

SAFETY DATA SHEET

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

Product identifier: Nickel Solution

Relevant identified uses of the substance or mixture and uses advised against:

For reducing EDTA interference during analysis of lead in blood using a Model 3010B Lead Analyzer.

Details of the supplier of the Safety Data Sheet:

United States:

Magellan Diagnostics, Inc.
 101 Billerica Ave., Bldg 4
 North Billerica, MA 01862 US
 Phone: (800) 275-0102
 Fax: (978) 600-1480
 Info: bloodleadtechsupport@magellandx.com

Europe:

Ichor Technologies Ltd
 1 Paper Mews
 300 High Street
 Dorking, Surrey, RH4 2TU UK
 Phone: +44 (0) 1372 377 754
 Fax: +44 (0) 1372 388 282
 Info: bloodleadtechsupport@magellandx.com

Emergency telephone number:

(800) 535-5053 (24-hour, US only)

1 (352) 323-3500 (24-hour)

Section 2: Hazards Identification

Classification of the substance or mixture:

Skin Corrosive Category 1; H314: Causes severe skin burns and eye damage.
 Carcinogenicity Category 1A; H350i: May cause cancer by inhalation.
 Mutagenicity Category 2; H341: Suspected of causing genetic defects.
 Reproductive Toxicity Category 1B; H360D: May damage the unborn child.
 Acute Toxicity Category 3; H331: Toxic if inhaled.
 Acute Toxicity Category 3; H301: Toxic if swallowed.
 Specific Target Organ Toxicity after Repeated Exposure Category 1; H372: Causes damage to organs through prolonged or repeated exposure.
 Respiratory Sensitization Category 1; H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
 Skin Sensitization Category 1; H317: May cause an allergic skin reaction.
 Aquatic Chronic 2; H411: Toxic to aquatic life with long-lasting effects.

Label elements:



Hydrochloric acid 4.76% Danger

H314: Causes severe skin burns and eye damage.

H350i: May cause cancer by inhalation.

H341: Suspected of causing genetic defects.

H360D: May damage the unborn child.

H331: Toxic if inhaled.

H301: Toxic if swallowed.

H372: Causes damage to organs through prolonged or repeated exposure.

H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.

H317: May cause an allergic skin reaction.

H411: Toxic to aquatic life with long-lasting effects.

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/vapors/spray.

P264: Wash hands thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.

SAFETY DATA SHEET

Section 2: Hazards Identification, continued

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.
 P301/330/331/310: IF SWALLOWED: rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/physician.
 P303/361/353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
 P333/313: If skin irritation or rash occurs: Get medical advice/attention.
 P304/340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
 P310: Immediately call a POISON CENTER or doctor/physician.
 P305/351/338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P308/313: IF exposed or concerned: Get medical advice/attention.
 P363: Wash contaminated clothing before reuse.
 P391: Collect spillage.
 P403/233: Store in a well-ventilated place. Keep container tightly closed.
 P405: Store locked up.
 P501: Dispose of contents/container in accordance with local/regional/national/international regulations

European Classification:

This preparation is classified as dangerous according to Directive 1999/45/EC.



Corrosive



Toxic



Dangerous for the environment

R35: Causes severe burns.

Carcinogenic Category 1; R49 May cause cancer by inhalation.

Mutagenic Category 3; R68 Possible risk of irreversible effects.

Toxic to Reproduction Category 2; R61 May cause harm to the unborn child.

R23/25-48/23 - Toxic by inhalation and if swallowed. Toxic: danger of serious damage to health by prolonged exposure through inhalation.

R42/43 - May cause sensitization by inhalation and skin contact.

R51-53 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

U.S.A.:

This material is considered hazardous by the OSHA Hazard Communication Standard (29CFR 1910.1200).

Section 2: Hazards Identification, continued

Canada:

This is a controlled product under WHMIS. Classifications: E-Corrosive.

D1B – Material causing immediate and serious toxic effects.

D2A – Material causing other toxic effects.



Other hazards:

Not applicable

SAFETY DATA SHEET

Section 3: Composition/Information on Ingredients

Hazardous Substances:

Product is a mixture, an aqueous solution of hydrogen chloride and nickel dichloride.

