**10 56-3 Tellurium (10µg/mL in 2% HNO₃ + Tr HF)**

**High-Purity Standards**

**Product Identifier**

<table>
<thead>
<tr>
<th>Product name</th>
<th>10 56-3 Tellurium (10µg/mL in 2% HNO₃ + Tr HF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms</td>
<td>10 µg/mL Tellurium in 2% HNO₃ + Tr HF</td>
</tr>
<tr>
<td>Proper shipping name</td>
<td>Corrosive liquid, acidic, inorganic, n.o.s. (contains nitric acid and hydrofluoric acid)</td>
</tr>
<tr>
<td>Other means of identification</td>
<td>10 56-3</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**

<table>
<thead>
<tr>
<th>Registered company name</th>
<th>High-Purity Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>PO Box 41727 SC 29423 United States</td>
</tr>
<tr>
<td>Telephone</td>
<td>843-767-7900</td>
</tr>
<tr>
<td>Fax</td>
<td>843-767-7906</td>
</tr>
<tr>
<td>Website</td>
<td>highpuritystandards.com</td>
</tr>
<tr>
<td>Email</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

**Emergency phone number**

<table>
<thead>
<tr>
<th>Association / Organisation</th>
<th>INFOTRAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency telephone numbers</td>
<td>1-800-636-5053</td>
</tr>
<tr>
<td>Other emergency telephone numbers</td>
<td>1-352-323-3500</td>
</tr>
</tbody>
</table>

**SECTION 2 HAZARD(S) IDENTIFICATION**

**Classification of the substance or mixture**

| Classification | Acute Toxicity (Oral) Category 4, Acute Toxicity (Dermal) Category 4, Metal Corrosion Category 1, Skin Corrosion/Initiation Category 1A, Serious Eye Damage Category 1 |

**Label elements**

<table>
<thead>
<tr>
<th>Hazard pictogram(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Hazard Pictogram" /></td>
</tr>
</tbody>
</table>

**SIGNAL WORD**

DANGER

**Hazard statement(s)**

- **H302** Harmful if swallowed.
- **H312** Harmful in contact with skin.
- **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

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

Precautionary statement(s) Response

P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Precautionary statement(s) Storage

P405 Store locked up.

Precautionary statement(s) Disposal

P501 Dispose of contents/container in accordance with local regulations.

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>13494-80-9</td>
<td>0.001</td>
<td>tellurium</td>
</tr>
<tr>
<td>7697-37-2</td>
<td>2</td>
<td>nitric acid</td>
</tr>
<tr>
<td>7664-39-3</td>
<td>0.49</td>
<td>hydrofluoric 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 the 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 there is evidence of severe skin irritation or skin burns:
- Avoid further contact. Immediately remove contaminated clothing, including footwear.
- Flush skin under running water for 15 minutes.
- Avoiding contamination of the hands, massage calcium gluconate gel into affected areas, pay particular attention to creases in skin.
- Contact the Poisons Information Centre.
- Continue gel application for at least 15 minutes after burning sensation ceases.
- If no gel is available, continue washing for at least 15 minutes, using soap if available. If patient is conscious, give six calcium gluconate or calcium carbonate tablets in water by mouth.
- Transport to hospital, or doctor, urgently.

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.
- Before any such manifestation, the administration of a spray containing a dexamethasone derivative or beclomethasone derivative may be considered. This must definitely be left to a doctor or person authorised by him/her.

Ingestion
- For advice, contact a Poisons Information Centre or a doctor at once.
- Urgent hospital treatment is likely to be needed.
- If swallowed 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.

