

Safety Data Sheet

1. Identification of the Substances and the Organization

Organization Name : National Institute of Advanced Industrial Science and Technology (AIST)
 Address : 1-3-1, Kasumigaseki, Chiyoda, Tokyo, Japan
 Office in Charge : Reference Material Office, Center for Quality Management of Metrology, The National Metrology Institute of Japan (NMIJ)
 Person in Charge : Person in Charge of Certified Reference Materials
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 Emergency No. : Same as above

Prepared on : September 26, 2008

Revised on : April 1, 2015

Reference No. : 4214001

Identity of Substance/Mixture : Certified reference material: NMIJ CRM 4214-a *p,p'*-DDT, *p,p'*-DDE, γ -HCH in 2,2,4-Trimethylpentane

Recommended Use of the Chemical and Restriction on Use : *p,p'*-DDT, *p,p'*-DDE, γ -HCH in 2,2,4-Trimethylpentane
 : This CRM can be used for calibration of analytical instruments such as gas chromatograph, GS/MS, LC/MS, and quality control of analytical instruments and validation of analytical techniques in the quantification of chlorinated pesticides. Do not use this reference material for other purposes than testing/research.

2. Hazard Identification

GHS classification :

Flammable liquid	:	Hazard Category 2
kin corrosion/irritation	:	Hazard Category 2
Serious eye damage/ Eye irritation	:	Hazard Category 2A
Specific target organ toxicity/Systemic toxicity (Single exposure)	:	Hazard Category 1 (Central nerve system) Hazard Category 3 (Narcotic) Hazard Category 3 (Airway irritation)
Aspiration hazard	:	Hazard Category 1
Toxic to the aquatic environment (Acute)	:	Hazard Category 1
Toxic to the aquatic environment (Chronic)	:	Hazard Category 1

GHS Label Element :



Signal Word : Danger

Hazards Statement : Highly flammable liquid and vapor

Causes skin irritation

Causes strong eye irritation

Causes damage to central nerve

May irritate respiratory

Causes damage to organs

May cause drowsiness or dizziness

May be fatal if swallowed and enters airways

Very toxic to aquatic life

Very toxic to aquatic life with long lasting effects

Other Hazards Statement : 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane(*p,p'*-DDT) may be carcinogenic.

1,1-dichloro-2,2-bis(4-chlorophenyl)ethylene(*p,p'*-DDE) is carcinogenic.

1,1-dichloro-2,2-bis(4-chlorophenyl)ethane(*p,p'*-DDD) is carcinogenic.

(1 α ,2 α ,3 β ,4 α ,5 α ,6 β)-hexachlorocyclohexane(γ -HCH) may be carcinogenic.

Precautionary Statement : [Precaution]

Strict ban on fire.

Do not drink, eat or smoke.

Do not handle until all safety precautions have been read and understood.

Use only outdoors or a well-ventilated area.

Avoid release to the environment.

Wash hands thoroughly after handling this reference material.

Avoid breathing gas/mist/vapor/spray.

Use eye protector/face protector/protective gloves. Use personal protective equipment as required.

[First-Aid Measure]

If ingested : Do not induce vomiting. Get medical advice/attention immediately.

If in eyes : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention if eye irritation prolongs.

If inhaled : Remove victim to fresh air and keep at rest in a position comfortable for breathing.

If on skin: Wash with plenty of soap and water. Get medical advice/attention.

If exposed or concerned : Get medical advice/attention.

Take off/Remove contaminated clothing. Wash contaminated

clothing before reuse.

Collect spillage.

[Storage]

Store locked up.

Store in light-shielded environment at room temperature (15 °C to 25 °C).

[Disposal]

As this reference material contains substances designated as Class 1 Specified Chemical Substance, it must be handled in accordance with Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc., and stored and disposed of in accordance with Waste Disposal and Public Cleaning Act.

※ Giving considerations to the fact that Class 1 Specified Chemical Substances are persistent, highly accumulative, toxic to human for long time or eco-toxic to high-level predator flora and fauna in the human living environment, ensure rational use by making a handling place tightly closed, carrying out collection, etc.

Regularly check containers, storage tanks, etc. for potential leakage.

Take precautions to prevent scattering or spill when handling it.

