

NICKEL NITRATE (HEXAHYDRATE)

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SECTION 1: IDENTIFICATION

1.1 GHS Product identifier:

NICKEL NITRATE (HEXAHYDRATE)
Synonyms: Nickel(II) nitrate hexahydrate; Nickelous nitrate hexahydrate
CAS: 13478-00-7

Other means of identification:

Not relevant

1.2 Recommended use of the chemical and restrictions on use:

Relevant uses: Electroplating (nickel strike/plating baths), catalyst manufacture (e.g. nickel catalysts), ceramic colourants, laboratory reagent, intermediate in nickel chemical production. For industrial user only.
Uses advised against: All uses not specified in this section or in section 7.3.

1.3 Supplier's details:

SURAJ CHEMICALS
No 92, Govindappa Naicken Street, Shiva Complex, Chennai – 600001, Tamil Nadu, India
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1.4 Emergency phone number:

Emergency Contact No: +91 - 7092722822, +91 - 9840284032

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture:

GHS:
Classification of this product has been carried out in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), per the harmonized classification established for nickel compounds (Table 3.1, Annex VI of Regulation (EC) 1272/2008 and corresponding GHS criteria).

Carc. 2	Carcinogenicity, Category 2, H351
Muta. 2	Germ cell mutagenicity, Category 2, H341
Repr. 1B	Reproductive toxicity, Category 1B, H360D
Acute Tox. 4	Acute oral toxicity, Category 4, H302
Skin Sens. 1	Skin sensitisation, Category 1, H317
STOT RE 1	Specific target organ toxicity, repeated exposure, Category 1, H372
Aquatic Acute 1	Hazardous to the aquatic environment, acute hazard, Category 1, H400
Aquatic Chronic 1	Hazardous to the aquatic environment, chronic hazard, Category 1, H410

2.2 GHS label elements, including precautionary statements:

GHS: Danger

Hazard statements:

H351 – Suspected of causing cancer.
H341 – Suspected of causing genetic defects.
H360D – May damage the unborn child.
H302 – Harmful if swallowed.
H317 – May cause an allergic skin reaction.
H372 – Causes damage to organs through prolonged or repeated exposure.
H400 – Very toxic to aquatic life.
H410 – Very toxic to aquatic life with long lasting effects.

Precautionary statements:

P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe dust.
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
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.
P301+P312: IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell.
P302+P352: IF ON SKIN: Wash with plenty of water.
P308+P313: IF exposed or concerned: Get medical advice/attention.
P333+P313: If skin irritation or rash occurs: Get medical advice/attention.
P391: Collect spillage.
P405: Store locked up.
P501: Dispose of contents/container in accordance with local/national regulations on hazardous waste.

2.3 Other hazards which do not result in classification:

This substance contains nickel; nickel and nickel compounds are well documented to cause skin sensitisation (allergic contact dermatitis) in sensitised individuals even at low exposure levels. Contains nitrate; the substance is an oxidiser (Ox. Sol. 3 per standard classification for nickel nitrate) and should be kept away from combustible/organic materials in addition to the nickel-specific hazards below.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances:

Chemical description: Nickel(II) Nitrate Hexahydrate, Ni(NO₃)₂·6H₂O
In accordance with Annex 4.3.3 of the GHS, the product contains:

Identification	Chemical Name / Classification	Concentration
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CAS: 13478-00-7	NICKEL NITRATE (HEXAHYDRATE) — Carc. 2: H351; Muta. 2: H341; Repr. 1B: H360D; Acute Tox. 4: H302; Skin Sens. 1: H317; STOT RE 1: H372; Aquatic Acute 1: H400; Aquatic Chronic 1: H410 – Danger	≥ 98% (typical commercial/technical grade)
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To obtain more information on the hazards of the substances, consult sections 11, 12 and 16.

3.2 Mixtures:

Non-applicable

SECTION 4: FIRST AID MEASURES

4.1 Description of necessary first-aid measures:

Request medical assistance immediately, showing the SDS of this product.

