1. IDENTIFICATION
   Product Name: Nickel Chloride, Nickel Chloride Hexahydrate
   Identified use: For research use only. Not for use in diagnostic procedures.
   Supplier: Nanomaterial Diagnostics, 6185 Cornerstone Ct. E, Suite 110, San
   Diego, CA 92121, USA, www.nanomaterialdiagnostics.com. Phone number:
   (619) 630-0703.

2. HAZARDS IDENTIFICATION
   - GHS07
     Skin Irrit. 2 H315 Cases skin irritation
   - GHS06
     Skin Sens. 1 H317 May cause allergic skin reaction
   - GHS08
     Acute Tox. 3 H301 Toxic if swallowed
     Acute Tox. 3 H331 Toxic if inhaled
     Resp. Sens. 1 H334 May cause allergy or asthma symptoms or breathing
difficulties if inhaled
     Muta. 2 H341 Suspected of causing genetic defects
     Carc. 1A H350 May cause cancer
     Repr. 1B H360 May damage fertility or the unborn child
     STOT RE 1 H372 Causes damage to the digestive system and the brain through
   prolonged or repeated exposure. Route of exposure: Oral

3. COMPOSITION/INFORMATION ON INGREDIENTS
   Ingredient Name: ORAL (LD50): Acute: 105 mg/kg
   CAS#: 7791-20-0

4. FIRST AID MEASURES
   1. Eye Contact: Check for and remove any contact lenses. In case of contact,
immediately flush eyes with plenty of water for at least 15 minutes. Cold water
may be used. Get medical attention.
   2. Skin Contact: In case of contact, immediately flush skin with plenty of water.
Cover the irritated skin with an emollient. Remove contaminated clothing and
shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean
shoes before reuse. Get medical attention.
   3. Serious Skin Contact: Wash with a disinfectant soap and cover the
contaminated skin with an anti-bacterial cream. Seek immediate medical
attention.
   4. Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial
respiration. If breathing is difficult, give oxygen. Get medical attention.
   5. Serious Inhalation: Evacuate the victim to a safe area as soon as possible.
Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is
difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth
resuscitation. WARNING: It may be hazardous to the person providing aid to give
mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.
6. Ingestion: If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
7. Serious Ingestion: No data

5. FIRE FIGHTING MEASURES
Flammability of the Product: Non-flammable.
Products of Combustion: No data.
Special Remarks on Fire Hazards: Noncombustible. Nickel chloride itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. When heated to decomposition it emits highly toxic fumes of hydrogen chloride.
Special Remarks on Explosion Hazards: Containers may explode when heated. A mixture of potassium and nickel chloride produces an explosion on impact

6. ACCIDENTAL RELEASE MEASURES
Small Spill: Use appropriate tools to put the spilled solid in a convenient waste disposal container.
Large Spill: Poisonous solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

7. HANDLING AND STORAGE
Handling precautions for safe handling: Keep locked up. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as acids.
Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area.

8. EXPOSURE CONTROLS/PERSONAL PROTECTIVE EQUIPMENT (PPE)
Engineering Controls: Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
Personal protective equipment: Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.
Personal Protection in Case of a Large Spill: Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
Exposure Limits: TWA: 0.1 (mg(Ni)/m) [United Kingdom (UK)] TWA: 1 (mg(Ni)/m) from OSHA (PEL) [United States] TWA: 0.1 (mg(Ni)/m) from ACGIH (TLV) [United States]Consult local authorities for acceptable exposure limits.
9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance: Solid. (Deliquescent crystals solid.)
Odor: Odorless.
Melting Point: No data.
Critical Temperature: No data.
Specific Gravity: 3.55 (Water = 1)
Vapor Pressure: No data.
Vapor Density: No data
Volvility: No data.
Odor Threshold: No data
Water/Oil Dist. Coeff.: No data
Ionicity (in Water): No data.
Dispersion Properties: See solubility in water.
Solubility: Soluble in cold water. Soluble in about 1 part water. Soluble in alcohol.
Molecular Weight: 237.71 g/mole
Taste: No data.
Color: Green.
pH (1% soln/water): No data.
Boiling Point: 1783°C (3241.4°F)

10. STABILITY AND REACTIVITY

Stability: The product is stable.
Instability Temperature: No data.
Conditions of Instability: Dust generation, Incompatible materials
Incompatibility with various substances: Reactive with acids.
Corrosivity: Non-corrosive in presence of glass.
Special Remarks on Reactivity: Incompatible with peroxides, potassium
Special Remarks on Corrosivity: No data.
Polymerization: Will not occur

