



Safety Data Sheet

Section 1. Identification of the substance/mixture and of the company/undertaking

Product identifier:

Product name: N,N-Dimethyl formamide dimethyl acetal

SDS No. : 2339E-4

Relevant identified uses of the substance or mixture and uses advised against

Research and Development

Details of the supplier of the safety data sheet

Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.

Address: 3-1, Honmachibashi, Chuo-ku, Osaka, JAPAN

Division: Chemical Safety Management Department

Telephone number: +81-6-6946-8061

FAX: +81-6-6946-1607

Section 2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture

PHYSICAL AND CHEMICAL HAZARDS

Flammable liquids: Category 2

HEALTH HAZARDS

Acute toxicity (Inhalation): Category 4

Serious eye damage/eye irritation: Category 1

Skin sensitization: Category 1

Carcinogenicity: Category 1B

Reproductive toxicity: Category 1B

(Note) GHS classification without description: Not classified/Classification not possible

Label elements



Signal word: Danger

HAZARD STATEMENT

H225 Highly flammable liquid and vapor

H332 Harmful if inhaled

H318 Causes serious eye damage

H317 May cause an allergic skin reaction

H350 May cause cancer

H360 May damage fertility or the unborn child

PRECAUTIONARY STATEMENT

Prevention

P202 Do not handle until all safety precautions have been read and understood.

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233 Keep container tightly closed.

P240 Ground and bond container and receiving equipment.



P241 Use explosion-proof electrical/ventilating/lighting equipment.

P242 Use non-sparking tools.

P243 Take action to prevent static discharges.

P261 Avoid breathing dust/fume/gas/mist/vapors/spray.

P271 Use only outdoors or in a well-ventilated area.

P272 Contaminated work clothing should not be allowed out of the workplace.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response

P370 + P378 In case of fire: Use appropriate media to extinguish.

P308 + P313 IF exposed or concerned: Get medical advice/attention.

P310 Immediately call a POISON CENTER/doctor/physician.

P312 Call a POISON CENTER/doctor/physician if you feel unwell.

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing.

Rinse skin with water or shower.

P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.

P362 + P364 Take off contaminated clothing and wash it before reuse.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage

P403 + P235 Store in a well-ventilated place. Keep cool.

P405 Store locked up.

Disposal

P501 Dispose of contents/container in accordance with local/national regulation.

Specific adverse human health effects

See "11. Toxicological Information".

Section 3. Composition/information on ingredients

Mixture/Substance selection:

Substance

Ingredient name	Content (%)	CAS No.	ENCS	Chemical formula
N,N-Dimethyl formamide dimethyl acetal	≥97	4637-24-5	2-3547	C ₅ H ₁₃ NO ₂

Note : The figures shown above are not the specifications of the product.

Impurities

Methanol ≤0.60% (CAS No.67-56-1)

N,N-Dimethylformamide ≤0.30% (CAS No.68-12-2)

Trimethyl orthoformate ≤2.5% (CAS No.149-73-5)

Methyl formate 0.10% (CAS No.107-31-3)

Section 4. First-aid measures

Descriptions of first-aid measures

General measures

IF exposed or concerned: Get medical advice/attention.

IF INHALED



Remove person to fresh air and keep comfortable for breathing.

Call a POISON CENTER/doctor/physician if you feel unwell.

IF ON SKIN

Take off immediately all contaminated clothing. Rinse skin with water or shower.

Wash with plenty of soap and water.

If skin irritation or rash occurs: Get medical advice/attention.

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 SWALLOWED

Rinse mouth.

Call a POISON CENTER/doctor/physician if you feel unwell.

Section 5. Fire-fighting measures**Extinguishing media****Suitable extinguishing media**

Use appropriate extinguishing media suitable for surrounding facilities.

In case of fire, use spraying loaded liquid, foam (water-soluble liquid: alcohol-resistant foam), inactive gases, dry powder, dry sand to extinguish.

*Fire Service Act Group 4 Hazardous Materials

Unsuitable extinguishing media

Indoor Fire Plug System or Outdoor Fire Plug System

Sprinkler System

Dry Chemical Extinguishing System—Others (except for phosphates etc., Hydrogen Carbonates etc.)

Fire Extinguisher Discharging Jet Water/Spraying Water

Fire Extinguisher Discharging Jet Loaded Liquid

Fire Extinguisher Discharging Dry Extinguishing agents—Others (except for phosphates etc., Hydrogen Carbonates etc.)

