1 Identification

- Product identifier
  - Product Name: 1000 µg/mL Thallium
  - Part Number: PLTL2-2M / 2Y / 2T / 2X
  - Relevant identified uses of the substance or mixture and uses advised against: No further relevant information available.
  - Application of the substance / the mixture: Certified Reference Material

- Details of the supplier of the safety data sheet
  - Manufacturer/Supplier: SPEX CertiPrep, LLC.
    203 Norcross Ave, Metuchen, NJ 08840 USA
  - Information department: product safety department
  - Emergency telephone number:
    Emergency Phone Number (24 hours) CHEMTREC (800-424-9300)
    Outside US: 703-527-3887

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.

- Classification according to Directive 67/548/EEC or Directive 1999/45/EC
  - Harmful
    Harmful by inhalation and if swallowed.
  - Irritant
    Irritating to eyes and skin.

- Information concerning particular hazards for human and environment:
  - The product has to be labeled due to the calculation procedure of international guidelines.
  - Classification system:
    The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

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

- Hazard pictograms

- Signal word
  - Warning

- Hazard statements
  - Causes skin irritation.
  - Causes serious eye irritation.

- Precautionary statements
  - Wear protective gloves.
  - Wear eye protection / face protection.
    If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
    Specific treatment (see on this label).
    If skin irritation occurs: Get medical advice/attention.
    If eye irritation persists: Get medical advice/attention.

- NFPA ratings (scale 0 - 4)
  - Health = 1
  - Fire = 0
  - Reactivity = 0

(Contd. on page 2)
4 First-aid measures

· Description of first aid measures
  · General information: Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
  · After inhalation: Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
  · 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: Immediately call a doctor.

· Information for Doctor:
  · Most important symptoms and effects, both acute and delayed: No further relevant information available.
  · Indication of any immediate medical attention and special treatment needed: No further relevant information available.

5 Fire-fighting measures

· Extinguishing media
  · Suitable extinguishing agents: CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
  · Special hazards arising from the substance or mixture: No further relevant information available.

· Advice for firefighters
  · Protective equipment: Mouth respiratory protective device.

6 Accidental release measures

· Personal precautions, protective equipment and emergency procedures: Not required.
· Environmental precautions: Do not allow to enter sewers/surface or ground water.
· Methods and material for containment and cleaning up:
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
  Dispose contaminated material as waste according to item 13.
  Ensure adequate ventilation.
· Reference to other sections
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.

7 Handling and storage

· Handling:
  · Precautions for safe handling
  Ensure good ventilation/exhaustion at the workplace.
  Prevent formation of aerosols.
8 Exposure controls/personal protection

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

- Control parameters

  - Components with limit values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>Substance</th>
<th>PEL Long-term value:</th>
<th>REL Short-term value:</th>
<th>TLV Short-term value:</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2 nitric acid</td>
<td>5 mg/m³, 2 ppm</td>
<td>10 mg/m³, 4 ppm</td>
<td>10 mg/m³, 4 ppm</td>
</tr>
<tr>
<td></td>
<td>5 mg/m³, 2 ppm</td>
<td>5 mg/m³, 2 ppm</td>
<td>5 mg/m³, 2 ppm</td>
</tr>
<tr>
<td>10102-45-1 thallium nitrate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.1 mg/m³, as Tl; Skin</td>
<td>0.1 mg/m³, as Tl; Skin</td>
<td>0.02* mg/m³, as Tl; *inhalable fraction; Skin</td>
</tr>
</tbody>
</table>

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

- Exposure controls

- Personal protective equipment:

  - General protective and hygienic measures:
    Keep away from foodstuffs, beverages and feed.
    Immediately remove all soiled and contaminated clothing.
    Wash hands before breaks and at the end of work.
    Avoid contact with the eyes and skin.

