

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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Person in Charge : Certified Reference Material Staff

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Identity of Substance/Mixture : Certified reference material: NMIJ CRM 6206-b
Okadaic Acid Standard Solution




Recommended Use of the Chemical and Restriction on Use : This CRM is intended for use in the preparation of standard solution for okadaic acid determination in diarrhetic shellfish toxin testing. Do not use this reference material for other purposes than testing/research.

2. Hazards Identification

GHS Classification :

Flammable liquid	:	Hazard Category 2
Acute Toxicity (oral)	:	Hazard Category 5
Serious Eye Damage/ Eye Irritation	:	Hazard Category 2B
Reproductive toxicity	:	Hazard Category 1B
Specific Target Organ Toxicity/Systemic Toxicity (Single Exposure)	:	Hazard Category 1 (central nervous system, visual organ, systemic Toxicity)
Specific Target Organ Toxicity/Systemic Toxicity (Repeated Exposure)	:	Hazard Category 3 (anesthetic action, respiratory tract irritation)
	:	Hazard Category 1 (central nervous system, visual organ)

GHS Label Element :

Signal Word : Danger

Hazards Statement : Flammable liquid and vapor
May be harmful if swallowed.
Eye irritation

Precautionary Statement	<p>May cause adverse effects on fertility or the unborn child. Causes damage to organs (visual organ and nerve system) Systemic Toxicity May cause respiratory irritation May cause drowsiness or dizziness Causes damage to organs (visual organ and nerve system) through prolonged or repeated exposure</p> <p>[Safety Precaution]</p> <p>Get the instruction manual before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment if necessary. Do not eat, drink or smoke when using this product. Keep away from heat/sparks/open flames/hot surfaces. No smoking. Wash hands thoroughly after use. Seal tightly after use. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Ground and fix container and receiving equipment. Take precautions against electrostatic discharge. Avoid breathing dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area.</p> <p>[First-aid Action]</p> <p>If there is an exposure or a concern on an exposure, consult a doctor. Get medical advice/attention if you feel unwell. If in eyes: Rinse cautiously with clean 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 or hair: Remove/Take off all contaminated clothing and adhered materials. Rinse skin or hair with running water. In case of fire, use a powder, CO₂ or foam fire extinguisher.</p> <p>[Storage]</p> <p>Store this reference material in a light-shielded clean environment at less than -20 °C.</p> <p>[Disposal]</p> <p>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.</p> <p>The other hazards than the above do not result in classification or are not classifiable.</p>
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3. Composition/Information on Ingredients

Substance/Mixture : Mixture

Ingredient 1	:	Methanol
Content	:	Ca. 99.5 %
Chemical Formula or Structural Formula	:	CH ₃ OH
Molecular Weight	:	32.04
Reference Number in Gazetted List in Japan	:	Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : (2)-201 Industrial Safety and Health Act : Published
CAS Number	:	67-56-1
Ingredient 2	:	Ethanol
Content	:	Ca. 0.5 %
Chemical Formula or Structural Formula	:	C ₂ H ₅ OH
Molecular Weight	:	46.07
Reference Number in Gazetted List in Japan	:	Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : (2)-202 Industrial Safety and Health Act : Published
CAS Number	:	64-17-5
Ingredient 3	:	Okadaic acid
Content	:	Ca. 0.0001 %
Chemical Formula or Structural Formula	:	C ₄₄ H ₆₈ O ₁₃
Molecular Weight	:	805.00
Reference Number in Gazetted List in Japan	:	Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. : - Industrial Safety and Health Act : -
CAS Number	:	78111-17-8
Hazardous Ingredient	:	Methanol, ethanol, Okadaic acid

4. First-aid Measures

If in Eyes	:	Rinse away thoroughly with clean water. Get medical advice/attention.
If on Skin	:	Rinse away thoroughly with clean water. Take off/Remove contaminated clothing, shoes, etc. Get medical advice/attention.
If inhaled	:	Remove victim to fresh air and keep at rest and warm. Get medical advice/attention.
If swallowed	:	Rinse mouth thoroughly with water. Get medical advice/attention immediately.
Expected Acute and Delayed Symptom	:	-
Most Critical	:	-

Characteristic and Symptom

Protection for first aid provider : Use appropriate protective equipment to avoid inhalation.