Continued...
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

Following acute or short term repeated exposure to hydrofluoric acid:
- Subcutaneous injections of Calcium Gluconate may be necessary around the burnt area. Continued application of Calcium Gluconate Gel or subcutaneous Calcium Gluconate should then continue for 3-4 days at a frequency of 4-6 times per day. If a “burning” sensation recurs, apply more frequently.
- Systemic effects of extensive hydrofluoric acid burns include renal damage, hypocalcaemia and consequent cardiac arrhythmias. Monitor haematological, respiratory, renal, cardiac and electrolyte status at least daily. Tests should include FBE, blood gases, chest X-ray, creatinine and electrolytes, urine output. Ca ions, Mg ions and phosphate ions. Continuous ECG monitoring may be required.
- Where serum calcium is low, or clinical, or ECG signs of hypocalcaemia develop, infusions of calcium gluconate, or if less serious, oral Sandocal, should be given. Hydrocortisone 500 mg in a four to six hour infusion may help.
- Antibiotics should not be given as a routine, but only when indicated.
- Eye contact pain may be excruciating and 2-3 drops of 0.05% pentocaine hydrochloride may be instilled, followed by further irrigation.

BIOLOGICAL EXPOSURE INDEX - BEI

These represent the determinants observed in specimens collected from a healthy worker exposed at the Exposure Standard (ES or TLV):

<table>
<thead>
<tr>
<th>Determinant</th>
<th>Index</th>
<th>Sampling Time</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Methaemoglobin in blood</td>
<td>1.5% of haemoglobin</td>
<td>During end of shift</td>
<td>B, NS, SQ</td>
</tr>
</tbody>
</table>

B: Background levels occur in specimens collected from subjects NOT exposed.

NS: Non-specific determinant; Also seen after exposure to other materials

SQ: Semi-quantitative determinant - Interpretation may be ambiguous; should be used as a screening test or confirmatory test.

For acute or short term repeated exposures to fluorides:
- Fluoride absorption from gastro-intestinal tract may be retarded by calcium salts, milk or antacids.
- Fluoride particulates or fume may be absorbed through the respiratory tract with 20-30% deposited at alveolar level.
- Peak serum levels are reached 30 mins. post-exposure; 50% appears in the urine within 24 hours.
- For acute poisoning (endotracheal intubation if inadequate tidal volume), monitor breathing and evaluate/monitor blood pressure and pulse frequently since shock may supervene with little warning. Monitor ECG immediately; watch for arrhythmias and evidence of Q-T prolongation or T-wave changes. Maintain monitor. Treat shock vigorously with isotonic saline (in 5% glucose) to restore blood volume and enhance renal excretion.
- Where evidence of hypocalcaemic or normocalcaemic tetany exists, calcium gluconate (10 ml of a 10% solution) is injected to avoid tachycardia.

BIOLOGICAL EXPOSURE INDEX - BEI

These represent the determinants observed in specimens collected from a healthy worker exposed at the Exposure Standard (ES or TLV):

<table>
<thead>
<tr>
<th>Determinant</th>
<th>Index</th>
<th>Sampling Time</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorides in urine</td>
<td>3 mg/gm creatinine</td>
<td>Prior to shift</td>
<td>B, NS</td>
</tr>
<tr>
<td></td>
<td>10 mg/gm creatinine</td>
<td>End of shift</td>
<td>B, NS</td>
</tr>
</tbody>
</table>

B: Background levels occur in specimens collected from subjects NOT exposed.

NS: Non-specific determinant; also observed after exposure to other exposures.

SECTION 5 FIRE-FIGHTING MEASURES

Extinguishing media
- There is no restriction on the type of extinguisher which may be used.
- Use extinguishing media suitable for surrounding area.

Special hazards arising from the substrate or mixture

Fire Incompatibility
- None known.

Special protective equipment and precautions for fire-fighters

Fire Fighting
- Non combustible.
- Not considered to be a significant fire risk.
- Acids may react with metals to produce hydrogen, a highly flammable and explosive gas.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- May emit corrosive, poisonous fumes. May emit acid smoke. May emit corrosive fumes.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

Continued...
To avoid violent reaction, **NEVER** eat, drink or smoke. **ALWAYS** use aluminium or galvanised containers with water to material. Add material to water and mix gently.

