

Safety Data Sheet



1. Identification of the Substance/Mixture and the Supplier

Supplier : National Institute of Advanced Industrial Science and Technology (AIST)
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Identity of Substance/Mixture : Certified reference material: NMIJ CRM 8003-a
 Recommended Use of the Chemical and Restriction on Use : Fine Silicon Nitride Powder for Fine Ceramics (Direct Nitridation)
 : This CRM is intended for use in controlling the precision of analysis or confirmation of the validity of analytical methods or instruments during the quantitative determination of main constituents and trace elements in silicon nitride.
 Do not use this reference material for other purposes than testing/research.

2. Hazards Identification

GHS Classification : Acute toxic if inhaled, dust or mist. : Class 5
 GHS Label Element: N/A
 Signal Word : Warning
 Hazards Statement: Toxic if inhaled. (dust)
 Other Hazards Statement : If silicon oxide, an impurity contained in this reference material, enters lungs, it will get gathered in lymph tissue, bronchi, blood vessel, etc. and will penetrate into pulmonary alveoli to cause chronic bronchitis, rheumatic disorder, coccus pneumonia, etc.
 Precautionary Statement : [Precaution]
 Do not eat, drink or smoke when using this product.
 Get the instruction manual before use. Do not handle until all safety precautions have been read and understood.
 Wash hands thoroughly after handling.
 Use personal protective equipment if necessary.
 Do not breathe dust, mist, vapors, etc.
 Wash hands thoroughly after handling.
 [Action]

If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical advice/attention if you feel unwell.

If exposed: Get medical advice/attention.

[Storage]

Keep out direct sun light and high relative humidity. Store it at clean and high relative humidity and

Keep out direct sun light and high relative humidity. Store this CRM in a clean 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

Substance/Mixture	: Mixture
Chemical name	: Silicon nitride
Other name	: -
Chemical or structural formula	: Si_3N_4
Molecular weight	: 140.28
CAS No.	: 12033-89-5
Content	: 96 % or more
Reference Number in Gazetted List in Japan	: Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : (1) -493 Industrial Safety and Health Act : Published
CAS No.	: 12033-89-5
This CRM contains minor elements shown below;	
Al, Ba, Ca, Cr, Fe, Mg, Mn, Mo, Sr, Ti, Y, Co, Cu, Ni, Zr, O, F.	
Hazardous substance	: Silicon oxide contained in Silicon nitride

4. First-aid Measures

If in 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	: Remove victim to fresh air and keep at rest. Rinse nose and mouth thoroughly with plenty of water. Get medical advice/attention.

- If Ingested : Rinse mouth thoroughly with water. Drink a lot of water then it induces vomiting. Immediately call a physician. Do not make victim take anything orally if unconscious.
- Predicted immediate and delayed symptoms : -
- Most important symptom/effect : -
- Protecting Personnel in emergency measures : Use personal protective equipment.

5. Fire-fighting Measures

- Extinguishing Media : Fire extinguishing agents for general purpose. This CRM has the potential to generate ammonia gas with hydrolysis occurs on contact with water at elevated temperature. At high temperatures, it is when irrigation or watering to a large amount of product it is necessary to pay attention. Therefore, in high temperature, and when irrigation or watering to a large amount of product it is necessary to pay attention.
- Fire-Specific Hazards : Non-flammable
- 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 (ammonia). Use personal protective equipment such as fire protection clothing, heat-resistant clothing, protective clothing, breathing apparatus, circulating oxygen respirator, rubber gloves, and rubber boots.

6. Accidental Release Measures

- Personal Precaution : Use appropriate personal protective equipment during the operation to avoid contact with skin, eyes, and clothes.
- Personal Protective Equipment and Emergency Procedures : When accidental release takes place in hot water, it may release toxic gas. Therefore thoroughly clear the air until the emergency measures are complete. Before the operation, wear appropriate protective equipment to protect skin from droplets and to prevent 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 spillage in empty containers by getting it adsorbed to wiping cloth, rag or earth and sand, etc.
- 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 : Avoid contact with the scattered dust.
- Precautions : Use dust mask, safety glasses, and protective gloves.
- Local and General Ventilation : Handle this CRM in place as much as possible good ventilation.
- Precautions for Safe Handling : Avoid rough handling such as turning over, dropping, giving a shock to or dragging containers.
 Prevent spill, overflow and scattering, and avoid vapor generation.
 Keep container tightly closed after using this reference material.
 Wash hands, face etc. thoroughly and gargle after handling this reference material.
 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.
 Use local ventilation system in indoor handling areas.
 Do not contact with water.
- Storage
- Appropriate Storage Conditions : Keep out of sunlight, high temperature and humidity. Store in clean place at normal room temperature.
- Safe Container : Glass
- Packaging Material

