# 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 : June 14, 2018 |
| | | Revised on : August 31, 2022 |
| | | Reference No. : 4228001 |
| Identity of Substance/Mixture | : | Certified reference material NMIJ CRM 4228-a<br>Water in Anisole/Diethylene Glycol Dimethyl Ether (1 mg/g) |
| Recommended Use of the Chemical and Restriction on Use | : | This CRM is intended for use in the calibration of instruments and confirming the validity of analytical methods or instruments during quantification of water by Karl Fischer (KF) titration. Do not use this reference material for other purposes than testing/research.<br>This CRM is a reference material (specified in the Japanese Industrial Standard (JIS) Q 0030). |

## 2. Hazards Identification

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|---|---|---|---|
| GHS classification | Flammable liquids | : | Class 3 |
| | Pyrophoric liquids | : | Not classified |
| | Acute toxicity (Oral) | : | Not classified |
| | Severe eye damages/eye irritant | : | Class 2B |
| | Reproductive toxicity | : | Class 2 |
| | Hazardous to the aquatic environment, acute hazard | : | Class 3 |
| | Hazardous to the aquatic environment, long-term hazard | : | Class 3 |
| GHS label element | : |  | |
| Signal word | : | Caution | |
| Hazard and toxicity | : | Flammable liquid and vapor<br>Causes eye irritation<br>May damage fertility or unborn child<br>Toxic to aquatic life<br>Harmful to aquatic life with long lasting effects | |
| Other hazard and | : | – | |

toxicity

Precautionary statement : [Precaution]
Use only non-sparking tools.
Avoid release to the environment.
Wash hands thoroughly after handling.
Take precautionary measures against static discharge.
Keep away from ignition sources such as heat, sparks, open flame and hot surfaces. – No smoking.
Wear protective gloves and eye/face protection.
Use explosion-proof electrical/ventilating/lighting equipment.
Keep container tightly closed.
[Action]
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: Wash with plenty of water and soap. Remove/Take off contaminated clothing and wash before reuse.
If skin irritation occurs: Get medical advice/attention.
[Storage]
Protect from sunlight, and store in a well-ventilated clean place at temperatures between 15 °C and 30 °C.
[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.
Hazardous and toxic properties not specified in the above are not subject to the classification or not classifiable.

## 3. Composition/Information on Ingredients

| | | |
|---|---|---|
| Substance or mixture | : | Mixture |
| Ingredient 1 | | |
| Chemical name | : | Anisole |
| Synonym | : | Methoxybenzene, methylphenyl ether |
| Chemical formula | : | $C_6H_5OCH_3$ |
| Molecular weight | : | 108.14 |
| CAS number | : | 100-66-3 |
| Content | : | 90.4 % |
| Reference Number in Gazetted List in Japan | : | Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. :3-556 |
| | : | Industrial Safety and Health Act : Published |
| Ingredient 2 | | |
| Chemical name | : | Diethylene glycol dimethyl ether |
| Synonym | : | Bis (2-methoxyethyl) ether, diglyme, dimethyl carbitol |
| Chemical formula | : | $(CH_3OCH_2CH_2)_2O$ |
| Molecular weight | : | 134.17 |
| CAS number | : | 111-96-6 |
| Content | : | 9.5 % |
| Reference Number in Gazetted List in Japan | : | Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. :2-434 |

: Industrial Safety and Health Act : Published

Hazardous Component : Anisol, diethylene glycol dimethyl ether

## 4. First-aid Measures

| | | |
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| If inhaled | : | Move to fresh air, and let the nose bite and gargle. |
| If on skin | : | Rinse with plenty of clean water and soap. |
| If in eyes | : | Rinse carefully with plenty of clean water for 15 minutes or more. Get medical assistance. |
| If swallowed | : | Drink plenty of water or saline and induce vomiting. Get medical attention. |
| Measures to be taken to protect the person applying first aid | : | Wear personal protective equipment such as rubber gloves and safety goggles. |

## 5. Fire-fighting Measures

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| Extinguishing Media | : | Dry chemical extinguisher, Carbon dioxide, Foam extinguishing agent, Dry sand |
| Unsuitable extinguishing media | : | Water |
| Fire-Specific Hazards | : | Wear appropriate personal protective equipment to avoid breathing smoke since irritating or toxic gases are emitted in case of fire.<br>Container may explode if heated. |
| Specific Fire-Fighting Method | : | Fight fire upwind.<br>At the early stage of fire: Use dry chemical extinguisher, carbon dioxide, dry sand, etc.<br>In case of major fire: It is effective to block air by using foam extinguishing agent.<br>Move movable containers immediately to a safe place.<br>If containers are immovable, cool them and their surroundings with water fog. |
| Protection of Fire-Fighters | : | Fight fire upwind and avoid breathing harmful gases.<br>Use personal protective equipment such as fire-protective clothing, heat-resistant clothing, protective clothing, compressed air open-circuit self-contained breathing apparatus, compressed oxygen closed-circuit self-contained breathing apparatus, rubber gloves and rubber boots. |

