1 Identification

· Product identifier

· Trade name: Custom Standard

· Part number: ICUS-4686

· 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

![GHS07]

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

· Label elements

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

· Hazard pictograms

![GHS07]

· Signal word: Warning

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

· Precautionary statements
  Wash thoroughly after handling.
  Wear protective gloves / eye protection / face protection.
  IF ON SKIN: Wash with plenty of water.
  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.
  Take off contaminated clothing and wash it before reuse.

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

- **Classification system:**
  - **NFPA ratings (scale 0 - 4)**
    - Health = 1
    - Fire = 0
    - Reactivity = 0

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

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

### 3 Composition/information on ingredients

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

- **Dangerous components:**
  - 7697-37-2 nitric acid 1.98%

### 4 First-aid measures

- **Description of first aid measures**
  - **After inhalation:** In case of unconsciousness place patient stably in side position for transportation.
  - **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
  - **After eye contact:** Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
  - **After swallowing:** If symptoms persist consult doctor.

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

### 5 Fire-fighting measures

- **Extinguishing media**
  - **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
  - **Special hazards arising from the substance or mixture** No further relevant information available.
  - **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.
**Trade name: Custom Standard**

- **Methods and material for containment and cleaning up:**
  Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

- **Reference to other sections**
  See Section 7 for information on safe handling.
  See Section 8 for information on personal protection equipment.
  See Section 13 for disposal information.

- **Protective Action Criteria for Chemicals**

  **PAC-1:**
<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>nitric acid</td>
<td>0.16 ppm</td>
</tr>
<tr>
<td>7440-74-6</td>
<td>indium</td>
<td>0.3 mg/m³</td>
</tr>
<tr>
<td>10022-31-8</td>
<td>barium nitrate</td>
<td>2.9 mg/m³</td>
</tr>
<tr>
<td>10294-41-4</td>
<td>Cerium (III) nitrate</td>
<td>13 mg/m³</td>
</tr>
<tr>
<td>1344-57-6</td>
<td>Uranium oxide (UO2)</td>
<td>0.68 mg/m³</td>
</tr>
<tr>
<td>554-13-2</td>
<td>lithium carbonate</td>
<td>3.1 mg/m³</td>
</tr>
<tr>
<td>10026-22-9</td>
<td>cobalt (II) nitrate hexahydrate</td>
<td>0.3 mg/m³</td>
</tr>
</tbody>
</table>

  **PAC-2:**
<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>nitric acid</td>
<td>24 ppm</td>
</tr>
<tr>
<td>7440-74-6</td>
<td>indium</td>
<td>3.3 mg/m³</td>
</tr>
<tr>
<td>10022-31-8</td>
<td>barium nitrate</td>
<td>350 mg/m³</td>
</tr>
<tr>
<td>10294-41-4</td>
<td>Cerium (III) nitrate</td>
<td>140 mg/m³</td>
</tr>
<tr>
<td>1344-57-6</td>
<td>Uranium oxide (UO2)</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>554-13-2</td>
<td>lithium carbonate</td>
<td>34 mg/m³</td>
</tr>
<tr>
<td>10026-22-9</td>
<td>cobalt (II) nitrate hexahydrate</td>
<td>23 mg/m³</td>
</tr>
</tbody>
</table>

  **PAC-3:**
<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>nitric acid</td>
<td>92 ppm</td>
</tr>
<tr>
<td>7440-74-6</td>
<td>indium</td>
<td>20 mg/m³</td>
</tr>
<tr>
<td>10022-31-8</td>
<td>barium nitrate</td>
<td>2,100 mg/m³</td>
</tr>
<tr>
<td>10294-41-4</td>
<td>Cerium (III) nitrate</td>
<td>830 mg/m³</td>
</tr>
<tr>
<td>1344-57-6</td>
<td>Uranium oxide (UO2)</td>
<td>30 mg/m³</td>
</tr>
<tr>
<td>554-13-2</td>
<td>lithium carbonate</td>
<td>210 mg/m³</td>
</tr>
<tr>
<td>10026-22-9</td>
<td>cobalt (II) nitrate hexahydrate</td>
<td>140 mg/m³</td>
</tr>
</tbody>
</table>

**7 Handling and storage**

- **Handling:**
  - **Precautions for safe handling:** No special precautions are necessary if used correctly.
  - **Information about protection against explosions and fires:** No special measures required.

