1 Identification

· Product identifier

· Trade name: 100 μg/mL Molybdenum in 2% HNO3 + Tr HF

· Article number: 100-34-3

· Details of the supplier of the safety data sheet

· Manufacturer/Supplier:
  High-Purity Standards
  7221 Investment Drive, North Charleston, SC 29418 United States
  Telephone: +1-843-767-7900
  Fax: +1-843-767-7906
  highpuritystandards.com
  Email: info@highpuritystandards.com

· Information department: Product safety department

· Emergency telephone number:
  INFOTRAC
  Emergency telephone numbers 1-800-535-5053
  Other emergency telephone numbers 1-352-323-3500

2 Hazard(s) identification

· Classification of the substance or mixture

  GHS05 Corrosion

  Met. Corr. 1   H290 May be corrosive to metals.
  Skin Corr. 1A  H314 Causes severe skin burns and eye damage.
  Eye Dam. 1    H318 Causes serious eye damage.

  GHS07

  Acute Tox. 4   H302 Harmful if swallowed.
  Acute Tox. 4   H312 Harmful in contact with skin.

· Label elements

  GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
  Hazard pictograms

  GHS05 GHS07

· Signal word Danger

(Contd. on page 2)
Safety Data Sheet
acc. to OSHA HCS

Trade name: 100 μg/mL Molybdenum in 2% HNO3 + Tr HF

(Contd. of page 1)

· Hazard-determining components of labeling:
  nitric acid
  hydrofluoric acid

· Hazard statements
  H290 May be corrosive to metals.
  H302+H312 Harmful if swallowed or in contact with skin.
  H314 Causes severe skin burns and eye damage.

· Precautionary statements
  Keep only in original container.
  Do not breathe dusts or mists.
  Wash thoroughly after handling.
  Do not eat, drink or smoke when using this product.
  Wear protective gloves/protective clothing/eye protection/face protection.
  If swallowed: Call a poison center/doctor if you feel unwell.
  If swallowed: Rinse mouth. Do NOT induce vomiting.
  If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  If INHALED: Remove person to fresh air and keep comfortable for breathing.
  If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  Immediately call a poison center/doctor.
  Specific treatment (see on this label).
  Take off contaminated clothing and wash it before reuse.
  Wash contaminated clothing before reuse.
  Absorb spillage to prevent material damage.
  Store locked up.
  Store in corrosive resistant container with a resistant inner liner.
  Dispose of contents/container in accordance with local/regional/national/international regulations.

· Classification system:
  · NFPA ratings (scale 0 - 4)
    Health = 3
    Fire = 0
    Reactivity = 0

  · HMIS-ratings (scale 0 - 4)
    HEALTH Health = 3
    FIRE Fire = 0
    REACTIVITY Reactivity = 0

· Other hazards
  · Results of PBT and vPvB assessment
    · PBT: Not applicable.
    · vPvB: Not applicable.

(Contd. on page 3)
3 Composition/information on ingredients

- **Chemical characterization:** Mixtures
- **Description:** Mixture of the substances listed below with nonhazardous additions.
- **Dangerous components:**
  - **7697-37-2 nitric acid** 2.0%
  - **7664-39-3 hydrofluoric acid** 0.49%

- **Chemical identification of the substance/preparation**
  - **7732-18-5 water, distilled, conductivity or of similar purity** 97.5%
  - **7439-98-7 molybdenum** 0.01%

4 First-aid measures

- **Description of first aid measures**
- **General information:**
  - Immediately remove any clothing soiled by the product.
  - Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
- **After inhalation:** In case of unconsciousness place patient stably in side position for transportation.
- **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
- **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
- **After swallowing:**
  - Immediately call a doctor.
  - Drink copious amounts of water and provide fresh air. Immediately call a doctor.
- **Information for doctor:**
  - **Most important symptoms and effects, both acute and delayed** No further relevant information available.
  - **Indication of any immediate medical attention and special treatment needed** No further relevant information available.

5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
- **Special hazards arising from the substance or mixture**
  - During heating or in case of fire poisonous gases are produced.
- **Advice for firefighters**
- **Protective equipment:** Mouth respiratory protective device.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
  - Mount respiratory protective device.
Trade name: 100 μg/mL Molybdenum in 2% HNO₃ + Tr HF

Wear protective equipment. Keep unprotected persons away.

- Environmental precautions: Dilute with plenty of water.
- Methods and material for containment and cleaning up:
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  Use neutralizing agent.
  Dispose contaminated material as waste according to item 13.
  Ensure adequate ventilation.

- 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.

- Protective Action Criteria for Chemicals

  - PAC-1:
    7697-37-2 nitric acid 0.16 ppm
    7439-98-7 molybdenum 30 mg/m³

  - PAC-2:
    7697-37-2 nitric acid 24 ppm
    7439-98-7 molybdenum 330 mg/m³

  - PAC-3:
    7697-37-2 nitric acid 92 ppm
    7439-98-7 molybdenum 2,000 mg/m³

7 Handling and storage

- Handling:
  - Precautions for safe handling
    Ensure good ventilation/exhaustion at the workplace.
    Prevent formation of aerosols.
  - Information about protection against explosions and fires: Keep respiratory protective device available.

