skin discolouration), supply oxygen by a qualified person. Apply artificial respiration with a respiratory medical device if not breathing. Do not use mouth to mouth resuscitation. Immediately medical attention is required.

Ingestion Rinse mouth thoroughly with water immediately, repeat until all traces of product have been removed. DO NOT INDUCE VOMITING. Seek immediate medical advice.

Skin Wash affected area thoroughly with copious amounts of running water. Remove contaminated clothing and wash before reuse. Seek medical attention.

Eye contact If contact with the eye(s) occurs, wash with copious amounts of water for approximately 15 minutes holding eyelid(s) open. Take care not to rinse contaminated water into the non-affected eye. Seek medical attention.

First Aid Facilities Maintain eyewash fountain and safety shower in work area.

Advice to Doctor Treat symptomatically based on judgement of doctor and individual reactions of the patient.

Other Information	For advice, contact a Poisons Information Centre (Phone eg Australia 13 1126; New Zealand 0800 764 766) or a doctor.

5. Fire-fighting measures

Hazards from Combustion Products	Very toxic fumes of sulfur oxides and toxic gases and vapours, such as nickel carbonyl.
Specific Methods	Use extinguishing media most appropriate for the surrounding fire. No limitations to the type of extinguishing media.
Specific hazards arising from the chemical	Material does not burn. Runoff may pollute waterways. Fire or heat may produce irritating, poisonous and/or corrosive fumes. Containers may explode when heated.
Hazchem Code	2Z
Decomposition Temp.	> 280 °C.

6. Accidental release measures

Spills & Disposal	Stop leak if safe to do so. Prevent entry into waterways, drains, confined areas. Prevent dust cloud. Use clean non-sparking tools to collect material and place it into loosely-covered plastic containers for later disposal. SEEK EXPERT ADVICE ON HANDLING AND DISPOSAL.
Personal Precautions	Avoid substance contact. Avoid generation of dusts: do not inhale dusts. Ensure supply of fresh air in enclosed rooms.
Personal Protection	Wear protective clothing specified for normal operations (see Section 8)
Clean-up Methods - Small Spillages	Sweep up (avoid generating dust) and using clean non-sparking tools transfer to a clean, suitable, clearly labelled container for disposal in accordance with local regulations.
Environmental Precautions	Do not discharge to the environment or sewer ststem. Prevent further leaking if safe to do so. If product contaminates rivers and lakes or drains inform respective authorities.

7. Handling and storage

Precautions for Safe Handling	Avoid ingestion and inhalation of dust. Avoid contact with eyes, skin, and clothing. Minimize dust generation and accumulation. Keep container closed. Use only with adequate ventilation. Wear clean impervious clothing, gloves, and boots; change clothing daily and maintain high standard of personal hygiene. Smoking, drinking, eating, storage of food or of food and beverage containers or utensils, and the application of cosmetics should be prohibited during work. Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. All personnel should remove gloves, if worn, after completion of procedures in which carcinogens have been used. The worker should immediately wash the skin when it becomes contaminated. Contaminated clothing should not be taken home at end of shift, but should remain at employee's place of work for cleaning. Work clothing that becomes wet or significantly contaminated should be removed and replaced. Procedures should ensure that maintenance workers are not exposed to carcinogens. In cleaning labs, procedures should be used which do not produce aerosols or dispersal of dust, ie, wet mop or vacuum cleaner equipped with high-efficiency particulate filter on exhaust, which are available commercially, should be used. Sweeping, brushing and use of dry dusters or mops should be prohibited. Doors leading into areas where carcinogens are used should be marked distinctively with appropriate labels. Access limited to authorised personnel.
Conditions for safe storage, including any incompatibilities	Store in original, tightly closed containers, in a cool, dry, well-ventilated area away from incompatible substances. Protect against physical damage, direct sunlight and moisture. Separate from strong acids. An inventory should be kept, showing quantity of carcinogen and date it was acquired. Facilities for dispensing should be contiguous to storage area. Areas in which exposure to nickel metal or soluble nickel compounds may occur should be identified by signs or appropriate means, and access to the area should be limited to authorized persons. Wash hands, face, forearms and neck when exiting restricted areas. Avoid cross-contamination of street clothes. Containers of this material may be hazardous when empty since they retain product residues

(dust, solids); observe all warnings and precautions listed for the product.