8. Exposure Controls/Personal Protection

- Threshold Limit Value
- Not specified
- Permissible Concentration (Silicon nitride)
- ACGIH TLV-TWA(2003) : 10 mg/m³, (total dust),
3 mg/m³ (respirable fraction)
 - Values recommended by Japan Society for Occupational Health : Class 3 dust: 8 mg/m³, (total dust),
2 mg/m³ (respirable fraction)

(2003)

Permissible Concentration (Amorphous silica)

- ACGIH TLV-TWA (2003) : fume: 2.0 mg/m³, fused: 0.1 mg/m³
- Values recommended by Japan Society for Occupational Health (2003) : Class 2 dust: 4 mg/m³, (total dust), 1 mg/m³ (respirable fraction)

- OSHA PEL TWA : 20 mppcf, 0.8 mg/m³

Facility engineering

- Ventilation, exhaust : When there is a risk of exceeding the above allowable concentration, wear personal protective equipment and install local ventilation system. Local exhaust is recommended to be used in conjunction with the general ventilation. It is desirable to confirm that the atmospheric conditions in the workplace are less than the allowable concentrations using appropriate measuring instruments.

- Safety : -

management/gas detector

- Storing precaution : Ventilate along floor surface. Seal.

Personal Protective equipment

- Respiratory protection : Protective dust mask, if necessary
- Hands : Protective gloves
- Eyes : Eye protector (Goggle type as necessary)
- Skin and Body : Protective clothing

Hygiene measure

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

9. Physical and Chemical Properties

- Appearance, etc. : Fine powder
- Color : White
- Odor : No data
- pH : 8~10
- Melting point : No data
- Boiling point : Silicon nitride (sublimation at about 1900 °C)
Amorphous silica : 2230 °C
- 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 : 3.18 g/cm³
- Solubility : Insoluble in water.
- *n*-Octanol/water partition coefficient (Log Po/w) : No data
- Auto-ignition temperature : No data

10. Stability and Reactivity

◇Stability

- Thermally stable up to 1900 °C under inert atmosphere.
- Chemically stable to light or shock. No self-polymerizable.

◇Stability

- No oxidizing nature, no self-reactive.
- On heating in water or an atmosphere containing water vapor, this CRM may result in hydrolysis reaction to produce ammonia gas slowly. In higher condition, this reaction is promoted, notably in several hundred degrees or more.

◇Conditions to Avoid

- Storage under high temperature and high humidity.
- Contact with water and strong oxidizing materials.

◇Hazardous Decomposition Products

- Ammonia gas

11. Toxicological Information

Acute Toxicity	Intravenous Rat LD50= 15 mg/kg
(Amorphous silica)	Oral Rat LD50 3160 mg/kg
	Oral Mouse LD50= 9 mg/kg
	Oral Rabbit LD50= 35 mg/kg
Other	When mixed with water, there is a case ammonia is slightly raised. Ammonia gas has a pungent odor, it is a strong stimulation and corrosive to the skin, mucous membranes.

12. Ecological Information

Degradability, concentration

- This substance is chemically stable. Attention should be paid to the possibility of a scattering of dust or a suspension in the air.

Bioaccumulative Potential

- No-data

Ecotoxicity

- No-data

13. Disposal Considerations

- 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 prefectural governor.
 - Dispose of containers after thoroughly removing their contents.

14. Transport Information

UN Number : Not applicable
UN : Not applicable
Classification
Material name : -
Container : -
grade
Marine : -
pollutant
Precautions : Avoid direct sunlight and transfer with care not to spill/leak by dropping or falling, etc.

15. Regulatory Information

- No applicable laws and regulations
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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.