  - Breathing equipment:
    In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

  - Protection of hands:

    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
9 Physical and chemical properties

- **Form:** Liquid
- **Color:** According to product specification
- **Odor:** Characteristic
- **Odour Threshold:** Not applicable.
- **pH-value:** Not applicable.
- **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.
- **Ignition temperature:**
  - Decomposition temperature: Not applicable.
  - Auto igniting: Product is not selfigniting.
- **Danger of explosion:** Product does not present an explosion hazard.
- **Explosion limits:**
  - Lower: Not applicable.
  - Upper: Not applicable.
- **Vapor pressure at 20 °C (68 °F):** 23 hPa (17 mm Hg)
- **Density at 20 °C (68 °F):** 1.01462 g/cm³ (8.467 lbs/gal)
- **Relative density:** Not applicable.
- **Vapour density:** Not applicable.
- **Evaporation rate:** Not applicable.
- **Solubility in / Miscibility with**
  - Water: Not miscible or difficult to mix.
- **Partition coefficient (n-octanol/water):** Not applicable.
- **Viscosity:**
  - Dynamic: Not applicable.
  - Kinematic: Not applicable.
- **Solvent content:**
  - Organic solvents: 0.0 %
  - Water: 97.9 %
  - Solids content: 0.1 %
- **Other information:** No further relevant information available.

10 Stability and reactivity

- **Reactivity**
- **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:**
    - 10102-45-1 thallium nitrate
    - Oral LD50 15 mg/kg (mouse)
  - **Primary irritant effect:**
    - on the skin: Irritant to skin and mucous membranes.
Product Name: 1000 µg/mL Thallium

- **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:
  - Harmful
  - Irritant

- **Carcinogenic categories**
  - **IARC (International Agency for Research on Cancer)**
    None of the ingredients is listed.
  - **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**: No further relevant information available.
  - **Mobility in soil**: No further relevant information available.
  - **Additional ecological information**: No further relevant information available.

- **General notes**
  - Water hazard class 1 (Self-assessment): slightly hazardous for water
  - Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

- **Results of PBT and vPvB assessment**
  - **PBT**: Not applicable.
  - **vPvB**: Not applicable.

- **Other adverse effects**: No further relevant information available.

### 13 Disposal considerations

- **Waste treatment methods**
  - **Recommendation**: Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

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

### 14 Transport information

- **UN-Number**
  - **DOT, ADR, IMDG, IATA**: UN3264

- **UN proper shipping name**
  - **DOT**
    - 3264 Corrosive liquid, acidic, inorganic, n.o.s. (Nitric acid solution)
  - **ADR**, **IMDG**, **IATA**
    - CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID SOLUTION)

- **Transport hazard class(es)**
  - **DOT**
    - 8 Corrosive substances
15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
  - Sara
    - Section 355 (extremely hazardous substances): 7697-37-2 nitric acid
    - Section 313 (Specific toxic chemical listings): 7697-37-2 nitric acid 10102-45-1 thallium nitrate
  - TSCA (Toxic Substances Control Act):
    - All ingredients are listed.
  - 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.
    - Chemicals known to cause developmental toxicity:
      - None of the ingredients is listed.
  - Carcinogenic categories
    - EPA (Environmental Protection Agency) 10102-45-1 thallium nitrate II
    - TLV (Threshold Limit Value established by ACGIH)
      - None of the ingredients is listed.
Product Name: 1000 µg/mL Thallium

- 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
  Causes skin irritation.
  Causes serious eye irritation.

- Precautionary statements
  Wear protective gloves.
  Wear eye protection / face protection.
  If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
  Specific treatment (see on this label).
  If skin irritation occurs: Get medical advice/attention.
  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: product safety department
- Contact:
  SPEX CertiPrep, LLC.
  1-732-549-7144
- Date of preparation / last revision: 05/01/2015 / -
- Abbreviations and acronyms:
  ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
  IMDG: International Maritime Code for Dangerous Goods
  DOT: US Department of Transportation
  IATA: International Air Transport Association
  ACGIH: American Conference of Governmental Industrial Hygienists
  EINECS: European Inventory of Existing Commercial Chemical Substances
  ELINCS: European List of Notified Chemical Substances
  CAS: Chemical Abstracts Service (division of the American Chemical Society)
  NFPA: National Fire Protection Association (USA)
  HMIS: Hazardous Materials Identification System (USA)
  LC50: Lethal concentration, 50 percent
  LD50: Lethal dose, 50 percent
  Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
  Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A