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

Identity of Substance/Mixture : Certified reference material: NMIJ CRM 8158-a
Recommended Use of the Chemical and Restriction on Use :

- Polystyrene for Raman Spectrometer
- This CRM is intended for use in the calibration of instruments, and validation of and instruments.
- Do not use this reference material for other purposes than testing/research.

2. Hazards Identification

GHS Classification : Not applicable
GHS Label Element : Not applicable
Signal Word : Not applicable
Hazards Statement : Not applicable
Other Hazards : Toxic if inhaled or swallowed

Precautionary Statement :

- [Precaution] Not applicable
- [Action] Not applicable
- [Storage] Store in an original aluminum laminated plastic bag, and keep out direct sun light and store clean place at 15 °C to 25 °C.
- [Disposal] Dispose of this reference material in accordance with applicable legislation and local government ordinance.
- Entrust disposal of this reference material to a professional waste disposal company licensed by prefectural governor.

The other hazards than the above do not result in classification or are not classifiable.
3. Composition/Information on Ingredients

Substance/Mixture : Single substance
Chemical name : Polystyrene for Raman Spectrometer
Ingredient : Polystyrene
Synonym : Styrene polymer
Amount : 99 % or higher
Chemical formula : \((C_8H_8)_{i} \); \((i:\text{Degree of polymerization})\)
Molecular weight : -

Official Gazette Reference No. : Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : (6)-120
Industrial Safety and Health Act : Published
CAS number : 9003-53-6

Hazardous Ingredient : -

4. First-aid Measures

If in Eyes : If dust or decomposed gas gets into eyes, rinse cautiously with clean water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention immediately.
If on Skin : Remove/Take off contaminated clothing, etc. Rinse thoroughly with clean water. Wash polluted clothing, if reuse them.
If Inhaled : If dust or decomposed gas is inhaled, remove victim to fresh air and keep at rest and warm. Get medical advice/attention immediately.
If Ingested : Rinse mouth thoroughly with water. Drink a lot of water then it induces vomiting. Immediately call a physician.

Predicted immediate and delayed symptoms : -
Most important symptom/effect : -
Protecting Personnel in emergency measures : Use personal protective equipment.

5. Fire-fighting Measures

Extinguishing Media : Water, carbon dioxide, dry chemical powder, alcohol resistant, polymer foam.
Fire-Specific Hazards : In the case of fire, irritating or toxic gas (CO, styrene monomer) may be generated. Extinguish fire from upwind as far as possible and avoid inhalation.

Specific Fire-Fighting Method : Eliminate ignition sources at the origin of a fire and put out fire by using extinguishing media. Remove movable containers promptly to a safe place. In the case of immovable containers, cool their surroundings with sprayed water.
Protection of : Use personal protective equipment such as fire protection.
Fire-Fighters clothing, protective clothing, breathing apparatus, circulating oxygen respirator, and rubber boots.

6. Accidental Release Measures

Personal Precaution: Use appropriate personal protective equipment during the operation to avoid skin contact and inhalation of dust and decomposed gas.

Personal Protective Equipment and Emergency Procedures: If indoors, provide adequate ventilation until treatment is complete. 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. 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 the scattered material or contaminated items in an empty container.

Prevention of Secondary Disaster: Promptly remove nearby ignition sources and prepare extinguishing media.

7. Handling and Storage

Handling

Engineering Precautions: Keep away from hot surfaces, sparks, and strong oxidizer. Provide appropriate ventilation.

Local and General Ventilation: When dust or decomposed gas is generated, seal the source, and provide local exhaust ventilation or central ventilation.

Precautions for Safe Handling: Avoid contact with eyes, skin and clothing. Do not eat, drink or smoke while working. Do not touch it directly with your hands. Wash hands thoroughly after handling.

Storage

Appropriate Storage Conditions: Store and seal in an original aluminum laminated plastic bag. Avoid direct sun light and store in a place at room temperature from 15 °C to 25 °C.