### SECTION 7 HANDLING AND STORAGE

#### Precautions for safe handling

**Safe handling**
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- **WARNING:** To avoid violent reaction, **ALWAYS** add material to water and **NEVER** water to material.
- Avoid smoking, naked lights or ignition sources.
- Avoid contact with incompatible materials.
- When handling, **DO NOT** eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately. Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer’s storage and handling recommendations contained within this SDS.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

**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

**Suitable container**
- **DO NOT** use aluminium or galvanised containers.
- 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.
  - Cans with friction closures and low pressure tubes and cartridges may be used.
- 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.
- Material is corrosive to most metals, glass and other siliceous materials.

**Storage incompatibility**
- Inorganic acids are generally soluble in water with the release of hydrogen ions. The resulting solutions have pHs of less than 7.0.
- Inorganic acids neutralise chemical bases (for example: amines and inorganic hydroxides) to form salts - neutralisation can generate dangerously large amounts of heat in small spaces.
- The dissolution of inorganic acids in water or the dilution of their concentrated solutions with additional water may generate significant heat.
- The addition of water to inorganic acids often generates sufficient heat in the small region of mixing to cause some of the water to boil explosively. The resulting “bumping” can spatter the acid.
- Inorganic acids react with active metals, including such structural metals as aluminum and iron, to release hydrogen, a flammable gas.
- Inorganic acids can initiate the polymerisation of certain classes of organic compounds.
- Inorganic acids react with cyanide compounds to release gaseous hydrogen cyanide.
- Inorganic acids generate flammable and/or toxic gases in contact with dithiocarbamates, isocyanates, mercaptans, nitriles, nitriles, sulfides, and strong reducing agents. Additional gas-generating reactions occur with sulfites, nitrites, thiosulfates (to give H2S and SO3), dithionites (SO2), and even carbonates.

---

**Continued...**
 SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

<table>
<thead>
<tr>
<th>INGREDIENT EXPOSURE LIMITS (OEL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
</tr>
<tr>
<td>US NIOSH Recommended Exposure Limits (RELs)</td>
</tr>
<tr>
<td>tellurium</td>
</tr>
<tr>
<td>Auran paradoxum, Metallum problematum</td>
</tr>
<tr>
<td>TWA 0.1 mg/m³, STEL Not Available, Peak Not Available</td>
</tr>
<tr>
<td>[Note: The REL also applies to other tellurium compounds (as Te) except Tellurium hexafluoride and Bismuth telluride.]</td>
</tr>
<tr>
<td>US OSHA Permissible Exposure Levels (PELs) - Table Z1</td>
</tr>
<tr>
<td>nitric acid</td>
</tr>
<tr>
<td>Nitric acid</td>
</tr>
<tr>
<td>TWA 5 mg/m³ / 2 ppm, STEL 10 mg/m³ / 4 ppm, Peak Not Available</td>
</tr>
<tr>
<td>TLV® Basis: URT, LRT &amp; eye irr; dental erosion</td>
</tr>
<tr>
<td>US NIOSH Recommended Exposure Limits (RELs)</td>
</tr>
<tr>
<td>nitric acid</td>
</tr>
<tr>
<td>Aqua fortis, Engravers acid, Hydrogen nitrate, Red fuming nitric acid (RFNA), White fuming nitric acid (WFNA)</td>
</tr>
<tr>
<td>TWA 5 mg/m³ / 2 ppm, STEL 4 ppm, Peak Not Available</td>
</tr>
<tr>
<td>Not Available</td>
</tr>
<tr>
<td>US ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td>nitric acid</td>
</tr>
<tr>
<td>Nitric acid</td>
</tr>
<tr>
<td>TWA 2 ppm, STEL Not Available, Peak Not Available</td>
</tr>
<tr>
<td>Not Available</td>
</tr>
<tr>
<td>US OSHA Permissible Exposure Levels (PELs) - Table Z1</td>
</tr>
<tr>
<td>hydrofluoric acid</td>
</tr>
<tr>
<td>Hydrogen fluoride</td>
</tr>
<tr>
<td>TWA 2.5 mg/m³ / 3 ppm, STEL 5 mg/m³ / 6 ppm</td>
</tr>
<tr>
<td>See Table Z-2:(as F)</td>
</tr>
<tr>
<td>US OSHA Permissible Exposure Levels (PELs) - Table Z2</td>
</tr>
<tr>
<td>hydrofluoric acid</td>
</tr>
<tr>
<td>Hydrogen fluoride</td>
</tr>
<tr>
<td>TWA 3 ppm, STEL Not Available, Peak 2 ppm</td>
</tr>
<tr>
<td>[237.28-1969]</td>
</tr>
<tr>
<td>US NIOSH Recommended Exposure Limits (RELs)</td>
</tr>
<tr>
<td>hydrofluoric acid</td>
</tr>
<tr>
<td>Anhydrous hydrogen fluoride; Aqueous hydrogen fluoride (i.e., Hydrofluoric acid); HF-A</td>
</tr>
<tr>
<td>TWA 0.5 ppm, STEL Not Available, Peak Not Available</td>
</tr>
<tr>
<td>[15-minute]</td>
</tr>
<tr>
<td>US ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td>hydrofluoric acid</td>
</tr>
<tr>
<td>Hydrogen fluoride, as F</td>
</tr>
<tr>
<td>TWA Not Available, STEL Not Available, Peak Not Available</td>
</tr>
<tr>
<td>TLV® Basis: URT, LRT, skin, &amp; eye irr; fluorosis; BEI</td>
</tr>
</tbody>
</table>

