Issue date: 7/31/2003
Revision date: 4/3/2024

Safety Data Sheet

1. Chemical product and company identification

Product name	:	Nickel(Ⅱ) nitrate hexahydrate

Company information

Name of manufacturer	:	KANTO CHEMICAL CO., INC.
Address	:	2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, JP
Name of section	:	Business Administration Department, Reagent Division
Telephone number	:	+81-3-6214-1090
Facsimile number	:	+81-3-3241-1047
Mail address	:	BC32@kanto.co.jp
Reference No	:	28127
Recommended use	:	For research use only
Restrictions on use	:	Seek expert judgment when using the product for applications other than those recommended.

2. Hazards identification

GHS classification

Physical hazards	Oxidizing solids	Category 3
Health hazards	Respiratory sensitization	Category 1A
	Skin sensitization	Category 1A
	Carcinogenicity	Category 1A
	Reproductive toxicity	Category 2
	Specific target organ toxicity (repeated exposure)	Category 1 (respiratory organs)
	Specific target organ toxicity (repeated exposure)	Category 2 (central nervous system, liver, reproductive organs (male))

Hazard pictograms

Signal word : Danger

Hazard statements :
May intensify fire; oxidizer
May cause an allergic skin reaction
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause cancer
Suspected of damaging fertility or the unborn child
Causes damage to organs (respiratory organs) through prolonged or repeated exposure
May cause damage to organs (central nervous system, liver, reproductive organs (male)) through prolonged or repeated exposure

Precautionary statements

Prevention :
Do not handle until all safety precautions have been read and understood.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

		Keep away from clothing and other combustible materials. Do not breathe dust. Wash hands, forearms and face thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves/protective clothing/eye protection/face protection. [In case of inadequate ventilation] wear respiratory protection.
Response	:	IF ON SKIN: Wash with plenty of water. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF exposed or concerned: Get medical advice/attention. Get medical advice/attention if you feel unwell. If skin irritation or rash occurs: Get medical advice/attention. If experiencing respiratory symptoms: Call a POISON CENTER or doctor. Take off contaminated clothing and wash it before reuse.
Storage	:	Store locked up.
Disposal	:	Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

3. Composition/information on ingredients

Distinction of substance or mixture : Substance

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Nickel(Ⅱ) nitrate hexahydrate	≥ 98	Ni(NO3)2・6H2O	Listed	236-068-5	13478-00-7

4. First aid measures

First aid measures

First-aid measures after inhalation	:	Remove the victim to fresh air, and make him blow his nose and gargle.
First-aid measures after skin contact	:	Wash the affected areas under running water.
First-aid measures after eye contact	:	Wash the affected areas under running water.
First-aid measures after ingestion	:	Give the victim water or salt water and make him vomit. Get medical attention.
Personal Protection in First Aid and Measures	:	Rescuers should wear proper protective equipment like rubber gloves, goggles.

5. Fire fighting measures

Suitable extinguishing media	:	Water, dry chemical powder, carbon dioxide, dry sand, foam
Unsuitable extinguishing media	:	None
Fire hazard	:	Contact with combustible material may cause fire.

Firefighting instructions	:	Move containers from fire area if it can be done without risk, if not possible, apply water from a safe distance to cool and protect surrounding area.
Personal protection (Emergency response)	:	Firefighters should wear protective equipment.

6. Accidental release measures

Personal Precautions, Protective Equipment and Emergency Procedures

General measures	:	Wear proper protective equipment and avoid contact with skin and inhalation of dust. Conduct operations from upwind and evacuate people downwind.

Environmental precautions

Environmental precautions	:	Attention should be given to avoid discharge of spilled product into rivers and resulting environmental damage. When diluting spill with large amounts of water, discharge of untreated wastewater into the environment must be avoided.

Methods and Equipment for Containment and Cleaning up

For containment	:	Sweep up in a chemical waste container. Flush contaminated area with copious amounts of water.
Prevention Measures for Secondary Accidents	:	Do not allow contact with organic substances or combustible substances.

7. Handling and storage

Handling

Technical measures	:	Wear appropriate protective equipment to avoid contact with skin or inhalation of dust.
Precautions for safe handling	:	Avoid formation of dust and aerosols. The substance is an oxdizer. Avoid contact with organic substances.

Storage

Storage conditions	:	As the chemical is deliquescent, keep the bottle tightly closed and store in a cool place. Keep away from combustible matrials.
Material used in packaging/containers	:	Glass, polyethylene, polypropylene.

