

Safety Data Sheet

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

Product identifier:

Product name: N,N-Dimethylformamide

Reference number(SDS):35770jis_E1-5

Product type:

Reagent

Details of the supplier of the safety data sheet

Manufacturer/Supplier: JUNSEI CHEMICAL CO., LTD.

Address: 1-6, Ohmano-cho, Koshigaya-shi, Saitama 343-0844, Japan

Division: Quality Assurance Department

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e-mail address: shiyaku-t@junsei.co.jp

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 3

HEALTH HAZARDS

Acute toxicity (Inhalation): Category 3

Skin corrosion/irritation: Category 2

Serious eye damage/eye irritation: Category 2B

Germ cell mutagenicity: Category 2

Carcinogenicity: Category 1B

Reproductive toxicity: Category 1B

Specific target organ toxicity – single exposure: Category 1(liver)

Specific target organ toxicity – single exposure: Category 2(respiratory system)

Specific target organ toxicity – repeated exposure: Category 1(liver)

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

Label elements

Signal word: Danger

HAZARD STATEMENT

H226-Flammable liquid and vapor

H331-Toxic if inhaled

H315-Causes skin irritation

H320-Causes eye irritation

H341-Suspected of causing genetic defects

H350-May cause cancer

H360-May damage fertility or the unborn child

H370-Causes damage to organs

H371-May cause damage to organs

H372-Causes damage to organs through prolonged or repeated exposure

PRECAUTIONARY STATEMENT**Prevention**

- Obtain special instructions before use.
- Do not handle until all safety precautions have been read and understood.
- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- Keep container tightly closed.
- Ground and bond container and receiving equipment.
- Use explosion-proof electrical/ventilating/lighting equipment.
- Use non-sparking tools.
- Take action to prevent static discharges.
- Do not breathe vapors.
- Use only outdoors or in a well-ventilated area.
- Wash contaminated parts thoroughly after handling.
- Wear protective gloves/protective clothing/eye protection/face protection.
- Use personal protective equipment as required.
- Do not eat, drink or smoke when using this product.

Response

- In case of fire: Use water mist, alcohol-resistant foam, dry powder, CO2 to extinguish.
- Get medical advice/attention if you feel unwell.
- IF exposed or concerned: Get medical advice/attention.
- Call a POISON CENTER/doctor/physician.
- IF exposed or concerned: Call a POISON CENTER/doctor/physician.
- IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- IF ON SKIN: Wash with plenty of soap and water.
- IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
- If skin irritation occurs: Get medical advice/attention.
- Take off contaminated clothing and wash it before reuse.
- 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.

Storage

- Store in a well-ventilated place. Keep container tightly closed. Keep cool.
- Store locked up.

Disposal

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

Specific Physical and Chemical hazards

- Flammable liquid. Vapor/air mixture may explode.

Section 3. Composition/information on ingredients**Mixture/Substance selection:****Substance**

Ingredient name: N,N-Dimethylformamide
Content (%): 99.0
Chemical formula: C₃H₇NO
Chemicals No, Japan: 2-680
CAS No.: 68-12-2
MW: 73.09
ECNO: 200-679-5

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

Components contributing to the hazard

Toxic for reproduction (Article 57c) in REACH SVHC candidate list

N,N-Dimethylformamide

Section 4. First-aid measures

Descriptions of first-aid measures

General measures

- Get medical advice/attention if you feel unwell.
- Call a POISON CENTER/doctor/physician.
- Keep victim warm and quiet.
- Call emergency medical service.
- Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

IF INHALED

- Remove person to fresh air and keep comfortable for breathing.
- Give artificial respiration if victim is not breathing.
- Administer oxygen if breathing is difficult.
- Call a POISON CENTER/doctor/physician if you feel unwell.

IF ON SKIN (or hair)

- Take off immediately all contaminated clothing. Rinse skin with water or shower.
- Wash with plenty of soap and water.
- In case of burns, immediately cool affected skin for as long as possible with cold water.
- Do not remove clothing if adhering to skin.
- If skin irritation or rash occurs: Get medical advice/attention.
- If skin irritation occurs: Get medical advice/attention.
- Remove and isolate contaminated clothing and shoes.

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. Do NOT induce vomiting.
- Call a POISON CENTER/doctor/physician if you feel unwell.

Most important symptoms and effects, both acute and delayed

(Symptoms when inhalation or ingestion)

- Sore throat. Abdominal pain. Diarrhoea. Vomiting. Jaundice.
- ※Aspiration hazard.

(Symptoms when skin and/or eye contact)

- Conjunctival redness of the eyes. Pain of the eyes.
- ※May be absorbed into the skin.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

- In case of fire, use water mist, alcohol-resistant foam, dry powder, CO₂ to extinguish.