The other hazards than the above do not result in classification or are not covered by the GHS.

3. Composition/Component Information

Substance/Mixture : Mixture

Ingredient 1

Chemical Identity : 1,1,1-trichloro-2,2-bis(4-chlorophenyl)ethane
(Class 1 Specified Chemical Substance)

Synonym : *p,p'*-DDT

Chemical Formula : C₁₄H₉Cl₅

Structural Formula

ID Number in Official Gazette : Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. (4)-910

CAS Number : 50-29-3

UN Classification : Class 6.1 (Toxic substance)

Ingredient 2

Chemical Identity : 1,1-dichloro-2,2-bis(4-chlorophenyl)ethylene

Synonym : *p,p'*-DDE

Chemical Formula or : C₁₄H₈Cl₄

Structural Formula

ID Number in Official Gazette : Not defined

CAS Number : 72-55-9

Ingredient 3

Chemical Identity : 1,1-dichloro-2,2-bis(4-chlorophenyl)ethane
Synonym : *p,p'*DDD
Chemical Formula or : C₁₄H₁₀Cl₄
Structural Formula
ID Number in Official Gazette : Not defined
CAS Number : 72-54-8

Ingredient 4

Chemical Identity : (1 α ,2 α ,3 β ,4 α ,5 α ,6 β)-hexachlorocyclohexane
(Class 1 Specified Chemical Substance)
Synonym : γ -HCH
Chemical Formula or : C₆H₆Cl₆
Structural Formula
ID Number in Official Gazette : Act on the Evaluation of Chemical Substances and Regulation
of Their Manufacture, etc. (3)-2250, (9)-1652
CAS Number : 58-89-9

Ingredient 5

Chemical Identity : 2,2,4-trimethylpentane
Synonym : isooctane
Chemical Formula or : C₈H₁₈
Structural Formula
Content : 99.9 %
Molecular Weight : 114.23
ID Number in Official Gazette : Act on the Evaluation of Chemical Substances and
Regulation of Their Manufacture, etc. (2)-8
CAS Number : 540-84-1
Hazardous : 2,2,4-trimethylpentane
Ingredient

4. Emergency 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 Ingested : Rinse mouth with water thoroughly. Make victim drink a couple glasses of water or milk. Get medical advice/attention. Do not induce vomiting.
Expected Acute and Delayed Symptom : Eyes/skin/airway irritation, Eyes/skin flush, Skin dryness/delipidation, Nausea, Headache, Lethargy, Dizziness, Confusion, Difficulty in breathing, Unconsciousness, Cough and

	Pharyngodynia,
	If exposed to high-concentration vapor, deterioration in consciousness and heart rhythm disorder
	Delayed symptom : Pulmonary edema, Chemical pneumonia
Most Critical Characteristic and Symptom	: This reference material is flammable. If mixed with air, its vapor generates explosive gas mixture which may cause flammable explosion. Its containers may explode due to heat of fire. This reference material is volatile and may cause fire explosion in indoor/outdoor environment or sewer.
Protection of First-Aid Responder	: -

5. Fire Fighting Measures

Extinguishing Media	: Dry chemical extinguishing agent, Foam extinguishing agent, Carbon Dioxide (CO ₂), Sand Strict ban on water jet.
Fire-Specific Hazards	: In the case of fire, irritating, corrosive or toxic gas and fume may be generated.
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. Use personal protective equipment such as compressed air open-circuit self-contained breathing apparatus.

6. Accidental Release Measures

Personal Precaution	: 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.
Personal Protective Equipment and Emergency Procedures	: 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	: Collect spillage in empty containers by getting it adsorbed to wiping cloth, rag or earth and sand, etc. Wipe out thoroughly and collect spillage in tightly-closed containers.
Prevention of	: In the case of leakage, communicate with relevant parties



Secondary Disaster promptly in order to prevent occurrence and spread of accidents.

7. Handling and Storage Precautions

Handling

Engineering : Strict ban on fire. Keep away from hot surfaces and sparks.

Precautions : Avoid contact with strong oxidizers.

Local and General : Use local ventilation system in indoor handling areas.

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.

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 explosion-proof equipment and take precautions against electrostatic discharge.

Storage

Appropriate Storage Conditions : Store in dark at room temperature (15 °C to 25 °C).

