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
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Prepared on: April 14, 2009
Revised on: March 31, 2017
ID Number: 1301001

Identity of Substance/Mixture: Reference material: NMIJ RM 1301-a
Reference thin film for heat diffusion time across a thickness (Titanium nitride thin film/Synthetic quartz substrate)

Recommended Use of the Chemical and Restriction on Use: This reference material (RM) is intended to use in calibrating the heat diffusion time across the thickness. Do not use this reference material for other purposes than testing/research.

2. Hazards Identification

GHS Classification: Not classified
GHS label element: –
Signal Word: –
Other Hazards: Incombustible solid and low risk in normal handling.
Statement: Continuous inhalation of the dust may cause respiratory failure.
Precautionary Statement: 
[Precaution]
A low risk in normal handling. Use appropriate personal protective equipment. Avoid release to the environment.
When dust is generated, seal the source, and wear respiratory protection equipment.
[First Aid Measure]
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.
[Storage]
Keep away from sunlight. Store at cool and dry place. Avoid direct sun light and stored at a clean, dry and well ventilated place at normal room temperature.
[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

<table>
<thead>
<tr>
<th>Single substance/Mixture</th>
<th>Mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical name</td>
<td>Titanium nitride thin film/Synthetic quartz substrate</td>
</tr>
<tr>
<td>Chemical Formula or</td>
<td>TiN/\text{SiO}_2</td>
</tr>
<tr>
<td>Structural Formula</td>
<td>-</td>
</tr>
<tr>
<td>Amount</td>
<td>-</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. : (1)-494</td>
</tr>
<tr>
<td></td>
<td>Industrial Safety and Health Act : Published</td>
</tr>
<tr>
<td>CAS No.</td>
<td>25583-20-4 (TiN)</td>
</tr>
</tbody>
</table>

4. First-aid Measures

If in Eyes : Rinse cautiously with clean water for over several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention immediately.

If on skin : Remove contaminated clothes, shoes, and garment. Rinse away thoroughly with plenty of clean water. If developing some symptoms, seek medical advice as needed.

If Inhaled : Remove victim to fresh air and keep at rest and warm. Get medical advice/attention.

If Ingested : Rinse mouth thoroughly with water. Drink a lot of water then it induces vomiting. Immediately call a physician.

Protecting Personnel in emergency measures : Wear protective equipment such as rubber gloves, eye protective goggles.

5. Fire-fighting Measures

Extinguishing Media : This RM is incombustible, and use extinguishing media for peripheral fire.

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 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, heat-resistant clothing,
6. Accidental Release Measures

Personal Precaution: –
Personal Protective Equipment and Emergency Procedures: –
Environmental Precautions: –
Recovery and Neutralization: Collect scattered powder in empty containers and close the containers tightly.
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

Handling Engineering Precautions: End of this RM is not to be handled with bare hands because it is sharp. Use tweezers and wear the appropriate protective equipment.
Local and General Ventilation Precautions for Safe Handling: Wear protective gloves when handling this reference material.
Since this reference material is easy to be broken and if broken its fracture surface may cause incised wound.

Storage Appropriate Storage Conditions: This RM should be kept at room temperature (23 °C ± 5 °C), at relative humidity (50% or less).
Safe Container Packaging Material: Polyethylene

8. Exposure Controls/Personal Protection

Threshold Limit Value
Not assigned
Permissible Concentration
- ACGIH TLV-TWA (2000): Not assigned
- Values recommended by Japan Society for Occupational Health (2000): Not assigned
- OSHA PEL TWA: Not assigned

Facility engineering
- Keep container tightly closed and avoid exposure to moisture.
- Install facilities to rinse eyes and to wash hands and body in the vicinity of a place handling this reference material and label them.
Personal Protective equipment
Respiratory protection : Protective dust mask, respiratory protection equipment.
Hands : Protective gloves
Eyes : Eye protector (Goggle type as necessary)
Skin and Body : Protective clothing, face mask
Hygiene measure : Treat in accordance with rules on Industrial hygiene and Industrial safety.

9. Physical and Chemical Properties
- Appearance, etc. : Solid
  TiN thin film on Synthetic quartz substrate. Rectangular piece of about 10 mm × 10 mm × 0.525 mm
- Color : Dark blue-black
- 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 : No data
- 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 in normal conditions
◇ Reactivity
  - No data
◇ Conditions to Avoid
  - No data
◇ Hazardous Decomposition Products
  - No data

11. Toxicological Information
Note: The information about the toxicity related to this product has been investigated in the forefront of the way, but pay enough attention to the handling as those with an unknown toxic.
Acute Toxicity : No data
Serious Eye Damage/ Eye Irritation : No data
12. Ecological Information
Persistence and Degradability : No·data
Bioaccumulative Potential : No·data
Ecotoxicity : No·data

13. Disposal Considerations
- Dispose in accordance with applicable regional, national and local laws and regulations.
- Dispose of containers after thoroughly removing their contents.

14. Transport Information
UN Number : Not applicable
UN Classification : Not applicable
Shipping Name : Titanium nitride thin film on Synthetic quartz substrate
Packing Group : –
ICAO/IATA : –
Marine Pollutant : Not applicable
Precautions : Check before transport if containers are free from leakage.
            Load in a way to avoid overturning, falling and being broken, and take all necessary measures to prevent collapsing.

15. Regulatory Information
◇ Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.
   · (1)·494

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.