Unsuitable extinguishing media

- Unsuitable extinguishing media data is not available.

Specific hazards arising from the substance or mixture

- Containers may explode when heated.
- Fire may produce irritating, corrosive and/or toxic gases.
- Runoff from fire control or dilution water may cause pollution.

Advice for firefighters

Specific fire-fighting measures

- Evacuate non-essential personnel to safe area.
- Cool container with water spray.

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 full face piece operated positive pressure mode.

Section 6. Accidental release measures

Personnel precautions, protective equipment and emergency procedures

Keep unauthorized personnel away.

In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.

Ventilate area until material pick up is complete.

Wear proper protective equipment.

PUBLIC SAFETY: Ventilate closed spaces before entering.

Do not touch or walk through spilled material.

Environmental precautions

Runoff to sewer may create fire or explosion hazard.

Vapor explosion hazard indoors, outdoors or in sewers.

Avoid release to headsprings, rivers, lakes, ocean and groundwater.

Methods and materials for containment and cleaning up

Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

Use clean non-sparking tools to collect absorbed material.

All equipment used when handling the product must be grounded.

Preventive measures for secondary accident

Collect spillage.

Stop leak if you can do it without risk.

ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).

Prevent entry into waterways, sewers, basements or confined areas.

A vapor suppressing foam may be used to reduce vapors.

Keep out of low areas.

Section 7. Handling and storage

Precautions for safe handling

Preventive measures

(Exposure Control for handling personnel)

Do not breathe vapors/fume.

(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

Obtain special instructions before use.

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.

Use personal protective equipment as required.

When using do not eat, drink or smoke.

Any incompatibilities

Strong oxidizing agents, Halogens, Halogenated hydrocarbons, Nitrates should not be mixed with the chemicals.

Advice on general occupational hygiene

Wash contaminated parts thoroughly after handling.
Do not eat, drink or smoke when using this product.
Take off contaminated clothing and wash it before reuse.

Storage**Conditions for safe storage**

Store in a well-ventilated place. Keep container tightly closed.
Keep cool. Protect from sunlight.
Store in accordance with local/national regulation.
Store locked up.

Container and packaging materials for safe handling data is not available.

Specific end use(s)

See information in Section 7.1 and 7.2 for handling and storage recommendations. See Section 8 for exposure controls and personal protection recommendations.

Section 8. Exposure controls/personal protection**Control parameters****Control value**

Japan control value (1995) ≤ 10 ppm

Adopted value

JSOH(1974) 10ppm; 30mg/m³ (dermal)
ACGIH(2018) TWA: 5ppm (Liver dam; eye & URT irr)

Notation...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**Respiratory protection**

Wear respiratory protection.
Wear positive pressure self-contained breathing apparatus (SCBA).

Hand protection

Wear protective gloves. Recommended material(s): butyl rubber
Inspect before use and replace worn or damaged gloves.
Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions.

Eye protection

Wear safety glasses with side-shields.
Wear eye/face protection.

Skin and body protection

Wear impervious clothing and boots in case of repeated or prolonged treatment.

Section 9. Physical and Chemical Properties**Information on basic physical and chemical properties**

Physical state: Liquid

Color: Colorless~Yellow

Odor: Characteristic odor

Odor threshold: 300 mg/m³

Melting point/Freezing point: -61°C
Boiling point or initial boiling point: 153°C
Boiling range data is not available.
Flammability (gases, liquids and solids): Ignitable
Lower and upper explosion limit/flammability limit:
 Lower explosion limit: 2.2vol %
 Upper explosion limit: 16vol %
Flash point: (C.C.) 58°C
Auto-ignition temperature: 445°C
Decomposition temperature data is not available.
Self-Accelerating Decomposition Temperature/SADT data is not available.
pH: 7 (200g/L, 20°C)
Dynamic viscosity: 0.92mPas(20°C)
Kinematic viscosity: 0.85mm²/s(25°C)
Solubility:
 Solubility in water: Miscible [1000g/liter(25°C)]
 Solubility in solvent: Very soluble in ethanol and diethyl ether.
n-Octanol/water partition coefficient: log Pow-0.87
Vapor pressure: 0.49 kPa (25°C)
Density and/or relative density: 0.95g/cm³(20°C)
Relative vapor density (Air=1): 2.5
Relative density of the Vapor/air - mixture at 20°C (Air = 1): 1.00
Particle characteristics data is not available.
Other information
 Critical temperature data is not available.
 Evaporation rate data is not available.
 VOC data is not available.

Section 10. Stability and Reactivity

Reactivity

Runaway polymerization will not occur.

Chemical stability

Stable under normal storage/handling conditions.

