Date of issue for the 1st edition : 20/Nov/2013
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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_E1-6

Product type:

Reagent

Recommended use of the chemical and restrictions on use

Recommended uses: Research and Development

Restrictions on uses: Do not use for other purposes.

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

Telephone number: +81-48-986-6161

FAX: +81-48-989-2787

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

Section 2. Hazards identification

Classification of the substance or mixture

PHYSICAL AND CHEMICAL HAZARDS

Flammable liquids: Category 3

HEALTH HAZARDS

Acute toxicity (Dermal): Category 4

Acute toxicity (Inhalation): Category 3

Skin corrosion/irritation: Category 2

Serious eye damage/eye irritation: Category 2

Carcinogenicity: Category 1B

Reproductive toxicity: Category 1B

Specific target organ toxicity - single exposure: Category 1 (respiratory organs, liver, gastrointestinal tract)

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

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

Label elements

Hazard pictograms:

Signal word: Danger

Hazard statements

H226-Flammable liquid and vapor

H312-Harmful in contact with skin

H331-Toxic if inhaled

H315-Causes skin irritation

H319-Causes serious eye irritation

H350-May cause cancer

H360-May damage fertility or the unborn child

H370-Causes damage to organs

H372-Causes damage to organs through prolonged or repeated exposure

Precautionary statements

Prevention

Obtain, read and follow all safety instructions before use.
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 hands thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
Wash hands thoroughly after handling. Do not touch eyes.
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.
IF exposed or concerned: Get emergency medical help immediately.
IF exposed or concerned, get medical advice.
Get medical help if you feel unwell.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF ON SKIN: Wash with plenty of water.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water or shower.
If skin irritation occurs: Get medical help.
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 help.

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/regional/national/international regulations.

Section 3. Composition/information on ingredients

Substance/mixture:

Substance

Ingredient name:N,N-Dimethylformamide
Content (%):100
Chemical formula:C3H7NO
ENCS:2-680
CAS No.:68-12-2
MW:73.09
EC No.: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

IF exposed or concerned, get medical advice.
IF exposed or concerned: Get emergency medical help immediately.
Keep victim warm and quiet.
Call emergency medical service.
Effects of exposure (inhalation, ingestion or skin contact) to substance may be delayed.

IF INHALED

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.
Get emergency medical help immediately.

IF ON SKIN

IF ON SKIN: Take off immediately all contaminated clothing. Immediately rinse with water for several minutes.
IF ON SKIN: Wash with plenty of 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.
Get medical help.
If skin irritation or rash occurs: Get medical help.
Remove and isolate contaminated clothing and shoes.

IF IN EYES

IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical help.

IF SWALLOWED

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
IF SWALLOWED: Get medical help.

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.

Indication of any immediate medical attention and special treatment needed

Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.
Specific treatment.

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

Do not use direct water jet.

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

Special extinguishing method

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 a full facepiece operated in the positive pressure mode.

Section 6. Accidental release measures

Personal 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 SAFTY: 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.

Reference to other sections

Refer to section 8

Refer to section 13

Section 7. Handling and storage

Engineering measures

(Measures to prevent operator exposure)

Do not breathe vapors.

(Measures to prevent 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.

(Local ventilation/general ventilation)

Exhaust/ventilator should be available.

(Precautions)

Avoid contact with skin.

Avoid contact with eyes.

Advice on safe handling

Obtain, read and follow all safety instructions before use.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
Use personal protective equipment as required.
When using do not eat, drink or smoke.

Avoidance of contact

See Section 10: Stability and Reactivity.

Advice on general occupational hygiene

Do not get in eyes, on skin, or on clothing.
Wash hands thoroughly after handling. Do not touch eyes.
Do not eat, drink or smoke when using this product.
Take off contaminated clothing and wash it before reuse.

Conditions for safe storage

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

Incompatible substances

Refer to Section 10. Stability and reactivity.

Safe packaging material

Keep only in original packaging.