Store in a closed container in a well-ventilated cool environment.

Strict ban on fire. Avoid storing together with oxidizers and strongly oxidizing substances.

Safe Container : Glass

Packaging Material

8. Exposure Controls/Personal Protection

Threshold Limit Value

Not specified

Permissible Concentration (*p,p'*-DDE)

• ACGIH TLV-TWA : Not specified

• Value recommended by Japan Society for Occupational Health : Not specified

Society for Occupational Health

• OSHA PEL TWA : Not specified

Permissible Concentration (*p,p'*-DDD)

• ACGIH TLV-TWA : Not specified

• Value recommended by Japan Society for Occupational Health : Not specified

Society for Occupational Health

• OSHA PEL TWA : Not specified

Permissible Concentration (γ -HCH)

• ACGIH TLV-TWA : 0.5 mg/m³ ; skin

• Value recommended by Japan Society for Occupational Health : Not specified



Society for Occupational Health	:	
• OSHA PEL TWA	:	8H TWA, 0.5 mg/m ³ ; skin
Permissible Concentration (2,2,4-trimethylpentane)		
• ACGIH TLV-TWA	:	Not specified
• Value recommended by Japan	:	Not specified
Society for Occupational Health		
• OSHA PEL TWA	:	Not specified
Engineering Controls		
Ventilation/Exhaust	:	Local or general ventilation equipment
Safety control/	:	Measuring equipment, Detecting tube
Gas detection		
Storage Precautions	:	Ventilated along floor surface. Tightly closed. Keep away from combustible materials, reducing agents and strong oxidizers.
Personal Protective Equipment (PPE)		
Respiratory System	:	Chemical cartridge respirator for organic gas, Compressed air open-circuit self-contained breathing apparatus
Hands	:	Protective gloves
Eyes	:	Eye protector
Skin and Body	:	Protective clothing, Face protector
Hygiene measure		
Treat in accordance with rules on Industrial hygiene and Industrial safety.		

9. Physical and Chemical Properties

(as 2,2,4-trimethylpentane)

• Appearance, etc.	:	Liquid
• Color	:	Clear and colorless
• Odor	:	Odor of gasoline
• pH	:	No data available
• Melting Point	:	-107.5 °C
• Boiling Point	:	99.3 °C
• Flash Point	:	-8 °C (Tagliabue closed test)
• Spontaneous Ignition Point	:	410 °C
• Explosive Range	:	Lower limit: 1.1 %, Upper limit: 6.0 %
• Vapor Pressure	:	5.1 kPa(20 °C)
• Relative Vapor Density (Air=1)	:	3.97 (Air=1)
• Specific Gravity or Bulk Specific Gravity	:	0.692(20/4 °C)
• Solubility	:	Extremely soluble in ethanol and diethyl ether and hardly-soluble in water
• Partition Coefficient : n-octanol/water log Po/w	:	No data available

10. Stability and Reactivity

Stability

- No data available

Reactivity

- No data available

Conditions to Avoid

- Sunlight, heat, open flame, high temperature, spark, static electricity, other ignition sources

Hazardous Decomposition Products

- Carbon monoxide (CO), Halide

11. Toxicological Information

Acute toxicity

(*p,p'*-DDT)

Oral Rat LD50: 87 mg/kg

Oral Mouse LD50: 110 mg/kg

Dermal toxicity Rat LD50: 250 mg/kg

(*p,p'*-DDE)

Oral Rat LD50: 880 mg/kg (RTECS)

Oral Mouse LD50: 700 mg/kg (RTECS)

Oral Guinea pig LD50: >5 gm/kg (RTECS)

(*p,p'*-DDD)

Oral Rat LD50: 113 mg/kg (RTECS)

Oral Mouse LDLo: 600 mg/kg (RTECS)

Dermal Rabbit LD50: 1200 mg/kg (RTECS)

(γ -HCH)

Oral Rat LD50: 76 mg/kg (RTECS)

Dermal Rat LD50: 414 mg/kg (RTECS)

Abdominal cavity Rat LD50: 35 mg/kg (RTECS)

Oral Mouse LD50: 44 mg/kg (RTECS)

Abdominal cavity Mouse LD50: 125 mg/kg (RTECS)