EMERGENCY LIMITS

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Material name</th>
<th>TEEL-1</th>
<th>TEEL-2</th>
<th>TEEL-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>tellurium</td>
<td>Tellurium</td>
<td>1.8 mg/m³</td>
<td>20 mg/m³</td>
<td>110 mg/m³</td>
</tr>
<tr>
<td>nitric acid</td>
<td>Nitric acid</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>hydrofluoric acid</td>
<td>Hydrogen fluoride; (Hydrofluoric acid)</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Original IDLH</th>
<th>Revised IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>tellurium</td>
<td>N.E. / N.E.</td>
<td>25 mg/m³</td>
</tr>
<tr>
<td>nitric acid</td>
<td>100 ppm</td>
<td>25 ppm</td>
</tr>
<tr>
<td>hydrofluoric acid</td>
<td>30 ppm</td>
<td>30 [Unch] ppm</td>
</tr>
<tr>
<td>water</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

Exposure 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.
- Enclose 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.

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
### SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

#### Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>colorless</td>
</tr>
<tr>
<td><strong>Physical state</strong></td>
<td>liquid</td>
</tr>
<tr>
<td>Relative density (Water = 1)</td>
<td>Not Available</td>
</tr>
<tr>
<td><strong>Odour</strong></td>
<td>Not Available</td>
</tr>
<tr>
<td><strong>Odour threshold</strong></td>
<td>Not Available</td>
</tr>
<tr>
<td><strong>pH (as supplied)</strong></td>
<td>&lt;2</td>
</tr>
<tr>
<td><strong>Melting point / freezing point</strong></td>
<td>Not Available</td>
</tr>
<tr>
<td><strong>Initial boiling point and boiling range (°C)</strong></td>
<td>Not Available</td>
</tr>
<tr>
<td><strong>Flash point (°C)</strong></td>
<td>Not Available</td>
</tr>
<tr>
<td>** Partition coefficient n-octanol / water**</td>
<td>Not Available</td>
</tr>
<tr>
<td><strong>Auto-ignition temperature (°C)</strong></td>
<td>Not Available</td>
</tr>
<tr>
<td><strong>Decomposition temperature</strong></td>
<td>Not Available</td>
</tr>
<tr>
<td><strong>Viscosity (cSt)</strong></td>
<td>Not Available</td>
</tr>
<tr>
<td><strong>Molecular weight (g/mol)</strong></td>
<td>Not Available</td>
</tr>
<tr>
<td><strong>Taste</strong></td>
<td>Not Available</td>
</tr>
</tbody>
</table>