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

Permissible concentration

Control value and Concentration standard value under ISHA

Japan control value　10ppm

Occupational exposure limit values

JSOH

10ppm; 30mg/m3 (skin)

ACGIH

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, such as personal protective equipment

Respiratory protection

Select and wear respiratory protection in accordance with approved standards (e.g. JIS T8150).
Recommended respiratory protection：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.

Chemical-resistant, impervious gloves complying with an approved standard (e.g. JIS T8116) should be used.

Eye/face protection

Wear safety glasses with side-shields.

Wear eye/face protection in accordance with approved standards (e.g. JIS T8147).

Skin and body protection

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

Personal protective equipment for the body and skin should be selected based on the task being performed and the risks involved.

Section 9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state: Liquid

Color: Colorless～Yellow

Odor: Characteristic odor

Odor threshold: 300mg/m3

Melting point/Freezing point: -61℃

Boiling point or initial boiling point and boiling range: 153℃

Flammability: Ignitable

Lower and upper explosion limit:

Lower explosion limit: 2.2vol %

Upper explosion limit: 16vol %

Flash point: 58℃(Closed cup)

Auto-ignition temperature: 445℃

Decomposition temperature data is not available.

pH: 7 (200g/L, 20℃)

Dynamic viscosity: 0.802mPa･s(25℃)

Kinematic viscosity: 0.85mm2/s(25℃)

Solubility:

Solubility in water: Miscible.

Solubility in solvent: Very soluble in ethanol and diethyl ether.

Partition coefficient n-octanol/water (log value): -0.87

Vapor pressure: 0.49 kPa (25℃)

Density and/or relative density: 0.95g/cm3(20℃)

Relative vapor density (Air=1): 2.5

Relative density of the Vapor/air - mixture at 20℃ (Air = 1): 1.00

Particle characteristics 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

Avoid direct sunlight, fire, flame, high temperature.

Contact with incompatible materials.

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]

[NITE-CHRIP]

rat LD50: 3010 mg/kg (source: NITE)

Acute toxicity (Dermal)

[Product]

Category 4, Harmful in contact with skin

[Data for components of the product]

[NITE-CHRIP]

female rabbit LD50: 1500 mg/kg (source: NITE)

Acute toxicity (Inhalation)

[Product]

Category 3, Toxic if inhaled

[Data for components of the product]

[NITE-CHRIP]

vapor: rat LC50: 9 - 15 mg/L (4-hour) (source: NITE)

dust/mist: rat LC50: 5000 ppm (4-hour) (source: NITE)

Skin corrosion/irritation

[Product]

Category 2, Causes skin irritation

[Data for components of the product]

[NITE-CHRIP]

Category 2 (source: NITE)

Serious eye damage/irritation

[Product]

Category 2, Causes serious eye irritation

[Data for components of the product]

[NITE-CHRIP]

Category 2 (source: NITE)

Respiratory or skin 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]

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

[Data for components of the product]
No data available.

Carcinogenicity

[Product]
Category 1B, May cause cancer

[Data for components of the product]
[NITE-CHRIP]
Category 1B (source: NITE)
[IARC]
Group 2A : Probably carcinogenic to humans
[ACGIH]
A3: 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]
[NITE-CHRIP]
Category 1B (source: NITE)

Specific target organ toxicity - single exposure

[Product]
Category 1, Causes damage to organs

[Data for components of the product]
[NITE-CHRIP]
Category 1 (gastrointestinal tract, liver, respiratory system) (source: NITE)

Specific target organ toxicity - repeated exposure

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

[Data for components of the product]
[NITE-CHRIP]
Category 1 (liver) (source: NITE)

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

Ecotoxicity

Aquatic toxicity

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

[Data for components of the product]
Hazardous to the aquatic environment, short-term (acute)
[NITE-CHRIP]
Fish (Oryzias latipes) 96-hour LC50: > 100 mg/L (OECD TG 203, GLP) (source: NITE)
Crustacea (Daphnia magna) 48-hour EC50: > 100 mg/L (OECD TG 202, GLP) (source: NITE)
Algae (Raphidocelis subcapitata) 72-hour ErC50: > 1000 mg/L (OECD TG 201, GLP) (source: NITE)

