Safety Data Sheet

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: November 09, 2010
Revised on: March 31, 2017
Reference No.: 6012001

Identity of Substance/Mixture: Certified Reference Material NMIJ CRM 6012-a
Recommended Use: L-Leucine

L-Leucine: One of the essential amino acids, have very low toxicity, but harmful if inhaled or ingested in large amounts. Irritates eyes, throat and mucous membrane.

Precautionary statement

[Preventive measures] Use appropriate protective equipment to avoid inhaling and coming in contact with eyes, skin and clothes

[Response]
If inhaled: Move to get a fresh air, cover with a blanket, etc. to keep warm and rest. Get medical assistance.
If on skin: Rinse with a large amount of water using soap.
Get medical assistance if necessary.
If in eyes: Immediately rinse the eyes with clean water and get medical treatment.
If swallowed: Induce vomiting by drinking water or salt solution.
Get medical assistance if there is any indication of abnormality.

[Storage]
Protect from light, in a clean desiccator at a normal temperature (15 °C to 25 °C).

[Disposal]
Outsource to a professional industrial waste disposal contractor licensed by the prefectural governor.

Hazardous and toxic properties not specified in the above are neither the object of the classification nor classifiable.

3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Single or compound</th>
<th>Single product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical name</td>
<td>L-Leucine</td>
</tr>
<tr>
<td>Other name</td>
<td>(S)-2-Amino-4-methylvaleric acid</td>
</tr>
<tr>
<td></td>
<td>(S)-2-Amino-4-methylpentanoic acid</td>
</tr>
<tr>
<td>Content</td>
<td>99.9 %</td>
</tr>
<tr>
<td>Chemical formula or structural formula</td>
<td>(CH₃)₂CHCH₂CH(NH₂)COOH</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>131.17</td>
</tr>
<tr>
<td>Reference Number in Gazetted List in Japan</td>
<td>Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : (9)—1632</td>
</tr>
<tr>
<td></td>
<td>Industrial Safety and Health Act : Published</td>
</tr>
<tr>
<td>CAS No.</td>
<td>61-90-5</td>
</tr>
</tbody>
</table>

4. First-aid Measures

If in eyes : Rinse well with plenty of clean water. Get medical assistance.
If on skin : Rinse with plenty of clean water using soap. Get medical assistance if necessary.
If inhaled : Move to get a fresh air, keep warm and rest. Get medical assistance.
If swallowed : Drink a large amount of water and induce vomiting. Get medical assistance if there is any indication of abnormality.
Measures to be taken to protect the person applying first aid : Use personal protective equipment.

5. Fire-fighting Measures

Extinguishing media : Water (spray), powder, foam, carbon dioxide, dry sand.
Specific hazards at the time of fire : Use appropriate protective equipment to protect from inhaling irritant or toxic gas formed at the time of fire
Specific extinguishing measures : Remove fire sources and extinguish using appropriate agent compatible with the substance. Movable container should be transferred to a safe place promptly. If impossible to transfer,
6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedure:
- If released indoor, ventilate well until the treatment is completed. Use appropriate protective equipment to protect the skin from contacting the airborne droplets and to avoid inhaling dust and gas.
- To prevent causing environmental impact, do not release the spilled material into sewer, rivers, etc. directly. Treat the contaminated waste water appropriately before discharged to the environment.

Environmental precaution:
- Recover and collect the spillage in an empty container. Wash out the spilled area with a large amount of water.
- Rope-off the leaked area and restrict access to the area to the authorized personnel only. Evacuate the people on the leeward and work on the windward side.

Recovery, neutralization:
- Nothing in particular

Measures to prevent secondary accident:
- Nothing in particular

7. Handling and Storage

Handling
- Nothing in particular

Precautions:
- Do not handle the container roughly, no dropping, knocking down or dragging.
- Prevent leakage, spillage or overflow that causes fume to form.
- Keep the container airtight after using.
- Wash hands and face, etc. well and gargle after the handling.
- Eating, drinking or smoking only at the designated areas.
- Take off the gloves, and other contaminated protective equipment before leaving the handling area or entering the rest areas.

Precautions for safe handling:
- Use appropriate protective equipment to prevent inhaling, coming in contact with eyes, skin and clothing.
- Use local exhaust ventilation system when handling indoor.

Storage
- Protect from light , in a clean desiccator at a normal temperature (15 °C to 25 °C)
- Nothing in particular

Incompatibility hazards:
- No data available

Materials for safe packing:
- Glass
8. Exposure Control/Personal Protection

Administrative levels
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
Ventilation, exhaust: Seal the source when handling indoor, or install local ventilation system. Install safety shower, hand/eye washer, and indicate their location conspicuously.

Safety management, gas detection
Storage precaution: Protect from light, in a clean place at a normal temperature (15 °C to 25 °C).

Protective equipment
- Respiratory organ: Dust protective mask
- Hand: Protective gloves
- Eyes: Protective eyeglasses (if necessary, safety goggles)
- Skin and body: Long-sleeved protective clothes

9. Physical and Chemical Properties

- Appearance, etc.: Powder
- Color: White
- Odor: No data
- pH: No data
- Melting point: 293 °C to 295 °C (Decomposition point)
- 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: Water soluble 2.27g(0 °C) and 2.19g(25 °C) per 100 g water. Slightly soluble in ethanol, insoluble in ether.
- Octanol/water partition coefficient (Log Po/w): No data
- Auto-ignition temperature: No data
10. Stability and Reactivity
◇ Stability
・ Stable under normal condition. Sublimates at 145 °C to 148 °C
◇ Reactivity
・ No data available
◇ Conditions to avoid
・ Sunlight, heat
◇ Hazardous decomposition products
・ Carbon monoxide, nitrogen oxide

11. Toxicological Information
Acute toxicity:
Abdominal cavity rats LD50: 5379 mg/kg (RTECS)
Subcutaneous rabbits LDLo: 2620 mg/kg (RTECS)

12. Ecological Information
Degradability, concentration
・ No data available
Bioaccumulation
・ No data available
Ecotoxicity
・ No data available

13. Disposal Considerations
Residue wastes:
Incineration method
Use an incinerator equipped with scrubber.
The disposal should be according to the relevant laws and regulations as well as the ordinances of the local authorities. If impossible to treat the waste according to the above stated methods, outsource to a professional waste disposal contractor licensed by the local authorities.
Contaminated container and packaging:
Clean the container completely before disposing of the contaminated container

14. Transport Information
UN number:
Not applicable
UN classification:
Not applicable
Material name:
-
Marine pollutant:
Not applicable
Precaution:
Transfer with caution by avoiding direct sunlight and fire sources. Protect from leakage or spill due to fall or drop.

15. Regulatory Information
・ No applicable laws and regulations
16. Other Information

Others
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.