5. Fire-fighting Measures

- Extinguishing media : Powder, foam, carbon dioxide, dry sand, water spray.
- Fire-Specific Hazards : In case of fire, may emit irritating or toxic fume (or gas).
- 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.
- Protecting fire-fighting personnel : Extinguish from windward, avoid inhaling toxic gases. Use personal protective equipment such as fire-resistant clothing, self-contained compressed air breathing apparatus, closed circuit breathing apparatus, rubber gloves, rubber boots, etc.

6. Accidental Release Measures

- Personal Precaution : Remove ignition source in the vicinity immediately. Prepare fire-fighting equipment for the possibility of fires.
- Personal Protective Protective equipment and emergency procedure : Ventilate the affected areas thoroughly, if it is in an indoor environment, until the clean-up operation is completed. Use appropriate personal protective equipment during the operation to avoid skin contact of splash etc. and 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 : Adsorb spillage with waste clothes or wiping clothes or dry sand, and collect in empty containers. Rinse away the remains with plenty of water.
- 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 : Strict ban on fire. Keep away from hot surfaces and sparks. Do not allow contact with strong oxidizer.
- Local and General Ventilation : When vapor or mist is generated, seal the source, and provide local exhaust ventilation or central 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 use.
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 area.

Storage

Appropriate Storage Conditions : Avoid direct sun-light and store in a clean freezer (less than – 20 °C)
Safe Container : Glass
Packaging Material

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

8. Exposure Controls/Personal Protection

Threshold Limit Value

Not specified

Permissible Concentration (methanol)

- ACGIH TLV-TWA : 200 ppm (260 mg/m³)
- Value recommended by Japan Society for Occupational Health : 200 ppm (260 mg/m³)
- OSHA PEL TWA : 200 ppm

Permissible Concentration (ethanol)

- ACGIH TLV-TWA : 1000 ppm
- Value recommended by Japan Society for Occupational Health : Not specified
- OSHA PEL TWA : 1000 ppm

Permissible Concentration (okadaic acid)

- ACGIH TLV-TWA : Not specified
- Value recommended by Japan Society for Occupational Health : Not specified
- OSHA PEL TWA : Not specified

Engineering Controls

- Ventilation/Exhaust : Local ventilation system or General ventilation system
- Safety Control/ : Measuring equipment, Detecting tube
- Gas Detection
- Storage Precaution : Ventilate along floor surface. Seal. Keep away from flammable substances, reducing agents and strong oxidizers.

Personal Protective Equipment (PPE)

- Respiratory System : Protective gas mask for organic vapors, Self-contained compressed air breathing apparatus.
- Hands : Protective gloves
- Eyes : Eye protector (Goggle type as necessary)
- Skin and Body : Protective clothing, Protective face mask

Hygiene Controls

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

9. Physical and Chemical Properties

- Appearance, etc. : Liquid
- Color : Clear and colorless
- Odor : Characteristic odor
- pH : No data
- Melting point : -98 °C (methanol)
- Boiling point : 64 °C (methanol)
- Flashing point : 11 °C (methanol)
- Explosive range : From 6.0 v/v% to 36.5 v/v% (methanol)
- Vapor pressure : 12.3 kPa (methanol)
- Relative vapor density(Air=1) : 1.1 (methanol)
- Specific gravity or bulk specific gravity : 0.791 to 0.793 (methanol)
- Solubility : Easily soluble in water, diethyl ether and ethanol.
- *n*-Octanol/water partition coefficient (Log Po/w) : -0.74 (methanol)
- Auto-ignition temperature : 464 °C (methanol)
- Decomposition temperature : No data
- Flammability : No data

10. Stability and Reactivity

◇Chemical Stability

- Stable under recommended storage conditions

◇Reactivity

- Contact with strong oxidizer may cause fire or explosion.

◇Conditions to Avoid

- Direct sunlight, heat, open flame, high temperature material, spark, static electrical

charge, and other fire sources.

- Contact with oxidizer.