8. Exposure controls / Personal protection equipment

ACGIH TWA	0.1 mg/m³ (I) (as Ni)

Appropriate engineering controls	:	Install a local ventilation system in case of dusty condition.

Protective equipment

Respiratory protection	:	If necessary, wear dust mask
Hand protection	:	Impervious protective gloves
Eye protection	:	Safety goggles
Skin and body protection	:	Protective clothing, protective boots

9. Physical and chemical properties

Physical state	:	Solid
Color	:	Green
Odor	:	Odorless
pH	:	≈ 4 (Aqueous solution)
Melting point	:	56.7 ° C
Freezing point	:	No data available
Boiling point	:	136.7 ° C (Decomposition)
Flash point	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Flammability	:	Non flammable.
Vapor pressure	:	No data available
Relative density	:	2.05
Density	:	No data available
Relative gas density	:	No data available
Solubility	:	Organic solvents: Soluble in ethanol. Water: 70 % (0℃)
Partition coefficient n-octanol/water (log Pow)	:	No data available
Explosive limits (vol %)	:	No data available
Viscosity, kinematic	:	No data available
Particle characteristics	:	Particle size distribution:< 0.1 % (particle size ≤ 0.1 mm)

10. Stability and reactivity

Reactivity	:	Has oxidative properties.
Chemical stability	:	Stable under normal conditions. Deliquescent.
Possibility of hazardous reactions	:	The mixture with powdery combustible materials may burn vigorously or explode by heating or shock.
Conditions to avoid	:	Light, heat, moisture.
Incompatible materials	:	Reducing substances, combustible materials.
Hazardous decomposition products	:	Nitrogen oxides, nickel oxide.

11. Toxicological information

Acute toxicity (oral)	:	Classification not possible
Acute toxicity (dermal)	:	Classification not possible
Acute toxicity (inhalation)	:	No classification (gas) No classification (vapor) Classification not possible (dust, mist)
Skin corrosion/irritation	:	Classification not possible Besides, skin irritation of nickel compounds has been tested with nickel sulfate anhydrate, and it is reported that there is no irritation in a primary irritation test using rabbits and in a test with human volunteers.
Serious eye damage/irritation	:	Classification not possible Besides, the eye irritation of nickel compounds has been tested with nickel sulfate anhydrate, and it is described that there is no irritation in a primary eye irritation test using rabbits.

Respiratory sensitization	:	May cause allergy or asthma symptoms or breathing difficulties if inhaled. Nickel and its compounds are classified as group 2 of occupational airway sensitizer according to the Recommendation of Occupational Exposure Limits. Besides, as for nickel sulfate, from several cases of asthma, it is suggested that nickel sulfate is a respiratory sensitizer. From the above, this substance was classified into category 1A.
Skin sensitization	:	May cause an allergic skin reaction Nickel and its compounds are classified in Group 1 of occupational skin sensitizer according to the Recommendation of Occupational Exposure Limits. In addition, in a test with volunteers challenged by occlusive application of the aqueous solution of nickel sulfate, allergic reactions were observed in 12 out of 25 people, and it was concluded that water soluble nickel compounds induce allergic dermatitis in humans. Moreover, in a skin sensitization test (maximization test) using guinea pigs, there are 2 tests using nickel sulfate, and "slight" to "clear" erythema on the skin was caused in one test and in the other, the incidence of sensitization was 40% as the result of intradermal injection of a 3% aqueous solution of nickel sulfate . Likewise, also with nickel chloride, in a skin sensitization test (maximization test), the incidence of sensitization was 8 out of 12 animals (66.7%) when induced by intradermal injection of a 1% solution, corresponding to positive. From the above, this substance was classified into category 1A.
Germ cell mutagenicity	:	Classification not possible
Carcinogenicity	:	May cause cancer IARC classifies nickel compounds as group 1 (carcinogenic to humans).
Reproductive toxicity	:	Suspected of damaging fertility or the unborn child There is no data on this substance itself, but it is considered that data on soluble nickel compounds can be used. In a 3-generation study using rats given nickel sulfate hexahydrate by feeding administration, as for the F0 parent animals, only reduced weight gain was observed at the dose of 1,000 Ni ppm, but as for the F1 pups, the increased number of stillborn pups was observed at doses of 250 - 500 Ni ppm. Also, in a 2-generation study using rats given nickel chloride hexahydrate by drinking water administration, for the F0 parent animals, only decreased weight gain was observed at 500 mg Ni/L, but as for the F1 pups, the decreased number of live pups was observed at doses of 250 mg Ni/L or higher. Moreover, in a developmental toxicity study using pregnant mice given nickel chloride hexahydrate by gavage administration on gestation days 6 to 13, dose-dependent low fetal body weight was observed from the dose which is lower than the doses with maternal toxicity, and in addition, increases in the frequency of malformations and delay in ossification were observed at the doses with maternal toxicity. Therefore, this substance was classified into category 2.
STOT-single exposure	:	Classification not possible

