1 Identification

· Product identifier
· Trade name: Custom Standard
· Part number: ICUS-3914
· Application of the substance / the mixture: Laboratory chemicals

· Details of the supplier of the safety data sheet
· Manufacturer/Supplier:
  ULTRA Scientific, Inc.
  250 Smith Street
  North Kingstown, RI 02852
  USA

· Information department:
  Telephone: (401) 294-9400
  Fax: (401) 295-2300
  E-mail: regulatory@ultrasci.com
· Emergency telephone number:
  US: (800) 424-9300
  Outside US: (703) 527-3887

2 Hazard(s) identification

· Classification of the substance or mixture
  The product is not classified according to the Globally Harmonized System (GHS).

· Label elements
  · GHS label elements: Void
  · Hazard pictograms: Void
  · Signal word: Void
  · Hazard statements: Void

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

· Other hazards
  · Results of PBT and vPvB assessment
    · PBT: Not applicable.
    · vPvB: Not applicable.

3 Composition/information on ingredients

· Chemical characterization: Mixtures
· Description: Mixture of the substances listed below with nonhazardous additions.

(Contd. on page 2)
Trade name: Custom Standard

- Dangerous components: Void

4 First-aid measures

- Description of first aid measures
  - General information: No special measures required.
  - After inhalation: Supply fresh air; consult doctor in case of complaints.
  - After skin contact: Generally the product does not irritate the skin.
  - After eye contact: Rinse opened eye for several minutes under running water.
  - After swallowing: If symptoms persist consult doctor.

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

5 Fire-fighting measures

- Extinguishing media
  - Suitable extinguishing agents: Use fire fighting measures that suit the environment.
  - Special hazards arising from the substance or mixture: No further relevant information available.
  - Advice for firefighters
  - Protective equipment: No special measures required.

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).
- Reference to other sections
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.
- Protective Action Criteria for Chemicals

<table>
<thead>
<tr>
<th>Protective Action Criteria</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAC-1:</td>
<td></td>
</tr>
<tr>
<td>7697-37-2 nitric acid</td>
<td>0.16 ppm</td>
</tr>
<tr>
<td>87-69-4 (+)-tartaric acid</td>
<td>1.6 mg/m3</td>
</tr>
<tr>
<td>7664-39-3 hydrogen fluoride</td>
<td>1.0 ppm</td>
</tr>
<tr>
<td>7722-76-1 ammonium dihydrogenorthophosphate</td>
<td>17 mg/m3</td>
</tr>
<tr>
<td>7782-61-8 iron (III) nitrate nonahydrate</td>
<td>22 mg/m3</td>
</tr>
<tr>
<td>13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate</td>
<td>1.5 mg/m3</td>
</tr>
<tr>
<td>10022-31-8 barium nitrate</td>
<td>2.9 mg/m3</td>
</tr>
<tr>
<td>10043-35-3 boric acid</td>
<td>6 mg/m3</td>
</tr>
<tr>
<td>10377-66-9 manganese dinitrate</td>
<td>9.8 mg/m3</td>
</tr>
<tr>
<td>7784-27-2 aluminium nitrate</td>
<td>83 mg/m3</td>
</tr>
<tr>
<td>10196-18-6 zinc(II) nitrate hexahydrate</td>
<td>27 mg/m3</td>
</tr>
<tr>
<td>7803-55-6 ammonium trioxovanadate</td>
<td>0.01 mg/m3</td>
</tr>
<tr>
<td>CAS Number</td>
<td>Substance Description</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>lead dinitrate</td>
</tr>
<tr>
<td>7440-36-0</td>
<td>antimony</td>
</tr>
<tr>
<td>10022-68-1</td>
<td>Nitric acid, cadmium salt, tetrahydrate</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>diarsenic trioxide</td>
</tr>
<tr>
<td>7446-08-4</td>
<td>selenium dioxide</td>
</tr>
</tbody>
</table>