Flammable.

Possibility of hazardous reactions

Decomposes on heating. This produces toxic fumes.

Reacts violently with strong oxidants, halogens, halogenated hydrocarbons and nitrates.

Attacks some plastics(e.g. Polyvinyl chloride) and rubber(e.g. Natural rubber and Nitrile rubber).

Conditions to avoid

Contact with incompatible materials.

Open flames. Heating. Sparks.

Incompatible materials

Strong oxidizing agents. Halogens, Halogenated hydrocarbons, Nitrates.

Hazardous decomposition products

Carbon oxides, Nitrogen oxides

Section 11. Toxicological Information

Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)

[Product]

Based on available data, the classification criteria are not met.

[Data for components of the product]
[GHS Cat. Japan, base data]
rat LD50=3000~7170 mg/kg (EHC 114, 1991)

Acute toxicity (Dermal)

[Product]
Based on available data, the classification criteria are not met.

[Data for components of the product]
[GHS Cat. Japan, base data]
rat LD50=3500mg/kg (MOE risk assessment vol.1, 2002)

Acute toxicity (Inhalation)

[Product]
Category 3, Toxic if inhaled
[Data for components of the product]
[GHS Cat. Japan, base data]
vapor: mouse LC50=4.7mg/L/4hr (HSDB, 2005)

Labor standard law, Japan; Toxic
N,N-Dimethylformamide

Irritant properties

Skin corrosion/irritation
[Product]
Category 2, Causes skin irritation
[Data for components of the product]
[GHS Cat. Japan, base data]
human : mild~moderate irritation (ACGIH, 2018 et al.)

Serious eye damage/irritation

[Product]
Category 2B, Causes eye irritation
[Data for components of the product]
[GHS Cat. Japan, base data]
rabbit : big water blister recover after 48 hours (REACH Registration dossier, Accessed Dec. 2018)

Sensitization

Respiratory sensitization
[Product]
Classification not possible (Insufficient data available or no data available).
[Data for components of the product]
No data available.

Skin sensitization

[Product]
Classification not possible (Insufficient data available or no data available).
[Data for components of the product]
No data available.

Germ cell mutagenicity

[Product]
Category 2, Suspected of causing genetic defects
[Data for components of the product]
[GHS Cat. Japan, base data]
cat. 2; CERI/NITE Hazard Assessment Report No.8, 2005

Carcinogenicity

[Product]
Category 1B, May cause cancer
[Data for components of the product]
[GHS Cat. Japan, base data]
cat.1B; (MHLW carcinogenicity examination, 2000)

[IARC]

Group 2A : Probably carcinogenic to humans

[ACGIH]

A3(2018) : Confirmed Animal Carcinogen with Unknown Relevance to Humans

[JSOH]

Group 2A: The agents which are probably or possibly carcinogenic to humans

Reproductive toxicity

[Product]

Category 1B, May damage fertility or the unborn child

[Data for components of the product]

[GHS Cat. Japan, base data]

cat. 1B; CERI/NITE Hazard Assessment Report No.8, 2005

Specific target organ toxicity (STOT)

STOT-single exposure

[Product]

Category 1, Causes damage to organs

Category 2, May cause damage to organs

[Data for components of the product]

[cat.1]

[GHS Cat. Japan, base data]

liver (CERI/NITE Hazard Assessment Report No.8, 2005)

[cat.2]

[GHS Cat. Japan, base data]

respiratory system (CERI/NITE Hazard Assessment Report No.8, 2005)

STOT-repeated exposure

[Product]

Category 1, Causes damage to organs through prolonged or repeated exposure

[Data for components of the product]

[cat.1]

[GHS Cat. Japan, base data]

liver (CERI/NITE Hazard Assessment Report No.8, 2005)

Aspiration hazard

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

No data available.

Section 12. Ecological Information

Toxicity

Aquatic toxicity

[Product]

Classification not possible (Insufficient data available or no data available).

[Data for components of the product]

Hazardous to the aquatic environment (Acute)

[GHS Cat. Japan, base data]

Fish (*Oryzias latipes*) LC50 > 100mg/L/96hr (MOE eco-toxicity tests of chemicals, 1995 et al.)

Water solubility

[Data for components of the product]

100 g/100 ml (PHYSPROP_DB, 2005)

Persistence and degradability

[Data for components of the product]

BOD_Degradation: 4.4% (Registered chemicals data check & review, Japan)

Bioaccumulative potential

[Data for components of the product]

BCF=0.3~0.8 (conc. 20 ppm), 0.3~1.2 (conc. 2 ppm) (Registered chemicals data check & review, Japan);

log Pow=-0.87 (ICSC, 2014)

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 in accordance with local/national regulation.

