SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name: Niobium Standard: 1000 µg/mL Nb in 2% HF [100ml bottle]

Part number: 5190-8493

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

No further relevant information available.

Application of the substance / the mixture Reference material for laboratory use only

Manufacturer/Supplier:

Agilent Technologies Manufacturing GmbH & Co. KG                      Tel: 0800 603 1000
Hewlett-Packard-Str. 8
76337 Waldbronn
Germany

Further information obtainable from: e-mail: pdl-msds_author@agilent.com

1.4 Emergency telephone number:

CHEMTREC®: +(44)-870-8200418

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

GHS06 skull and crossbones

Acute Tox. 3    H311 Toxic in contact with skin.

GHS05 corrosion

Skin Corr. 1B H314 Causes severe skin burns and eye damage.

Eye Dam. 1    H318 Causes serious eye damage.

GHS07

Acute Tox. 4    H302 Harmful if swallowed.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC

T; Toxic

R24: Toxic in contact with skin.

Xi; Irritant

R38-41: Irritating to skin. Risk of serious damage to eyes.

Information concerning particular hazards for human and environment:

The product has to be labelled due to the calculation procedure of the “General Classification guideline for preparations of the EU” in the latest valid version.

Classification system:

The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008

The product is classified and labelled according to the CLP regulation.
Product name: Niobium Standard: 1000 µg/mL Nb in 2% HF [100ml bottle]

- Hazard pictograms

GHS05 GHS06

- Signal word Danger

- Hazard-determining components of labelling:
  Hydrofluoric acid -

- Hazard statements
  H302 Harmful if swallowed.
  H311 Toxic in contact with skin.
  H314 Causes severe skin burns and eye damage.

- Precautionary statements
  P280 Wear protective gloves/protective clothing/eye protection/face protection.
  P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
  P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  P310 Immediately call a POISON CENTER/doctor.
  P405 Store locked up.
  P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

- 2.3 Other hazards

- Results of PBT and vPvB assessment
  - PBT: Not applicable.
  - vPvB: Not applicable.

SECTION 3: Composition/information on ingredients

- 3.2 Chemical characterisation: Mixtures
  - Description:
    Aqueous solution.
    Also contains substances at levels not considered to be hazardous.

- Dangerous components:

| CAS: 7664-39-3 | Hydrofluoric acid - |
| EINECS: 231-634-8 | T+ R26/27/28; C R35 |
| RTECS: MW 7875000 | Acute Tox. 2, H300; Acute Tox. 1, H310; Acute Tox. 2, H330; Skin Corr. 1A, H314 |

- Additional information: For the wording of the listed risk phrases refer to section 16.

SECTION 4: First aid measures

- 4.1 Description of first aid measures
  - General information:
    Immediately remove any clothing soiled by the product.
    In case of irregular breathing or respiratory arrest provide artificial respiration.
  - After inhalation: In case of unconsciousness place patient in recovery position for transport.
  - After skin contact:
    Immediately wash with water and soap and rinse thoroughly.
    If skin irritation continues, consult a doctor.
  - After eye contact: Rinse opened eye for several minutes under running water. Then consult a doctor.
**Product name:** Niobium Standard: 1000 µg/mL Nb in 2% HF [100ml bottle]

(Contd. from page 2)

- **After swallowing:** Rinse mouth. Do not induce vomiting.
- **4.2 Most important symptoms and effects, both acute and delayed** No further relevant information available.
- **4.3 Indication of any immediate medical attention and special treatment needed**
  No further relevant information available.

**SECTION 5: Firefighting measures**

- **5.1 Extinguishing media**
  - Suitable extinguishing agents:
    - CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **5.2 Special hazards arising from the substance or mixture**
  - Formation of toxic gases is possible during heating or in case of fire.
- **5.3 Advice for firefighters**
  - **Protective equipment:** Wear self-contained respiratory protective device.

**SECTION 6: Accidental release measures**

- **6.1 Personal precautions, protective equipment and emergency procedures**
  - Wear protective clothing.
- **6.2 Environmental precautions:**
  - Dilute with plenty of water.
  - Do not allow to enter sewers/ surface or ground water.
- **6.3 Methods and material for containment and cleaning up:**
  - Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  - Dispose of contaminated material as waste according to item 13.
  - Ensure adequate ventilation.
- **6.4 Reference to other sections**
  - See Section 7 for information on safe handling.
  - See Section 8 for information on personal protection equipment.
  - See Section 13 for disposal information.