**PAC-2:**

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Substance Description</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>nitric acid</td>
<td>24 ppm</td>
</tr>
<tr>
<td>87-69-4</td>
<td>(+)-tartaric acid</td>
<td>17 mg/m³</td>
</tr>
<tr>
<td>7664-39-3</td>
<td>hydrogen fluoride</td>
<td>24 ppm</td>
</tr>
<tr>
<td>7722-76-1</td>
<td>ammonium dihydrogenorthophosphate</td>
<td>190 mg/m³</td>
</tr>
<tr>
<td>7782-61-8</td>
<td>iron (III) nitrate nonahydrate</td>
<td>110 mg/m³</td>
</tr>
<tr>
<td>13478-00-7</td>
<td>Nitric acid, nickel(2+) salt, hexahydrate</td>
<td>53 mg/m³</td>
</tr>
<tr>
<td>10022-31-8</td>
<td>barium nitrate</td>
<td>350 mg/m³</td>
</tr>
<tr>
<td>10043-35-3</td>
<td>boric acid</td>
<td>23 mg/m³</td>
</tr>
<tr>
<td>10377-66-9</td>
<td>manganese dinitrate</td>
<td>16 mg/m³</td>
</tr>
<tr>
<td>7784-27-2</td>
<td>aluminium nitrate</td>
<td>920 mg/m³</td>
</tr>
<tr>
<td>10196-18-6</td>
<td>zinc(II) nitrate hexahydrate</td>
<td>300 mg/m³</td>
</tr>
<tr>
<td>7803-55-6</td>
<td>ammonium trioxovanadate</td>
<td>0.11 mg/m³</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>lead dinitrate</td>
<td>180 mg/m³</td>
</tr>
<tr>
<td>7440-36-0</td>
<td>antimony</td>
<td>13 mg/m³</td>
</tr>
<tr>
<td>10022-68-1</td>
<td>Nitric acid, cadmium salt, tetrahydrate</td>
<td>2.1 mg/m³</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>diarsenic trioxide</td>
<td>3.0 mg/m³</td>
</tr>
<tr>
<td>7446-08-4</td>
<td>selenium dioxide</td>
<td>1.6 mg/m³</td>
</tr>
</tbody>
</table>

**PAC-3:**

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Substance Description</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>nitric acid</td>
<td>92 ppm</td>
</tr>
<tr>
<td>87-69-4</td>
<td>(+)-tartaric acid</td>
<td>100 mg/m³</td>
</tr>
<tr>
<td>7664-39-3</td>
<td>hydrogen fluoride</td>
<td>44 ppm</td>
</tr>
<tr>
<td>7722-76-1</td>
<td>ammonium dihydrogenorthophosphate</td>
<td>1,100 mg/m³</td>
</tr>
<tr>
<td>7782-61-8</td>
<td>iron (III) nitrate nonahydrate</td>
<td>640 mg/m³</td>
</tr>
<tr>
<td>13478-00-7</td>
<td>Nitric acid, nickel(2+) salt, hexahydrate</td>
<td>320 mg/m³</td>
</tr>
<tr>
<td>10022-31-8</td>
<td>barium nitrate</td>
<td>2,100 mg/m³</td>
</tr>
<tr>
<td>10043-35-3</td>
<td>boric acid</td>
<td>830 mg/m³</td>
</tr>
<tr>
<td>10377-66-9</td>
<td>manganese dinitrate</td>
<td>96 mg/m³</td>
</tr>
<tr>
<td>7784-27-2</td>
<td>aluminium nitrate</td>
<td>5,500 mg/m³</td>
</tr>
<tr>
<td>10196-18-6</td>
<td>zinc(II) nitrate hexahydrate</td>
<td>1,800 mg/m³</td>
</tr>
<tr>
<td>7803-55-6</td>
<td>ammonium trioxovanadate</td>
<td>80 mg/m³</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>lead dinitrate</td>
<td>1,100 mg/m³</td>
</tr>
<tr>
<td>7440-36-0</td>
<td>antimony</td>
<td>80 mg/m³</td>
</tr>
<tr>
<td>10022-68-1</td>
<td>Nitric acid, cadmium salt, tetrahydrate</td>
<td>13 mg/m³</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>diarsenic trioxide</td>
<td>9.1 mg/m³</td>
</tr>
<tr>
<td>7446-08-4</td>
<td>selenium dioxide</td>
<td>9.5 mg/m³</td>
</tr>
</tbody>
</table>
7 Handling and storage

- **Handling:**
  - Precautions for safe handling: No special measures required.
  - Information about protection against explosions and fires: No special measures required.

- **Conditions for safe storage, including any incompatibilities**
  - Storage:
    - Requirements to be met by storerooms and receptacles: No special requirements.
    - Information about storage in one common storage facility: Not required.
    - Further information about storage conditions: None.
    - Specific end use(s): No further relevant information available.

8 Exposure controls/personal protection

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

- **Control parameters**
  - Components with limit values that require monitoring at the workplace:
    The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
  - Additional information: The lists that were valid during the creation were used as basis.

