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
Person in Charge: Certified Reference Material Staff
Telephone No.: +81-29-861-4059
Fax No.: +81-29-861-4009
Emergency Contact: Same as above

Prepared on: July 13, 2009, Revised on: November 13, 2017
Reference No: 3004001

Identity of Substance/Mixture: Certified reference material: NMIJ CRM 3004-a
Recommend Use of the Chemical and Restriction on Use:
This CRM can be used for the primary standard in titrimetric analysis. This reference material can also be used as standard in quantification of nitrogen in elemental analysis. Do not use this reference material for other purposes than testing/research.

2. Hazards Identification

GHS Classification:
Skin corrosion/irritation: Hazard Category 2 (315)
Serious Eye Damage/ Eye Irritation: Hazard Category 2 (H319)
Water environment toxicity (Prolonged): Hazard Category 3 (H412)

GHS Label Element:

Signal Word: Warning
Hazard and toxicity: [Major hazardous toxicity]
Corrosivity
Toxicity
Cause skin irritation
Cause serious eye irritation
Harmful to aquatic life with long lasting effects
Strong corrosivity causes chemical burn. Inhaling dust irritates respiratory tract and may cause bronchial asthma, coughing, chest
pain, pulmonary edema, etc. Oral intake causes burning sensation
in the mouth, and affects mucous membrane of esophagus, digestive
organ, etc. High concentration lethal. Dermal absorption causes
similar symptoms.

[Physical and chemical hazards]

Violent exoergic reaction in contact with alkali

Precautionary
statement :

[Preventive measures]

Use appropriate protective equipment such as protective globes.
Use local exhaust ventilation when handling indoor.
Wash hands, face, etc. well and gargle after the handling.
Do not eat, drink or smoke when handling this product.
Avoid release to the environment.

[Response]
If swallowed : Take a large amount of milk or water. Do not force
vomiting. When vomited, take sodium bicarbonate water.
Get medical treatment immediately.
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.
If inhaled : Move to get some fresh air and rest, keep the body
warm with a blanket, and get medical treatment
If on skin : Rinse with a large amount of water using soap. When
some symptoms appear, get medical assistance as need
arises. Remove/take off contaminated clothing. Wash
contaminated clothing before reuse.

[Storage]
Avoid direct sunlight, store in an airtight container at well
ventilated cool place.

[Disposal]
Outsource to a professional industrial waste disposal contractor
licensed by a 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>Substance or mixture</th>
<th>Single product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical name</td>
<td>Amidosulfuric acid</td>
</tr>
<tr>
<td>Other name</td>
<td>Sulphamic acid</td>
</tr>
<tr>
<td>Chemical formula or</td>
<td>HOSO₂NH₂</td>
</tr>
<tr>
<td>structural formula</td>
<td></td>
</tr>
<tr>
<td>Mass fraction(%)</td>
<td>99.9 % and over</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>97.09</td>
</tr>
<tr>
<td>Reference Number in</td>
<td>Act on the Evaluation of Chemical Substance and Regulation of</td>
</tr>
</tbody>
</table>
4. First-aid Measures

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.

If on skin: Rinse with a large amount of water using soap. When start having symptoms, get medical assistance as necessary. Remove/take off contaminated clothing. Wash contaminated clothing before reuse.

If inhaled: Move to get some fresh air and rest, get medical treatment. Keep the body warm with a blanket, etc.

If swallowed: Take a large amount of milk or water. Do not force vomiting. When vomited, take sodium bicarbonate water. Get medical treatment immediately.

Most important symptoms and effects, both acute and delayed: Irritant effects, Cough, Shortness of breath, Pain, shock, Nausea.

Measures to be taken to protect the person applying first aid: Use personal protective equipment.

5. Fire-fighting Measures

Extinguishing media: The material being non-flammable, use appropriate extinguishing media compatible with the surrounding.

Specific hazards at the time of fire: Use appropriate protective equipment to protect from inhaling irritating and toxic smoke, fume or gas formed due to a fire.

Specific extinguishing measure: Transfer a movable container to a safe place promptly. If impossible to transfer, use water spray to cool the container and the periphery.

Protecting fire-fighting personnel: Extinguishing activities on windward side, and avoid inhaling toxic gases. Use protective equipment such as air-breathing apparatus, etc.

6. Accidental Release Measures

Personal precaution: If released indoor, ventilate well until the treatment is completed. Persons involved in the treatment activity should use protective equipment to protect the eyes and skin from contact with the substance or prevent from inhaling the gas. Rope-off the leaked area and restrict access to the area to the authorized
Environmental precaution: To prevent causing environmental impact, the spilled material should not be released into rivers, etc. directly. The contaminated waste water should be treated appropriately before discharged to the environment.

