Safety Data Sheet
acc. to OSHA HCS

1 Identification

- Product identifier
- Trade name: Custom Standard
- Part number: ICUS-1454
- 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.
### 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>PAC-1 Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>7697-37-2</td>
<td>nitric acid</td>
<td>0.16 ppm</td>
</tr>
<tr>
<td>87-69-4</td>
<td>(+)-tartaric acid</td>
<td>1.6 mg/m³</td>
</tr>
<tr>
<td>7664-39-3</td>
<td>hydrogen fluoride</td>
<td>1.0 ppm</td>
</tr>
<tr>
<td>10377-66-9</td>
<td>manganese dinitrate</td>
<td>9.8 mg/m³</td>
</tr>
<tr>
<td>10026-22-9</td>
<td>cobalt (II) nitrate hexahydrate</td>
<td>0.3 mg/m³</td>
</tr>
<tr>
<td>13478-00-7</td>
<td>Nitric acid, nickel(2+) salt, hexahydrate</td>
<td>1.5 mg/m³</td>
</tr>
<tr>
<td>10196-18-6</td>
<td>zinc(II) nitrate hexahydrate</td>
<td>27 mg/m³</td>
</tr>
<tr>
<td>1327-53-3</td>
<td>diarsenic trioxide</td>
<td>0.27 mg/m³</td>
</tr>
<tr>
<td>7446-08-4</td>
<td>selenium dioxide</td>
<td>0.84 mg/m³</td>
</tr>
<tr>
<td>1313-27-5</td>
<td>molybdenum trioxide</td>
<td>2.3 mg/m³</td>
</tr>
<tr>
<td>7761-88-8</td>
<td>silver nitrate</td>
<td>0.047 mg/m³</td>
</tr>
<tr>
<td>10022-68-1</td>
<td>Nitric acid, cadmium salt, tetrahydrate</td>
<td>0.27 mg/m³</td>
</tr>
<tr>
<td>7440-36-0</td>
<td>antimony</td>
<td>1.5 mg/m³</td>
</tr>
<tr>
<td>10022-31-8</td>
<td>barium nitrate</td>
<td>2.9 mg/m³</td>
</tr>
<tr>
<td>10102-45-1</td>
<td>thallium nitrate</td>
<td>0.078 mg/m³</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>lead dinitrate</td>
<td>0.24 mg/m³</td>
</tr>
<tr>
<td>7803-55-6</td>
<td>ammonium trioxovanadate</td>
<td>0.01 mg/m³</td>
</tr>
</tbody>
</table>

#### PAC-2:

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>PAC-2 Value</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>10377-66-9</td>
<td>manganese dinitrate</td>
<td>16 mg/m³</td>
</tr>
<tr>
<td>10026-22-9</td>
<td>cobalt (II) nitrate hexahydrate</td>
<td>23 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>10196-18-6</td>
<td>zinc(II) nitrate hexahydrate</td>
<td>300 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>
<tr>
<td>1313-27-5</td>
<td>molybdenum trioxide</td>
<td>43 mg/m³</td>
</tr>
<tr>
<td>7761-88-8</td>
<td>silver nitrate</td>
<td>0.9 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>7440-36-0</td>
<td>antimony</td>
<td>13 mg/m³</td>
</tr>
<tr>
<td>10022-31-8</td>
<td>barium nitrate</td>
<td>350 mg/m³</td>
</tr>
<tr>
<td>10102-45-1</td>
<td>thallium nitrate</td>
<td>4.3 mg/m³</td>
</tr>
<tr>
<td>10099-74-8</td>
<td>lead dinitrate</td>
<td>180 mg/m³</td>
</tr>
<tr>
<td>7803-55-6</td>
<td>ammonium trioxovanadate</td>
<td>0.11 mg/m³</td>
</tr>
</tbody>
</table>
45.2.5 PAC-3:

- 7697-37-2 nitric acid 92 ppm
- 87-69-4 (+)-tartaric acid 100 mg/m³
- 7664-39-3 hydrogen fluoride 44 ppm
- 10377-66-9 manganese dinitrate 96 mg/m³
- 10026-22-9 cobalt (II) nitrate hexahydrate 140 mg/m³
- 13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate 320 mg/m³
- 10196-18-6 zinc(II) nitrate hexahydrate 1,800 mg/m³
- 1327-53-3 diarsenic trioxide 9.1 mg/m³
- 7446-08-4 selenium dioxide 9.5 mg/m³
- 1313-27-5 molybdenum trioxide 260 mg/m³
- 7761-88-8 silver nitrate 5.4 mg/m³
- 10022-68-1 Nitric acid, cadmium salt, tetrahydrate 13 mg/m³
- 7440-36-0 antimony 80 mg/m³
- 10022-31-8 barium nitrate 2,100 mg/m³
- 10102-45-1 thallium nitrate 26 mg/m³
- 10099-74-8 lead dinitrate 1,100 mg/m³
- 7803-55-6 ammonium trioxovanadate 80 mg/m³

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:
    - 7697-37-2 nitric acid
      - PEL Long-term value: 5 mg/m³, 2 ppm
      - REL Short-term value: 10 mg/m³, 4 ppm
      - Long-term value: 5 mg/m³, 2 ppm
      - TLV Short-term value: 10 mg/m³, 4 ppm
      - Long-term value: 5.2 mg/m³, 2 ppm

  - Additional information: The lists that were valid during the creation were used as basis.
9 Physical and chemical properties

- **Information on basic physical and chemical properties**

  - **General Information**
  
  - **Appearance:**
    
    - **Form:** Fluid
    - **Color:** Colorless
    - **Odor:** Odorless
    - **Odor threshold:** Not determined.
  