<u>Chemical Name</u>	<u>CAS No.</u>	<u>Wt. %</u>	<u>EINECS / ELINCS</u>	<u>Classification of pure substance</u>	<u>Risk/Hazard Phrases</u>
Hydrochloric acid	7647-01-0	4.76	231-595-7	C; Xi	R34;R37
				Skin irritant. 1B (STOT SE 3)	H314 H335
Nickel dichloride	7718-54-9	4.05	231-743-0	Carc. Cat. 1; Muta. Cat. 3; Repr. Cat. 2; T; Xi; N	R49 R68 R61 R23/25-48/23 R38 R42/43 R50-53
				Carc. 1A Muta. 2 Repr. 1B Acute Tox. 3 * Acute Tox. 3 * STOT RE 1 Skin Irrit. 2 Resp. Sens. 1 Skin Sens. 1 Aquatic Acute 1 Aquatic Chronic 1	H350i H341 H360D*** H331 H301 H372** H315 H334 H317 H400 H410

Note: See Section 16 for the full text of the Risk and Hazard phrases above.

Section 4: First Aid Measures

Description of first aid measures:

Inhalation: Remove source of contamination or move victim to fresh air and keep at rest in a position comfortable for breathing. If breathing is difficult, trained personnel should administer emergency oxygen. Immediately call a POISON CENTER or medical advice.

Eye Contact: Avoid direct contact with the victim. First aid responders should wear chemical protective gloves. Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 15 minutes, while holding the eyelid(s) open. Neutral saline solution may be used as soon as it is available. Do not interrupt flushing. Take care not to rinse contaminated water into the unaffected eye or onto face. Immediately obtain medical attention.

Skin Contact: Avoid direct contact with the victim. First aid responders should wear chemical protective gloves. As quickly as possible, Remove/Take off immediately all contaminated clothing. Rinse skin with water or shower. If skin irritation or rash occurs, obtain medical advice. Completely decontaminate clothing, shoes and leather goods before re-use or discard.

Ingestion: Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. **DO NOT INDUCE VOMITING.** If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Have victim rinse mouth with water again. Immediately call a POISON CENTER or doctor/physician.

SAFETY DATA SHEET

Section 4: First Aid Measures, continued

Most important symptoms and effects, both acute and delayed:

Inhalation: Symptoms of exposure may include coughing, wheezing, pain and swelling in the upper respiratory tract. Prolonged or severe exposure may lead to pulmonary edema; symptoms of pulmonary edema include chest pain and shortness of breath and can be delayed up to 24 or 48 hours after exposure. Repeated exposure to Nickel compounds by inhalation may cause scarring of the lungs (fibrosis). Inhalation of Nickel may cause respiratory sensitization. It can take some time for sensitization to develop (e.g. months or years). Once sensitized, the person will experience symptoms of asthma such as wheezing, difficult breathing, sneezing and runny or blocked nose following exposure to airborne concentrations that have no effect on unsensitized people. Symptoms can develop immediately following exposure or hours later.

Eye Contact: Direct contact with liquid or vapor can cause a burning sensation in the eyes, severe eye irritation or chemical burns. Serious damage may result if treatment is delayed.

Skin Contact: Direct contact with the liquid causes severe irritation. Symptoms include local discomfort or pain, redness and swelling, blister formation and possible tissue destruction. Nickel can cause skin sensitization. Once a person is sensitized, contact with even a small amount of Nickel can cause outbreaks of allergic dermatitis with symptoms such as redness, rash, itching and swelling. This reaction can spread from the hands or arms to the face and body.

Ingestion: Swallowing can cause irritation to the lips, tongue, throat and digestive tract, abdominal and chest pain, nausea and vomiting. Nickel may adversely affect the liver and kidney.

Indication of any immediate medical attention and special treatment needed: Not available.

Section 5: Fire Fighting Measures

Extinguishing media:

Aqueous solution, does not burn. Use extinguishing agents compatible with hydrochloric acid and appropriate for the surrounding fire.

Special hazards arising from the substance or mixture:

Contact with common metals produces flammable hydrogen gas.

When heated or in a fire, toxic and corrosive hydrogen chloride gas is released. Heat from a fire can cause a rapid build-up of pressure inside closed containers, which may cause explosive rupture and a sudden release of corrosive gas.

Thermal decomposition may release acrid smoke and toxic nickel oxide fumes.

Advice for firefighters:

Firefighters should wear full protective gear including self-contained breathing apparatus when fighting chemical fires. Any water runoff should be minimized and contained.

Section 6: Accidental Release Measures

Personal precautions, protective equipment and emergency procedures:

Wear proper protective gloves (butyl rubber, neoprene, nitrile), goggles, boots, clothing and other protective equipment. Ventilate the area.