Storage Regulations Refer Australian Standard AS/NZS 4681:2000 'The storage and handling of Class 9 (miscellaneous) dangerous goods and articles'.

Storage Temperatures Store at room temperature (15 to 25 °C recommended).

8. Exposure controls/personal protection

Occupational exposure limit values

Name	STEL		TWA		
	mg/m3	ppm	mg/m3	ppm	Footnote
Nickel sulfate hexahydrate			0.1		Nickel, soluble compounds (as Ni)

Other Exposure Information A time weighted average (TWA) has been established for Nickel, soluble compounds (as Ni) (Safe Work Australia) of 0.1 mg/m³. The exposure value at the TWA is the average airborne concentration of a particular substance when calculated over a normal 8 hour working day for a 5 day working week. 'Sen' notice - sensitiser. The substance can cause a specific immune response in some people. An affected individual may subsequently react to minute levels of that substance.

Appropriate engineering controls In industrial situations maintain the concentrations values below the TWA. This may be achieved by process modification, use of local exhaust ventilation, capturing substances at the source, or other methods.

Respiratory Protection Where ventilation is not adequate, respiratory protection may be required. Avoid breathing dust, vapours or mists. Respiratory protection should comply with AS 1716 - Respiratory Protective Devices and be selected in accordance with AS 1715 - Selection, Use and Maintenance of Respiratory Protective Devices. Filter capacity and respirator type depends on exposure levels. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

Eye Protection The use of a face shield, chemical goggles or safety glasses with side shield protection as appropriate. Must comply with Australian Standards AS 1337 and be selected and used in accordance with AS 1336.

Hand Protection Hand protection should comply with AS 2161, Occupational protective gloves - Selection, use and maintenance. Recommendation: Excellent: Vinyl, nitrile, neoprene gloves. Good: NR latex. Avoid skin contact when removing gloves from hands, do not touch the gloves outer surface. Dispose of gloves as hazardous waste.

Personal Protective Equipment Final choice of personal protective equipment will depend on individual circumstances and/or according to risk assessments undertaken.

Body Protection Clean clothing or protective clothing should be worn. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.

Hygiene Measures Always wash hands before smoking, eating or using the toilet. Wash contaminated clothing and other protective equipment before storing or re-using.

Other Information Revised IDLH value (Nickel metal and other compounds (as Ni)): 10 mg Ni/m³.

9. Physical and chemical properties

Form Solid

Appearance Alpha-form: Blue to blue-green tetragonal crystals.
Beta-form (transition at 53.3°): Green transparent monoclinic crystals; stable at 40 °C; somewhat efflorescent - becomes blue and opaque at room temperature.

Odour Odourless. Slight acidic odour if wet.

Decomposition Temperature > 280 °C.

Melting Point	53.3 °C (transition pt); loses 5 H20 @ about 100 °C.
Solubility in Water	Very soluble (65.52 g/100 cm³ (0 °C); 75.6 g/100 cm³ (15.5 °C); 625 g/L (20 °C); 340.7 g/100 cm³ (100 °C)).
Solubility in Organic Solvents	Very soluble in alcohol, ammonium hydroxide. Solubility in methanol: 12.5 g/100 cm³.
Specific Gravity	2.03; 2.07.
pH	4.3 - 4.7 (100 g/l H2O, 20 °C).
Vapour Pressure	Negligible.
Volatile Component	0 %vol @ 21 °C
Flammability	Non combustible material.
Explosion Properties	Not considered to be an explosion hazard.
Molecular Weight	262.86
Other Information	Taste: Sweet astringent taste. Index of Refraction: 1.581, 1.487.