(2,2,4-trimethylpentane)

Oral Rat TDLo: 2500 mg/kg/5D-I (RTECS)

Oral Rat TDLo: 10 gm/kg/4W-I (RTECS)

Carcinogenicity

(*p,p'*-DDT)

IARC Group 2B

EPA B2

ACGIH A3

Japan Society for Occupational Health 2B

(*p,p'*-DDE)

EPA B2: May be carcinogenic in humans based on sufficient evidence in animals

(*p,p'*-DDD)

EPA B2: May be carcinogenic in humans based on sufficient evidence in animals

IARC Group 2B (Possibly to be carcinogenic to humans)

(γ -HCH)

Others

Classified in Group 2B by IARC (IARC Suppl.7 (1987)), 2B by Japan Society for Occupational Health (Recommendation of Japan Society for Occupational Health (2005)), A3 by ACGIH (ACGIH 7th, 2001) and R by NTP (NTP RoC 11th (2005)).

Giving considerations to the fact that Class 1 Specified Chemical Substances are persistent, highly accumulative, toxic to human for long time or eco-toxic to high-level predator flora and fauna in the human living environment, ensure rational use by making a handling place tightly closed, carrying out collection, etc.

Regularly check containers, storage tanks, etc. for potential leakage.

Take precautions to prevent scattering or spill when handling it. As this reference material contains substances designated as Class 1 Specified Chemical Substance, it must be handled in accordance with Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc., and stored and disposed of in accordance with Waste Disposal and Public Cleaning Act.

12. Ecological Information

Persistence and Degradability

- (*p,p'*-DDT) 0 % by BOD (METI Existing Chemical Substance Safety Check)
- (*p,p'*-DDE) 0 % by BOD (METI Existing Chemical Substance Safety Check)
- (γ -HCH) 0 % by BOD (METI Existing Chemical Substance Safety Check)

Bioaccumulative Potential

(2,2,4-trimethylpentane)

- Concentration rate: 440 to 580 (Concentration: 10 μ g/l) : 460 to 650 (Concentration: 1 μ g/l) (METI Existing Chemical Substance Safety Check)

Ecotoxicity

(2,2,4-trimethylpentane)

- *Oryzias latipes* LC50: 0.561 mg/L/96hr.

(γ -HCH)

- Acute toxicity to *Oryzias latipes* LC50 : 0.18 mg/L/48hours Crustacea (Pink shrimp): 96 hours LC50=0.00017 mg/L (EHC124 (1991))

Acute toxicity: Category 1

Not rapidly degradable (BOD degradability: 0% (Existing Chemical Substance Safety Check Data)), but bioaccumulative (BCF=893 (Existing Chemical Substance Safety Check Data))

13. Disposal Considerations

- Dispose of this reference material in accordance with applicable legislation and local government ordinance.
- Dispose of container after thoroughly removing its contents.

14. Transport Information

UN Number : 1262



UN	: Class 3 (Flammable liquid)
Classification	
Shipping Name	: Octanes
Packing Group	: PG II
ICAO/IATA	: Class 3 Grade II
Marine	: Not Applicable
Pollutant	
Precautions	: Transport this reference material carefully while keeping it away from direct sunlight and fire, maintaining temperature around -20 °C and preventing accidental release due to falling, overturning, etc.

15. Applicable Legislation

Fire Defense Law

- Dangerous substance Class 4 Class 1 petroleum (insoluble in water) Danger Rating 2

Industrial Safety and Health Law

- Hazardous substance whose name, etc. must be notified No.115

Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.

- Class 1 Specified Chemical Substance

Ship Safety Law

- Flammable liquid

Air Pollution Control Act

- Hazardous air pollutant

16. Other Information

Others

The information in this Safety Data Sheet is not intended to be exhaustive and is based on currently-available information and data. The precautions given in this data sheet are applicable only to normal handling conditions. When handling this reference material under special conditions etc., it is recommended to take safety precautions appropriate to each specific application and context of use. This Safety Data Sheet (SDS) is intended to provide information and not intended to guarantee anything in handling the reference material. This Safety Data Sheet (SDS) is prepared based on JIS Z7253, and presents identical information to Material Safety Data Sheet (MSDS) prepared based on JIS Z7250:2010.