Environmental precautions:

Prevent releases to drains, sewers and natural waterways.

Methods and material for containment and cleaning up:

Contain and soak up spill with absorbent material which does not react with spilled chemical (e.g. cloth) or a commercial acid-neutralizing absorbent product. Place any absorbent and waste product in suitable, covered, labeled containers for proper disposal. Do not return the spilled liquid to original containers. Flush area with water.

Regional regulations may require the reporting of toxic substances released to soil, water and air.

SAFETY DATA SHEET

Section 6: Accidental Release Measures, continued

Reference to other sections:

See Section 8 for information on selection of personal protective equipment.
See Section 13 for information on disposal of spilled product and contaminated absorbents.

Section 7: Storage and Handling

Precautions for safe handling:

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
Use only in a well ventilated area in the workplace. Do not get on skin or in eyes. Do not breathe the mist/vapors/spray. Wear personal protective equipment required for the workplace. Guidelines for selection of protective equipment are described in Section 8.
Wash hands thoroughly immediately after exposure to product and at the end of the work-shift. Workers whose clothing has been contaminated by product should change into clean clothing promptly. Do not eat, smoke or drink where product is handled, processed, or stored. Keep contaminated clothing in closed containers. Discard or launder before rewearing. Contaminated work clothing should not be allowed out of the workplace. Inform laundry personnel of contaminant's hazards.
Avoid release to the environment.
If exposed or concerned: Get medical advice/attention

Conditions for safe storage, including any incompatibilities:

Reagents must be stored according to label directions. Store at 15 – 30°C. Do not freeze or refrigerate. Protect from direct sunlight. Store in a well-ventilated place. Keep container tightly closed. Store locked up.

Specific end use(s):

For reducing EDTA interference during analysis of lead in blood using a Model 3010B Lead Analyzer.

Section 8: Exposure Controls / Personal Protection

Control parameters:

Consult regional/local authorities for acceptable exposure limits.

Ingredient	Ontario TWAEV (ppm)	ACGIH TLV (8-hr. TWA) (ppm)	U.S. OSHA PEL (8-hr. TWA) (ppm)	U.K. WEL (8-hr. TWA) (ppm)
Hydrogen chloride	2 (CEV)	2 (Ceiling)	5 (Ceiling)	1 5 STEL
Nickel, soluble inorganic compounds	0.1 mg/m ³ (inhalable)	0.1 mg/m (inhalable)	0.1 mg/m ³ (inhalable)	0.1 mg/m ³

Exposure controls:

Engineering Controls: Use chemical fume hood, local exhaust ventilation or other engineering controls to minimize exposure.

Personal Protection: Workers must comply with the Personal Protective Equipment requirements of the workplace in which this product is handled.

Eye/Face Protection: Wear laboratory safety goggles or other appropriate eye protection.

Skin Protection: Wear impervious gloves and protective lab coat or other appropriate skin protection.

SAFETY DATA SHEET

Section 8: Exposure Controls / Personal Protection, continued

Respiratory Protection: If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection. Where occupational exposure limits are exceeded, workers should wear an approved respirator. Consult with respirator manufacturer to determine respirator selection, use and limitations. Wear a positive pressure air supplied respirator for uncontrolled releases.

A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 or Canadian Standards Association (CSA) Standard Z94.4-2002 must be followed whenever workplace conditions warrant a respirator's use.

Other: Workplaces should have a safety shower, hand-wash station and eye-wash fountain readily available in the immediate work area.

Section 9: Physical and Chemical Properties

Information on basic physical and chemical properties:

Appearance:	Liquid, light green. 7 mL per tube, 5 tubes per bag.
Odor:	Odorless
Odor threshold:	Not applicable
pH:	1.25
Melting point/freezing point:	Not available
Initial boiling point and boiling range:	Not available
Flash point:	Not applicable, product is not flammable or combustible.
Auto-ignition temperature:	Not applicable
Upper/lower flammability or explosive limits:	Not applicable
Explosive properties:	Not applicable
Oxidising properties:	Not applicable
Sensitivity to mechanical impact:	Not applicable
Sensitivity to static discharge:	Not applicable
Vapor pressure:	Not available
Vapor density:	Not available
Relative density:	Not available
Solubility (ies):	Completely soluble in water.
Partition coefficient (n-octanol/water):	Not available
Decomposition temperature:	Not available
Viscosity:	Not available
Other information:	Not available

Section 10: Stability and Reactivity

Reactivity:
 Not classified as dangerously reactive.