- **Exposure controls**
  - Personal protective equipment:
    - General protective and hygienic measures:
      The usual precautionary measures for handling chemicals should be followed.
    - Breathing equipment: Not required.
  - Protection of hands:
    - 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: Goggles recommended during refilling.
### 45.2.5

- **pH-value:** Not determined.

- **Change in condition**
  - Melting point/Melting range: Undetermined.
  - Boiling point/Boiling range: 100°C (°F)

- **Flash point:** Not applicable.

- **Flammability (solid, gaseous):** Not applicable.

- **Ignition temperature:**
  - Decomposition temperature: Not determined.

- **Auto igniting:** Product is not selfigniting.

- **Danger of explosion:** Product does not present an explosion hazard.

- **Explosion limits:**
  - Lower: Not determined.
  - Upper: Not determined.

- **Vapor pressure at 20°C (68 °F):** 23 hPa (mm Hg)

- **Density:** Not determined.
  - Relative density: Not determined.
  - Vapor density: Not determined.
  - Evaporation rate: Not determined.

- **Solubility in / Miscibility with Water:** Not miscible or difficult to mix.

- **Partition coefficient (n-octanol/water):** Not determined.

- **Viscosity:**
  - Dynamic at 20°C (68 °F): 0.952 mPas
  - Kinematic: Not determined.

- **Solvent content:**
  - Water: 98.7 %
  - VOC content: 0.00 %
  - 0.0 g/l / 0.00 lb/gl

- **Solids content:** 0.0 %

- **Other information**
  - No further relevant information available.

### 10 Stability and reactivity

- **Reactivity**
  - No further relevant information available.

- **Chemical stability**

- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

- **Possibility of hazardous reactions**
  - No dangerous reactions known.

- **Conditions to avoid**
  - No further relevant information available.

- **Incompatible materials:** No further relevant information available.

- **Hazardous decomposition products:**
  - No dangerous decomposition products known.
11 Toxicological information

- Information on toxicological effects
  - Acute toxicity:
    - LD/LC50 values that are relevant for classification:
      - ATE (Acute Toxicity Estimate)

<table>
<thead>
<tr>
<th>Route</th>
<th>LD50</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>LD50</td>
<td>1,276,000 mg/kg (rat)</td>
</tr>
<tr>
<td>Dermal</td>
<td>LD50</td>
<td>5,000 mg/kg</td>
</tr>
<tr>
<td>Inhalative</td>
<td>LC50/4 h</td>
<td>500 mg/L</td>
</tr>
</tbody>
</table>

- Primary irritant effect:
  - on the skin: No irritant effect.
  - on the eye: No irritating effect.
  - Sensitization: No sensitizing effects known.

- Additional toxicological information:
  The product is not subject to classification according to internally approved calculation methods for preparations: When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

- Carcinogenic categories

<table>
<thead>
<tr>
<th>Agency</th>
<th>Code</th>
<th>Substance</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>IARC (International Agency for Research on Cancer)</td>
<td></td>
<td>13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10099-74-8 lead dinitrate</td>
<td>2A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10022-68-1 Nitric acid, cadmium salt, tetrahydrate</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1327-53-3 diaryenic trioxide</td>
<td>K</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7446-08-4 selenium dioxide</td>
<td>3</td>
</tr>
</tbody>
</table>

- NTP (National Toxicology Program)

<table>
<thead>
<tr>
<th>Code</th>
<th>Substance</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>Nitric acid, nickel(2+) salt, hexahydrate</td>
<td></td>
</tr>
<tr>
<td>R</td>
<td>lead dinitrate</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Nitric acid, cadmium salt, tetrahydrate</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>diaryenic trioxide</td>
<td></td>
</tr>
</tbody>
</table>

- OSHA-Ca (Occupational Safety & Health Administration)

None of the ingredients is listed.

12 Ecological information

- Toxicity
  - Aquatic toxicity: No further relevant information available.
  - Persistence and degradability: No further relevant information available.

- Behavior in environmental systems:
  - Bioaccumulative potential: No further relevant information available.
  - Mobility in soil: No further relevant information available.

- Additional ecological information:

- General notes:
  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: Smaller quantities can be disposed of with household waste.

