1 Identification

· Product identifier
  · Trade name: Rubidium
  · Article number: 10M45-2

· 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
  GHS07
  Skin Irrit. 2  H315  Causes skin irritation.
  Eye Irrit. 2A  H319  Causes serious eye irritation.

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

  GHS07

· Signal word Warning

· Hazard statements
  H315 Causes skin irritation.
  H319 Causes serious eye irritation.

· Precautionary statements
  Wash thoroughly after handling.
  Wear protective gloves / eye protection / face protection.
  If on skin: Wash with plenty of water.
  Specific treatment (see on this label).
  If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  If skin irritation occurs: Get medical advice/attention.
  Take off contaminated clothing and wash it before reuse.
  If eye irritation persists: Get medical advice/attention.
49.4.3.1

· Classification system:
  · NFPA ratings (scale 0 - 4)
  
  - Health = 2
  - Fire = 0
  - Reactivity = 0

· HMIS-ratings (scale 0 - 4)
  
  - Health = *2
  - Fire = 0
  - 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:
  
  - 7440-17-7 rubidium 1.0%
  - 7647-01-0 hydrochloric acid 1.0%

· Chemical identification of the substance/preparation
  
  - 7732-18-5 water, distilled, conductivity or of similar purity 98.0%

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. If symptoms persist, consult a doctor.
  · After swallowing: If symptoms persist consult 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 No further relevant information available.
6 Accidental release measures

- Personal precautions, protective equipment and emergency procedures: Not required.
- 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).
- 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:**
  - 7440-17-7 rubidium 3.9 mg/m³
  - 7647-01-0 hydrochloric acid 1.8 ppm

- **PAC-2:**
  - 7440-17-7 rubidium 43 mg/m³
  - 7647-01-0 hydrochloric acid 22 ppm

- **PAC-3:**
  - 7440-17-7 rubidium 260 mg/m³
  - 7647-01-0 hydrochloric acid 100 ppm

7 Handling and storage

- Handling:
  - Precautions for safe handling: No special precautions are necessary if used correctly.
  - Information about protection against explosions and fires: No special measures required.
- 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:
    The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.
    At this time, the remaining constituent has no known exposure limits.
Trade name: Rubidium

| \(7647-01-0\) hydrochloric acid
|---|
| **PEL** Ceiling limit value: 7 mg/m³, 5 ppm
| **REL** Ceiling limit value: 7 mg/m³, 5 ppm
| **TLV** Ceiling limit value: 2.98 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 and skin.
  - Breathing equipment: Not required.
  - Protection of hands:
    - Protective gloves
      - 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

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### 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.
### 49.4.3.1 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):

1.00682 g/cm³ (8.40191 lbs/gal)

### Bulk density:

1,007 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 %
  - 0.0 g/l / 0.00 lb/gal

### Solids content:

1.0 %

### 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:**
  - **LD/LC50 values that are relevant for classification:**
    - 7647-01-0 hydrochloric acid
      - Oral LD50 900 mg/kg (rabbit)
  - **Primary irritant effect:**
    - **on the skin:** Irritant to skin and mucous membranes.
    - **on the eye:** Irritating effect.
    - **Sensitization:** No sensitizing effects known.
  - **Additional toxicological information:**
    - The product shows the following dangers according to internally approved calculation methods for preparations: Irritant
- **Carcinogenic categories**
  - **IARC (International Agency for Research on Cancer)**
    - 7647-01-0 hydrochloric acid 3
  - **NTP (National Toxicology Program)**
    - None of the ingredients is listed.
  - **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.
  - **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.
  - **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.
Trade name: Rubidium

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

- UN-Number
  DOT, ADR, IMDG, IATA not regulated

- UN proper shipping name
  DOT, ADR, IMDG, IATA not regulated

- Transport hazard class(es)
  DOT, ADR, ADN, IMDG, IATA Class not regulated

- Packing group
  DOT, ADR, IMDG, IATA not regulated

- Environmental hazards: Not applicable.
- Special precautions for user Not applicable.

- Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code Not applicable.
- UN "Model Regulation": not regulated

15 Regulatory information

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

  - Section 355 (extremely hazardous substances):
    7647-01-0 hydrochloric acid

  - Section 313 (Specific toxic chemical listings):
    7647-01-0 hydrochloric acid

  - TSCA (Toxic Substances Control Act):
    All components have the value ACTIVE.

- Hazardous Air Pollutants
  7647-01-0 hydrochloric acid

  - Proposition 65
    - Chemicals known to cause cancer:
      None of the ingredients is listed.

    - 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.
Trade name: Rubidium

- **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)**
    7647-01-0 hydrochloric acid A4
  - **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**
    GHS07

- **Signal word** Warning
- **Hazard statements**
  H315 Causes skin irritation.
  H319 Causes serious eye irritation.
- **Precautionary statements**
  Wash thoroughly after handling.
  Wear protective gloves / eye protection / face protection.
  If on skin: Wash with plenty of water.
  Specific treatment (see on this label).
  If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  If skin irritation occurs: Get medical advice/attention.
  Take off contaminated clothing and wash it before reuse.
  If eye irritation persists: Get medical advice/attention.

**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 08/27/2019 / -**
- **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
### Trade name: Rubidium

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IATA</td>
<td>International Air Transport Association</td>
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<tr>
<td>ACGIH</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
<tr>
<td>EINECS</td>
<td>European Inventory of Existing Commercial Chemical Substances</td>
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<tr>
<td>ELINCS</td>
<td>European List of Notified Chemical Substances</td>
</tr>
<tr>
<td>CAS</td>
<td>Chemical Abstracts Service (division of the American Chemical Society)</td>
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<tr>
<td>NFPA</td>
<td>National Fire Protection Association (USA)</td>
</tr>
<tr>
<td>HMDIS</td>
<td>Hazardous Materials Identification System (USA)</td>
</tr>
<tr>
<td>VOC</td>
<td>Volatile Organic Compounds (USA, EU)</td>
</tr>
<tr>
<td>LC50</td>
<td>Lethal concentration, 50 percent</td>
</tr>
<tr>
<td>LD50</td>
<td>Lethal dose, 50 percent</td>
</tr>
<tr>
<td>PBT</td>
<td>Persistent, Bioaccumulative and Toxic</td>
</tr>
<tr>
<td>vPvB</td>
<td>very Persistent and very Bioaccumulative</td>
</tr>
<tr>
<td>NIOSH</td>
<td>National Institute for Occupational Safety</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety &amp; Health</td>
</tr>
<tr>
<td>TLV</td>
<td>Threshold Limit Value</td>
</tr>
<tr>
<td>PEL</td>
<td>Permissible Exposure Limit</td>
</tr>
<tr>
<td>REL</td>
<td>Recommended Exposure Limit</td>
</tr>
<tr>
<td>Skin Irrit. 2</td>
<td>Skin corrosion/irritation – Category 2</td>
</tr>
<tr>
<td>Eye Irrit. 2A</td>
<td>Serious eye damage/eye irritation – Category 2A</td>
</tr>
</tbody>
</table>