1. Identification of the Substance/Mixture and the Supplier

Supplier: National Institute of Advanced Industrial Science and Technology (AIST)
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Office in Charge: Reference Materials Office, Center for Quality Management of Metrology, National Metrology Institute of Japan
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Prepared on: September 26, 2014
Revised on: March 31, 2017
ID Number: 5012001

Identity of Substance/Mixture: Reference material NMIJ RM 5012-a Polystyrene (for Light Scattering)
Recommended applications and limitations of use: This reference material can be used to control measurement accuracy and to validate measurement techniques used to determine the molecular weight and size of highly polymerized compounds. This material shall not be used for purposes other than testing and research.

2. Hazards Identification

GHS classification: Classification not possible
GHS-labeling element:
Signal word:
Hazard and toxicity information:
Other toxicity information:
Cautionary statement: Hazardous if inhaled or swallowed.
[Safety Measures]
Hazardous if ingested.
[Emergency Measures]
Ingestion: Drink plenty of water and induce vomiting. Seek medical attention.
[Storage]
Keep out of sunlight and in a clean area at 25 °C or lower.

[Disposal]
Follow the pertinent regulations and ordinances established by the local government.
Use a waste-treatment firm certified by a prefectural governor.

Classification is impossible or not applicable for hazards not mentioned above.

3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Single substance or compound</th>
<th>Single substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical name</td>
<td>Polystyrene</td>
</tr>
<tr>
<td>Synonym</td>
<td>Styrene polymer</td>
</tr>
<tr>
<td>Chemical or structural formula</td>
<td>Molecular formula: $(C_8H_8)_i$; $(i$: polymerization degree)</td>
</tr>
<tr>
<td>Molecular weight/content</td>
<td>Multiple polymer chains with an average molar mass of $6.18 \times 10^5$</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. : (6)-120</td>
</tr>
<tr>
<td>CAS number</td>
<td>9003-53-6</td>
</tr>
<tr>
<td>Hazardous component</td>
<td>None</td>
</tr>
</tbody>
</table>

4. First-aid Measures

| Eye contact | Wash eyes with plenty of clean water. Seek medical attention. |
| Skin contact| Wash with plenty of clean water. Remove contaminated clothing such as gloves, shoes, or apron and seek medical attention. |
| Inhalation  | Move to fresh air, keep warm, and rest. Seek medical attention. |
| Ingestion   | Wash the mouth well with water. If unconscious, do not give anything by mouth. Contact a physician. |

5. Fire-fighting Measures

| Extinguishing media | Water spray, carbon dioxide, dry chemical powder, alcohol foam. |
| Specific hazards with regard to fire-fighting | There is no danger of ignition under ambient conditions. |
| | As the combustion gas contains carbon monoxide, NOx, HCN, and other toxic gases, work from the windward side as much as possible to prevent inhalation. |
| Specific methods of fire-fighting | Eliminate the origin of fire and put the fire out with extinguishing media. If possible, move containers to a safe place immediately. If not, cool the peripheral areas with water spray. |
Protection for firefighters: Work from the windward side to prevent the inhalation of toxic gas. Use fire-prevention clothing, fireproof clothing, fire-protection clothing, respirator, circulating oxygen breathing apparatus, rubber gloves, rubber boots, and other appropriate protective equipment.

6. Accidental Release Measures

Personal precautions: Promptly remove all potential ignition sources from peripheral areas. In case of ignition, prepare firefighting equipment.

Protective equipment and emergency measures: When accidental release takes place indoors, thoroughly clear the air until emergency measures are complete. Before beginning, wear appropriate protective equipment to protect skin from droplets and to prevent inhalation of dust and gas.

Environmental precautions: Prevent the released product from being drained into a river or other area that might cause environmental damage. Prevent the polluted discharge from being drained into the environment without being processed properly.

Recovery and neutralization: Collect the leaked product in an empty container. Then, wash the spilled area with plenty of water.

Prevention of secondary accidents: Surround the area with a rope or some other marker to prevent unauthorized people from entering the area. Work from the windward side and evacuate people to the leeward side.

7. Handling and Storage

Handling

Technical measures: Avoid sources of high temperature and sparks.

Local ventilation and general ventilation: In case steam or mist is generated, seal the source and provide local exhaust ventilation.

Precautions for safe handling: Avoid rough handling such as dropping, shocking, dragging, or otherwise agitating the container. Do not cause the substance to leak, overflow, or drift, and prevent steam from being generated. Seal the container after use. Wash hands, face, and other necessary parts thoroughly, and gargle after handling. Do not eat, drink, or smoke in places other than the designated areas. Do not bring gloves and other contaminated protective equipment into the break area. Only authorized people should be allowed in the handling area. Wear appropriate protective equipment to prevent inhalation, or contact with eyes, skin, or clothing. When handling indoors, provide local exhaust ventilation.

Storage
Appropriate storage conditions: Keep out of sunlight and in a clean area at 25 °C or lower.
Safe packaging materials: Glass

8. Exposure Controls/Personal Protection

Standard control concentration

N/A

Threshold limit values (material name)
- ACGIH TLV-TWA: N/A
- Value recommended by Japanese Society of Occupational Health: N/A
- OSHA PEL TWA: N/A

Engineering controls
- Ventilation and emission: Local ventilation equipment or general ventilation equipment
- Safety management and gas detection: Measuring device, detection tube
- Storage precautions: Ventilate along the floor surface. Seal the container. Keep out of sunlight, in a clean location, and at room temperature.

Protective equipment
- Respiratory protection: Protective mask
- Hand protection: Protective gloves
- Eye protection: Protective glasses with side wall (goggle type as needed)
- Skin and body protection: Protective clothing

Hygiene measures
Handle in accordance with industrial hygiene and safety standards.

9. Physical and Chemical Properties

- Appearance, etc.: Solid
- Color: White
- 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
- Octanol/water partition coefficient (Log Po/w): No data
10. Stability and Reactivity

◇ Stability
  - Stable against acid and alkaline; weak resistance to oil and grease.

◇ Reactivity
  - Decomposes and generates styrene and other toxic fumes if heated to 300 °C or more.

◇ Conditions to avoid
  - Contact with sunlight and heat.

◇ Hazardous decomposition products
  - Carbon monoxide

11. Toxicological Information

No data

12. Ecological Information

Degradability/Concentration
  - Not decomposed by microorganisms or other natural means

Bioaccumulation
  - The material accumulates minimally or not at all in fish and shellfish.

Ecotoxicity
  - No data

13. Disposal Considerations

Residues
  - Dispose in accordance with pertinent laws, regulations, and local ordinances.
  - Use a waste-treatment vendor certified by a prefectural governor.

Contaminated containers and packaging
  - To dispose of an empty container, completely remove the contents.

14. Transport Information

UN Dangerous Goods Number
  - Not applicable

UN classification
  - Not applicable

Product name
  - -

Packing group
  - -

ICAO/IATA
  - Not applicable

Marine pollutant
  - Not applicable

Matters to be attended to
  - Avoid direct sunlight. Prevent leakage and fire caused by overturning, falling, and other disruptions. Transport with caution.
15. Regulatory Information
   Not applicable

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.