#### 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 whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted.
- Full face shield (20 cm, 8 in minimum) may be required for 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 1336 or national equivalent]
- 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 1336 or national equivalent]

#### Eye and face protection

- Ensure there is ready access to a safety shower.
- Eyewash unit.
- PVC protective suit may be required if exposure severe.
- PVC Apron.
- Overalls.
- When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.
- 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 whenever there is a danger of the material coming in contact with the eyes; goggles must be properly fitted.
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#### Skin protection

- See Hand protection below

#### Hands/feet protection

- Elbow length PVC gloves
- When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

#### Body protection

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

#### Other protection

- Alternative gas masks to 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 1336 or national equivalent]

#### Thermal hazards

- Not Available

#### Respiratory protection

SECTION 10 STABILITY AND REACTIVITY

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evaporation rate</td>
<td>Not Available</td>
</tr>
<tr>
<td>Flammability</td>
<td>Not Available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Not Available</td>
</tr>
<tr>
<td>Upper Explosive Limit (%)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Lower Explosive Limit (%)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Flammability</td>
<td>Not Available</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>Not Available</td>
</tr>
<tr>
<td>Upper Explosive Limit (%)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Lower Explosive Limit (%)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Vapour pressure (kPa)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Solubility in water (g/L)</td>
<td>Miscible</td>
</tr>
<tr>
<td>Vapour density (Air = 1)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Vapour pressure (kPa)</td>
<td>Not Available</td>
</tr>
<tr>
<td>Solubility in water (g/L)</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

**Inhaled**
Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful. The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage. Exposure to fluoride can irritate the respiratory tract, causing coughing, choking, and mucous membrane reaction. There may be dizziness, headache, nausea, and weakness. Acute effects of fluoride inhalation include irritation of the nose and throat, coughing, and chest discomfort. A single acute over-exposure may even cause nose bleeds. Acute inhalation of hydrogen fluoride (hydrofluoric acid) vapours causes severe irritation of the eye, nose, throat, delayed fever, bluing of the extremities and water in the lungs, and may cause death. The above irritation occurs even with fairly low concentrations of hydrogen fluoride. Hydrogen fluoride has a strong irritating odor, that can be detected at concentrations of about 0.04 parts per million. Higher levels cause corrosion of the throat, nose, and lungs, leading to severe inflammation and water buildup in the lungs (which may occur with 1 hour of exposure). A vapour concentration of 10 parts per millions is regarded as intolerable, but a vapour concentration of 30 parts per million is considered as immediately dangerous to life and health. It is estimated that the lowest lethal concentration for a 5-minute human exposure to hydrogen fluoride is in the range of 50 to 250 parts per million. Exposure by either skin contact or inhalation may lead to low levels of calcium and magnesium in the blood, which may result in heart rhythm disturbances. Animal testing suggests that repeated exposure produces liver and kidney damage.

**Ingestion**
Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual. Ingestion of acidic corrosives may produce burns around and in the mouth, the throat, and oesophagus. Immediate pain and difficulties in swallowing and speaking may also be evident. Fluoride causes severe loss of calcium in the blood, with symptoms appearing several hours later including painful and rigid muscle contractions of the limbs. Cardiovascular collapse can occur and may cause death with increased heart rate and other heart rhythm irregularities.

