SECTION 1 IDENTIFICATION

Product Identifier

<table>
<thead>
<tr>
<th>Product name</th>
<th>10 38-2 Palladium (10μg/mL in 2% HCl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms</td>
<td>10μg/mL Palladium in 2% HCl</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>Hydrochloric acid (contains hydrochloric acid)</td>
</tr>
<tr>
<td>Other means of identification</td>
<td>10 38-2</td>
</tr>
</tbody>
</table>

Recommended use of the chemical and restrictions on use

Relevant identified uses

Use according to manufacturer's directions.

Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Registered company name | High-Purity Standards |
Address | PO Box 41727 SC 29423 United States |
Telephone | 843-767-7900 |
Fax | 843-767-7906 |
Website | highpuritystandards.com |
Email | Not Available |

Emergency phone number

Association / Organisation | INFOTRAC |
Emergency telephone numbers | 1-800-535-5053 |
Other emergency telephone numbers | 1-352-323-3500 |

SECTION 2 HAZARD(S) IDENTIFICATION

Classification of the substance or mixture

Classification | Metal Corrosion Category 1, Skin Corrosion/Irritation Category 1A, Serious Eye Damage Category 1 |

Label elements

| Hazard pictogram(s) | |

| SIGNAL WORD | DANGER |

Hazard statement(s)

| H290 | May be corrosive to metals. |
| H314 | Causes severe skin burns and eye damage. |

Hazard(s) not otherwise specified

Not Applicable

Precautionary statement(s) Prevention

Continued...
SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances
See section below for composition of Mixtures

Mixtures

<table>
<thead>
<tr>
<th>CAS No</th>
<th>%[weight]</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-05-3</td>
<td>0.001</td>
<td>palladium</td>
</tr>
<tr>
<td>7647-01-0</td>
<td>2</td>
<td>hydrochloric acid</td>
</tr>
<tr>
<td>7732-18-5</td>
<td>balance</td>
<td>water</td>
</tr>
</tbody>
</table>

SECTION 4 FIRST-AID MEASURES

Description of first aid measures

Eye Contact
If this product comes in contact with the eyes:
- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Skin Contact
If skin or hair contact occurs:
- Immediately flush body and clothes with large amounts of water, using safety shower if available.
- Quickly remove all contaminated clothing, including footwear.
- Wash skin and hair with running water. Continue flushing with water until advised to stop by the Poisons Information Centre.
- Transport to hospital, or doctor.

Inhalation
- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor, without delay.
- Inhalation of vapours or aerosols (mists, fumes) may cause lung oedema.
- Corrosive substances may cause lung damage (e.g. lung oedema, fluid in the lungs).
- As this reaction may be delayed up to 24 hours after exposure, affected individuals need complete rest (preferably in semi-recumbent posture) and must be kept under medical observation even if no symptoms are (yet) manifested.

Ingestion
- For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- DO NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.
- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Transport to hospital or doctor without delay.

Most important symptoms and effects, both acute and delayed
See Section 11

Indication of any immediate medical attention and special treatment needed
for corrosives:

BASIC TREATMENT

- Establish a patent airway with suction where necessary.
- Watch for signs of respiratory insufficiency and assist ventilation as necessary.
- Administer oxygen by non-rebreather mask at 10 to 15 l/min.
- Monitor and treat, where necessary, for pulmonary oedema.
- Monitor and treat, where necessary, for shock.
- Anticipate seizures.
- Where eyes have been exposed, flush immediately with water and continue to irrigate with normal saline during transport to hospital.
- DO NOT use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and

Continued...
Advanced Treatment

Skin burns should be covered with dry, sterile bandages, following decontamination. DO NOT attempt neutralisation as exothermic reaction may occur.

ADVANCED TREATMENT

Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.

Positive pressure ventilation using a bag-valve mask might be of use.

Monitor and treat, where necessary, for arrhythmias.

Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.

Drug therapy should be considered for pulmonary oedema.

Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.

Treat seizures with diazepam.

Proparacaine hydrochloride should be used to assist eye irrigation.

Emergency Department

Laboratory analysis of complete blood count, serum electrolytes, BUN, creatinine, glucose, urinalysis, baseline for serum aminotransferases (ALT and AST), calcium, phosphorus and magnesium, may assist in establishing a treatment regime.