- **Conditions for safe storage, including any incompatibilities**

- **Storage:**
  - **Requirements to be met by storerooms and receptacles:** No special requirements.
  - **Information about storage in one common storage facility:** Not required.
  - **Further information about storage conditions:** Keep receptacle tightly sealed.
  - **Specific end use(s):** No further relevant information available.
8 Exposure controls/personal protection

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

- Control parameters

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

<table>
<thead>
<tr>
<th>Component</th>
<th>PEL Long-term value</th>
<th>REL Short-term value</th>
<th>REL Long-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>5 mg/m³, 2 ppm</td>
<td>10 mg/m³, 4 ppm</td>
</tr>
</tbody>
</table>

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

- Personal protective equipment:
  - General protective and hygienic measures:
    - Keep away from foodstuffs, beverages and feed.
    - Immediately remove all soiled and contaminated clothing.
    - Wash hands before breaks and at the end of work.
    - Avoid contact with the eyes and skin.
  - Breathing equipment: Not required.
  - Protection of hands:
    - Protective gloves
    - The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
    - Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
    - Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
  - Material of gloves
    - The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and
      varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance
      of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
  - Penetration time of glove material
    - The exact break through time has to be found out by the manufacturer of the protective gloves and has to be
      observed.
  - Eye protection:
    - Tightly sealed goggles

9 Physical and chemical properties

- Information on basic physical and chemical properties
- General Information
- Appearance:
  - Form: Fluid
### 45.2.5 Change in condition
- **Melting point/Melting range:** Undetermined.
- **Boiling point/Boiling range:** 100°C (°F)

### 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.**
11 Toxicological information

- Information on toxicological effects
  - Acute toxicity:
    - LD/LC50 values that are relevant for classification:
      | ATEx (Acute Toxicity Estimate) | 
      | Inhalative | LC50/4 h | Value |
      | 7697-37-2 nitric acid | Inhalative | LC50/4 h | 67 mg/L (rat) |
      | 7697-37-2 nitric acid | Inhalative | LC50/4 h | 3,384 mg/L (rat) |
  - Primary irritant effect:
    - on the skin: Irritant to skin and mucous membranes.
    - on the eye: Irritating effect.
    - Sensitization: No sensitizing effects known.
  - Additional toxicological information:
    The product shows the following dangers according to internally approved calculation methods for preparations: Irritant.

- Carcinogenic categories
  - IARC (International Agency for Research on Cancer)
    10026-22-9 cobalt (II) nitrate hexahydrate 2B
  - NTP (National Toxicology Program)
    None of the ingredients is listed.
  - OSHA-Ca (Occupational Safety & Health Administration)
    None of the ingredients is listed.

12 Ecological information

- Toxicity
  - Aquatic toxicity: No further relevant information available.
  - Persistence and degradability: No further relevant information available.
- Behavior in environmental systems:
  - Bioaccumulative potential: No further relevant information available.
  - Mobility in soil: No further relevant information available.
- Additional ecological information:
  - General notes:
    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, IMDG, IATA: UN3264

- UN proper shipping name
  - DOT
  - 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
  - Warning: Corrosive substances
  - Danger code (Kemler): 80
  - EMS Number: F-A,S-B
  - Segregation groups: Acids
  - Stowage Category: A
  - Stowage Code: SW2 Clear of living quarters.

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

(Contd. on page 8)
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
  - Section 313 (Specific toxic chemical listings):
    - 7697-37-2 nitric acid
    - 10022-31-8 barium nitrate
    - 10294-41-4 Cerium (III) nitrate
    - 554-13-2 lithium carbonate
    - 10026-22-9 cobalt (II) nitrate hexahydrate
  - TSCA (Toxic Substances Control Act):
    - 7697-37-2 nitric acid
    - 7440-74-6 indium
    - 10022-31-8 barium nitrate
    - 1344-57-6 Uranium oxide (UO2)
    - 554-13-2 lithium carbonate
    - 7732-18-5 water
  - 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:
      - 554-13-2 lithium carbonate

(Contd. on page 9)
## Carcinogenic categories
- **EPA (Environmental Protection Agency)**
  - 10022-31-8 barium nitrate: D, CBD(inh), NL(oral)
- **TLV (Threshold Limit Value established by ACGIH)**
  - 10022-31-8 barium nitrate: A4
- **NIOSH-Ca (National Institute for Occupational Safety and Health)**
  - None of the ingredients is listed.

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

### Hazard pictograms

![GHS07]

### Signal word
Warning

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

### Precautionary statements
- Wash thoroughly after handling.
- Wear protective gloves / eye protection / face protection.
- IF ON SKIN: Wash with plenty of water.
- 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.
- Take off contaminated clothing and wash it before reuse.

### Chemical safety assessment
A Chemical Safety Assessment has not been carried out.

## 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
09/01/2017 / -

### 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
Trade name: Custom Standard

TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A