10. Stability and reactivity

Chemical Stability	Stable under ordinary temperatures, pressures and conditions of use and storage. Stable @ 40 °C. At 53.3 °C, the substance undergoes transition to transparent green crystals. Forms anhydrous salt at 280 °C. Loses SO3 at 840 °C.
Conditions to Avoid	Strong heating (decomposition, releases water of crystallization), dust generation, and incompatible materials.
Incompatible Materials	Strong acids, strong oxidizing agents.
Hazardous Decomposition Products	Very toxic fumes of sulfur oxides and toxic gases and vapours, such as nickel carbonyl, and nickel oxide.
Hazardous Polymerization	Will not occur.

11. Toxicological Information

Ingestion	Harmful if swallowed. Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract. Nickel is a sensitizer - ingestion of 2.5 mg nickel sulfate aggravated chronic dermatitis in 17 of 28 patients. Symptoms may include abdominal pain, diarrhoea, nausea, and vomiting. Absorption is poor, but should it occur, symptoms may include giddiness, capillary damage, myocardial weakness, central nervous system depression, kidney and liver damage, respiratory effects, blood effects (leukocytosis, reticulocytosis, and erthrocytosis), and death.
Inhalation	Harmful if inhaled. Causes irritation to the respiratory tract. Symptoms may include coughing, sore throat, and shortness of breath. Lung damage may result from a single high exposure or lower repeated exposures. Irritation to soft mucous tissues, resulting in sneezing. Risk of respiratory sensitization. Lung allergy occasionally occurs, with asthma type symptoms. Future exposures can cause asthma attacks with shortness of breath, wheezing, cough and chest tightness. The following applies to soluble nickel compounds in general: Inorganic nickel produces astringent effects on the mucous.
Skin	Causes irritation. Risk of sensitization by skin contact. Contact dermatitis or hypersensitivity, possibly severe, occurs in sensitized individuals (2 to 5% of the general population). Nickel is the most common cause of allergic contact sensitization (10% of all positive patch tests). Exposure can result in localized pruritus (a burning and itching sensation) ('nickel itch'), followed by erythema, papules, eczema and possibly vesicles after 1 to 2 days of continuous contact, and may also be linked to conjunctivitis, asthma and allergic rhinitis. Once acquired, nickel sensitivity usually persists. Nickel and its inorganic compounds can be absorbed through the skin but not in amounts sufficient to cause intoxication. May be harmful if absorbed through

	the skin.
Eye	Causes mild eye irritation, redness, and pain. There is speculation that conjunctivitis and epiphora have occurred in nickel plating work environments due to poor ventilation.
Carcinogenicity	Nickel compounds are evaluated in the IARC Monographs (Vol. 49; 1990) as Group 1: Carcinogenic to humans. R40(3) Carcinogen Category 3, Harmful - Limited evidence of a carcinogenic effect. - Worksafe Aust. Listed as a carcinogen, category 3 in List of Designated Hazardous Substances, - NOHSC. Category 3 - Substances that cause concern for man owing to possible carcinogenic effects but in respect of which the available information is not adequate for making a satisfactory assessment. There is some evidence from appropriate animal studies, but this is insufficient to place the substance in Category 2.
Reproductive Toxicity	Nickel compounds: Suspected Toxicant. Oral administration of nickel sulfate to rats caused decreased testicular, prostate, and seminal vesicle size as well as abnormalities of sperm and decreased sperm count.
Chronic Effects	Prolonged or repeated exposure to excessive concentrations may affect lungs, liver and kidneys. Repeated exposure may cause scarring of the lungs. Chronic exposure to nickel sulfate at levels below 0.5 mg/m³ as well as to low concentrations of other nickel compounds, may cause an increased risk for nasal cancer, and an excess risk for stomach and lung cancers. Chronic exposure to nickel and nickel compounds is associated with cancer, mainly nasal, lung and respiratory cancers. Prolonged or repeated exposure may cause sensitization in certain sensitive individuals.
Mutagenicity	Evidence of mutagenic effects.