Safe Container Packaging Material: Aluminum laminated plastic bag

8. Exposure Controls/Personal Protection

Threshold Limit Value

- Not specified

Permissible Concentration

Japan Society for Occupational Health has not set a permissible concentration for polystyrene dust, but it is considered appropriate to apply the following values.

- 2 mg/m³ (Inhalable dust)
8 mg/m\(^3\) (Total dust)

- ACGIH TLV-TWA : Not specified
- Values recommended by Japan Society for Occupational Health : Not specified
- OSHA PEL TWA : Not specified

Facility engineering

- Ventilation, exhaust : Use closed processing equipment or install local ventilation system when dust is generated. During high-temperature processing decomposed gas is generated, it is desirable to install facilities to rinse eyes and to wash hands and body in the vicinity of a place handling this reference material and label them.
- Safety management/gas detector : Measuring instrument, detector tube
- Storing precaution : Store and seal in an original aluminum laminated plastic bag. Avoid direct sun light and store in a place at room temperature from 15 °C to 25 °C. Keep away from flammable substances and strong oxidizers.

Personal Protective equipment

Respiratory protection : Use protective mask when dust is generated. During high-temperature processing, decomposed gas is generated, use protective mask for organic gases.

Hands : Protective gloves
Eyes : Eye protector (Goggle type as necessary)
Skin and Body : Protective clothing (long sleeve), protective boots

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

9. Physical and Chemical Properties

Appearance, etc. : Solid. Disk with 25 mm diameter and 4 mm thickness.
Color : Colorless and transparent.
Odor : No data
pH : No data
Melting point : About 240 °C
Boiling point : No data
Flashing point : 345 °C~427 °C
Explosive range : No data
Vapor pressure : No data
Relative vapor density (Air=1) : No data
Specific gravity or bulk specific gravity : 1.05 g/cm\(^3\)
Solubility : Not soluble in water, ether. Easily soluble in organic solvents such as toluene chloroform, tetrahydrofuran.
\(n\)-Octanol/water partition : No data
coefficient (Log Po/w)
Auto-ignition temperature : 427 °C

10. Stability and Reactivity
Stability : Stable in normal conditions
Reactivity : Flammable material.
Possibility of hazardous reaction : No data
Conditions to avoid : Sunlight, Heat, contact with strong oxidizing agent.
Incompatible materials : Strong oxidizing agent
Hazardous decomposition products : Carbon monoxide, styrene monomer

11. Toxicological Information
Acute toxicity : No data
Skin corrosivity/irritation : No data
Serious eye damage/ Eye irritation : No data
Respiratory sensitization : No data
Skin sensitization : No data
Germ cell mutagenicity : No data
Carcinogenicity : Evaluated as Group 3 (cannot be classified as carcinogenic to humans) by IARC.
Reproductive toxicity : No data
Specific organ toxicity (single exposure) : No data
Specific organ toxicity (repeated exposure) : Rats were fed 2% polystyrene in 5% diet and had no effect.
Aspiration hazard : No data
※This reference material is stable under normal conditions, and there is no danger of the noxious additive ingredient being eluted. However, when handling this reference material under special conditions, such as high temperatures, etc., safety precautions for appropriate use are recommended.

12. Ecological Information
Ecotoxicity : No data
Persistence and Degradability : No data
Bioaccumulative Potential : No data
Mobility in soil : No data
Influence to the ozone layer : No data
13. **Disposal Considerations**

Residual waste : Dispose of this reference material in accordance with applicable legislation and local government ordinance. When the above-mentioned treatments are not possible, entrust disposal of residual waste to a professional waste disposal company licensed by prefectoral governor.

Contaminated container and package : Dispose of containers after thoroughly removing their contents.

14. **Transport Information**

UN Number : Not applicable
UN Classification : Not applicable
Material name : Not applicable
Container grade : Not applicable
ICAO/IATA : Not applicable
Marine pollutant : Not applicable
Precautions : Transport this reference material carefully while keeping it away from direct sunlight and fire and preventing accidental release due to falling, overturning, and etc.

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**

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.