Positive end-expiratory pressure (PEEP)-assisted ventilation may be required for acute parenchymal injury or adult respiratory distress syndrome.

Consider endoscopy to evaluate oral injury.

Consult a toxicologist as necessary.
DO NOT allow clothing wet with material to stay in contact with skin.

Other information
- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storage and handling recommendations contained within this SDS.

Conditions for safe storage, including any incompatibilities
- Lined metal can, lined metal pail, can.
- Plastic pail.
- Polyliner drum.
- Packing as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

For low viscosity materials
- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

For materials with a viscosity of at least 2680 cSt (23 deg. C) and solids (between 15 C deg. and 40 deg C.):
- Removable head packaging;
- Cans with friction closures and
- low pressure tubes and cartridges
may be used.

Where combination packages are used, and the inner packages are of glass, porcelain or stoneware, there must be sufficient inert cushioning material in contact with inner and outer packages unless the outer packaging is a close fitting moulded plastic box and the substances are not incompatible with the plastic.

Storage incompatibility
Hydrochloric acid:
- Reacts strongly with strong oxidisers (releasing chlorine gas), acetic anhydride, caesium cyanotridecahydrolecoborate(2-), ethyldiene difluoride, hexafluorine disiloxide, metal acetylde, sodium, silicon dioxide, tetrastereum tetrasiloxide, and many organic materials.
- Is incompatible with alkaline materials, acetic anhydride, acetylides, aliphatic amines, alcohalsamines, alkyle oxides, aluminium, aluminium-titanium alloys, aromatic amines, amines, amides, 2-aminoethanol, ammonia, ammonium hydroxide, borides, calcium phosphate, carbides, carbonates, cyanides, chlorosulfonic acid, ethylenediamine, ethyleneimine, epichlorohydrin, formaldehyde, isocyanates, metals, metal oxides, metal hydroxides, metal acetylides, metal carbides, oleum, organic anhydrides, potassium permanganate, perchloric acid, phosphides, 3-propiolactone, silicdes, sulfides, sulfites, sulfuric acid, uranium phosphate, vinyl acetate, vinylene fluoride.
- Attacks most metals forming flammable hydrogen gas, and some plastics, rubbers and coatings.
- Reacts with zinc, brass, galvanised iron, aluminium, copper and copper alloys.
- Reacts with mild steel, galvanised steel / zinc producing hydrogen gas which may form an explosive mixture with air.
- Avoid strong bases.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

<table>
<thead>
<tr>
<th>INGREDIENT DATA</th>
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<tbody>
<tr>
<td>Source</td>
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<tr>
<td>US OSHA Permissible Exposure Levels (PELs) - Table Z1</td>
</tr>
<tr>
<td>US NIOSH Recommended Exposure Limits (RELs)</td>
</tr>
<tr>
<td>US ACGIH Threshold Limit Values (TLV)</td>
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</table>

EMERGENCY LIMITS

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<th>TEEL-2</th>
<th>TEEL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>palladium</td>
<td>Palladium</td>
<td>6 mg/m³</td>
<td>66 mg/m³</td>
<td>400 mg/m³</td>
</tr>
<tr>
<td>hydrochloric acid</td>
<td>Hydrochloric acid</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>hydrochloric acid</td>
<td>Deuterohloric acid; (Deuterium chloride)</td>
<td>1.8 ppm</td>
<td>22 ppm</td>
<td>100 ppm</td>
</tr>
<tr>
<td>water</td>
<td>Not Available</td>
<td>Not Available</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Exposure controls

Appropriate engineering controls
Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:
- Process controls which involve changing the way a job activity or process is done to reduce the risk.
- Enclosure and/or isolation of emission source which keeps a selected hazard “physically” away from the worker and ventilation that strategically “adds” and “removes” air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.
- Employers may need to use multiple types of controls to prevent employee overexposure.

Continued...
Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection. An approved self-contained breathing apparatus (SCBA) may be required in some situations.

Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying “escape” velocities which, in turn, determine the “capture velocities” of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant: Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air). 0.25-0.5 m/s (50-100 f/min.)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyor transfers, welding, spray drift, plating acid fumes, picking (released at low velocity into zone of active generation) 0.5-1 m/s (100-200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyor loading, crusher dusts, gas discharge (active generation into zone of rapid air motion) 1-2.5 m/s (200-500 f/min.)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion). 2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

<table>
<thead>
<tr>
<th>Lower end of the range</th>
<th>Upper end of the range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Room air currents minimal or favourable to capture</td>
<td>1: Disturbing room air currents</td>
</tr>
<tr>
<td>2: Contaminants of low toxicity or of nuisance value only</td>
<td>2: Contaminants of high toxicity</td>
</tr>
<tr>
<td>3: Intermittent, low production</td>
<td>3: High production, heavy use</td>
</tr>
<tr>
<td>4: Large hood or large air mass in motion</td>
<td>4: Small hood-local control only</td>
</tr>
</tbody>
</table>

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min.) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

### Personal protection

- Safety glasses with unperforated side shields may be used where continuous eye protection is desirable, as in laboratories; spectacles are not sufficient where complete eye protection is needed such as when handling bulk-quantities, where there is a danger of splashing, or if the material may be under pressure.
- Chemical goggles, wherever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted.
- Full face shield (30 cm, 8 in minimum) may be required in supplementary but never for primary protection of eyes; these afford face protection.
- Alternatively a gas mask may replace splash goggles and face shields.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC/NIOSH Current Intelligence Bulletin 59]. [AS/NZS 1396 or national equivalent]

### Eye and face protection

- Chemical goggles whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted.
- Full face shield (30 cm, 8 in minimum) may be required in supplementary but never for primary protection of eyes; these afford face protection.
- Alternatively a gas mask may replace splash goggles and face shields.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC/NIOSH Current Intelligence Bulletin 59]. [AS/NZS 1396 or national equivalent]

### Skin protection

See Hand protection below.

- Elbow length PVC gloves
- When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.
- The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical 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.
- The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.
- Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
- Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:
  - frequency and duration of contact,
  - chemical resistance of glove material,
  - glove thickness and
  - dexterity
- Select gloves tested to a relevant standard (e.g. Europe EN 374, US F799, AS/NZS 2161.10.1 or national equivalent).
  - When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
  - When brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
  - Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use.
- Contaminated gloves should be replaced.
- For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended. It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.
- Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers’ technical data should always be taken into account to ensure selection of the most appropriate glove for the task.
- Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:
  - Thinner gloves (down to 0.1 mm or less) may be required when a high degree of dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.
  - Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential
- Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

### Hands/feet protection

- Elbow length PVC gloves
- When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.
- The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical 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.
- The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.
- Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
- Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:
  - frequency and duration of contact,
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  - Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential
- Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.
Body protection
See Other protection below

Other protection
- Overalls.
- PVC Apron.
- PVC protective suit may be required if exposure severe.
- Eyewash unit.
- Ensure there is ready access to a safety shower.

Thermal hazards
Not Available

Respiratory protection
Type B-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

76b-p()
Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

Eye

The material can produce severe chemical burns to the eye following direct contact. Vapours or mists may be extremely irritating. If applied to the eyes, this material causes severe eye damage.

Chronic

Repeated or prolonged exposure to corrosives may result in the erosion of teeth, inflammatory and ulcerative changes in the mouth and necrosis (rarely) of the jaw. Bronchial irritation, with cough, and frequent attacks of bronchial pneumonia may ensue. Long-term exposure to respiratory irritants may result in airways disease, involving difficulty breathing and related whole-body problems. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment. Chronic minor exposure to hydrogen chloride (HCl) vapour or fume may cause discolouration or erosion of the teeth, bleeding of the nose and gums; and ulceration of the mucous membranes of the nose. Workers exposed to hydrochloric acid suffered from stomach inflammation and a number of cases of chronic bronchitis (airway inflammation) have also been reported. Repeated or prolonged exposure to dilute solutions of hydrogen chloride may cause skin inflammation.