**Skin Contact**
Skin contact with the material may be harmful; systemic effects may result following absorption. Skin contact with acidic corrosives may result in pain and burns; these may be deep with distinct edges and may heal slowly with the formation of scar tissue. Contact of the skin with liquid hydrofluoric acid (hydrogen fluoride) may cause severe burns, erythema, and swelling, vesiculation, and serious burning. With more severe burns, ulceration, blue-gray discoloration, and necrosis may occur. Solutions of hydrofluoric acid, as dilute as 2%, may cause severe skin burns. Fluorides are easily absorbed through the skin and cause death of soft tissue and erode bone. Healing is delayed and death of tissue may continue to spread beneath skin. Open cuts, abraded or irritated skin should not be exposed to this material. 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**
If applied to the eyes, this material causes severe eye damage. Direct eye contact with acid corrosives may produce pain, tears, sensitivity to light and burns. Mild burns of the epithelia generally recover rapidly and completely. Animal testing showed that a 20% solution of hydrofluoric acid (hydrogen fluoride) in water caused immediate damage in the form of total clouding of the lens and ischaemia of the conjunctiva. Swelling of the stroma of the cornea occurred within 1 hour, followed by tissue death (necrosis) of structures of the front of the eye.

**Chronic**
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. Repeated or prolonged exposure to acids may result in the erosion of teeth, swelling and/or ulceration of mouth lining. Irritation of airways to lung, with cough, and inflammation of lung tissue often occurs. Extended exposure to inorganic fluorides causes fluorosis, which includes signs of joint pain and stiffness, tooth discoloration, nausea and vomiting, loss of appetite, diarrhoea or constipation, weight loss, anaemia, weakness and general unwellness. There may also be frequent urination and thirst. Hydrogen fluoride easily penetrates the skin and causes destruction and corrosion of the bone and underlying tissue. Ingestion causes severe pains and burns in the mouth and throat and blood calcium levels are dangerously reduced.

**10 56-3 Tellurium (10µg/mL in 2% HNO3 + Tr HF)**

<table>
<thead>
<tr>
<th>Property</th>
<th>Toxicity</th>
<th>Irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>Irritation</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

**Tellurium**

<table>
<thead>
<tr>
<th>Property</th>
<th>Toxicity</th>
<th>Irritation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral (rat) LD50</td>
<td>83 mg/kgf</td>
<td>Not Available</td>
</tr>
</tbody>
</table>
### Nitric Acid

**Toxicity**

Inhalation (rat) LC50: 625 ppm/1hr

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Test Duration (hr)</th>
<th>Species</th>
<th>Value</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>18.413mg/L</td>
<td>3</td>
</tr>
<tr>
<td>EC50</td>
<td>48</td>
<td>Crustacea</td>
<td>5.79mg/L</td>
<td>2</td>
</tr>
<tr>
<td>NOEC</td>
<td>72</td>
<td>Algae or other aquatic plants</td>
<td>&gt;11.7mg/L</td>
<td>2</td>
</tr>
</tbody>
</table>

**Irritation**

Not Available

### Hydrofluoric Acid

**Toxicity**

Inhalation (rat) LC50: 1276 ppm/4hr

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Test Duration (hr)</th>
<th>Species</th>
<th>Value</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>51mg/L</td>
<td>2</td>
</tr>
<tr>
<td>EC50</td>
<td>48</td>
<td>Crustacea</td>
<td>270mg/L</td>
<td>1</td>
</tr>
</tbody>
</table>

**Irritation**

Eye (human): 50 mg - SEVERE

### Water

**Toxicity**

Not Available

**Irritation**

Not Available

### Tellurium

Changes to respiratory system, kidney, ureter, bladder and specific developmental abnormalities involving central nervous, craniofacial, musculoskeletal system.

**Nitric Acid**

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 cause severe skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

Oral (?) LD50: 50-500 mg/kg  *[Various Manufacturers]*

**Hydrofluoric Acid**

(liver and kidney damage) *[Manufacturer]* for hydrogen fluoride (as vapour)

**Nitric Acid & Hydrofluoric Acid**

Asthma-like symptoms may continue for months or even years after exposure to the material ends.

**Nitric Acid & Hydrofluoric Acid**

The material may produce severe irritation to the eye causing pronounced inflammation.

**Nitric Acid & Hydrofluoric Acid**

The material may produce respiratory tract irritation, and result in damage to the lung including reduced lung function.

**Hydrofluoric Acid & Water**

No significant acute toxicological data identified in literature search.