11. TOXOLOGICAL INFORMATION

Routes of Entry: Inhalation. Ingestion.
Toxicity to Animals: Acute oral toxicity (LD50): 105 mg/kg [Rat].
Chronic Effects on Humans: CARCINOGENIC EFFECTS: IARC Cancer Review: Animal Limited Evidence; Not assigned an overall evaluation by IARC.
MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. May cause damage to the following organs: blood, kidneys, liver, mucous membranes, upper respiratory tract, skin.
Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant), of ingestion, of inhalation.
Special Remarks on Toxicity to Animals: No data.
Special Remarks on Chronic Effects on Humans: May cause cancer. May affect genetic material (mutagenic). May cause adverse reproductive effects.
Special Remarks on other Toxic Effects on Humans: Acute Potential Health Effects: Skin: Causes skin irritation. May cause skin allergy. Some individuals may become sensitized and suffer "nickel itch", a form of dermatitis resulting from sensitization to nickel. It is characterized by skin eruptions followed by discrete ulcers, or by eczema. Eyes: Causes irritation, redness and pain.
Inhalation: Causes respiratory tract irritation. Symptoms may include coughing, wheezing, sore throat, hoarseness, shortness of breath (dyspnea), asthma, bronchitis, metallic taste in mouth. Other symptoms of inhalation of nickel or nickel compounds may include nausea, vomiting, abdominal pain, giddiness, dizziness, weakness, somnolence, sleeplessness, dysphoria, blurred vision, and
numbness. Ingestion: Toxic if swallowed. Causes abdominal pain, nausea, vomiting, hypermotility, diarrhea. It may affect behavior/central nervous system (somnolence, giddiness, dizziness, headache, lassitude, central nervous system depression), heart (decreased myocardial contractility, myocardial damage). It may cause liver and kidney damage. Chronic Potential Health Effects: Skin: Prolonged or repeated skin contact may cause sensitization dermatitis known as "nickel itch." Ingestion: Prolonged or repeated ingestion may cause liver and kidney damage, degenerative changes in the brain, and weight loss. It may also affect the blood (changes in blood serum composition, leukocytosis, reticulocytosis, erythrocytosis). Inhalation: Repeated or prolonged inhalation may cause allergic asthma, pneumonitis Aggravation of Pre-existing Conditions: Individuals with pre-existing skin disorders, impaired respiratory or pulmonary function, or with a history of asthma, allergies, or sensitization to nickel compounds may be at increased risk upon exposure to this substance.

12. ECOLOGICAL INFORMATION
Ecotoxicity: No data.
BOD5 and COD: No data.
Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.
Toxicity of the Products of Biodegradation: The products of degradation are as toxic as the original product.
Special Remarks on the Products of Biodegradation: No data.

13. DISPOSAL CONSIDERATION
Waste Disposal: Waste must be disposed of in accordance with federal, state and local environmental control regulations

14. TRANSPORTATION INFORMATION
DOT Classification: CLASS 6.1: Poisonous material.
Identification: : Toxic solid, inorganic, n.o.s. (Nickel chloride) UNNA: 3288 PG: III
Special Provisions for Transport: Not available

15. REGULATORY INFORMATION
Federal and State Regulations: California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Nickel compounds California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: Nickel compounds. Connecticut hazardous material survey.: Listed as Nickel chloride Illinois chemical safety act: Listed as Nickel chloride New York acutely hazardous substances: Listed as Nickel chloride Pennsylvania RTK: Listed Nickel chloride Massachusetts RTK: Listed as Nickel chloride Massachusetts spill list: Listed as Nickel chloride New Jersey: Listed as Nickel chloride New Jersey spill list: Listed as Nickel (II)chloride., California Director's List of Hazardous substances: Listed as Nickel Chloride (NiCl2) Louisiana RTK reporting list: Listed as Nickel chloride SARA 313 toxic chemical notification and release reporting: Nickel compounds CERCLA: Hazardous substances.: Listed as Nickel chloride: 100 lbs. (45.36 kg) Nickel Chloride hexahydrate (CAS no. 7791-20-0) is not present on State Lists. Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). Other Classifications:
WHMIS (Canada): CLASS D-1B: Material causing immediate and serious toxic effects (TOXIC). CLASS D-2A: Material causing other toxic effects (VERY TOXIC).


HMIS (U.S.A.):
- Health Hazard: 3
- Fire Hazard: 0
- Reactivity: 0
- Personal Protection: E

National Fire Protection Association (U.S.A.):
- Health: 3
- Flammability: 0
- Reactivity: 0
- Specific hazard:

Protective Equipment: Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

16. OTHER INFORMATION

References: Not available.
Other Special Considerations: Not available.
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