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
Department: Reference Material Office, Center for Quality Management of Metrology, The 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: August 29, 2007  Revised on: March 31, 2017
ID Number: 5004001

Identity of Substance/Mixture: Certified reference material: NMIJ CRM 5004-a
Polystyrene 1000

Recommended Use of the Chemical and Restriction on Use:
This reference material can be used for calibration, quality control of analysis equipment and validation of analysis method/equipment for measurement of molecular weight distribution/average molecular weight of polymers. Do not use this reference material for other purposes than testing/research.

2. Hazards Identification

GHS Classification: No classification
GHS Label Element: No classification
Signal Word: -
Hazards Statement: -
Other Hazards Statement: Toxic if inhaled or swallowed
Precautionary Statement: [Safety Precaution]
Harmful if swallowed.
[First-aid Action]
If swallowed: Drink lot of water and induce vomiting. Immediately get medical advice/attention.
[Storage]
Store this CRM in dark and clean place at normal room temperature, and seal tightly after use.
[Disposal]
Dispose of this reference material in accordance with applicable legislation and local government ordinance. Entrust disposal of this reference material and its containers to a professional waste disposal company licensed by prefectural government.
The other hazards than the above do not result in classification or are not covered by the GHS.

### 3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Substance/Mixture</th>
<th>Single substance (Mixture of polystyrene with various molecular weights)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Identity</td>
<td>Polystyrene</td>
</tr>
<tr>
<td>Synonym</td>
<td>Styrene polymer</td>
</tr>
<tr>
<td>Structural Formula</td>
<td>(CsHs)(_i);(i: Degree of polymerization)</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>Weight-average molecular weight ((M_w)) : 1012.9</td>
</tr>
<tr>
<td></td>
<td>Number-average molecular weight ((M_n)) : 868.3</td>
</tr>
<tr>
<td>CAS number</td>
<td>9003-53-6</td>
</tr>
<tr>
<td>Content</td>
<td>Over 99.9 %</td>
</tr>
<tr>
<td>Reference Number in</td>
<td>Act on the Evaluation of Chemical Substances and Regulation</td>
</tr>
<tr>
<td>Gazetted List in Japan</td>
<td>of Their Manufacture, etc.</td>
</tr>
<tr>
<td></td>
<td>Industrial Safety and Health Act : Published</td>
</tr>
</tbody>
</table>

| Hazardous Ingredient       | None                                                                     |

### 4. First-aid Measures

◇ If in Eyes:
1. Wash with plenty of clean water.
2. Get medical advice/attention.

◇ If on skin:
1. Wash with plenty of soap and water.
2. Take off/Remove contaminated clothing, shoes, etc. Get medical advice/attention.

◇ If Inhaled:
1. Remove victim to fresh air. Get medical advice/attention.
2. Keep at rest and warm.

◇ If Ingested:
1. Rinse mouth thoroughly with water.
2. Do not make victim take anything orally if unconscious.
3. Get medical advice/attention.

◇ Measures to be taken to protect the person applying first aid:
1. Use personal protective equipment.

### 5. Fire-fighting Measures

<table>
<thead>
<tr>
<th>Extinguishing Media</th>
<th>Water spray, carbon dioxide, dry chemical and hydrosoluble foam extinguisher (alcohol resistance foam)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire-Specific Hazards</td>
<td>Under the general environment, there is no risk of ignition. The combustion gas include carbon monoxide and NOx, CN and etc. Carry out fire-fighting from the windward as far as</td>
</tr>
</tbody>
</table>
Specific Fire-Fighting Method

Possible, in order to avoid breathing hazardous gas.

Remove any combustible sources from the seat of fire and extinguish using appropriate extinguishing agent. Transfer the movable container to a safe place promptly. If impossible to transfer, use water spray to cool the periphery. Carry out fire-fighting from the windward in order to avoid breathing hazardous gas.

Protection of Fire-Fighters

Carry out fire-fighting from the windward in order to avoid breathing hazardous gas. Use personal protective equipment such as fire protection clothing, breathing apparatus, circulating oxygen respirator, rubber gloves, rubber boots, and etc.

6. Accidental Release Measures

Personal Precaution

Use appropriate personal protective equipment during the operation to avoid contact with skin, eyes, and clothes.

Protection of Fire-Fighters

Ventilate the affected areas thoroughly, if it is in an indoor environment, until the clean-up operation is completed. Use appropriate personal protective equipment during the operation to avoid skin contact of splash etc. and inhalation of dust and gas.

Environmental Precautions

Take precautions to prevent spillage from draining into rivers etc. to adversely impact the environment. Make it sure to appropriately treat contaminated wastewater in order to prevent untreated wastewater from being released into the surrounding environment.

Recovery and Neutralization

Collect in empty containers that can be sealed.

Prevention of Secondary Disaster

Mark the restricted area with rope etc. to keep out unauthorized people. Carry out the clean-up operation from the windward and make people on the leeward side evacuate.

7. Handling and Storage Precautions

Handling

- Avoid contact with eyes, skin and clothing.
- Do not eat, drink or smoke when handling this reference material.
- Do not touch directly with hands.
- Wash hands thoroughly after handling this reference material.
- Keep away from any possible contact with strong oxidizers.
- Avoid dust and vapor generation.

Storage

- Store in a closed container in a clean light-shielded environment at room temperature.

8. Exposure Controls/Personal Protection

Safety Precautions

Not defined
Permissible Concentration (Polystyrene)
Not specified

Engineering Controls
◇ Precautions for storage
   • Store in a closed container in a clean light-shielded environment at room temperature.
   • Keep container tightly closed and install local ventilation system when dust is generated.

Personal Protective Equipment (PPE)
   • Protective mask, Protective gloves, Eye protector, Eye protector with side plates
     (Goggle-type as required), Protective clothing, Protective boots

Hygiene measure
   Treat in accordance with rules on Industrial hygiene and Industrial safety.

9. Physical and Chemical Properties

   • Appearance, etc.: Highly viscous liquid
   • Color: Colorless
   • Odor: No data
   • pH: No data
   • Melting point: No data
   • 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: No data
   • n-Octanol/water partition coefficient (Log Po/w): No data
   • Auto-ignition temperature: No data

10. Stability and Reactivity

Stability
   • Stable against acids and alkalis but poor oil resistance

Reactivity
   • Decomposed, when being heated above 300 °C, to generate toxic fumes such as styrene.

Conditions to Avoid
   • Sunlight, Heat

Hazardous Decomposition Products
   • Carbon monoxide (CO)

11. Toxicological Information

   No data available
12. Ecological Information
Persistence and Degradability
・No degradability by microorganisms and the like.
Bioaccumulative Potential
・No or limited concentration or bio-accumulation in fish/shellfish body
Ecotoxicity
・No data available

13. Disposal Considerations
・Entrust disposal of this reference material and its containers to a professional waste disposal company licensed by prefectural governor.

14. Transport Information
UN Number : Not applicable
UN : Not applicable
Classification
Shipping Name : Not applicable
Packing Group : -
ICAO/IATA : Not applicable
Marine : Not applicable
Pollutant
Precautions : Transport this reference material carefully while keeping it away from direct sunlight and fire and preventing accidental release due to falling, overturning, etc.

15. Regulatory Information
・No applicable legislation

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.