12. Ecological information

Ecotoxicity	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. The following applies to nickel salts in general: biological effects: dissolved Ni toxic for aquatic organisms.
Mobility	Nickel is very mobile in aquatic environment.
Bioaccumulative Potential	Nickel shows potential for bioaccumulation.
Other Adverse Effects	A hazardous air pollutant, generally known or suspected to cause serious health problems.
Environmental Protection	Do not allow to enter waters, waste water, or soil!
Acute Toxicity - Fish	Salmo gairdneri (Rainbow trout) LC50: 263 mg/l/48 hr in a static bioassay. Rainbow trout (fresh water) TLm: 160 ppm/48 hr. The following applies to nickel salts in general: L. idus (soft water) LC50: 570 mg/l. Lethal concentration for fish: 1 mg/l. P. promelas LD50: 27 mg/l (hard water) (all values referring to dissolved Ni). The following applies to sulfate in general: biological effects: fish: toxic as from 7 g/l.
Acute Toxicity - Daphnia	The following applies to nickel salts in general: Daphnia magna LC50: 11 mg/l (value refers to dissolved Ni).
Acute Toxicity - Algae	Selenastrum capricornutum, EC50: 0.75 mg/l/72 hr (Method: OECD Guide-line 201 'Algae, Growth Inhibition Test'); The following applies to nickel salts in general: Sc. quadricauda toxic from 1.3 mg/l up (value refers to dissolved Ni); M. aeruginosa toxic from 0.005 mg/l up (value refers to dissolved Ni).
Acute Toxicity - Bacteria	The following applies to nickel salts in general: Ps. putida toxic from 0.0025 mg/l up (value refers to dissolved Ni); The following applies to sulfates in general: bacteria: toxic from: 2.5 g/l.
Acute Toxicity - Other Organisms	The following applies to nickel salts in general: Protozoa: E. sulcatum, toxic from 0.14 mg/l up; U. parduczi, toxic from 0.042 mg/l up (all values referring to dissolved Ni).

13. Disposal considerations

Disposal Considerations	Dispose of according to relevant local, state and federal government regulations.
Special precautions for landfill or incineration	Take precautions as for carcinogens.

14. Transport information

Transport Information	Dangerous goods of Class 9 (Miscellaneous Dangerous Goods) are incompatible in a placard load with any of the following: -Class 1, Class 5, if the Class 9 dangerous goods are fire risk substances.
U.N. Number	3077
UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.
Transport hazard class(es)	9
Hazchem Code	2Z
Packing Group	III
EPG Number	9C1
IERG Number	47
Environmental Hazards	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

15. Regulatory information

Poisons Schedule	S6

16. Other Information

Literature References	'Standard for the Uniform Scheduling of Medicines and Poisons .', Commonwealth of Australia. National Road Transport Commission, 'Australian Code for the Transport of Dangerous Goods by Road and Rail 7th. Ed.'. Safe Work Australia, 'National Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals'. Standards Australia, 'SAA/SNZ HB 76:2010 Dangerous Goods - Initial Emergency Response Guide', Standards Australia/Standards New Zealand. Safe Work Australia, 'Hazardous Chemical Information System'. Safe Work Australia, 'National Code of Practice for the Labelling of Safe Work Hazardous Substances'. Safe Work Australia, 'National Exposure Standards for Atmospheric Contaminants in the Occupational Environment'.
Contact Person/Point	Paul McCarthy Ph. (08) 8440 2000 DISCLAIMER STATEMENT: All information provided in this data sheet or by our technical representatives is compiled from the best knowledge available to us. However, since data, safety standards and government regulations are subject to change and the conditions of handling and use, or misuse, are beyond our control, we make no warranty either expressed or implied, with respect to the completeness or accuracy to the information contained herein. ChemSupply Australia Pty Ltd accepts no responsibility whatsoever for its accuracy or for any results that may be obtained by customers from using the data and disclaims all liability for reliance on information provided in this data sheet or by our technical representatives.
Empirical Formula & Structural Formula	$NiSO_4.6H_2O$

...End Of MSDS...

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