## 6. Accidental Release Measures

| | | |
|---|---|---|
| Personal Precaution | : | Carry out clean-up operations from the upwind side and make people on the downwind side evacuate.<br>Immediately remove potential ignition sources from surrounding areas.<br>Make fire-extinguishing tools available to prepare for fire ignition.<br>Mark affected area with rope etc. to keep out unauthorized people. |
| Personal Protective Equipment and Emergency Procedures | : | Wear appropriate personal protective equipment during clean-up operations to prevent leaked liquid from contacting skin and avoid inhalation of vapor. |
| Environmental Precautions | : | Take precautions to prevent leaked materials from draining into rivers etc. to adversely affect the environment. |

| | | |
|---|---|---|
| | | Take precautions to prevent untreated contaminated wastewater from being released into the surrounding environment. |
| Recovery and Neutralization | : | Collect leaked liquid in empty containers by making it adsorbed to waste cloth, soil, sand etc. Rinse away the remains with plenty of water. |
| Prevention of Secondary Disaster | : | Immediately remove potential ignition sources from surrounding areas. Make fire-extinguishing tools available to prepare for fire ignition. |

## 7. Handling and Storage

Handling

| | | |
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| Technological counter measures | : | Pay attention to fire.<br>Wear appropriate protective equipment so as not to get on the skin or inhale vapor. |
| Local ventilation/ general ventilation | : | When steam or mist is generated, the source is sealed and a local exhaust system is installed.<br>Handle in a well-ventilated place. |
| Precautions for safe handling | : | Wear appropriate protective equipment to avoid inhaling and touching eyes, skin and clothing.<br>For handling in indoor workshops, use local exhaust ventilation. |

Storage

| | | |
|---|---|---|
| Appropriate condition | : | Keep container tightly closed and store in cool, dark place in the range of 15 °C to 30 °C. |
| Safe packing material | : | Glass |

※Refer to the Certificate for the precaution statement regarding the appropriate condition of the storage and usage of the reference material.

## 8. Exposure Controls/Personal Protection

Administrative levels

Not established

Occupational exposure limit (Anisole, diethylene glycol dimethyl ether)

| | | |
|---|---|---|
| ・ACGIH TLV-TWA | : | Not established |
| ・Japan Society for Occupational Health Recommended Reference Value | : | Not established |

Facility engineering control

| | | |
|---|---|---|
| Ventilation, exhaust | : | Local ventilation equipment or general ventilation equipment. |
| Safety management, gas detection | : | Hand wash, Eye wash facility is set near the handling place. |
| Storage precaution | : | No fire, keep away from fire. |

Protective equipment

| | | |
|---|---|---|
| Respiratory organ | : | If necessary, a gas mask for organic gas, an air respirator |
| Hand | : | Solvent Protective Gloves |
| Eyes | : | Goggle type protective glasses |
| Skin and body | : | Protective clothing (long sleeve), protective boots |

Hygiene Controls

Handle this reference material in accordance with industrial health and safety standards.

## 9. Physical and Chemical Properties

| | | |
|---|---|---|
| Appearance, etc. | : | Liquid |
| Color | : | Colorless |
| Odor | : | Specific aromatic odor |
| pH | : | No data |
| Melting point | : | −37.3 °C (as anisole) |
| Boiling point | : | 154 °C (as anisole) |
| Flashing point | : | 51.7 °C (as anisole) |
| Explosive range | : | Upper limit: 6.3 vol%, Lower limit: 0.3 vol% (as anisole) |
| Vapor pressure | : | 1.33 hPa (20 °C) (as anisole) |
| Relative vapor density(Air=1) | : | 3.7 (as anisole) |
| Specific gravity | : | 0.9848 g/cm$^3$(25 °C), 0.9895 g/cm$^3$(20 °C) |
| Solubility | : | Not soluble in water. Soluble in ethanol and acetone. |
| *n*-Octanol/water partition coefficient (Log Po/w) | : | 2.11 (as anisole) |
| Auto-ignition temperature | : | 475 °C (as anisole) |
| Decomposition temperature | : | No data |
| Flammability | : | No data |

## 10. Stability and Reactivity

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|---|---|---|
| Stability | : | Stable under normal condition |
| Reactivity | : | May react with strong oxidants, causing fire. |
| Possibility of hazardous reactions | : | No data |
| Conditions to avoid | : | Light, heat, open flame, high temperature, spark, static electricity, and other ignition source |
| Incompatible materials | : | Oxidizing agents |
| Hazardous decomposition products | : | Carbon monoxide |