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

14 Transport information
- UN-Number
- DOT, IMDG, IATA: UN3264
- UN proper shipping name
  - DOT: Corrosive liquid, acidic, inorganic, n.o.s. (Nitric acid)
  - IMDG, IATA: CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID)
- Transport hazard class(es)
  - DOT
    - Class: 8 Corrosive substances
    - Label: 8
  - IMDG, IATA
    - Class: 8 Corrosive substances
    - Label: 8
- Packing group
  - DOT, IMDG, IATA: III
- Environmental hazards: Not applicable.
- Special precautions for user
  - Danger code (Kemler): Warning: Corrosive substances
  - EMS Number: F-A,S-B
  - Segregation groups: Acids
  - Stowage Category: A
  - Stowage Code: SW2 Clear of living quarters.
Trade name: Custom Standard

- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**: Not applicable.

- **Transport/Additional information:**
  - **DOT**
    - **Quantity limitations**: On passenger aircraft/rail: 5 L
    - On cargo aircraft only: 60 L
  - **IMDG**
    - **Limited quantities (LQ)**: 5L
    - **Excepted quantities (EQ)**: Code: E1
      - Maximum net quantity per inner packaging: 30 ml
      - Maximum net quantity per outer packaging: 1000 ml
  - **UN "Model Regulation"**: UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID), 8, III

### 15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
  - **Sara**
    - **Section 355 (extremely hazardous substances):**
      - 7697-37-2 nitric acid
      - 7664-39-3 hydrogen fluoride
      - 1327-53-3 diarsenic trioxide
    - **Section 313 (Specific toxic chemical listings):**
      - 7697-37-2 nitric acid
      - 7664-39-3 hydrogen fluoride
      - 7782-61-8 iron (III) nitrate nonahydrate
      - 13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate
      - 10022-31-8 barium nitrate
      - 7789-02-8 chromium (III) nitrate nonahydrate
      - 10377-66-9 manganese dinitrate
      - 7784-27-2 aluminium nitrate
      - 10196-18-6 zinc(II) nitrate hexahydrate
      - 7803-55-6 ammonium trioxovanadate
      - 10099-74-8 lead dinitrate
      - 7440-36-0 antimony
      - 10022-68-1 Nitric acid, cadmium salt, tetrahydrate
      - 1327-53-3 diarsenic trioxide
      - 7446-08-4 selenium dioxide
      - 10099-74-8 lead dinitrate
      - 7440-36-0 antimony
      - 10022-68-1 Nitric acid, cadmium salt, tetrahydrate
      - 1327-53-3 diarsenic trioxide
      - 7446-08-4 selenium dioxide
      - 10031-43-3 cupric nitrate
  - **TSCA (Toxic Substances Control Act):**
    - 7697-37-2 nitric acid
    - 87-69-4 (+)-tartaric acid
    - 7664-39-3 hydrogen fluoride

(Contd. on page 9)
Trade name: Custom Standard

- Proposition 65

- **Chemicals known to cause cancer:**
  - 13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate
  - 10099-74-8 lead dinitrate
  - 10022-68-1 Nitric acid, cadmium salt, tetrahydrate
  - 1327-53-3 diarsenic trioxide

- **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:**
  - 1327-53-3 diarsenic trioxide

- **Carcinogenic categories**

  - **EPA (Environmental Protection Agency)**
    - 10022-31-8 barium nitrate D, CBD(inh), NL(oral)
    - 10043-35-3 boric acid I (oral)
    - 10377-66-9 manganese dinitrate D
    - 10099-74-8 lead dinitrate B2
    - 1327-53-3 diarsenic trioxide A
    - 7446-08-4 selenium dioxide D

  - **TLV (Threshold Limit Value established by ACGIH)**
    - 10022-31-8 barium nitrate A4
    - 10043-35-3 boric acid A4
    - 10099-74-8 lead dinitrate A3
    - 1327-53-3 diarsenic trioxide A1

  - **NIOSH-Ca (National Institute for Occupational Safety and Health)**
    - None of the ingredients is listed.

- **GHS label elements** Void
- **Hazard pictograms** Void
- **Signal word** Void
- **Hazard statements** Void
- **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.

· Date of preparation / last revision: 10/19/2017 / -

· 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)
  VOC: Volatile Organic Compounds (USA, EU)
  LC50: Lethal concentration, 50 percent
  LD50: Lethal dose, 50 percent
  PBT: Persistent, Bioaccumulative and Toxic
  vPvB: very Persistent and very Bioaccumulative
  NIOSH: National Institute for Occupational Safety
  OSHA: Occupational Safety & Health
  TLV: Threshold Limit Value
  PEL: Permissible Exposure Limit
  REL: Recommended Exposure Limit