10 38-2 Palladium (10μg/mL in 2% HCl)

<table>
<thead>
<tr>
<th>ENDPOINT</th>
<th>TEST DURATION (HR)</th>
<th>SPECIES</th>
<th>VALUE</th>
<th>SOURCE</th>
</tr>
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<tbody>
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Palladium

<table>
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<tr>
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Hydrochloric Acid

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<th>VALUE</th>
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<tr>
<td>Water</td>
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<td>Not Applicable</td>
<td>Not Applicable</td>
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</tbody>
</table>

Acute Toxicity

Skin Irritation/Corrosion

Serious Eye Damage/Irritation

Respiratory or Skin sensitisation

Mutagenicity

Carcinogenicity

Reproductivity

STOT - Single Exposure

STOT - Repeated Exposure

Aspiration Hazard

Legend: 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. * Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

HYDROCHLORIC ACID

Asthma-like symptoms may continue for months or even years after exposure to the material ends. For acid mists, aerosols, vapours Test results suggest that eukaryotic cells are susceptible to genetic damage when the pH falls to about 6.5. The material may be irritating to the eye, with prolonged contact causing inflammation. The substance is classified by IARC as Group 3: NOT classifiable as to its carcinogenicity to humans.

PALLADIIUM & HYDROCHLORIC ACID & WATER

No significant acute toxicological data identified in literature search.

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

10 38-2 Palladium (10μg/mL in 2% HCl)

<table>
<thead>
<tr>
<th>ENDPOINT</th>
<th>TEST DURATION (HR)</th>
<th>SPECIES</th>
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Palladium

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Hydrochloric Acid

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<th>SPECIES</th>
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<tr>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
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</tr>
<tr>
<td>EC50</td>
<td>96</td>
<td>Algae or other aquatic plants</td>
<td>344.947mg/L</td>
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<tr>
<td>EC50</td>
<td>9.33</td>
<td>Fish</td>
<td>0.014000mg/L</td>
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</tbody>
</table>

Continued...
Prevent, by any means available, spillage from entering drains or water courses. **DO NOT** discharge into sewer or waterways.

### Persistence and degradability

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydrochloric acid</td>
<td>LOW</td>
<td>LOW</td>
</tr>
<tr>
<td>water</td>
<td>LOW</td>
<td>LOW</td>
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</tbody>
</table>

### Bioaccumulative potential

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Bioaccumulation</th>
</tr>
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<tr>
<td>hydrochloric acid</td>
<td>LOW (LogKOW = 0.5392)</td>
</tr>
<tr>
<td>water</td>
<td>LOW (LogKOW = -1.38)</td>
</tr>
</tbody>
</table>

### Mobility in soil

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydrochloric acid</td>
<td>LOW (KOC = 14.3)</td>
</tr>
<tr>
<td>water</td>
<td>LOW (KOC = 14.3)</td>
</tr>
</tbody>
</table>

### SECTION 13 DISPOSAL CONSIDERATIONS

#### Waste treatment methods

Legislation addressing waste disposal requirements may differ by country, state and/or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. A Hierarchy of Controls seems to be common - the user should investigate:

- **Reduction**
- **Reuse**
- **Recycling**
- **Disposal (if all else fails)**

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

- **DO NOT** allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.
- Recycle wherever possible.
- Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified.
- Treat and neutralise at an approved treatment plant. Treatment should involve: Neutralisation followed by: burial in a land-fill specifically licensed to accept chemical and/or pharmaceutical wastes or Incineration in a licensed apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

### SECTION 14 TRANSPORT INFORMATION

#### Labels Required

<table>
<thead>
<tr>
<th>Marine Pollutant</th>
<th>NO</th>
</tr>
</thead>
</table>

#### Land transport (DOT)

<table>
<thead>
<tr>
<th>UN number</th>
<th>1789</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>Hydrochloric acid (contains hydrochloric acid)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>Class 8 Subrisk Not Applicable</td>
</tr>
</tbody>
</table>
### Air transport (ICAO-IATA / DGR)