Section 14. Transport Information

UN No., UN CLASS

UN No. or ID No.: 2265

UN Proper Shipping Name : N,N-DIMETHYLFORMAMIDE

Class or division (Transport hazard class) : 3

Packing group : III

ERG GUIDE No.: 129

IMDG Code (International Maritime Dangerous Goods Regulations)

UN No.: 2265

Proper Shipping Name : N,N-DIMETHYLFORMAMIDE

Class or division : 3

Packing group : III

IATA Dangerous Goods Regulations

UN No.: 2265

Proper Shipping Name : N,N-DIMETHYLFORMAMIDE

Class or division : 3

Hazard labels : Flamm.liquid

Packing group : III

Environmental hazards

MARPOL Annex III – Prevention of pollution by harmful substances

Marine pollutants (yes/no) : no

MARPOL Annex V – Prevention of pollution by garbage discharge

Carcinogenicity: cat.1, 1A, 1B

N,N-Dimethylformamide

Reproductive toxicity: cat.1, 1A, 1B

N,N-Dimethylformamide

Specific target organ toxicity – repeated exposure: cat.1

N,N-Dimethylformamide

Maritime transport in bulk according to IMO instruments

Noxious Liquid ; Cat. Y

N,N-Dimethylformamide(Y-251)

Section 15. Regulatory Information

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

List of substances subject to authorisation (REACH, Annex XIV)/SVHC – candidate list

Toxic for reproduction (Article 57c)

N,N-Dimethylformamide

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

Chemicals listed in TSCA Inventory

68-12-2

All components are listed or exempted.

Superfund Amendments and Reauthorizations Act (SARA), Title III

SARA 313 (TRI)

N,N-Dimethylformamide

Other regulatory information

We are not able to check up the regulatory information with regard to the substances in your country or region, therefore, we request this matter would be filled by your responsibility.

Regulatory information with regard to this substance in your country or in your region should be examined by your own responsibility.

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

Regulatory information in this section are limited to intentional ingredient(s), but does not contain information on non-intentional ingredients or impurities which are not informed by supplier(s).

Chemical safety assessment

Advice on safe handling for this product can be found in sections 7 and 8 of this SDS.

Section 16. Other information

GHS classification and labelling

H226-Flammable liquids, Category 3: H226 Flammable liquid and vapour

H331-Acute toxicity, Category 3: H331 Toxic if inhaled

H315-Skin corrosion/irritation, Category 2: H315 Causes skin irritation

H320-Serious eye damage/eye irritation, Category 2B: H320 Causes eye irritation

H341-Germ cell mutagenicity, Category 2: H341 Suspected of causing genetic defects

H350-Carcinogenicity, Category 1B: H350 May cause cancer

H360-Reproductive toxicity, Category 1B H360 May damage fertility or the unborn child

H370-STOT – single exposure, Category 1: H370 Causes damage to organs

H371-STOT – single exposure, Category 2: H371 May cause damage to organs

H372-STOT – Repeated exposure, Category 1: H372 Causes damage to organs through prolonged or repeated exposure

References and sources for data

Globally Harmonized System of classification and labelling of chemicals, UN

Recommendations on the TRANSPORT OF DANGEROUS GOODS 21th edit., 2019 UN

IMDG Code, 2018 Edition (Incorporating Amendment 39-18)

IATA Dangerous Goods Regulations (62nd Edition) 2021

2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)

2022 TLVs and BEIs. (ACGIH)

JIS Z 7252 : 2019

JIS Z 7253 : 2019

2021 Recommendation on TLVs (JSOH)

Supplier's data/information

Chemicals safety data management system "GHS Assistant" Version 4.19 (<https://www.asahi-ghs.com/>)

NITE Chemical Risk Information Platform "NITE-CHRIP"

(https://www.nite.go.jp/en/chem/chrip/chrip_search/systemTop)

GHS Classification Guidance for Enterprises 2019 Revised Edition (Ver. 2.0) (Mar. 2020, METI)

Abbreviations and acronyms

SDS (Safety Data Sheet)
LD50 (Lethal Dose, 50%)
LC50 (Lethal Concentration, 50%)
IARC (International Agency for Research on Cancer)
ACGIH (American Conference of Governmental Industrial Hygienists)
EPA (US Environmental Protection Agency)
NTP (US National Toxicology Program)
JSOH (Japan Society for Occupational Health)
EU (European Union)
EC50 (Effective Concentration, 50%)
NOEC (No Observed Effect Concentration)
BOD (Biochemical Oxygen Demand)
COD (Chemical Oxygen Demand)
BCF (Bioconcentration Factor)
anh (anhydride)

General Disclaimer

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 Japan official data (NITE published in 2021).