**SECTION 7: Handling and storage**

- **7.1 Precautions for safe handling**
  - Ensure good ventilation/extraction at the workplace.
  - Store in cool, dry place in tightly closed receptacles.
  - Prevent formation of aerosols.
- **Information about fire - and explosion protection:**
  - No special measures required.
- **7.2 Conditions for safe storage, including any incompatibilities**
  - **Storage:**
    - **Requirements to be met by storerooms and receptacles:**
      - Store in a cool location.
      - Please refer to the manufacturer’s certificate for specific storage and transport temperature conditions.
      - Store only in the original receptacle.
      - Keep container in a well-ventilated place. Keep away from sources of ignition and heat.
- **Information about storage in one common storage facility:** Store away from foodstuffs.
- **Further information about storage conditions:**
  - **None.**
- **7.3 Specific end use(s)**
  - No further relevant information available.

**SECTION 8: Exposure controls/personal protection**

- **Additional information about design of technical facilities:**
  - No further data; see item 7.

(Contd. on page 4)
Product name: Niobium Standard: 1000 µg/mL Nb in 2% HF [100ml bottle]

8.1 Control parameters

Ingredients with limit values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical</th>
<th>Short-term value</th>
<th>Long-term value</th>
</tr>
</thead>
<tbody>
<tr>
<td>7664-39-3</td>
<td>Hydrofluoric acid</td>
<td>2.5 mg/m³, 3 ppm</td>
<td>1.5 mg/m³, 1.8 ppm</td>
</tr>
</tbody>
</table>

Additional information: Lists used were valid at the time of SDS preparation.

8.2 Exposure controls

Personal protective equipment:

General protective and hygienic measures:

- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing
- Wash hands before breaks and at the end of work.
- Store protective clothing separately.
- Avoid contact with the skin.
- Avoid contact with the eyes and skin.

Respiratory protection:

- In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.

Protection of hands:

- Chemical-resistant, impervious gloves with an approved standards should be worn at all times.

The selection of the glove material is based on the penetration times, rates of diffusion and its degradation

Material of gloves

- PVC gloves
- Neoprene gloves

Penetration time of glove material

The protection time of the gloves can not be accurately estimated for mixtures consisting of several substances

Refer to and observe manufacturers break through times of the protective gloves.

Eye protection:

Tightly sealed goggles

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

General Information

- Form: Liquid
- Colour: Colourless
- Odour: Odourless
- Odour threshold: Not determined.
- pH-value at 20 °C: < 4
- Change in condition
  - Melting point/Melting range: Not determined.
Product name: Niobium Standard: 1000 µg/mL Nb in 2% HF [100ml bottle]

- **Boiling point/Boiling range:** 100 °C
- **Flash point:** Not applicable.
- **Flammability (solid, gaseous):** Not determined.
- **Ignition temperature:**
  - Decomposition temperature: Not determined.
- **Self-igniting:** Product is not selfigniting.
- **Danger of explosion:** Not determined.
- **Explosion limits:**
  - Lower: Not determined.
  - Upper: Not determined.
- **Vapour pressure at 20 °C:** 23 hPa
- **Density at 20 °C:** 0.98002 g/cm³
  - Relative density: Not determined.
  - Vapour density: Not determined.
  - Evaporation rate: Not determined.
- **Solubility in / Miscibility with water:** Fully miscible.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
  - Dynamic: Not determined.
  - Kinematic: Not determined.
- **9.2 Other information** No further relevant information available.

### SECTION 10: Stability and reactivity

- **10.1 Reactivity** Stable under normal conditions.
- **10.2 Chemical stability** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** Formation of toxic gases is possible during heating or in case of fire.
- **10.3 Possibility of hazardous reactions** No dangerous reactions known.
- **10.4 Conditions to avoid** Heat.
- **10.5 Incompatible materials:** Strong oxidizing agents.
- **10.6 Hazardous decomposition products:** Formation of toxic gases is possible during heating or in case of fire.