By inhalation:

Remove the person affected from the area of exposure, provide fresh air and keep at rest. Seek medical attention if symptoms occur or persist.

By skin contact:

Remove contaminated clothing and footwear immediately. Wash affected skin thoroughly with plenty of soap and water. Seek medical advice if irritation, rash or allergic reaction develops.

By eye contact:

Rinse eyes thoroughly with lukewarm water for at least 15 minutes, lifting upper and lower eyelids. Remove contact lenses if present and easy to do. Seek medical attention.

By ingestion/aspiration:

Do not induce vomiting. Rinse mouth with water. Seek immediate medical attention/call a Poison Control Centre, showing the SDS of this product.

4.2 Most important symptoms/effects, acute and delayed:

Acute: gastrointestinal discomfort, skin/eye irritation. Delayed/chronic: allergic skin sensitisation (nickel dermatitis), and, on prolonged/repeated exposure, damage to organs (see sections 2 and 11).

4.3 Indication of immediate medical attention and special treatment needed, if necessary:

Treat symptomatically. Individuals with known nickel sensitisation should avoid further exposure.

SECTION 5: FIRE-FIGHTING MEASURES

5.1 Suitable extinguishing media:

Suitable: Water spray – preferred, to cool and dilute. Foam, dry chemical powder, carbon dioxide also acceptable for surrounding fire.

Note: as an oxidiser, large quantities of water may be needed to control fires involving this product.

Unsuitable: None known

5.2 Specific hazards arising from the chemical:

As an oxidising solid, may intensify fire if involved; contact with combustible/organic materials may increase fire risk. On heating/combustion, may emit toxic nickel oxide and nitrogen oxide fumes.

5.3 Special protective actions for fire-fighters:

Wear self-contained breathing apparatus and full protective clothing. Avoid inhalation of combustion/decomposition fumes.

Additional provisions:

Contain fire-fighting water run-off; do not allow to enter drains or watercourses – very toxic to aquatic life.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:

For non-emergency personnel:

Avoid generating and inhaling dust/mist. Avoid skin and eye contact. Use personal protective equipment described in section 8. Evacuate unprotected personnel.

For emergency responders:

Wear appropriate PPE including respiratory protection. Keep unprotected persons away.

6.2 Environmental precautions:

Prevent entry into drains, watercourses and soil – very toxic to aquatic life with long lasting effects. Notify relevant authorities in case of significant environmental release.

6.3 Methods and materials for containment and cleaning up:

Carefully sweep/vacuum up (avoid dust generation) and place in a suitable, labelled, closed container for disposal as hazardous waste, away from combustible materials. Do not flush with water into drains.

6.4 Reference to other sections:

See sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling:

A. General precautions for safe use:

Avoid generating and breathing dust/mist. Avoid all skin and eye contact; nickel compounds are known skin sensitisers. Handle in a well-ventilated area or under local exhaust ventilation. Do not eat, drink or smoke while handling.

B. Technical recommendations for the prevention of fires and explosions:

Keep away from combustible and organic materials due to oxidising nature. Store separately from reducing agents and flammable substances.

C. Technical recommendations on general occupational hygiene:

Wash hands and exposed skin thoroughly after handling and before eating, drinking or smoking. Launder contaminated clothing before reuse.

D. Technical recommendations to prevent environmental risks:

Prevent discharge to drains, soil and watercourses. Use dedicated containment for spills and waste.

7.2 Conditions for safe storage, including any incompatibilities:

A. Specific storage requirements:

Minimum Temp.	Ambient
Maximum Temp.	Ambient (cool, dry conditions)
Maximum time	Typical value – refer to current specification sheet

B. General conditions for storage:

Store in tightly closed, labelled containers in a dry, well-ventilated, locked area away from incompatible materials (section 10.5) and direct sunlight. For additional information see subsection 10.5.