Water Bucket or Water Tank

*Cabinet Order Concerning the Control of Hazardous Materials (Attached Table 5) Group 4 Hazardous Materials

Specific hazards arising from the substance or mixture

Fire may produce irritating, corrosive and/or toxic gases.

Runoff from fire control or dilution water may cause pollution.

See "10.Stability and Reactivity".

Advice for firefighters**Specific fire-fighting measures**

Evacuate non-essential personnel to safe area.

Special protective equipment and precautions for fire-fighters

Wear fire resistant or flame retardant clothing.

Wear protective gloves/protective clothing/eye protection/face protection.

Firefighters should wear self-contained breathing apparatus with a full facepiece operated in the positive pressure mode.

Section 6. Accidental release measures

Personnel precautions, protective equipment and emergency procedures



- Keep unauthorized personnel away.
- Ventilate area until material pick up is complete.
- Wear proper protective equipment.

Environmental precautions

- Prevent spills from entering sewers, watercourses, low areas or rivers. To be careful not discharged to the environment without being properly handled waste water contaminated.

Methods and materials for containment and cleaning up

- Absorb spill with inert material (dry sand, earth, et al), then place in a chemical waste container.

Preventive measures for secondary accident

- Collect spillage.

Section 7. Handling and storage**Precautions for safe handling****Preventive measures****(Exposure Control for handling personnel)**

- Do not breathe dust/fume/gas/mist/vapors/spray.

(Protective measures against fire and explosion)

- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- Ground and bond container and receiving equipment.
- Use explosion-proof electrical/ventilating/lighting equipment.
- Use non-sparking tools.
- Take action to prevent static discharges.

(Exhaust/ventilator)

- Exhaust/ventilator should be available.

(Safety treatments)

- Avoid contact with skin.
- Avoid contact with eyes.

Safety Measures

- Do not handle until all safety precautions have been read and understood.
- Use only outdoors or in a well-ventilated area.
- Wear protective gloves/protective clothing/eye protection/face protection.
- Wash hands et al thoroughly after handling.
- When using do not eat, drink or smoke.

Any incompatibilities

- See "10.Stability and Reactivity".

Advice on general occupational hygiene

- Contaminated work clothing should not be allowed out of the workplace.
- Take off contaminated clothing and wash it before reuse.

Storage**Conditions for safe storage**

- Keep container tightly closed.
- Store locked up. (P405)
- Store in a cool, dry place. Do not store in direct sunlight.
- Storage in accordance with local/national regulation.

Container and packaging materials for safe handling

- Use closed unbreakable containers.



Section 8. Exposure controls/personal protection

Control parameters

Control value and Concentration standard value

(Methanol)

Japan control value 200ppm

(N,N-Dimethylformamide)

Japan control value 10ppm

Adopted value

(Methanol)

JSOH(1963) 200ppm; 260mg/m³

(N,N-Dimethylformamide)

JSOH(1974) 10ppm; 30mg/m³ (skin)

(Methanol)

ACGIH(2009) TWA: 200ppm;

STEL: 250ppm (Headache; eye dam; dizziness; nausea)

(N,N-Dimethylformamide)

ACGIH(2018) TWA: 5ppm (Liver dam; eye & URT irr)

(Methyl formate)

ACGIH(2015) TWA: 50ppm;

STEL: 100ppm (CNS impair; URT irr; eye dam)

[ACGIH] Notation

(Methanol)

Skin

(N,N-Dimethylformamide)

Skin

(Methyl formate)

Skin

Exposure controls

Appropriate engineering controls

Do not use in areas without adequate ventilation.

Eye wash station should be available.

Washing facilities should be available.

Individual protection measures

Recommend to use protective equipment in conformity with the standards.

Use appropriate protective equipment in accordance with local/national regulation.

Respiratory protection

Wear respiratory protection (dust-proof mask/gas mask). Select chemical cartridge corresponding to type of gases when using a gas mask.

Hand protection

Wear impervious protective glove.

Eye protection

Wear eye/face protection. Wear safety goggles in cases gas is generated.

Skin and body protection

Wear protective clothing.

Section 9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state: Liquid



Color: Colorless

Odor: Characteristic odor

Melting point/Freezing point: -85°C

Boiling point or initial boiling point: (N,N-Dimethyl formamide dimethyl acetal)104 through 108°C

Boiling range data is not available.

