1 Identification

· Product identifier
  · Trade name: ICP-MS Tuning Solution 7
  · Article number: ICP-MS-TS-7

· Details of the supplier of the safety data sheet
  · Manufacturer/Supplier: High-Purity Standards
    PO Box 41727 Charleston, SC 29423 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.

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

  GHS05

· Signal word Danger

· Hazard-determining components of labeling:
  · Hazard acid

· Hazard statements
  H290 May be corrosive to metals.
  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.
  Wear protective gloves/protective clothing/eye protection/face protection.
  If swallowed: Rinse mouth. Do NOT induce vomiting.

(Contd. on page 2)
Trade name: ICP-MS Tuning Solution 7

49.4.3.4 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).
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.

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%

· Chemical identification of the substance/preparation
  7732-18-5 water, distilled, conductivity or of similar purity 97.991%
  513-77-9 barium carbonate 0.001%
  543-81-7 beryllium acetate 0.001%
  7439-92-1 lead 0.001%
  7439-95-4 magnesium 0.001%
  7440-28-0 thallium 0.001%
  7440-29-1 thorium 0.001%
  7440-45-1 cerium 0.001%
  7440-48-4 cobalt 0.001%

(Contd. of page 1)
4 First-aid measures

· Description of first aid measures
  · General information: Immediately remove any clothing soiled by the product.
  · 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: 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.
  Wear protective equipment. Keep unprotected persons away.
  · Environmental precautions: No special measures required.
  · 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:
    |CAS Number| Chemical       | Concentration |
    |-----------|----------------|---------------|
    |7697-37-2  | nitric acid    | 0.16 ppm      |
    |513-77-9   | barium carbonate| 2.2 mg/m³    |
    |7439-92-1  | lead           | 0.15 mg/m³    |
    |7439-95-4  | magnesium      | 18 mg/m³      |
    |7440-28-0  | thallium       | 0.06 mg/m³    |

(Contd. on page 4)
Trade name: ICP-MS Tuning Solution 7

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Substance</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-29-1</td>
<td>thorium</td>
<td>30 mg/m³</td>
</tr>
<tr>
<td>7440-45-1</td>
<td>cerium</td>
<td>30 mg/m³</td>
</tr>
<tr>
<td>7440-48-4</td>
<td>cobalt</td>
<td>0.18 mg/m³</td>
</tr>
<tr>
<td>7440-74-6</td>
<td>indium</td>
<td>0.3 mg/m³</td>
</tr>
</tbody>
</table>

- **PAC-2:**
<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Substance</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>nitric acid</td>
<td>24 ppm</td>
</tr>
<tr>
<td>513-77-9</td>
<td>barium carbonate</td>
<td>270 mg/m³</td>
</tr>
<tr>
<td>7439-92-1</td>
<td>lead</td>
<td>120 mg/m³</td>
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<tr>
<td>7439-95-4</td>
<td>magnesium</td>
<td>200 mg/m³</td>
</tr>
<tr>
<td>7440-28-0</td>
<td>thallium</td>
<td>3.3 mg/m³</td>
</tr>
<tr>
<td>7440-29-1</td>
<td>thorium</td>
<td>330 mg/m³</td>
</tr>
<tr>
<td>7440-45-1</td>
<td>cerium</td>
<td>330 mg/m³</td>
</tr>
<tr>
<td>7440-48-4</td>
<td>cobalt</td>
<td>2 mg/m³</td>
</tr>
<tr>
<td>7440-74-6</td>
<td>indium</td>
<td>3.3 mg/m³</td>
</tr>
</tbody>
</table>

- **PAC-3:**
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<thead>
<tr>
<th>CAS Number</th>
<th>Substance</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>nitric acid</td>
<td>92 ppm</td>
</tr>
<tr>
<td>513-77-9</td>
<td>barium carbonate</td>
<td>1,600 mg/m³</td>
</tr>
<tr>
<td>7439-92-1</td>
<td>lead</td>
<td>700 mg/m³</td>
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<tr>
<td>7439-95-4</td>
<td>magnesium</td>
<td>1,200 mg/m³</td>
</tr>
<tr>
<td>7440-28-0</td>
<td>thallium</td>
<td>20 mg/m³</td>
</tr>
<tr>
<td>7440-29-1</td>
<td>thorium</td>
<td>2,000 mg/m³</td>
</tr>
<tr>
<td>7440-45-1</td>
<td>cerium</td>
<td>2,000 mg/m³</td>
</tr>
<tr>
<td>7440-48-4</td>
<td>cobalt</td>
<td>20 mg/m³</td>
</tr>
<tr>
<td>7440-74-6</td>
<td>indium</td>
<td>20 mg/m³</td>
</tr>
</tbody>
</table>

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.
**Trade name: ICP-MS Tuning Solution 7**

- **Control parameters**
  - **Components with limit values that require monitoring at the workplace:**
    | 7697-37-2 nitric acid |
    |---------------------|
    | **PEL** Long-term value: 5 mg/m³, 2 ppm |
    | **REL** Short-term value: 10 mg/m³, 4 ppm |
    | Long-term value: 5 mg/m³, 2 ppm |
    | **TLV** Short-term value: 10 mg/m³, 4 ppm |
    | Long-term value: 5.2 mg/m³, 2 ppm |

- **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.