7.3 Specific end use(s):

Except for the instructions already specified, it is not necessary to provide any special recommendation regarding the uses of this product.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters:

Substances whose occupational exposure limits have to be assessed in the workplace, per the Factories Act, 1948, as amended, and generally referenced international occupational exposure limits for nickel and inorganic nickel compounds (soluble):

Identification	Occupational Exposure Limit Type	Value
NICKEL NITRATE (HEXAHYDRATE) CAS: 13478-00-7	Time Weighted average (8 hrs), as Ni	0.1 mg/m³ (typical reference value for soluble inorganic nickel compounds)

- 8.2 Appropriate engineering controls:**
- Use local exhaust ventilation/dust or mist suppression to keep airborne concentrations below occupational exposure limits. Provide washing facilities and designated clean/dirty change areas where handling is routine.
- B. Respiratory protection:**
- Use a particulate respirator (P2/P3 or equivalent) where dust/mist generation cannot be adequately controlled by engineering measures.
- C. Specific protection for the hands:**
- Chemical-resistant protective gloves (e.g. nitrile or neoprene). Replace at any sign of damage or breakthrough.
- D. Eye and face protection:**
- Safety goggles or face shield to prevent dust/splash contact with eyes.
- E. Bodily protection:**
- Protective coveralls/work clothing; launder separately from personal clothing. Safety footwear recommended.
- F. Additional emergency measures:**
- Emergency shower and eyewash stations should be available in the work area.
- Environmental exposure controls:**
- Prevent environmental discharge of product, dust/mist and contaminated wash-water. See subsection 7.1.D.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

Appearance	
Physical state at 20°C	Solid (crystals)
Appearance	Crystalline solid, deliquescent
Color	Green
Odor	Odourless
Odour threshold	Not relevant *
Volatility	
Boiling point at atmospheric pressure	Decomposes before boiling
Vapour pressure at 20°C / 50°C	Negligible
Evaporation rate at 20°C	Not relevant *
Product Description	
Density / Relative density at 20°C	≈2.05 g/cm³
Dynamic / Kinematic viscosity	Not relevant *
Concentration	≥98% (typical)
pH	≈3–4 (aqueous solution, 50 g/L)
Vapour density at 20°C	Not relevant *
Partition coefficient n-octanol/water 20°C	Not relevant *
Solubility in water at 20°C	Readily soluble, ≈2380 g/L at 20°C
Decomposition temperature	Loses water of crystallisation ≈55–100°C; decomposes with release of nitrogen oxides above ≈140°C
Melting point/freezing point	≈56.7°C
Flammability	
Flash Point	Non-applicable
Flammability (solid, gas)	Non-flammable
Autoignition temperature	Not relevant *
Lower / Upper flammability limit	Not relevant *
Particle Characteristics	
Median equivalent diameter	Typical value – refer to current specification sheet

* Not relevant due to the nature of the product, not providing information on the properties of its hazards.

9.2 Other information:

Explosive properties	Not relevant *
Oxidising properties	Oxidising solid (contains nitrate) – may intensify fire
Corrosive to metals	Not corrosive
Heat of combustion	Not relevant *
Surface tension at 20°C	Not relevant *
Refraction index	Not relevant *

SECTION 10: STABILITY AND REACTIVITY

- 10.1 Reactivity:**
- Oxidising properties due to nitrate content. Reacts with reducing agents, combustible/organic materials and strong acids. Stable under normal conditions when stored correctly.
- 10.2 Chemical stability:**
- Chemically stable under the indicated conditions of storage, handling and use.
- 10.3 Possibility of hazardous reactions:**
- Under the specified conditions, hazardous reactions are not expected. Avoid contact with strong reducing agents and incompatible materials listed in 10.5.
- 10.4 Conditions to avoid:**

Shock/Friction	Contact with Air	Increase in Temperature	Sunlight	Humidity
Not applicable	Not applicable	Avoid heat – oxidiser, may intensify fire	Not applicable	Avoid high humidity (caking)