  - **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.
### 45.2.5

- **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: 97.5 %
  - 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)**
    - Inhalative LC50/4 h: 3,384 mg/L (rat)
  - **7697-37-2 nitric acid**
    - Inhalative LC50/4 h: 67 mg/L (rat)
  - **7664-39-3 hydrogen fluoride**
    - Oral LD50: 1,276 mg/kg (rat)
Trade name: Custom Standard

- **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)**
    | CAS Number | Substance                  | IARC category |
    |-------------|-----------------------------|---------------|
    | 10026-22-9  | cobalt (II) nitrate hexahydrate | 2B            |
    | 13478-00-7  | Nitric acid, nickel(2+) salt, hexahydrate | 1             |
    | 1327-53-3   | diarsenic trioxide           | 1             |
    | 7446-08-4   | selenium dioxide             | 3             |
    | 10022-68-1  | Nitric acid, cadmium salt, tetrahydrate | 1             |
    | 10099-74-8  | lead dinitrate               | 2A            |
    | 543-81-7    | acetic acid beryllium salt   | 1             |
  - **NTP (National Toxicology Program)**
    | CAS Number | Substance                  | NTP notation  |
    |-------------|-----------------------------|---------------|
    | 13478-00-7  | Nitric acid, nickel(2+) salt, hexahydrate | K             |
    | 1327-53-3   | diarsenic trioxide           | K             |
    | 10022-68-1  | Nitric acid, cadmium salt, tetrahydrate | K             |
    | 10099-74-8  | lead dinitrate               | R             |
    | 543-81-7    | acetic acid beryllium salt   | K             |
  - **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.
### 14 Transport information

| · UN-Number | DOT, IMDG, IATA | UN3264 |
| · UN proper shipping name | DOT | IMDG, IATA |
| · Class | 8 | Corrosive liquid, acidic, inorganic, n.o.s. (Nitric acid) |
| · Label | 8 | CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID) |
| · IMDG, IATA | Corrosive liquid, acidic, inorganic, n.o.s. (Nitric acid) |
| · Class | 8 | Corrosive substances |
| · Label | 8 |

#### Special precautions for user
- **Warning:** Corrosive substances
- **DOT**
- **EMS Number:** F-A,S-B
- **Segregation groups:** Acids
- **Stowage Category:** A
- **Stowage Code:** SW2 Clear of living quarters.

#### Environmental hazards:
- Not applicable.

#### 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

(Contd. on page 9)
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
      - 10377-66-9 manganese dinitrate
      - 10026-22-9 cobalt (II) nitrate hexahydrate
      - 13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate
      - 10031-43-3 cupric nitrate
      - 10196-18-6 zinc(II) nitrate hexahydrate
      - 1327-53-3 diarsenic trioxide
      - 7446-08-4 selenium dioxide
      - 7761-88-8 silver nitrate
      - 10022-68-1 Nitric acid, cadmium salt, tetrahydrate
      - 7440-36-0 antimony
      - 10022-31-8 barium nitrate
      - 10102-45-1 thallium nitrate
      - 10099-74-8 lead dinitrate
      - 7789-02-8 chromium (III) nitrate nonahydrate
      - 543-81-7 acetic acid beryllium salt
      - 7803-55-6 ammonium trioxovanadate
  - TSCA (Toxic Substances Control Act):
    - 7697-37-2 nitric acid
    - 87-69-4 (+)-tartaric acid
    - 7664-39-3 hydrogen fluoride
    - 10377-66-9 manganese dinitrate
    - 1327-53-3 diarsenic trioxide
    - 7446-08-4 selenium dioxide
    - 1313-27-5 molybdenum trioxide
    - 7761-88-8 silver nitrate

(Contd. of page 8)
7440-36-0 antimony
10022-31-8 barium nitrate
10102-45-1 thallium nitrate
10099-74-8 lead dinitrate
7803-55-6 ammonium trioxovanadate
7732-18-5 water

· Proposition 65
  · Chemicals known to cause cancer:
    13478-00-7 Nitric acid, nickel(2+) salt, hexahydrate
    1327-53-3 diarsenic trioxide
    10022-68-1 Nitric acid, cadmium salt, tetrahydrate
    10099-74-8 lead dinitrate
    543-81-7 acetic acid beryllium salt

  · 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)
    10377-66-9 manganese dinitrate D
    1327-53-3 diarsenic trioxide A
    7446-08-4 selenium dioxide D
    10022-31-8 barium nitrate D, CBD(inh), NL(oral)
    10102-45-1 thallium nitrate II
    10099-74-8 lead dinitrate B2

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

· 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.

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: 11/03/2017 / -

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)
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
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A