

## 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 (NMIJ)
Person in Charge	: Person in Charge of Certified Reference Materials
Telephone No.	: +81-29-861-4059
Emergency Contact	: Same as above
	Creation date : February 28, 2020
	Revised on : August 11, 2020
	ID Number : 5801001
Identity of Substance/Mixture	: Certified reference material NMIJ CRM 5801-a Al <sub>2</sub> O <sub>3</sub> Ceramics for Thermal Expansivity Measurement
Recommended Use of the Chemical and Restriction on Use	: This CRM is intended for use in the calibration and validation of instruments for thermal expansivity measurements. Do not use this CRM for other purposes than testing/research.

### 2. Hazards Identification

GHS classification	: Classification not possible
GHS-labeling element	: -
Signal word	: -
Hazard and toxicity information	: -
Hazards Statement	: As this reference material is distributed in the solid state (ceramic plate), it is chemically stable. Prolonged exposure to this reference material in a form of fine particles or to grinding fluid used in its processing (cutting/polishing) may cause skin irritation. Local exhaust ventilation must be provided to remove fine particles of this reference material that scatter during its processing. Personal protective equipment must be used to minimize the exposure of human body.
Precautionary Statement	: [Safety Precaution] Wear protective gloves when handling. Do not subject to excessive shock such as dropping. This reference material is easy to be chipped or broken, which may cause skin injury. [First-Aid Measures] If swallowed: Give/Drink plenty of water to induce vomiting. If exposed and concerned: Get medical advice/attention.

If you feel unwell: Get medical advice/attention.

[Storage]

Store at temperatures of 23 °C ± 10 °C and relative humidity of 50% or less.

[Disposal]

Abide by applicable legislation and ordinances set by local governments.

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	:	Al <sub>2</sub> O <sub>3</sub> Ceramics
Ingredient (1)	:	Aluminum oxide
Synonym	:	Alumina
Amount	:	99.9 % or more
Chemical formula	:	Al <sub>2</sub> O <sub>3</sub>
Molecular weight	:	101.96
Official Gazette Reference No.	:	Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : (1)-23 Industrial Safety and Health Act : Published
CAS number	:	1344-28-1
Hazardous component	:	Aluminum oxide

### 4. First-aid Measures

If in Eyes	:	Rinse cautiously with plenty of clean water. Get medical advice/attention.
If on Skin	:	Wash thoroughly with clean water. If skin irritation or rash occurs: Get medical advice/attention.
If Inhaled	:	Remove victim to fresh air. If you feel unwell: Get medical advice/attention.
If Swallowed	:	Give/Drink plenty of water to induce vomiting. Get medical advice/attention.
Expected Acute and Delayed Symptom	:	No data available
Most Critical Characteristic and Symptom	:	No data available
Protection of First-Aid Responders	:	Use personal protective equipment. Risks are low as long as this reference material is handled appropriately.

## 5. Fire-fighting Measures

- Extinguishing Media : Use extinguishing media appropriate for surrounding fire as this reference material is incombustible.
- Fire-Specific Hazard : No data available
- Specific Fire-Fighting Method : Eliminate ignition sources at the origin of fire and put out fire by using extinguishing media. Move containers to a safe place if this can be done without risk.
- Protection of Fire-Fighters : Fight fire upwind to avoid breathing toxic gas. Use fire-resistant clothing, fireproof clothing, fire-protection clothing, respirator, circulating oxygen breathing apparatus, rubber gloves, rubber boots, or other appropriate personal protective equipment.

## 6. Accidental Release Measures

- Personal Precaution : Promptly remove all potential ignition sources from peripheral areas. Make fire extinguishing media/equipment available to prepare for potential ignition.
- Personal Protective Equipment and Emergency Procedure : Ventilate the affected areas thoroughly, if it is in an indoor environment, until the clean-up operation is completed.  
Wear appropriate personal protective equipment during the operation to avoid skin contact of splash, etc. and inhalation of dust and gas.
- Environmental Precaution : Take precautions to prevent spillages from draining into rivers, etc. to adversely affect 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 : Gather scattered reference materials and collect them in an empty container that can be sealed.  
Maintain safe distance from fine particles released in grinding and processing and remove them by using a vacuum cleaner or other equipment with a filter mounted for effectively collecting very fine particles.  
If appropriate removal methods are not available: Dampen fine particles with water mist or wet floor mop to wipe them out.
- Prevention of Secondary Disaster : Clean up contaminated items and areas thoroughly in accordance with applicable environmental regulations.