10.5 Incompatible materials:

Strong Oxidising Agents	Strong Reducing Agents	Alkalis/Carbonates	Strong Acids	Zinc / Magnesium Powders

Not applicable (product itself is the oxidiser) – keep away from reducing agents	Avoid contact	Forms insoluble precipitate	May liberate hazardous fumes	Avoid contact
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10.6 Hazardous decomposition products:
Thermal decomposition may release nitrogen oxides (NOx) and nickel oxide (NiO) fume.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:
In case of exposure that is repetitive, prolonged, or at concentrations higher than the recommended occupational exposure limits, adverse health effects may result depending on the means of exposure:

A. Ingestion (acute effect):
Harmful if swallowed (H302). May cause gastrointestinal irritation, nausea, vomiting, abdominal pain.

B. Inhalation (acute effect):
Inhalation of dust/mist may cause irritation of respiratory passages; repeated exposure contributes to systemic nickel absorption and is associated with respiratory tract effects.

C. Contact with skin and eyes (acute effect):
May cause skin and eye irritation on contact. Well documented to cause allergic contact dermatitis (nickel sensitisation, H317) in sensitised individuals.

D. CMR effects (carcinogenicity, mutagenicity, reproductive toxicity):
Classified Carc. 2 (H351) – suspected of causing cancer; Muta. 2 (H341) – suspected of causing genetic defects; Repr. 1B (H360D) – may damage the unborn child, per the harmonized classification for nickel compounds.
IARC: Nickel compounds classified as Group 1 (carcinogenic to humans).

E. Sensitizing effects:
Classified Skin Sens. 1 (H317) – may cause an allergic skin reaction. Nickel is among the most common causes of allergic contact dermatitis.

F. Specific target organ toxicity (STOT) – single exposure:
Classification criteria are not met based on available data.

G. Specific target organ toxicity (STOT) – repeated exposure:
Classified STOT RE 1 (H372) – causes damage to organs through prolonged or repeated exposure, consistent with the harmonized classification for nickel compounds.

H. Aspiration hazard:
Not applicable (solid).

Product-specific toxicological information:

Identification	Acute Toxicity	Genus
NICKEL NITRATE (HEXAHYDRATE) CAS: 13478-00-7	LD50 oral: ≈onset values vary – Typical value – refer to current specification sheet	Rat
	LD50 dermal: Not established	–

SECTION 12: ECOLOGICAL INFORMATION

Very toxic to aquatic life with long lasting effects.

12.1 Toxicity:

Acute Toxicity	Species	Genus
LC50: ≈0.5–5 mg/L (96h), as Ni (typical range for soluble nickel salts), as Ni (typical range for soluble nickel salts)	Non-applicable	Fish
EC50: ≈0.5–5 mg/L (48h), as Ni (typical range for soluble nickel salts), as Ni (typical range for soluble nickel salts)	Non-applicable	Crustacean

12.2 Persistence and degradability:
Inorganic substance; biodegradability concept not applicable. The nickel ion persists in the environment.

12.3 Bioaccumulative potential:
Nickel does not significantly bioaccumulate in most organisms, but may accumulate in some aquatic species and sediments.

12.4 Mobility in soil:

Koc	Henry	Dry Soil	Moist Soil
Not relevant	Not relevant	Moderate to high (highly soluble)	Moderate to high (highly soluble)

12.5 Results of PBT and vPvB assessment:
Nickel compounds are not formally assessed under standard organic PBT/vPvB criteria (inorganic substance).

12.6 Other adverse effects:
Not described

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Disposal methods:
Dispose of as hazardous waste (heavy-metal-bearing) through a licensed hazardous waste contractor/TSDF in accordance with the Hazardous and Other Wastes (Management and Transboundary Movement) Rules. Do not discharge to drains or water bodies. For packaging: use dedicated containers; do not rinse into general drains.
Refer to national and local regulations on waste management.