### Acute Toxicity

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>No</th>
<th>Carcinogenicity</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin Irritation/Corrosion</td>
<td>Yes</td>
<td>Reproductivity</td>
<td>Yes</td>
</tr>
<tr>
<td>Serious Eye Damage/Irritation</td>
<td>Yes</td>
<td>STOT - Single Exposure</td>
<td>No</td>
</tr>
<tr>
<td>Respiratory or Skin sensitisation</td>
<td>No</td>
<td>STOT - Repeated Exposure</td>
<td>No</td>
</tr>
<tr>
<td>Mutagenicity</td>
<td>No</td>
<td>Aspiration Hazard</td>
<td>No</td>
</tr>
</tbody>
</table>

### Environmental Information

**10 56-3 Tellurium (10µg/mL in 2% HNO3 + Tr HF)**

#### Nitric Acid

**ENDPOINT**

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Test Duration (HR)</th>
<th>Species</th>
<th>Value</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOEC</td>
<td>16</td>
<td>Crustacea</td>
<td>107mg/L</td>
<td>4</td>
</tr>
</tbody>
</table>

#### Hydrofluoric Acid

**ENDPOINT**

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>Test Duration (HR)</th>
<th>Species</th>
<th>Value</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50</td>
<td>96</td>
<td>Fish</td>
<td>51mg/L</td>
<td>2</td>
</tr>
<tr>
<td>EC50</td>
<td>48</td>
<td>Crustacea</td>
<td>270mg/L</td>
<td>1</td>
</tr>
</tbody>
</table>
Persistence and degradability

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Persistence: Water/Soil</th>
<th>Persistence: Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tellurium</td>
<td>HIGH</td>
<td>HIGH</td>
</tr>
<tr>
<td>Water</td>
<td>LOW</td>
<td>LOW</td>
</tr>
</tbody>
</table>

Bioaccumulative potential

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Bioaccumulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tellurium</td>
<td>LOW (LogKOW = 2.229)</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>Tellurium</td>
<td>LOW (KOC = 23.74)</td>
</tr>
<tr>
<td>Water</td>
<td>LOW (KOC = 14.3)</td>
</tr>
</tbody>
</table>

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

- Containers may still present a chemical hazard/danger when empty.
- Return to supplier for reuse/recycling if possible.
- Otherwise:
  - If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.
  - Where possible retain label warnings and SDS and observe all notices pertaining to the product.
  - 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 with soda-ash or soda-lime followed by burial in a landfill specifically licensed to accept chemical and/or pharmaceutical wastes or incineration in a licensed apparatus (after admixture with suitable combustible material).
  - Decontaminate empty containers with 5% aqueous sodium hydroxide or soda ash, followed by water. Observe all label safeguards until containers are punctured, to prevent re-use, and bury at an authorised landfill.
  - If container can not be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorised landfill.
  - Where possible retain label warnings and SDS and observe all notices pertaining to the product.
## SECTION 14 TRANSPORT INFORMATION

### Labels Required

| Marine Pollutant | NO |

### Land Transport (DOT)

| UN number | 3264 |
| UN proper shipping name | Corrosive liquid, acidic, inorganic, n.o.s. (contains nitric acid and hydrofluoric acid) |
| Transport hazard class(es) | | |
| Class | 8 |
| Subrisk | Not Applicable |
| Packing group | II |
| Environmental hazard | Not Applicable |
| Special precautions for user | Hazard Label 8 |
| Special provisions | 386, B2, IB2, T11, TP2, TP27 |

### Air Transport (ICAO-IATA / DGR)

| UN number | 3264 |
| UN proper shipping name | CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (contains nitric acid and hydrofluoric acid) |
| Transport hazard class(es) | | |
| ICAO/IATA Class | 8 |
| ICAO / IATA Subrisk | Not Applicable |
| ERG Code | 8L |
| Packing group | II |
| Environmental hazard | Not Applicable |
| Special precautions for user | Cargo Only Packing Instructions 855 |
| Cargo Only Maximum Qty / Pack | 30 L |
| Passenger and Cargo Packing Instructions | 851 |
| Passenger and Cargo Maximum Qty / Pack | 1 L |
| Passenger and Cargo Limited Quantity Packing Instructions | Y840 |
| Passenger and Cargo Limited Maximum Qty / Pack | 0.5 L |