STOT-repeated exposure	:	Causes damage to organs (respiratory organs) through prolonged or repeated exposure May cause damage to organs (central nervous system, liver, reproductive organs (male)) through prolonged or repeated exposure There is no information on the hazards of this substance to humans and experimental animals. As for nickel chloride, the lung was determined to be the target organ, based on the information that inflammation of the lungs characterized by alveolar accumulation of alveolar macrophages and atrophy of Type II alveolar epithelial cells were observed at 35 mg Ni/kg/day, equivalent to category 2, in a 90-day toxicity study using rats by oral administration. In addition, in a 77-day oral administration toxicity test using rats, a decline in perception, a decrease in coordination function and a decrease in food-rewarded lever-pushing reactions were observed at 20 mg Ni/kg/day, which is equivalent to category 2. Also in a 90-day oral administration toxicity test using rats, salivation, coordination ataxia, lethargy, etc. were observed at 100 mg Ni/kg/day, which is the upper limit of category 2. Based on these, the central nervous system was determined to be the target organ. As for nickel(Ⅱ) sulfate hexahydrate, the respiratory organs were determined to be the target organ based on 90-day or 2-year inhalation tests using rats or mice, in which inflammatory changes in the lungs and bronchi, atrophy of the olfactory epithelium, etc. were observed at 0.0002 mg Ni/L or under, which is in the range of category 1; and the liver and testis were determined to be the target organs, based on a 30-day dermal administration test using rats, in which effects on the liver, and testis lesions were observed in addition to skin lesions at a doses equivalent to category 2. Since this substance is considered to have the similar effects, it was classified into category 1 (respiratory organs) and category 2 (central nervous system, liver, reproductive organs (male)).
Aspiration hazard	:	Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute	:	Classification not possible
Aquatic chronic	:	Classification not possible

Persistence and degradability

No additional information available

Bioaccumulative potential

No additional information available

Mobility in soil

No additional information available

Hazardous to the ozone layer

Ozone	:	Classification not possible

13. Disposal considerations

Ecological waste information	:	Disposal should be made by one of following methods. Or entrust approved waste disposal companies with the disposal.

Precipitation method :
Dissolve in water and add calcium hydroxide or sodium carbonate solution to precipitate. Filter the precipitation and bury in a landfill site approved for hazardous waste disposal. Flush the supernatant in a drain after adjusting the pH to neutral.

Roasting method :
In case of a large amount of the chemical, recover metal cobalt by roast reduction method.

<Note>
＊The pH of the neutralization should be above 8.5. The precipitation does not form completely below pH 8.5.
＊In case of disposal by roasting method, it is desirable to entrust to disposal companies.

Contaminated container and packaging : In case of disposal of empty bottles, dispose bottles after removing the content thoroughly.

14. Transport information

International Regulations

Transport by sea(IMDG)

UN-No. (IMDG)	:	2725
Proper Shipping Name (IMDG)	:	NICKEL NITRATE
Packing group (IMDG)	:	III
Transport hazard class(es) (IMDG)	:	5.1

Air transport(IATA)

UN-No. (IATA)	:	2725
Proper Shipping Name (IATA)	:	Nickel nitrate
Packing group (IATA)	:	III
Transport hazard class(es) (IATA)	:	5.1
Marine pollutant	:	Not applicable
MFAG-No	:	140

15. Regulatory information

Regulatory information with regard to this substance in your country or region should be examined by your own responsibility.

16. Other information

Data sources : Encyclopaedia Chimica, Kyoritsu Shuppan Co, Ltd. (1963) .
Handbook of Dangerous Substances Springer-Verlag Tokyo (1991) .
Handbook of 17322 Chemical Products, The Chemical Daily Co. (2022) .
NITE Chemical Risk Information Platform (NITE-CHRIP), National Institute of Technology and Evaluation.

The information contained herein is based on several references and the present state of our knowledge. However the SDS does not always cover all information about the product, handle the product carefully.The information is intended to ordinary usage, in case of particular handlings, conduct appropriate safety measurements.The information herein is only provision of information, and

it does not represent a guarantee the properties of the product.The Safety Data Sheet(SDS) is prepared based on JIS Z7253.