SECTION 14: TRANSPORT INFORMATION

Transport of dangerous goods by land (ADR 2023 / RID 2023):	
14.1 UN number	UN2725
14.2 UN proper shipping name	NICKEL NITRATE
14.3 Transport hazard class(es)	5.1 (Label: 5.1)
14.4 Packing group	III
14.5 Environmental hazard	Yes
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

Transport of dangerous goods by sea (IMDG 41-22):	
14.1 UN number	UN2725
14.2 UN proper shipping name	NICKEL NITRATE
14.3 Transport hazard class(es)	5.1 (Label: 5.1)
14.4 Packing group	III
14.5 Marine pollutant	Yes
14.6 Special precautions for user	EmS Codes: F-A, S-Q

14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant
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Transport of dangerous goods by air (IATA/ICAO 2024):

14.1 UN number	UN2725
14.2 UN proper shipping name	NICKEL NITRATE
14.3 Transport hazard class(es)	5.1 (Label: 5.1)
14.4 Packing group	III
14.5 Environmental hazard	Yes
14.6 Special precautions for user	Physico-chemical properties: see section 9
14.7 Transport in bulk (Annex II MARPOL 73/78, IBC Code)	Not relevant

SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations specific for the product in question:

It is recommended to use the information included in this safety data sheet as data used in a risk evaluation of local circumstances, in order to establish the necessary risk prevention measures for the manipulation, use, storage and disposal of this product.

Other legislation:

- Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989
- The Factories Act, 1948 (Act No. 63 of 1948), as amended by the Factories (Amendment) Act, 1987 (Act 20 of 1987)
- Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016
- The Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996

SECTION 16: OTHER INFORMATION

Legislation related to safety data sheets:

This safety data sheet has been designed in accordance with Annex 4 – Guidance on the preparation of Safety Data Sheets of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS).

Texts of the legislative phrases mentioned in sections 2 and 3:

- H302: Harmful if swallowed.
- H317: May cause an allergic skin reaction.
- H341: Suspected of causing genetic defects.
- H351: Suspected of causing cancer.
- H360D: May damage the unborn child.
- H372: Causes damage to organs through prolonged or repeated exposure.
- H400: Very toxic to aquatic life.
- H410: Very toxic to aquatic life with long lasting effects.

The phrases indicated do not refer to the product itself; they are present merely for informative purposes and refer to the individual components which appear in section 3.

Advice related to training:

Personnel handling this product should receive training on nickel sensitisation risk, safe handling practices, and the use of personal protective equipment, to ensure correct interpretation and application of this safety data sheet and the product label.

Principal bibliographical sources:

The United Nations Economic Commission for Europe (UNECE); Regulation (EC) No 1272/2008 (CLP) Annex VI harmonized classification for nickel compounds; publicly available GHS classification references for CAS 13478-00-7.

Abbreviations and acronyms:

- ADR: European agreement concerning the international carriage of dangerous goods by road | IMDG: International maritime dangerous goods code | IATA: International Air Transport Association | ICAO: International Civil Aviation Organisation | LD50: Lethal Dose 50 | LC50: Lethal Concentration 50 | EC50: Effective Concentration 50 | Koc: Partition coefficient of organic carbon | IARC: International Agency for Research on Cancer | STOT RE: Specific target organ toxicity – repeated exposure | CLP: Classification, Labelling and Packaging Regulation

The information contained in this safety data sheet is based on sources, technical knowledge and current legislation, without being able to guarantee its accuracy. This information cannot be considered a guarantee of the properties of the product; it is simply a description of the security requirements. The occupational methodology and conditions for users of this product are not within Suraj Chemicals' awareness or control, and it is ultimately the responsibility of the user to take the necessary measures to obtain the legal requirements concerning the manipulation, storage, use and disposal of chemical products. The information on this safety data sheet only refers to this product, which should not be used for needs other than those specified.

END OF SAFETY DATA SHEET