Incompatible materials

- No data

◇ Hazardous Decomposition Products

- Carbon monoxide, carbon dioxide

11. Toxicological Information

Acute Toxicity	(Methanol) Oral Rat LD ₅₀ =6200 mg/kg Dermal Rabbit LD ₅₀ =15800 mg/kg (Ethanol) Oral Rat LD ₅₀ =7060 mg/kg Inhalation Rat LC ₅₀ =20000 ppm (10H) (Okadaic acid) Abdominal cavity mouse 200 µg/kg (body mass) Oral Mouse 400 to 2000 µg/kg (body mass)
Serious Eye Damage/Eye Irritation	(Methanol) In the Draize test using rabbits, the mean score for conjunctivitis after 24, 48, and 72 hours was 2.1 (greater than 2.0), and conjunctive edema was observed for 4 hours (score 2.00), but it was noticeably improved after 72 hours (score 0.50). However, it is unknown whether the symptoms recovered within 7 days. (Ethanol) In the Draize test using rabbits, it was found to be a moderate irritant. Corneal opacity, iritis, conjunctive redness, and conjunctive edema were observed on the 1st through 3rd days after application. The MMAS was 24.0. The symptoms mostly recovered within 7 days.
Carcinogenicity	(Okadaic acid) Tests in mice showed that it served as a promoter of carcinogenesis. In a two-stage carcinogenicity test of skin application using CD-1 mice, 10 µg of okadaic acid was applied twice per week after 100 µg DMBA was applied as a promoter. Tumors developed in 80% of the mice treated with DMBA + okadaic acid by the 30th week. Tumors developed in one mouse in each group treated with DMBA (from the 9th week) or okadaic acid (from the 30th week) alone. Among the developed tumors, 95–98% was benign papillomas, whereas 2–5% was squamous cell carcinomas. In a two-stage carcinogenicity test in which SD rats received eight weeks of oral administration of MNNG in drinking water followed by 0.25 mg/L of okadaic acid (10 µg/rat/day from the 9th to 55th weeks) and 0.5 mg/L of okadaic acid (from the 56th to 72nd weeks), adenomatous

Reproductive Toxicity

hyperplasia and adenocarcinoma were observed in the stomach of 75% of treated rats. The incidence rate of adenomatous hyperplasia and adenocarcinoma was 46.4% in the group administered MNNG only, whereas it was 0% in the group administered okadaic acid only.

(Methanol)

In a test of pregnant mice exposed by inhalation during the period of organogenesis, fetal resorption and exencephaly were observed. In separate inhalation and oral exposure tests, similar results were obtained, including cleft palate.

As for the effect of methanol on reproduction, there is sufficient evidence to provide a strong presumption on the basis of sound scientific judgment that exposure to methanol may result in health impairment. Although the available data on humans are limited, there is clear evidence for effects on animals, and it is concluded that sufficient human exposure to methanol may result in adverse effects on human development. It is accordingly assumed that it causes developmental toxicity to humans.

(Ethanol)

Considerable epidemiological information on ethanol is available. Forward-looking studies and case control studies report that drinking sufficient alcohol can significantly increase the occurrence or the risk of occurrence of miscarriage. Several reports suggest that habitual alcohol use during pregnancy results in fetal alcohol syndrome, which may cause growth deficiency, microcephaly, characteristic facial features, and mental disorders. In addition, defects caused by prenatal ethanol exposure, such as cleft palate, abnormalities in palmar crease patterns, atrial or ventricular septal defects, and auditory tube defects, have been observed. There is strong evidence of teratogenicity and embryotoxicity as a result of pregnant women consuming excessive amount of ethanol. These epidemiological reports and the results of other epidemiological studies are clear evidence of the reproductive toxicity of ethanol to humans. In tests using animals, no adverse effects were observed in a single generation study utilizing oral administration to rats and mice, whereas litter size was reduced in a two-generation study using mice. In some studies utilizing oral administration to rats during pregnancy, deformities such as polydactyly and polysyndactyly have been reported.

Specific Target
Organ/Systemic
Toxicity (Single
Exposure)

(Methanol)

Symptoms of acute intoxication in humans include central nervous system depression and metabolic acidosis resulting from formic acid accumulation in the blood. Symptoms such as

vision disorders, blindness, headache, dizziness, nausea, vomiting, tachypnea, and coma can occur, in addition to death. Disorders in the central nervous system, specifically tremor and extrapyramidal paralysis, as well as cerebral white matter necrosis, have been reported. The visual organs are the primary target organs; eye disorders are distinctive clinical features of metabolic acidosis, in addition to headache, nausea, vomiting, tachypnea, and coma. Anesthesia is produced by inhalation exposure in mice, rats, and humans as a result of central nervous system depression.