Chemical Stability:
 Normally stable.

Possibility of Hazardous Reactions:
 Hazardous polymerization does not occur.

Conditions to Avoid:
 Avoid unintended contact with other chemicals specifically incompatible materials.

SAFETY DATA SHEET

Section 10: Stability and Reactivity, continued

Incompatible Materials:

Bases (e.g. sodium hydroxide, potassium hydroxide, ammonium hydroxide, amines, 2-aminoethanol or ethyleneimine) - react violently generating heat and pressure.
 Metals (e.g. steel, copper, brass or zinc) - extremely flammable hydrogen gas is released on reaction with many common metals.
 Sodium, metal - explodes on contact.
 Formaldehyde - can react to form the carcinogen, bis(chloromethyl) ether.
 Oxidizing agents (e.g. hydrogen peroxide, chlorates or chlorites) - may react generating heat and very toxic, corrosive chlorine gas.
 Reducing agents (e.g. metal hydrides) - reaction may produce extremely flammable hydrogen gas, heat and fire. Perchloric acid - decomposes spontaneously and violently.
 Potassium – Nickel dichloride may react violently with potassium

Hazardous Decomposition Products:

Not applicable

Section 11: Toxicological Information

Information on toxicological effects:

Acute Health Effects:

Relevant Route(s) of Exposure: Inhalation, Skin contact, Eye contact.

Inhalation: At room temperature, hydrochloric acid solutions can release vapors of hydrogen chloride. Overexposure to airborne vapors or mists can cause irritation to the respiratory tract. Symptoms of exposure may include coughing, pain and swelling in the upper respiratory tract.

Ingestion: Swallowing amounts can cause serious irritation or burns of the lips, mouth and digestive tract with abdominal and chest pain, nausea, vomiting and diarrhea.

Skin: Data is not available for the mixture. Based on the pH (1.25) this product may cause burns to the skin.

Eye: Direct contact with the product causes serious eye irritation and eye damage. Airborne vapors or mists may cause serious eye irritation. Concentrations as low as 0.0000036% have caused slight corneal damage, while 3.6-10% have caused severe damage. In inhalation studies, hydrogen chloride gas has caused extreme eye irritation and corneal opacity.

Acute Toxicity Data:

Acute toxicology data is not available for this mixture. The data listed below is for the substances in the mixture.

Chemical	LD₅₀ Oral (mg/kg)	LD₅₀ Dermal (mg/kg)	LC₅₀ Inhalation (mg/m³ 4 hrs.)
Hydrogen chloride	900 (rabbit)	>5 000 (rabbit)	1 400 – 1 560 ppm (rat)
Nickel dichloride	105 (rat)	Not available	Not available

Chronic Health Effects:

No data is available for the product. In general, long-term, repeated skin contact with low concentrations of corrosive materials can cause dry, red, cracked skin (dermatitis). Occupational exposure to high airborne concentrations of acids can cause erosion of the teeth.

Sensitization:

Repeated skin contact with Nickel compounds can cause an allergic skin reaction. Repeated exposures to Nickel compounds by inhalation may cause allergy or asthma symptoms or breathing difficulties.

SAFETY DATA SHEET

Section 11: Toxicological Information, continued**Neurological Effects:**

Not available

Genetic Effects:

Nickel soluble, inorganic compounds are suspected of causing genetic defects

Reproductive Effects:

Nickel soluble, inorganic compounds may damage the unborn child.

Developmental Effects:

Not available

Target Organ Effects:

Lung damage; Kidney and liver effects with exposures to Nickel dichloride

Carcinogenicity:

Nickel dichloride is listed in Group 1, confirmed human carcinogen by IARC (International Agency for Research on Cancer). NTP (National Toxicology Program) describes Nickel dichloride as a known human carcinogen. ACGIH lists Hydrogen chloride and Nickel dichloride as A4-Not classifiable as a human carcinogen.

Nickel dichloride is an OSHA carcinogen (USA).

Medical Conditions Aggravated by Exposure:

Repeated skin contact may aggravate an existing dermatitis. Repeated inhalation may aggravate respiratory conditions, such as asthma and bronchitis.

Interactions With Other Chemicals:

Not available

Section 12: Ecological Information**Toxicity:**

Based on aquatic toxicology data for Nickel dichloride, this mixture is expected to be toxic to aquatic life with long-lasting effects.