## 11. Toxicological information

Acute toxicity

| | | |
|---|---|---|
| Acute toxicity(Oral) | : | Not classified<br>Rat oral: LD50 = 3700 mg/kg (as anisole)<br>Rat oral: LD50 = 4760 mg/kg (as diethylene glycol dimethyl ether) |
| Acute toxicity(Skin) | : | Classification is not possible due to lack of data. |
| Acute toxicity (Inhalation, gas) | : | - |
| Acute toxicity (Inhalation, vapor) | : | Classification is not possible due to lack of data. |
| Acute toxicity (Inhalation, dust/mist) | : | Classification is not possible due to lack of data.<br>Rat inhalation: LD50 = 24 mg/L/4H (as diethylene glycol dimethyl ether) |

| | | |
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| Skin corrosivity/ irritation | : | No data |
| Serious Eye Damage/ Eye Irritation | : | Classified as Category 2B: Causes eye irritation, based on the following data:<br>Diethylene glycol diethyl ether causes mild eye irritation in rabbits. |
| Respiratory sensitization | : | Classification is not possible due to lack of data. |
| Skin sensitization | : | Classification is not possible due to lack of data. |
| Germ cell mutagenicity | : | Classification is not possible due to lack of data. |
| Carcinogenicity | : | Classification is not possible due to lack of data. |
| Reproductive Toxicity | : | Classified as Category 2: Suspected of damaging fertility or unborn child, based on the following data:<br>Anisole: No data available<br>Diethylene glycol diethyl ether: In the reproductive toxicity study in which male rats were exposed to diethylene glycol diethyl ether through inhalation, decline of fertility rate was observed. In the developmental toxicity study in which rats were exposed through inhalation during the period of organogenesis, deformation was found limited among the young but an increase of embryo absorption was observed (100 % at 4000 ppm). In the developmental toxicity study in which mice were orally exposed during the period of organogenesis, deformation of fingers and legs, exencephaly and bone deformation were observed among the young mice with the doses at which death of the parents was observed.<br>In the reproductive developmental toxicity study using rabbits, embryo absorption and bone deformation were observed with the young at the doses toxic to the parents. |
| Specific organ toxicity/ (single exposure) | : | Classification is not possible due to lack of data. |
| Specific organ toxicity/ (repeated exposure) | : | Classification is not possible due to lack of data. |
| Aspiration hazard | : | Classification is not possible due to lack of data. |

## 12. Ecological Information

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|---|---|---|
| Hazard to the Aquatic Environment (Acute aquatic toxicity) | : | Harmful to aquatic life (Category 3) |
| Hazard to the Aquatic Environment (Chronic aquatic toxicity) | : | Harmful to aquatic life with long lasting effects (Category 3) (as anisole) |
| Ecotoxicity | : | Crustacea (Dephnia pulex) EC50: 11.05 mg/L/24 hours |
| Persistence and Degradability | : | Anisole and diethylene glycol diethyl ether are considered to feature good microbial degradability.<br>56 % by BOD (as anisole) |
| Bioaccumulation | : | No data available |
| Mobility in soil | : | No data available |
| Ozone depletion | : | No data available |

potential

## 13. Disposal Considerations

| | | |
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| Residual Waste | : | Incineration method<br>Use incinerator equipped with scrubber.<br>Dispose of this reference material in accordance with applicable legislation and local government ordinance.<br>When the above-mentioned treatments are not possible, entrust disposal of residual waste to a professional waste disposal company licensed by prefectural governor. |
| Contaminated Container and Package | : | Disposal of the empty container should be after the complete removal of the content. |

## 14. Transport Information

| | | |
|---|---|---|
| UN Number | : | 2222 (anisole) |
| UN Classification | : | Class 3 (flammable liquid) (anisole) |
| Material name | : | Anisol, diethylene glycol dimethyl ether |
| Container grade | : | PG Ⅲ |
| ICAO/IATA | : | Class 3 |
| Marine pollutant | : | – |
| Precautions | : | Transport this reference material carefully while keeping it away from direct sunlight and fire and preventing accidental release due to falling, overturning, etc. |

## 15. Regulatory Information (as Anisole)

◇Fire Service Act
・Hazardous materials Category IV: Flammable liquids, Class II petroleum: Liquid insoluble in water.
◇Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.
・Not applicable
◇Poisonous and Deleterious Substances Control Act
・Not applicable
◇Industrial Safety and Health Act
・Dangerous goods/Flammable materials (Enforcement Order Appendix 1-4)
◇Road act:
・Restriction on the passage of vehicles (Enforcement Order Article 19-13)
◇Act for the Prevention of Marine Pollution and Maritime Disasters
・Not applicable
◇Ship Safety Act
・Flammable liquid (Enforcement Order: Article 3, Dangerous Goods Publication Appendix 1)
◇Civil Aeronautics Act
・Flammable Liquid (Enforcement Order: Article 194, Dangerous Goods Publication Appendix 1)
◇Act on Port Regulations
・Other dangerous goods / flammable liquid (Enforcement order: Article 12)

## 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.