<table>
<thead>
<tr>
<th>UN number</th>
<th>1789</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>HYDROCHLORIC ACID (contains hydrochloric acid)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>ICAO/IATA Class 8, ICAO / IATA Subrisk Not Applicable, ERG Code 8L</td>
</tr>
<tr>
<td>Packing group</td>
<td>II</td>
</tr>
<tr>
<td>Environmental hazard</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special precautions for user</th>
<th>Cargo Only Packing Instructions</th>
<th>865</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cargo Only Maximum Qty / Pack</td>
<td>30 L</td>
</tr>
<tr>
<td></td>
<td>Passenger and Cargo Packing Instructions</td>
<td>881</td>
</tr>
<tr>
<td></td>
<td>Passenger and Cargo Maximum Qty / Pack</td>
<td>1 L</td>
</tr>
<tr>
<td></td>
<td>Passenger and Cargo Limited Quantity Packing Instructions</td>
<td>Yb40</td>
</tr>
<tr>
<td></td>
<td>Passenger and Cargo Limited Maximum Qty / Pack</td>
<td>0.5 L</td>
</tr>
</tbody>
</table>

### Sea transport (IMDG-Code / GGSee)

<table>
<thead>
<tr>
<th>UN number</th>
<th>1789</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN proper shipping name</td>
<td>Hydrochloric acid (contains hydrochloric acid)</td>
</tr>
<tr>
<td>Transport hazard class(es)</td>
<td>IMDG Class 8, IMDG Subrisk Not Applicable</td>
</tr>
<tr>
<td>Packing group</td>
<td>II</td>
</tr>
<tr>
<td>Environmental hazard</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special precautions for user</th>
<th>EMS Number</th>
<th>F-A, S-B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Special provisions</td>
<td>Not Applicable</td>
</tr>
<tr>
<td></td>
<td>Limited Quantities</td>
<td>1 L</td>
</tr>
</tbody>
</table>

### Transport in bulk according to Annex II of MARPOL and the IBC code

<table>
<thead>
<tr>
<th>Source</th>
<th>Product name</th>
<th>Pollution Category</th>
<th>Ship Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk</td>
<td>Hydrochloric acid</td>
<td>Z</td>
<td>3</td>
</tr>
</tbody>
</table>

### SECTION 15 REGULATORY INFORMATION

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

<table>
<thead>
<tr>
<th>Palladium(7440-05-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs</td>
</tr>
<tr>
<td>US - California OEHHAAARB - Chronic Reference Exposure Levels and Target Organs (CRELSs)</td>
</tr>
<tr>
<td>US - California Permissible Exposure Limits for Chemical Contaminants</td>
</tr>
<tr>
<td>US - Hawaii Air Contaminants Limits</td>
</tr>
<tr>
<td>US - Michigan Exposure Limits for Air Contaminants</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hydrochloric acid(7647-01-0) IS FOUND ON THE FOLLOWING REGULATORY LISTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>US - Oregon Permissible Exposure Limits (Z-1)</td>
</tr>
<tr>
<td>US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants</td>
</tr>
<tr>
<td>US - Washington Permissible exposure limits of air contaminants</td>
</tr>
<tr>
<td>US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants</td>
</tr>
<tr>
<td>US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory</td>
</tr>
</tbody>
</table>

Continued...
Continued...

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC
Monographs
US - Alaska Limits for Air Contaminants
US - Alaska Limits for Air Contaminants
US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)
US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Minnesota Permissible Exposure Limits (PELs)
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants

WATER(7732-18-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Federal Regulations
Superfund Amendments and Reauthorization Act of 1986 (SARA)
SECTION 311/312 HAZARD CATEGORIES
Immediate (acute) health hazard
Delayed (chronic) health hazard
Fire hazard
Pressure hazard
Reactivity hazard

US. EPA CERCLA HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES (40 CFR 302.4)

State Regulations
US. CALIFORNIA PROPOSITION 65
None Reported

National Inventory
Status
Australia - AICS
Y
Canada - DSL
Y
Canada - NDSL
N (hydrochloric acid; water; palladium)
China - IEGSC
Y
Europe - ELINCS / NLP
Y
Japan - ENCS
N (water; palladium)
Korea - KECI
Y
New Zealand - NZIoC
Y
Philippines - PICTCS
Y
USA - TSCA
Y

Legend:
Y = All ingredients are on the inventory
N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing (see specific ingredients in brackets)

SECTION 16 OTHER INFORMATION

Other information
Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations
PC – TWA: Permissible Concentration - Time Weighted Average
PC – STEL: Permissible Concentration - Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit,
IDLH: Immediately Dangerous to Life or Health Concentrations
OSF: Odour Safety Factor

Continued...