1. Identification of the Substance/Mixture and the Supplier
Supplier: National Institute of Advanced Industrial Science and Technology (AIST)
Address: 1-3-1, Kasumigaseki, Chiyoda, Tokyo, Japan
Office in Charge: Reference Materials Office, Center for Quality Management of Metrology, National Metrology Institute of Japan
Person in Charge: Certified Reference Material Staff
Telephone No.: +81-29-861-4059
Fax No.: +81-29-861-4009
Emergency Contact: Same as above
Prepared on: January 21, 2010
Revised on: March 31, 2017
Reference No.: 6016001
Identification of the Material: Certified Reference Material NMIJ CRM 6016-a
Recommended Use of the Chemical and Restriction on Use: This reference material can be used, in amino acid analysis, for preparation of standard solution, calibration of analysis equipment and validation of analysis method/equipment. Do not use this reference material for other purposes than testing/research.

2. Hazards Identification
GHS Classification: Not classifiable
GHS Label element: -
Signal word: -
Hazard communication: Low in toxicity, but harmful if inhaled or ingested in large quantity. Irritates eye, respiratory tract and mucous membrane.
Other hazard communication: [Preventive Measures]
Precautionary statement: Use appropriate protective equipment to prevent the inhalation and contact with eye, skin or clothing
[Response]
If inhaled: Remove from area of exposure and get some fresh air. Keep warm with a blanket and keep one at rest. Get medical treatment.
If on skin: Wash with soap and plenty of water. If necessary, get medical assistance
If in eye: Immediately flush with plenty of clean water and get medical treatment
If swallowed: Wash the mouth with water thoroughly, drink 1 to 2 glasses of water or milk. Get medical assistance if there is
any abnormal condition.

[Storage]
Store in a clean desiccator at room temperature (about 15 °C to 25 °C) protected from light.

[Disposal]
Commission waste disposal to a specialized industrial waste disposal contractor licensed by the prefectural governor.

Hazardous and toxic properties not specified in the above are not subject to the classification or not classifiable.

### 3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Single or compound product</th>
<th>Single product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Ingredient Name</td>
<td>L-Proline</td>
</tr>
<tr>
<td>Other name</td>
<td>(S)-pyrrolidine-2-carboxylic acid</td>
</tr>
<tr>
<td>Content</td>
<td>99.9 %</td>
</tr>
<tr>
<td>Chemical formula or</td>
<td>C₅H₉NO₂</td>
</tr>
<tr>
<td>structural formula</td>
<td></td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>115.13</td>
</tr>
<tr>
<td>Reference Number in</td>
<td>Act on the Evaluation of Chemical Substances and</td>
</tr>
<tr>
<td>Gazetted List in Japan</td>
<td>Regulation of Their Manufacture, etc. : (9-)1626</td>
</tr>
<tr>
<td></td>
<td>Industrial Safety and Health Act : Published</td>
</tr>
<tr>
<td>CAS No.</td>
<td>147-85-3</td>
</tr>
</tbody>
</table>

### 4. First-aid Measures

| If in eyes                  | Rinse with plenty of clean water, get medical assistance |
| If on skin                  | Wash with soap and plenty of water, if necessary, get medical assistance |
| If inhaled                  | Remove from area of exposure and get some fresh air, keep warm and rest. Get medical assistance |
| If swallowed                | Wash the mouth thoroughly with water, drink 1 to 2 glasses or water or milk. Get medical treatment if there is any abnormal condition |
| Measures to be taken to protect the person applying first aid | Use personal protective equipment. |

### 5. Fire-fighting Measures

| Extinguishing media         | Water, powder, carbon dioxide, foam, dry sand |
| Specific hazards at the time of fire | May generate irritating or toxic gas |
| Specific extinguishing measures | Immediately remove combustible or ignitable materials from near the fire and start extinguishing with extinguishing agent, transfer movable containers to a safe place promptly, if impossible to move, |
Protecting fire-fighting personnel

- Cool the periphery of the container with water spray.
- Fire extinguishing activities from the windward and avoid inhaling toxic gas. Use personal protective equipment such as fire-safe clothing, air breathing apparatus, etc. as the situation demands.