Aqueous mixture has very low pH; avoid release of this product to the natural environment.

Persistence and degradability:

Not available

Bioaccumulative potential:

Not available

Mobility in soil:

Not available

Results of PBT and vPvB assessment:

Not available

Other adverse effects:

Not available

Section 13: Disposal Considerations**Waste treatment methods:**

Do NOT discard into any sewers, on the ground or into any body of water. Store material for disposal in covered, labeled containers.

Follow applicable laboratory practices for disposing of potentially hazardous waste. Dispose of contents/container in accordance with local/regional/national/ international regulations.

SAFETY DATA SHEET

Section 14: Transport Information

Shipped in EXCEPTED QUANTITIES.
Product is packaged as 7 mL per tube, 5 tubes per bag.

UN Number: UN2922
UN proper shipping name: Corrosive liquid, toxic n.o.s. (Hydrogen chloride, Nickel dichloride)
Transport hazard class(es): Class 8 (6.1)
Packing group: III
Environmental hazards: This product contains substances that meet the criteria of environmentally hazardous substances in the aquatic environment (Nickel dichloride).

Section 15: Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture:

USA

Toxic Substances Control Act 8(b) Inventory: Substances are listed on the TSCA inventory.

SARA Title III:

Sec. 302/304: Not applicable for this product
Sec. 311/312: Immediate health effects; Delayed health effects
Sec. 313: Not applicable for this product
CERCLA RQ: Nickel dichloride 100 lb (45.4 kg) (Hydrogen chloride: 5000 lb or 2270 kg)

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the MSDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification:

E-Corrosive; classification based on pH of less than 2.
D1B-Immediate and serious toxic effect, Nickel dichloride, toxic by inhalation and if swallowed.
D2A-Other toxic effects, Nickel dichloride identified as a Group 1 carcinogen by IARC, respiratory sensitization effects.

New Substance Notification Regulations: All substances in this preparation are listed on the Domestic Substances List (DSL).

National Pollutant Release Inventory: Nickel is a NPRI reportable substance.

EU

EINECS Inventory: All chemical substances in this mixture are listed in EINECS.

Other National Inventories

Australia: All substances are present on the Inventory of Chemical Substances (AICS).

China: All substances are present on the Inventory.

Japan: All substances are present on ENCS.

Korea: All substances are present on the Inventory of Existing and Evaluated Chemical Substances.

New Zealand: All substances are present on the Inventory.

Philippines: All substances are present on the Inventory of Chemicals and Chemical Substances (PICCS).

Chemical safety assessment:

Not applicable

SAFETY DATA SHEET

Section 16: Other Information

References and sources for data:

HSDB – Hazardous Substances Data Bank; US National Library of Medicine
Cheminfo – Canadian Centre for Occupational Health and Safety
RTECS – Registry of Toxic Effects of Chemical Substances
Supplier MSDSs for component substances.

Methods for classification of mixtures:

Classification of this solution was determined from Regulation EC No 1272/2008 Annex I Section 3.3.3.3.4.2, a mixture containing a strong acid with a pH < 2.

Full text of risk/hazard statements under Section 3:

R34 Causes burns.
R37 Irritating to respiratory system.
R49 May cause cancer by inhalation.
R68 Possible risk of irreversible effects.
R61 May cause harm to the unborn child.
R23/25-48/23 - Toxic by inhalation and if swallowed. Toxic: danger of serious damage to health by prolonged exposure through inhalation.
R38 - Irritating to skin.
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

Legend to abbreviations:

WHMIS – Workplace Hazardous Materials Information System.
SARA - Title III of the Superfund Amendments and Reauthorization Act of 1986
CERCLA RQ - Comprehensive Environmental Response, Compensation, and Liability Act of 1980
PBT Persistent, Bioaccumulative and Toxic substances
vPvB Very Persistent, very Bioaccumulative substances
TWA EV – Time weighted average exposure value
TWA – Time weighted average
TLV - Threshold Limit Value
WEL – Workplace exposure limit
PEL – Permissible exposure limit
ACGIH – American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration

Supplier Note:

Product is intended for use by qualified professionals experienced in handling potentially hazardous chemicals and trained in good laboratory practices. The above information is believed to be correct but does not purport to be all inclusive. All materials may present unknown hazards and should be used with caution. Magellan Diagnostics, Inc. shall not be held liable for any damage resulting from handling or contact with above product.

Prepared by:

Magellan Diagnostics, Inc.