- Conditions for safe storage, including any incompatibilities

- Storage:
  - Requirements to be met by storerooms and receptacles: No special requirements.
  - Information about storage in one common storage facility: Not required.
  - Further information about storage conditions: Keep receptacle tightly sealed.
  - Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

- Additional information about design of technical systems: No further data; see item 7.
Control parameters

Components with limit values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>Substance</th>
<th>PEL Long-term value</th>
<th>REL Long-term value</th>
<th>REL Ceiling limit</th>
<th>TLV Long-term value</th>
<th>TLV Ceiling limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric acid</td>
<td>5 mg/m³, 2 ppm</td>
<td>10 mg/m³, 4 ppm</td>
<td>5 mg/m³, 2 ppm</td>
<td>10 mg/m³, 4 ppm</td>
<td>5.2 mg/m³, 2 ppm</td>
</tr>
<tr>
<td>Hydrofluoric acid</td>
<td>3 ppm</td>
<td>2.5 mg/m³, 3 ppm</td>
<td>5 mg/m³, 6 ppm</td>
<td>0.41 mg/m³, 0.5 ppm</td>
<td>1.64 mg/m³, 2 ppm</td>
</tr>
</tbody>
</table>

Ingredients with biological limit values:

<table>
<thead>
<tr>
<th>Substance</th>
<th>BEI 3 mg/g creatinine</th>
<th>Medium: urine</th>
<th>Time: prior to shift</th>
<th>Parameter: Flourides (background)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrofluoric acid</td>
<td>10 mg/g creatinine</td>
<td>Medium: urine</td>
<td>Time: end of shift</td>
<td>Parameter: Flourides (background)</td>
</tr>
</tbody>
</table>

Additional information: The lists that were valid during the creation were used as basis.

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.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.

Breathing equipment:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
9 Physical and chemical properties

| · Information on basic physical and chemical properties |
| · General Information |
| · Appearance: |
| Form: Liquid |
| Color: colorless |
| · Odor: Characteristic |
| · Odor threshold: Not determined. |
| · pH-value: Not determined. |

| · Change in condition |
| · Melting point/Melting range: Undetermined. |
| · Boiling point/Boiling range: 100 °C (212 °F) |

| · Flash point: Not applicable. |
| · Flammability (solid, gaseous): Not applicable. |
| · Decomposition temperature: Not determined. |
| · Auto igniting: Product is not selfigniting. |
| · Danger of explosion: Product does not present an explosion hazard. |
Trade name: 100 μg/mL Molybdenum in 2% HNO₃ + Tr HF

- Explosion limits:
  - Lower: Not determined.
  - Upper: Not determined.
- Vapor pressure at 20 °C (68 °F): 23 hPa (17.3 mm Hg)
- Density at 20 °C (68 °F): 1.00613 g/cm³ (8.39615 lbs/gal)
- Bulk density: 1,006 kg/m³
  - Relative density: Not determined.
  - Vapor 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.
- Solvent content:
  - Water: 97.5 %
  - VOC content:
    - 0.00 %
    - 0.0 g/l / 0.00 lb/gal
- Solids content: 0.0 %
- Other information: No further relevant information available.

10 Stability and reactivity

- Reactivity: No further relevant information available.
- Chemical stability
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions: No dangerous reactions known.
- Conditions to avoid: No further relevant information available.
- Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

- Information on toxicological effects
- Acute toxicity:
- Primary irritant effect:
- on the skin: Strong caustic effect on skin and mucous membranes.
- on the eye: Strong caustic effect.
12 Ecological information

- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Behavior in environmental systems:**
  - **Bioaccumulative potential** No further relevant information available.
  - **Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:**
  - Not hazardous for water.
  - Must not reach bodies of water or drainage ditch undiluted or unneutralized.
- **Results of PBT and vPvB assessment**
  - **PBT:** Not applicable.
  - **vPvB:** Not applicable.
- **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**
- **Recommendation:**
  - Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.
### 14 Transport information

| · UN-Number | DOT, ADR, IMDG, IATA | UN3264 |
| · UN proper shipping name | DOT | Corrosive liquid, acidic, inorganic, n.o.s. (Hydrofluoric acid, Nitric acid) |
| · ADR | 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (HYDROFLUORIC ACID, NITRIC ACID) |
| · IMDG, IATA | CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (HYDROFLUORIC ACID, NITRIC ACID) |

| · Transport hazard class(es) | DOT |
| · Class | 8 Corrosive substances |
| · Label | 8 |

| · ADR |
| · Class | 8 (C1) Corrosive substances |
| · Label | 8 |

| · IMDG, IATA |
| · Class | 8 Corrosive substances |
| · Label | 8 |

| · Packing group | DOT, ADR, IMDG, IATA | III |
| · Environmental hazards: | Not applicable. |
| · Special precautions for user | Warning: Corrosive substances |
| · Hazard identification number (Kemler code): | 80 |

(Contd. on page 10)
Safety Data Sheet
acc. to OSHA HCS

Trade name: 100 μg/mL Molybdenum in 2% HNO3 + Tr HF

· EMS Number: F-A,S-B
· Segregation groups: Acids
· Stowage Category: A
· Stowage Code: SW2 Clear of living quarters.

· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

· DOT
· Quantity limitations: On passenger aircraft/rail: 5 L
  On cargo aircraft only: 60 L

· ADR
· Excepted quantities (EQ): Code: E1
  Maximum net quantity per inner packaging: 30 ml
  Maximum net quantity per outer packaging: 1000 ml

· IMDG
· Limited quantities (LQ): 5L
· Excepted quantities (EQ): Code: E1
  Maximum net quantity per inner packaging: 30 ml
  Maximum net quantity per outer packaging: 1000 ml

· UN "Model Regulation": UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
  (HYDROFLUORIC ACID, NITRIC ACID), 8, III

15 Regulatory information

· Safety, health and environmental regulations/legislation specific for the substance or mixture
  · Sara
    · Section 355 (extremely hazardous substances):
      7697-37-2 nitric acid
    · Section 313 (Specific toxic chemical listings):
      7697-37-2 nitric acid
  · TSCA (Toxic Substances Control Act):
    7732-18-5 water, distilled, conductivity or of similar purity ACTIVE
    7697-37-2 nitric acid ACTIVE
    7439-98-7 molybdenum ACTIVE
  · Hazardous Air Pollutants
    None of the ingredients is listed.
  · Proposition 65
    · Chemicals known to cause cancer:
      None of the ingredients is listed.
Trade name: 100 μg/mL Molybdenum in 2% HNO3 + Tr HF

· Chemicals known to cause reproductive toxicity for females:
  None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:
  None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:
  None of the ingredients is listed.

· Carcinogenic categories
  · EPA (Environmental Protection Agency)
    None of the ingredients is listed.
  · TLV (Threshold Limit Value established by ACGIH)
    7439-98-7 molybdenum A3
  · NIOSH-Ca (National Institute for Occupational Safety and Health)
    None of the ingredients is listed.

· GHS label elements
  The product is classified and labeled according to the Globally Harmonized System (GHS).
  · Hazard pictograms
    GHS05  GHS07

· Signal word
  Danger

· Hazard-determining components of labeling:
  nitric acid
  hydrofluoric acid

· Hazard statements
  H290 May be corrosive to metals.
  H302+H312 Harmful if swallowed or in contact with skin.
  H314 Causes severe skin burns and eye damage.

· Precautionary statements
  Keep only in original container.
  Do not breathe dusts or mists.
  Wash thoroughly after handling.
  Do not eat, drink or smoke when using this product.
  Wear protective gloves/protective clothing/eye protection/face protection.
  If swallowed: Call a poison center/doctor if you feel unwell.
  If swallowed: Rinse mouth. Do NOT induce vomiting.
  If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
  IF INHALED: Remove person to fresh air and keep comfortable for breathing.
  If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  Immediately call a poison center/doctor.
  Specific treatment (see on this label).
Take off contaminated clothing and wash it before reuse.  
Wash contaminated clothing before reuse.  
Absorb spillage to prevent material damage.  
Store locked up.  
Store in corrosive resistant container with a resistant inner liner.  
Dispose of contents/container in accordance with local/regional/national/international regulations.  

- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

### 16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Department issuing SDS:** Environment protection department.
- **Contact:**  
  High-Purity Standards  
  Tel: 843-767-7900  
  Fax: 843-767-7906
- **Date of preparation / last revision** 04/24/2020 /
- **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
  - DOT: US Department of Transportation
  - IATA: International Air Transport Association
  - ACGIH: American Conference of Governmental Industrial Hygienists
  - 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)
  - NFPA: National Fire Protection Association (USA)
  - HMIS: Hazardous Materials Identification System (USA)
  - VOC: Volatile Organic Compounds (USA, EU)
  - PBT: Persistent, Bioaccumulative and Toxic
  - vPvB: very Persistent and very Bioaccumulative
  - NIOSH: National Institute for Occupational Safety
  - OSHA: Occupational Safety & Health
  - TLV: Threshold Limit Value
  - PEL: Permissible Exposure Limit
  - REL: Recommended Exposure Limit
  - BEI: Biological Exposure Limit
  - Met. Corr. 1: Corrosive to metals – Category 1
  - Acute Tox. 4: Acute toxicity – Category 4
  - Skin Corr. 1A: Skin corrosion/irritation – Category 1A
  - Eye Dam. 1: Serious eye damage/eye irritation – Category 1