6. Accidental Release Measures

<table>
<thead>
<tr>
<th>Personal precaution</th>
<th>If indoor, ventilate well until the treating process is completed properly.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protective equipment and emergency procedures</td>
<td>Wear appropriate protective equipment to protect the skin from spattering droplets, etc. and prevent inhaling dust/particulate or gas.</td>
</tr>
<tr>
<td>Environmental precautions</td>
<td>To prevent causing environmental impact, do not release products into rivers, etc. through drainage. Before discharging contaminated waste water, treat the waste water properly.</td>
</tr>
<tr>
<td>Collection, neutralization</td>
<td>Collect the leakage in a container. Wash down the leaked area with plenty of water.</td>
</tr>
<tr>
<td>Secondary disaster prevention</td>
<td>Rope in the leakage area and prohibit the entrance of unauthorized persons. Work at windward and evacuate the people in leeward.</td>
</tr>
</tbody>
</table>

7. Handling and Storage

**Handlings**
- Avoid unnecessary dust generation causing leakage, spillage, scattering, etc.
- Use appropriate protective equipment to avoid contact with eye, skin, clothing, etc.
- No eating, drinking and smoking when working
- Wash hands, face, etc. and gargle well after the handling
- Restrict the access to the handling area
- Store the product in an airtight container
- Use of the product is restricted to research experiments
- Do not use the product for in vivo experiments

**Storage**
- Protect from light and store in a clean desiccator at room temperature (about 15 °C to 25 °C).

8. Exposure Controls/Personal

**Administrative Level**
- Not established

**Occupational exposure limit**
- ACGIH TLV-TWA : Not established
- Japan Society for Occupational Health recommended reference value : Not established
- OSHA PEL TWA : Not established

**Facility engineering control**
- Ventilation, exhaust : If generating dust/particle, seal the source of release and install local exhaust ventilation equipment
Install eye wash facility and emergency safety shower and indicate their location with signage conspicuously

Safety control, gas detection:

Storage precaution:
Protect from light and store in a clean place at room temperature (about 15 °C to 25 °C)

Protective equipment:
Respiratory tract protection:
Dust protective mask

Hands:
Protective gloves

Eyes:
Protective eyeglasses (safety goggles if needed)

Skin and body:
Long-sleeved protective clothing

9. Physical and Chemical Properties

- Appearance, etc.: Powder
- Color: White
- Odor: No data
- pH: No data
- Melting point: 220 °C to 222 °C (decomposition)
- Boiling point: No data
- Flashing point: No data
- Explosive range: No data
- Vapor pressure: No data
- Relative vapor density (Air=1): No data
- Specific gravity or bulk specific gravity: No data
- Solubility: Easily soluble in water, slightly soluble in ethanol, non-soluble in diethyl ether
- n-Octanol/water partition coefficient (Log Po/w): No data
- Auto-ignition temperature: No data

10. Stability and Reactivity
◇ Stability
- Stable under normal condition
◇ Reactivity
- Color reaction with ninhydrin to give yellow, with isatin blue. Reacts to nitrous acid to produce nitroso compound. Does not generate nitrogen
◇ Condition to avoid
- Sunlight, heat
◇ Hazardous decomposition products
- Carbon monoxide, nitrogen oxide
11. Toxicological Information

- No data available

12. Ecological Information

Degradability, concentration
- No data available

Bioaccumulation
- No data available

Ecotoxicity
- No data available

13. Disposal Considerations

- Disposal shall be in compliance with Laws and Regulations concerned, and ordinances of the local authorities
- Disposal of an empty container shall be after removing/decontaminating the content completely.

14. Transport Information

UN number : Not applicable
UN classification : Not applicable
Name : -
Marine pollutant : Not applicable
Precautions : Transfer with care avoiding direct sunlight, leakage or spill due to fall, keep away from sources of ignition.

15. Regulatory Information

- No applicable laws and regulations

◎ This SDS is originally prepared for the use of the material in Japan, thus the stated laws and regulations are stipulated and carried out in Japan. The use of the material in other countries should be referred to and by application of the relevant laws and regulations of the country in which the material will be used.

16. Other Information

Other
The information in this document is not intended to be exhaustive and is based on currently available information and data. The measures given in this document are applicable only to normal handling conditions. When handling this reference material under special conditions etc., it is recommended to take safety measures appropriate to each specific application and context of use. This document is intended to provide information and not intended to guarantee anything in handling this reference material.