### Sea Transport (IMDG-Code / GGVSee)

| UN number | 3264 |
| UN proper shipping name | Corrosive liquid, acidic, inorganic, n.o.s. * (contains nitric acid and hydrofluoric acid) |
| Transport hazard class(es) | | |
| IMDG Class | 8 |
| IMDG Subrisk | Not Applicable |
| Packing group | II |
| Environmental hazard | Not Applicable |
| Special precautions for user | EMS Number F-A, S-B |
| Special provisions | 274 |
| Limited Quantities | 1 L |

### 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>Nitric acid (70% and over)</td>
<td>Y, Y</td>
<td>2:2</td>
</tr>
<tr>
<td></td>
<td>Nitric acid (less than 70%)</td>
<td>Y, Y</td>
<td>2:2</td>
</tr>
</tbody>
</table>
SECTION 15 REGULATORY INFORMATION

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

**TELLURIUM (13494-80-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- US - Alaska Limits for Air Contaminants
- 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

**NITRIC ACID (7697-32-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft
- US - Alaska Limits for Air Contaminants
- US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organ (RELs)
- US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organ (RELs)
- 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

**HYDROFLUORIC ACID (7664-39-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

- International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
- US - Alaska Limits for Air Contaminants
- US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organ (RELs)
- US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organ (RELs)
- US - California Permissible Exposure Limits for Chemical Contaminants
- US - Hawaii Air Contaminant Limits
- US - Idaho - Acceptable Maximum Peak Concentrations
- 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 - Oregon Permissible Exposure Limits (Z-2)
- US - Pennsylvania - Hazardous Substance List
- US - Rhode Island Hazardous Substance List
- US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants

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

- US - Pennsylvania - Hazardous Substance List

Federal Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA)

**SECTION 311/312 HAZARD CATEGORIES**

- Immediate (acute) health hazard: Yes
- Delayed (chronic) health hazard: No
- Fire hazard: No
- Pressure hazard: No
- Reactivity hazard: No

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Reportable Quantity in Pounds (lb)</th>
<th>Reportable Quantity in kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitric acid</td>
<td>1000</td>
<td>454</td>
</tr>
<tr>
<td>Hydrofluoric</td>
<td>100</td>
<td>45.4</td>
</tr>
</tbody>
</table>

State Regulations

- US, CALIFORNIA PROPOSITION 65

Continued...
National Inventory Status

<table>
<thead>
<tr>
<th>Country</th>
<th>Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia - AICS</td>
<td>Y</td>
</tr>
<tr>
<td>Canada - DSL</td>
<td>Y</td>
</tr>
<tr>
<td>Canada - NDSL</td>
<td>N (water; tellurium; hydrofluoric acid; nitric acid)</td>
</tr>
<tr>
<td>China - IECSC</td>
<td>Y</td>
</tr>
<tr>
<td>Europe - EINEC / ELINCS / NLP</td>
<td>Y</td>
</tr>
<tr>
<td>Japan - ENCS</td>
<td>N (water; tellurium; hydrofluoric acid; nitric acid)</td>
</tr>
<tr>
<td>Korea - KECI</td>
<td>Y</td>
</tr>
<tr>
<td>New Zealand - NZIoC</td>
<td>Y</td>
</tr>
<tr>
<td>Philippines - PICCS</td>
<td>Y</td>
</tr>
<tr>
<td>USA - TSCA</td>
<td>Y</td>
</tr>
</tbody>
</table>

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

Ingredients with multiple cas numbers

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydrofluoric acid</td>
<td>7664-39-3, 790596-14-4</td>
</tr>
</tbody>
</table>

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
NOAEL: No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index

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