Recovery, neutralization: Sweep and collect the material in an empty container. Use lime or soda ash process, and wash away the material from the area with a large amount of water.

7. Handling and Storage

Handling
- Technological countermeasures: Being a strong acidic substance, avoid contact with alkali,
- Local ventilation/general ventilation: Use local exhaust ventilation when handling indoor.
- Precautions for safe handling: The container should not be treated roughly. Do not drop, knock down or drag the container. Prevent leakage, spillage or overflow that causes fume to form. Close the container tightly after the use. Wash hands and face, etc. well and gargle after the handling. Eating, drinking or smoking should be only at the designated areas. Use appropriate protective equipment to prevent inhaling, contact with eyes, skin and clothes. Entering the handling area only by the authorized persons.

Storage
- Appropriate condition: Avoid direct sunlight in a well ventilated and if possible, cool place in airtight container.

※ Please refer the certificate about the details of appropriate storage conditions and precautions for the use as reference material.

8. Exposure Controls/Personal Protection

Facility engineering
- If generating dust, seal the source and install local exhaust ventilation system.
- Install emergency shower, eye end face washing facility and indicate the facilities conspicuously nearby.

Protective equipment
- ◇ Respiratory organs: Dust respirator
- ◇ Hands: Protective gloves
- ◇ Eyes: Spectacles with a side shield
- ◇ Skin and body: Long-sleeved work clothes
Hygiene Controls
◇Wash hands, face, etc. thoroughly after handling this reference material.
◇Remove/take off contaminated clothing. Wash contaminated clothing before reuse.

9. Physical and Chemical Properties

- **Appearance, etc.**: Crystalline powder
- **Color**: White
- **Odor**: No data
- **pH**: Aqueous solution is strongly acidic
- **Melting point**: Ca. 205 °C (Decomposition)
- **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**: 2.15 g/cm$^3$
- **Solubility**: Water-soluble (17.5 g/100 ml), not easily dissolves in ethanol, dissolves readily in pyridine and dimethylformamide
- **n-Octanol/water partition coefficient (Log Po/w)**: No data
- **Auto-ignition temperature**: No data

10. Stability and Reactivity

◇Stability
Stable under dry form
◇Reactivity
Strong acidic compound. Has reducing character and reacts violently with chlorine, bromine, fuming nitric acid, etc. Decomposes when heated, and forms nitrogen and corrosive fume and gas (sulfur dioxide, ammonia). Aqueous solution gradually decomposes and generates ammonium hydrogen sulfate.
◇Conditions to avoid
Sunlight, heat, humidity
◇Hazardous decomposition products
Nitrogen oxide, sulfur oxide, ammonia

11. Toxicological Information

<table>
<thead>
<tr>
<th>Acute toxicity</th>
<th>Oral</th>
<th>rat</th>
<th>LD50: 3160 mg/kg (RTECS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal cavity</td>
<td>rat</td>
<td>LDLo: 100 mg/kg (RTECS)</td>
<td></td>
</tr>
<tr>
<td>Oral</td>
<td>mouse</td>
<td>LD50: 1312 mg/kg (RTECS)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skin corrosivity/ irritability</th>
<th>Skin irritation</th>
<th>rabbit</th>
<th>500 mg/24 h serious (RTECS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe damage to eyes/irritation</td>
<td>Eye irritation</td>
<td>rabbit</td>
<td>250 μg/24 h serious (RTECS)</td>
</tr>
<tr>
<td></td>
<td>Eye irritation</td>
<td>rabbit</td>
<td>20 mg moderate (RTECS)</td>
</tr>
</tbody>
</table>
12. Ecological Information

Ecotoxicity
   No data available
Toxicity to aquatic
   Fish: Fathead minnow LC50 = 70.3mg/L/96hr (ECETOC TR91, 2003)
Degradability, concentration
   No data available
Bioaccumulation
   No data available
Mobility in soil
   No data available
Ozone depletion potential
   No data available

13. Disposal Considerations

   ・Disposal in compliance with the relevant laws and regulations; and ordinances of the local authorities.
   ・When disposing of the empty container, make sure that the content is completely removed.

14. Transport Information

UN Number : 2967
UN Classification : Class 8 (Corrosive substance)
Material Name : Sulphamic acid
Container grade : PG III
ICAO/IATA : -
Marine pollutant : Not applicable
Precautions : Before the transport, check and ensure that there is no damage to the container. Also check for corrosion or leakage, etc. Fall, drop and damage should be avoided when loading, and make sure to take preventive measures against load shifting.

15. Regulatory Information

   Ship Safety Act (Enforcement Ordinance for the Transport of Dangerous Goods) :
       Corrosive Substances) Class 8
   Civil Aeronautics Act :
       Corrosive substances Class 8

© 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

References

- Registry of Toxic Effects of Chemical Substance (NIOSH)

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.