Flammability (gases, liquids and solids) data is not available.

Lower and upper explosion limit/flammability limit data is not available.

Flash point: (N,N-Dimethyl formamide dimethyl acetal)6.5°C

Auto-ignition temperature data is not available.

Decomposition temperature data is not available.

pH data is not available.

Kinematic viscosity data is not available.

Solubility:

Solubility in water: Hydrolysis

Solubility in solvent data is not available.

n-Octanol/water partition coefficient data is not available.

Vapor pressure data is not available.

Density and/or relative density data is not available.

Relative vapor density (Air=1) data is not available.

Particle characteristics data is not available.

Other information

Other information is not available.

Section 10. Stability and Reactivity

Reactivity

Not available.

Chemical stability

Stable under normal storage/handling conditions.

Possibility of hazardous reactions

Not available.

Conditions to avoid

Contact with incompatible materials.

Contact with fire source.

Incompatible materials

Strong acids, Oxidizing agents

Hazardous decomposition products

Carbon oxides, Methanol, N,N-Dimethylformamide

Section 11. Toxicological Information

Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)

[Data for components of the product]

[NITE-CHRIP]

(Methanol)

human LD50: ca. 1400 mg/kg (source: NITE)

(N,N-Dimethylformamide)

rat LD50: 3000 mg/kg (source: NITE)



(Trimethyl orthoformate)
rat LD50: 3130 mg/kg (source: NITE)
(Methyl formate)
rat LD50: 1500 mg/kg (source: NITE)
[Company proprietary data]
(N,N-Dimethyl formamide dimethyl acetal)
rat LD50 > 5,000 mg/kg

Acute toxicity (Dermal)

[Data for components of the product]
[NITE-CHRIP]
(Methanol)
rabbit LD50: 15800 mg/kg (source: NITE)
(N,N-Dimethylformamide)
rat LD50: 3500 mg/kg (source: NITE)
(Methyl formate)
rat LD50: > 4000 mg/kg (source: NITE)

Acute toxicity (Inhalation)

[Product]
Category 4, Harmful if inhaled
[Data for components of the product]
[NITE-CHRIP]
(Methanol)
vapor: rat LC50: > 22500 ppm (converted 4-hour equivalent value: > 31500 ppm) (source: NITE)
(N,N-Dimethylformamide)
vapor: mouse LC50: 9400 mg/m³ (2-hour) (converted 4-hour equivalent value: 4.7 mg/L) (source: NITE)
(Trimethyl orthoformate)
vapor: rat LC50: 40 mg/L (4-hour) (converted 4-hour equivalent value: 9217 ppm) (source: NITE)
[Company proprietary data]
(N,N-Dimethyl formamide dimethyl acetal)
rat LC50=12.16 mg/L/4hr

Irritant properties**Skin corrosion/irritation**

[Data for components of the product]
[NITE-CHRIP]
(N,N-Dimethylformamide)
Category 2 (source: NITE)
(Methyl formate)
Category 2 (source: NITE)

Serious eye damage/irritation

[Product]
Category 1, Causes serious eye damage
[Data for components of the product]
[NITE-CHRIP]
(Methanol)
Category 2 (source: NITE)
(N,N-Dimethylformamide)
Category 2B (source: NITE)



(Trimethyl orthoformate)
Category 2 (source: NITE)
(Methyl formate)
Category 2 (source: NITE)
[Company proprietary data]
(N,N-Dimethyl formamide dimethyl acetal)
Category 1

Sensitization**Skin sensitization**

[Product]
Category 1, May cause an allergic skin reaction
[Data for components of the product]
[Company proprietary data]
(N,N-Dimethyl formamide dimethyl acetal)
Category 1

Mutagenic effects data is not available.

Carcinogenicity

[Product]
Category 1B, May cause cancer
[Data for components of the product]
[NITE-CHRIP]
(N,N-Dimethylformamide)
Category 1B (source: NITE)
[IARC]
(N,N-Dimethylformamide)
Group 2A : Probably carcinogenic to humans
[ACGIH]
(N,N-Dimethylformamide)
A3(2018) : Confirmed Animal Carcinogen with Unknown Relevance to Humans

Reproductive toxicity

[Product]
Category 1B, May damage fertility or the unborn child
[Data for components of the product]
[NITE-CHRIP]
(Methanol)
Category 1B (source: NITE)
(N,N-Dimethylformamide)
Category 1B (source: NITE)

Specific target organ toxicity (STOT)**STOT-single exposure**

[Data for components of the product]
[NITE-CHRIP]
(Methanol)
Category 3 (Narcotic effects) (source: NITE)
(Methyl formate)
Category 3 (Narcotic effects) (source: NITE)

STOT-repeated exposure data is not available.