### SECTION 11: Toxicological information

- **11.1 Information on toxicological effects**
- **Acute toxicity:**
  - LD/LC50 values relevant for classification:
    - 7664-39-3 Hydrofluoric acid -
      - Oral [LD50] 1276 mg/kg (rat)
- **Primary irritant effect:**
  - on the skin: Irritant to skin and mucous membranes.
  - on the eye: Strong irritant with the danger of severe eye injury.
- **Sensitisation:** No sensitising effects known.
Product name: Niobium Standard: 1000 µg/mL Nb in 2% HF [100ml bottle]

(Contd. from page 5)

Additional toxicological information:
The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:
Toxic
Irritant

SECTION 12: Ecological information

- 12.1 Toxicity
- Aquatic toxicity: No further relevant information available.
- 12.2 Persistence and degradability No further relevant information available.
- 12.3 Bioaccumulative potential No further relevant information available.
- 12.4 Mobility in soil No further relevant information available.
- Additional ecological information:
- General notes:
  Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water
  Do not allow undiluted product to reach ground water, water course or sewage system.
- 12.5 Results of PBT and vPvB assessment
- PBT: Not applicable.
- vPvB: Not applicable.
- 12.6 Other adverse effects No further relevant information available.

SECTION 13: Disposal considerations

- 13.1 Waste treatment methods
- Recommendation
  Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- European waste catalogue
  Waste disposal key numbers from EWC have to be assigned depending on origin and processing.
- Uncleaned packaging:
  Recommendation: Dispose of in accordance with national regulations.
  Recommended cleansing agents: Water, if necessary together with cleansing agents.

SECTION 14: Transport information

- 14.1 UN-Number
  ADR, IMDG, IATA UN2922
  ADR 2922 CORROSIVE LIQUID, TOXIC, N.O.S. (HYDROFLUORIC ACID)
  IMDG, IATA CORROSIVE LIQUID, TOXIC, N.O.S. (HYDROFLUORIC ACID)

- 14.3 Transport hazard class(es)
- ADR
  - Class 8 Corrosive substances.
Product name: Niobium Standard: 1000 µg/mL Nb in 2% HF [100ml bottle]

- Label 8+6.1
- IMDG
- Class 8 Corrosive substances.
- Label 8/6.1
- IATA
- Class 8 Corrosive substances.
- Label 8 (6.1)

14.4 Packing group
- ADR, IMDG, IATA III
- ADR
- Limited quantities (LQ) 5L
- Transport category 3
- Tunnel restriction code E

14.5 Environmental hazards:
- Marine pollutant: No
- Dangerous goods classification according to IMDG and ADR (7th Ed.):
- Class 8 Corrosive substances.
- Label 8/6.1
- IMDG
- Class 8 Corrosive substances.
- Label 8 (6.1)

14.6 Special precautions for user
- Warning: Corrosive substances.
- Danger code (Kemler): 86
- EMS Number: F-A,S-B
- Segregation groups Acids

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
- Transport category 3
- Tunnel restriction code E
- UN "Model Regulation": UN2922. CORROSIVE LIQUID, TOXIC, N.O.S. (HYDROFLUORIC ACID), 8 (6.1), III
- ADR
- Limited quantities (LQ) 5L
- Transport category 3
- Tunnel restriction code E

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
- Philippines Inventory of Chemicals and Chemical Substances
  All ingredients are listed.
- Australian Inventory of Chemical Substances
  All ingredients are listed.
- Standard for the Uniform Scheduling of Medicines and Poisons
  7664-39-3 Hydrofluoric acid - S5, S6, S7
- 15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.
SECTION 16: Other information

The information contained in this document is based on Agilent’s state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.

- Relevant phrases
  H300 Fatal if swallowed.
  H310 Fatal in contact with skin.
  H314 Causes severe skin burns and eye damage.
  H330 Fatal if inhaled.
  R26/27/28 Very toxic by inhalation, in contact with skin and if swallowed.
  R35 Causes severe burns.

- Abbreviations and acronyms:
  ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
  IMDG: International Maritime Code for Dangerous Goods
  IATA: International Air Transport Association
  GHS: Globally Harmonised System of Classification and Labelling of Chemicals
  EINECS: European Inventory of Existing Commercial Chemical Substances
  ELINCS: European List of Notified Chemical Substances
  CAS: Chemical Abstracts Service (division of the American Chemical Society)
  LC50: Lethal concentration, 50 percent
  LD50: Lethal dose, 50 percent
  Acute Tox. 2: Acute toxicity, Hazard Category 2
  Acute Tox. 4: Acute toxicity, Hazard Category 4
  Acute Tox. 1: Acute toxicity, Hazard Category 1
  Acute Tox. 3: Acute toxicity, Hazard Category 3
  Skin Corr. 1A: Skin corrosion/irritation, Hazard Category 1A
  Skin Corr. 1B: Skin corrosion/irritation, Hazard Category 1B
  Eye Dam. 1: Serious eye damage/eye irritation, Hazard Category 1

- Sources