## 7. Handling and Storage

- Handling
- Engineering Precaution : Avoid contact with acids. Avoid contact with strong bases.
- Local Ventilation and : If powder dust is emitted when processing this reference

General Ventilation	material, etc.: Seal the source and provide local exhaust ventilation.
Precautions for Safe Handling	: Avoid rough handling such as dropping, knocking over, dragging, or giving a shock to containers. Prevent this reference material from leaking, overflowing and splashing. Do not allow power dust to be emitted. Keep container tightly closed after using this reference material.  Wash hands, face, etc. thoroughly, and gargle after handling. Restrict drinking, eating and smoking to a designated area.  Do not bring gloves and other contaminated personal protective equipment into staff room. Make a place handling this reference material a restricted area to keep out unauthorized people.  Use appropriate personal protective equipment to avoid inhalation and contact with eyes, skin, and clothing. Provide local exhaust ventilation in indoor handling areas.
Storage	
Appropriate Storage Condition	: Protect from direct sunlight and store at temperatures of 23 °C ± 10 °C and relative humidity of 50% or less.
Safe Container	: Plastic
Packaging Material	
Incompatible Material	: Strong acids, Strong bases

## 8. Exposure Controls/Personal Protection

Standard control concentration

N/A

Threshold limit values (Aluminum oxide powder)

- ACGIH TLV-TWA : 1 mg/m<sup>3</sup> (respirable fraction)
- Value recommended by Japanese Society of Occupational Health : 2 mg/m<sup>3</sup> OEL
- OSHA PEL TWA : 5 mg/m<sup>3</sup> OEL
- OSHA PEL TWA : N/A

Engineering controls (in case powdered dust is generated by processing work, etc.)

- 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 and seal the container. Keep away from combustible/reducing materials and strong oxidants.

Protective equipment (in case powdered dust is generated by processing work, etc.)

- Respiratory protection : Dust mask
- Hand protection : Protective gloves
- Eye protection : Safety goggle

Skin and body protection : Protective clothing, face shield  
Hygiene measures :  
Handle in accordance with the industrial hygiene and safety standards.

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## 9. Physical and Chemical Properties

Appearance, etc. : Solid (square rod)  
Color : White  
Odor : No data available  
pH : No data available  
Melting point : 2030 °C  
Boiling point : 2980 °C  
Flashing point : No data available  
Explosive range : No data available  
Vapor pressure : No data available  
Relative vapor density (Air=1) : No data available  
Specific gravity or bulk specific gravity : About 4 g/cm<sup>3</sup>  
Solubility : Insoluble in water and organic solvents  
*n*-Octanol/water partition coefficient (Log Po/w) : No data available  
Auto-ignition temperature : No data available

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## 10. Stability and Reactivity

Stability : Stable under recommended storage conditions  
Reactivity : No data available  
Conditions to Avoid : Sunlight, heat, and contact with oxidant.  
Incompatible materials : No data available  
Hazardous Decomposition Products : No data available

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## 11. Toxicological Information

Acute toxicity : No data available  
Skin corrosivity/irritation : No data available  
Serious eye damage/ Eye irritation : No data available  
Respiratory sensitization : No data available  
Skin sensitization : No data available  
Germ cell mutagenicity : No data available  
Carcinogenicity : No data available  
Reproductive toxicity : No data available  
Specific organ toxicity (single exposure) : No data available

Specific organ toxicity : No data available  
(repeated exposure)

Aspiration hazard : No data available

※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.

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## 12. Ecological Information

Ecotoxicity : No data available

Degradability, : No data available

Concentration

Bioaccumulative : No data available

Potential

Mobility in soil : No data available

Influence to the : No data available  
ozone layer

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## 13. Disposal Considerations

Residual Waste : Dispose of this reference material as industrial waste.  
Dispose in accordance with applicable laws, regulations, and local government ordinances.  
When the above-mentioned treatments are not possible, entrust disposal of residual waste to a professional waste disposal company licensed by prefectural governor.

Contaminated : Dispose of containers after thoroughly removing their contents.  
Containers and  
Packaging

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## 14. Transport Information

UN Dangerous : Not applicable

Goods Number

UN classification : Not applicable

Product name : -

Packing group : -

ICAO/IATA : -

Marine pollutant : Not applicable

Precaution : Transport this reference material carefully while keeping it away from direct sunlight and fire and preventing accidental release due to falling, being knocked over, etc.

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## 15. Regulatory Information

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◇Industrial Safety and Health Law

- Article 57-2 (Enforcement Order: Article 18-2): Hazardous substance whose name, etc. must be notified, No. 189.

◇Pneumoconiosis Act (Aluminum oxide)

- Appendix of the Article 2 of the Enforcement Ordinance: Work in dusty environment (alumina, powder dust)

- ◎ **This SDS was originally prepared for the use of the reference material in Japan, and therefore Section 15 “Regulatory Information” covers only those laws and regulations which are enacted and enforced in Japan. In case of using this reference material outside of Japan, it is necessary to refer to and apply relevant laws and regulations of the country in which it is used.**

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## 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.

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