(Ethanol)

A stuporous state, somnolence, and minor paralysis are observed following inhalation exposure in humans. It is also described that the acute toxic impact of ethanol consumption includes depression of the central nervous system and, in the case of severe intoxication, dystonia, blurred vision, double vision, stupor, hypothermia, nausea, vomiting, and convulsions. Excessive consumption leads to coma, hyporeflexia, respiratory depression, and hypotension, possibly leading to death caused by respiratory or circulatory failure, or as a result of aspiration of gastric contents if the gag reflex is absent. In addition to a stuporous state and somnolence in humans, anesthesia, somnolence, and ataxia are observed in inhalation exposure tests in rats, mice, and guinea pigs. In humans, inhalation of ethanol vapor, even at a low concentration, causes irritation of the eyes and upper respiratory tract. In human subjects, inhalation exposure to ethanol causes coughing and aches in the eyes and nasal cavity, whereas non-resistant human subjects also felt nasal irritation.

Specific Target
Organ/Systemic
Toxicity (Repeated
Exposure)

(Methanol)

In humans, long-term exposure to low-concentration methanol causes eye damage; blindness is a toxic effect of chronic occupational methanol exposure. Chronic toxic symptoms caused by repeated exposure to methanol vapor include headache, dizziness, insomnia, and stomach disorders have been reported. Although changes in liver weight and hepatocyte hypertrophy have been reported in rats following oral administration, such changes are considered to be adaptive changes to methanol exposure.

(Ethanol)

Long-term heavy alcohol use by humans damages almost every organ, but the worst adverse effects are observed in the liver. Fatty degeneration in the liver progresses to necrosis, fibril formation, and eventually to liver cirrhosis. Patients who become severely physically-dependent on alcohol suffer from withdrawal symptoms, including tremor, spasm, delirium,

nausea, weakness, anxiousness, and diaphoresis, as well as significant intentional behavior to acquire alcohol and hyperreflexia. Adverse effects are less prominent in tests using animals; in 90-day repeated oral exposure tests in rats and mice, fatty degeneration in the liver occurred as a result of exposure to a high dose.

Other

* For the toxicity information, due to no information as a mixture, it is originated from the information about raw materials.

The present product is stable under the normal condition, and there is no hazard such as eluting any harmful additive agent ingredients; however, in case of special handling such as its use under higher temperature, sufficient measures for safety should be taken.

12. Ecological Information

Ecotoxicity

- No data

Persistence and Degradability

- Degree of decomposition: 89 % by BOD (ethanol)

Bioaccumulative Potential

- No data

Mobility in soil

- No data

Influence to the ozone layer

- No data
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13. Disposal Considerations

- Residual Waste : Incineration method
Incinerate in an incinerator equipped with scrubber.
Dispose in accordance with applicable legislation and local government ordinance.
When the above-mentioned treatments are not possible, entrust disposal of this reference material to a professional waste disposal company licensed by local or national authority.
- Contaminated Container and Package : Dispose of containers after thoroughly removing their contents.
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14. Transport Information

- UN Number : 2924
UN Classification : Class 3
Shipping Name : Flammable liquid, corrosive, N.O.S., methanol
Packing Group : PG III
ICAO/IATA : Class 8, grade II
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Marine Pollutant	: Hazardous Liquid Substance (Class Y Substance)
Precautions	: Avoid direct sunlight and fire sources and transfer with care not to spill/leak by dropping or falling, etc.

15. Regulatory Information

- ◇ Fire Service Act
 - Hazardous materials Category IV Alcohols Hazard Class II Water soluble
- ◇ Industrial Safety and Health Act
 - Article 57 (Enforcement Order: Article 18) Hazardous substance whose name, etc. must be labeled.
 - Article 57-2 (Enforcement Order: Article 18-2) Hazardous substance whose name, etc. must be notified No. 560, No. 61.
 - Type 2 Organic Solvents (Order of Enforcement Appended Table 6-2 Ordinance on Prevention of Organic Solvent Poisoning Article 1 Section 1 Paragraph 4
 - Dangerous goods and flammable substances (Order of Enforcement Appended Table 1 Paragraph 4)
 - Criteria for assessment of the working environment (Article 65-2, Paragraph 1 of the Act)
- ◇ Regulations for the Carriage and Storage of Dangerous Goods in Ships
 - Flammable liquid (Dangerous Goods Regulations Article 3 Notification of Dangerous Goods Appended Table 1)
- ◇ Civil Aeronautics Act
 - Flammable liquid (Regulations for Enforcement Article 194 Notification of Dangerous Goods Appended Table 1)
- ◇ Act for the Prevention of Marine Pollution and Maritime Disasters
 - Order for Enforcement Appended Table 1 Noxious Liquid Substances Category Y Substance

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.