- **Protection of hands:**
  
  The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

  **Material of gloves**
  - The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

  **Penetration time of glove material**
  - The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

  **Eye protection:**
  
  Tightly sealed goggles
### 9 Physical and chemical properties

- **Information on basic physical and chemical properties**
  - **General Information**
    - **Appearance:**
      - *Form:* Liquid
      - *Color:* colorless
    - **Odor:**
      - *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.
  - **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):** 1.01062 g/cm³ (8.43362 lbs/gal)
  - **Bulk density:** 1.010 kg/m³
  - **Relative density** Not determined.
  - **Vapor density** Not determined.
  - **Evaporation rate** Not determined.
  - **Solubility in / Miscibility with**
    - *Water:* Not miscible or difficult to mix.
  - **Partition coefficient (n-octanol/water):** Not determined.
  - **Viscosity:**
    - *Dynamic:* Not determined.
    - *Kinematic:* Not determined.
  - **Solvent content:**
    - *Water:* 98.0 %
    - *VOC content:* 0.00 %
    - *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.
    - Strong irritant with the danger of severe eye injury.
  - Sensitization: No sensitizing effects known.
- Additional toxicological information:
The product shows the following dangers according to internally approved calculation methods for preparations:
  - Corrosive
  - Irritant
  - Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.
- Carcinogenic categories
  - IARC (International Agency for Research on Cancer)
    - 543-81-7 beryllium acetate 1
    - 7439-92-1 lead 2B
    - 7440-29-1 thorium 1
    - 7440-48-4 cobalt 2B
  - NTP (National Toxicology Program)
    - 543-81-7 beryllium acetate K
    - 7439-92-1 lead R
    - 7440-48-4 cobalt R
  - OSHA-Ca (Occupational Safety & Health Administration)
    - None of the ingredients is listed.

12 Ecological information

- Toxicity
  - Aquatic toxicity: No further relevant information available.
  - Persistence and degradability: 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. (Nitric acid)
  
  ADR: 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID)
  
  IMDG, IATA: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID)

- **Transport hazard class(es)**
  
  - **DOT**
    
    - **Class:** 8 Corrosive substances
    - **Label:** 8

  - **ADR, IMDG, IATA**
    
    - **Class:** 8 Corrosive substances
### SAFETY DATA SHEET

**Trade name:** ICP-MS Tuning Solution 7

#### 49.4.3.4

- **Label:** 8
- **Packing group:** III
- **DOT, ADR, IMDG, IATA:** Not applicable.
- **Environmental hazards:** Not applicable.
- **Special precautions for user:** Warning: Corrosive substances
- **Danger code (Kemler):** 80
- **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.
- **Transport/Additional information:**
  - **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. (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
    - 513-77-9 barium carbonate
    - 543-81-7 beryllium acetate
    - 7439-92-1 lead
    - 7440-28-0 thallium
    - 7440-48-4 cobalt
Trade name: ICP-MS Tuning Solution 7

### TSCA (Toxic Substances Control Act):

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>7732-18-5</td>
<td>water, distilled, conductivity or of similar purity</td>
<td>ACTIVE</td>
</tr>
<tr>
<td>7697-37-2</td>
<td>nitric acid</td>
<td>ACTIVE</td>
</tr>
<tr>
<td>513-77-9</td>
<td>barium carbonate</td>
<td>ACTIVE</td>
</tr>
<tr>
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<td>lead</td>
<td>ACTIVE</td>
</tr>
<tr>
<td>7439-95-4</td>
<td>magnesium</td>
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</tr>
<tr>
<td>7440-29-1</td>
<td>thorium</td>
<td>ACTIVE</td>
</tr>
<tr>
<td>7440-45-1</td>
<td>cerium</td>
<td>ACTIVE</td>
</tr>
<tr>
<td>7440-48-4</td>
<td>cobalt</td>
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</tr>
<tr>
<td>7440-74-6</td>
<td>indium</td>
<td>ACTIVE</td>
</tr>
</tbody>
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### Hazardous Air Pollutants

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>7439-92-1</td>
<td>lead</td>
</tr>
<tr>
<td>7440-48-4</td>
<td>cobalt</td>
</tr>
</tbody>
</table>

### Proposition 65

- Chemicals known to cause cancer:
  - 543-81-7 beryllium acetate
  - 7439-92-1 lead
  - 7440-48-4 cobalt

- Chemicals known to cause reproductive toxicity for females:
  - 7439-92-1 lead

- Chemicals known to cause reproductive toxicity for males:
  - 7439-92-1 lead

- Chemicals known to cause developmental toxicity:
  - 7439-92-1 lead

### Carcinogenic categories

- **EPA (Environmental Protection Agency)**
  - 513-77-9 barium carbonate: D, CBD(inh), NL(oral)
  - 7439-92-1 lead: B2

- **TLV (Threshold Limit Value established by ACGIH)**
  - 513-77-9 barium carbonate: A4
  - 7439-92-1 lead: A3
  - 7440-48-4 cobalt: A3

- **NIOSH-Ca (National Institute for Occupational Safety and Health)**
  - 543-81-7 beryllium acetate

- **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
Trade name: ICP-MS Tuning Solution 7

- **Hazard pictograms**

  ![GHS5]

- **Signal word** Danger

- **Hazard-determining components of labeling:**
  - nitric acid

- **Hazard statements**
  - H290 May be corrosive to metals.
  - 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.
  - Wear protective gloves/protective clothing/eye protection/face protection.
  - 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).
  - 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** 08/30/2019 / -
- **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)
Trade name: ICP-MS Tuning Solution 7

| 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 |
| Met. Corr. 1: Corrosive to metals – Category 1 |
| Skin Corr. 1A: Skin corrosion/irritation – Category 1A |
| Eye Dam. 1: Serious eye damage/eye irritation – Category 1 |