Aspiration hazard data is not available.



Section 12. Ecological Information**Toxicity****Aquatic toxicity**

[Data for components of the product]

Hazardous to the aquatic environment, short-term (acute)

[NITE-CHRP]

(Methanol)

Fish (Bluegill) 96-hour LC50: 15400 mg/L (source: NITE)

Crustacea (Brown shrimp) 96-hour LC50: 1340 mg/L (source: NITE)

(N,N-Dimethylformamide)

Fish (Oryzias latipes) 96-hour LC50: > 100 mg/L (source: NITE)

(Methyl formate)

Algae (Desmodesmus subspicatus) 72-hour ErC50: 1063 mg/L (source: NITE)

Crustacea (Daphnia magna) 48-hour EC50: > 500 mg/L (source: NITE)

Fish (Leuciscus idus) 96-hour LC50: 115 mg/L (source: NITE)

Water solubility

(Methanol)

not poorly water-soluble (1000000 mg/L) (source: NITE)

(N,N-Dimethylformamide)

not poorly water-soluble (1000000 mg/L) (source: NITE)

(Methyl formate)

30 g/100 mL (20°C) (source: ICSC, 2010)

Persistence and degradability

Persistence and degradability data is not available.

Bioaccumulative potential

[Data for components of the product]

(Methanol)

log Pow: -0.74 (source: ICSC, 2018)

(N,N-Dimethylformamide)

log Pow: -0.87 (source: ICSC, 2014)

(Methyl formate)

log Pow: -0.21 (source: ICSC, 2010)

Mobility in soil

Mobility in soil data is not available.

Other adverse effects

Ozone depleting chemical data is not available.

Section 13. Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging

Waste treatment methods

Dispose of contents/container as industrial waste. Accordance with local/national regulation.

Section 14. Transport Information

UN Number or ID Number : 1993

UN Proper Shipping Name :



FLAMMABLE LIQUID, N.O.S.

Class or division (Transport hazard class) : 3

Packing group : II

ERG GUIDE No.: 128

IMDG Code (International Maritime Dangerous Goods Regulations)

UN Number or ID Number : 1993

UN Proper Shipping Name :

FLAMMABLE LIQUID, N.O.S.

Class or division (Transport hazard class) : 3

Packing group : II

IATA (Dangerous Goods Regulations)

UN Number or ID Number : 1993

UN Proper Shipping Name :

FLAMMABLE LIQUID, N.O.S.

Class or division (Transport hazard class) : 3

Hazard labels : Flamm.liquid

Packing group : II

Environmental hazards

Marine pollutants (yes/no) : no

Section 15. Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

U.S. Toxic Substances Control Act (TSCA) Inventory

Chemicals listed in TSCA Inventory

Methanol; N,N-Dimethylformamide; Methyl formate; Trimethyl orthoformate; N,N-Dimethyl formamide dimethyl acetal

Other regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

Section 16. Other information

References and sources for data

Globally Harmonized System of classification and labelling of chemicals, UN

Recommendations on the TRANSPORT OF DANGEROUS GOODS 22nd edit., 2021 UN

IMDG Code, 2022 Edition (Incorporating Amendment 41-22)

IATA Dangerous Goods Regulations (65th Edition) 2024

2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)

2024 TLVs and BEIs. (ACGIH)

JIS Z 7252 : 2019

JIS Z 7253 : 2019

2023 Recommendation on TLVs (JSOH)

Supplier's data/information

General Disclaimer

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Unauthorized translation or modification is prohibited.

Please provide SDS to customers for selling or transferring.

All chemicals have unknown hazard. Handle the product with care.

This data sheet was created based on the information we currently have and may be revised



according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety.

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.

The GHS classification data given here is based on current Data published in Japan (National Institute of Technology and Evaluation (NITE) Chemical Risk Information Platform (NITE-CHRIP), up to FY2023).