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
		Creation date : February 28, 2020
		Revised on : October 2, 2020
		ID Number : 6212001
Identity of Substance/Mixture	:	Certified reference material: NMIJ CRM 6212-a 3β, 4α-Dihydroxy-5α-androstan-17-one Standard Solution
Recommended Use of the Chemical and Restriction on Use	:	This CRM is intended for use in the calibration of instruments and validation of analytical methods. Do not use this CRM for other purposes than testing/research.

2. Hazards Identification

GHS Classification :	Flammable liquid	:	Hazard Category 2
	Acute Toxicity (oral)	:	Hazard Category 4
	Serious Eye Damage/ Eye Irritation	:	Hazard Category 2
	Reproductive toxicity	:	Hazard Category 1B
	Specific Target Organ Toxicity/Systemic Toxicity (Single Exposure)	:	Hazard Category 1 (central nervous system, visual organ, systemic Toxicity) Hazard Category 3 (anesthetic action, respiratory tract irritation)
	Specific Target Organ Toxicity/Systemic Toxicity (Repeated Exposure)	:	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
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

Precautionary Statement : [Safety Precaution]
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 reference material.
Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Wash hands thoroughly after handling.
Keep container tightly closed after using this reference material.
Use explosion-proof electrical/ventilating/lighting equipment.
Use only non-sparking tools.
Ground and bond 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.
[First-Aid Measures]
If exposed or concerned: Get medical advice/attention.
If you feel unwell: Get medical advice/attention.
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 powder, CO_2 or foam fire extinguisher.
[Storage]
Store this reference material in a light-shielded clean environment at temperatures of −30 °C to −15 °C.
[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 : 3*β*, 4*α*-Dihydroxy-5*α*-androstan-17-one Standard Solution

Ingredient 1	:	Methanol
Synonym	:	Methyl alcohol, Wood alcohol
Chemical Formula or Structural Formula	:	CH_3OH
Molecuar Weight	:	32.04
CAS Number	:	67-56-1
Content	:	Ca. 99 %
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
Ingredient 2	:	3*β*, 4*α*-Dihydroxy-5*α*-androstan-17-one
Synonym	:	-
Chemical Formula or Structural Formula	:	$C_{19}H_{30}O_3$
Molecuar Weight	:	306.43
CAS Number	:	-
Content	:	135.2 μg/g, 107.0 μg/mL
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 : -
Hazardous Ingredient	:	Methanol

4. First-aid Measures

If inhaled	:	Remove victim to fresh air and keep at rest and warm. Get medical advice/attention.
If on Skin	:	Rinse away thoroughly with clean water. Take off/Remove contaminated clothing, shoes, etc. If skin irritation or rash occurs get medical advice/attention.
If in Eyes	:	Rinse away thoroughly with clean water. Get medical advice/attention.
If swallowed	:	Rinse mouth thoroughly with water. Get medical advice/attention immediately.
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 Hazard	:	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. If containers are immovable, cool their surroundings with water spray.
Protection of Fire-Fighters	:	Fight fire upwind to avoid breathing hazardous gas. Use personal protective equipment such as fire-resistant clothing, self-contained compressed air breathing apparatus, closed

circuit breathing apparatus, rubber groves, and rubber boots.

6. Accidental Release Measures

Personal Precaution	:	Remove ignition sources in the vicinity immediately. 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. Use 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 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, 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 Precaution	:	Strict ban on fire. Keep away from hot surfaces and sparks. Do not allow contact with strong oxidizers.
Local and General Ventilation	:	If vapor or mist is emitted: Seal the source. Provide local exhaust ventilation or general ventilation.
Precautions for Safe Handling	:	Avoid rough handling such as turning over, dropping, giving a shock to and dragging containers. Prevent this reference material from leaking, overflowing, and splashing. Do not allow vapor to be emitted. 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 Condition	:	Store at temperatures of −30 °C to −15 °C in a clean place and protect from light.
Safe Container Packaging Material	:	Glass

※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 (Methanol)

Threshold Limit Value

Not specified

Permissible Concentration

・ACGIH TLV-TWA	:	200 ppm (260 mg/m^3)
・Value recommended by Japan Society for Occupational Health	:	200 ppm (260 mg/m^3)
・OSHA PEL TWA	:	200 ppm

Engineering Controls

Ventilation/Exhaust	:	Local ventilation system or General ventilation system
Safety Control/ Gas Detection	:	Measuring equipment, Detecting tube
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 as required.
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 (Methanol)

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 oxidizers.
Incompatible materials	:	Contact with strong oxidizer.
Hazardous Decomposition Products	:	Carbon monoxide, carbon dioxide

11. Toxicological Information (Methanol)

Acute toxicity	:	Oral: Rat LD50=6200 mg/kg Dermal: Rabbit LD50=15800 mg/kg
Skin corrosivity/ irritation	:	No data available
Serious eye damage/ Eye irritation	:	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.
Respiratory sensitization	:	No data available
Skin sensitization	:	No data available
Germ cell mutagenicity	:	No data available
Carcinogenicity	:	Not classifiable
Reproductive toxicity	:	In a test of pregnant mice exposed through 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 enough 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 prolonged human exposure to methanol may result in adverse effects on

development of human fetus. It is accordingly assumed that it causes developmental toxicity to humans.

Specific organ toxicity (single exposure)	:	Symptoms of acute intoxication in humans include central nervous system depression and metabolic acidosis resulting from formic acid accumulation in 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 was produced by inhalation exposure in mice, rats, and humans as a result of central nervous system depression.
Specific organ toxicity (repeated exposure)	:	In humans, prolonged exposure to low-concentration methanol caused eye damage; blindness is a toxic effect of chronic occupational methanol exposure. Chronic toxic symptoms caused by repeated exposure to methanol vapor including 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.
Aspiration hazard	:	No data available

* Section “Toxicological Information” is prepared based on the information on the raw materials because no information on the mixture is available.

This reference material is stable under normal condition, and there is no risk of noxious additive ingredient elusion. In case of handling this reference material under special conditions, such as high temperatures, however, it is recommended to take sufficient safety precautions for appropriate use.

12. Ecological Information

Ecotoxicity	:	Not classifiable
Persistence and Degradability	:	Easily degradable by microorganisms.
Bioaccumulative Potential	:	No data available
Mobility in soil	:	No data available
Influence to the ozone layer	:	No data available

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.

14. Transport Information

UN Number	:	1230
UN Classification	:	Class 3
Shipping Name	:	METHANOL
Packing Group	:	PG Ⅲ
ICAO/IATA	:	Class 8, grade Ⅱ
Marine Pollutant	:	Hazardous Liquid Substance (Class Y Substance)
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.

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
・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

◎ **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.

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.