Hazardous to the aquatic environment, long-term (chronic)
[NITE-CHRIP]
Crustacea (Daphnia magna) 21-day NOEC: > 1000 mg/L (OECD TG 202, GLP) (source: NITE)
Algae (Raphidocelis subcapitata) 72-hour NOErC: 1000 mg/L (OECD TG 201, GLP) (source: NITE)

Water solubility

[Data for components of the product]

miscible (source: ICSC, 2014)

Persistence and degradability

[Data for components of the product]

Rapidly degradable (Degradation rate: 4% (14-day), 100% (21-day) (by DOC))(OECD TG 301E)(source: NITE)

Bioaccumulative potential

[Data for components of the product]

log Pow: -0.87 (source: 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

Waste treatment methods

Waste from residues

Disposal should be in accordance with local, national, and international laws and regulations.
Comply with relevant laws and regulations as well as local municipal standards.
Do not dump into sewers, on the ground or into any body of water.

Contaminated packing

Disposal should be in accordance with local, national, and international laws and regulations.
Comply with relevant laws and regulations as well as local municipal standards.
Dispose of container after using the contents completely.

Section 14. Transport Information

UNRTDG

UN number : UN2265
UN Proper Shipping Name : N,N-DIMETHYLFORMAMIDE
Transport hazard class(es) : 3
Packing group : III

IMDG Code (International Maritime Dangerous Goods Regulations)

UN number : UN2265
UN Proper Shipping Name : N,N-DIMETHYLFORMAMIDE
Transport hazard class(es) : 3
Packing group : III

IATA (Dangerous Goods Regulations)

UN number : UN2265
UN Proper Shipping Name : N,N-DIMETHYLFORMAMIDE
Transport hazard class(es) : 3
Hazard labels : Flamm. liquid
Packing group : III

Environmental hazards

Marine pollutants (yes/no) : no
Environmentally hazardous substance/mixture (yes/no) : no

Special precautions for user

No information available.

Maritime transport in bulk according to IMO instruments

MARPOL Annex II - Noxious Liquid Substances

Noxious Liquid Substances ; Cat. Y
N,N-Dimethylformamide

MARPOL Annex V - HME (Harmful to the Marine Environment)
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
ERG GUIDE No.: 129

Section 15. Regulatory Information

Labor Standards Act, Japan
Chemical substances or compounds (including alloys) causing disease (item (iv)-1 of Appended Table 1-2 of Regulation)
N,N-Dimethylformamide
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 vapor
H312-Acute toxicity, Category 4: H312 Harmful in contact with skin
H331-Acute toxicity, Category 3: H331 Toxic if inhaled
H315-Skin corrosion/irritation, Category 2: H315 Causes skin irritation
H319-Serious eye damage/eye irritation, Category 2: H319 Causes serious eye irritation
H350-Carcinogenicity, Category 1B: H350 May cause cancer
H360-Reproductive toxicity, Category 1B: H360 May damage fertility or the unborn child
H370-Specific target organ toxicity - single exposure, Category 1: H370 Causes damage to organs
H372-Specific target organ toxicity - 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 23rd edit., 2023 UN
IMDG Code, 2024 Edition (Incorporating Amendment 42-24)
IATA Dangerous Goods Regulations (67th Edition) 2026
2024 EMERGENCY RESPONSE GUIDEBOOK (US DOT)
2026 TLVs and BEIs. (ACGIH)
JIS Z 7252 : 2025
JIS Z 7253 : 2025
Recommendation of occupational exposure limits (2024-2025) (JSOH)
Notification No. 0111-1 (January 11, 2022), Chemical Hazards Control Division, Industrial Safety and Health Department, Labour Standards Bureau, MHLW in Japan
Supplier's data/information
Chemicals safety data management system "GHS Assistant" Version 4.38 (https://www.asahi-ghs.com/)
NITE Chemical Risk Information Platform "NITE-CHRIP" (https://www.chem-info.nite.go.jp/en/chem/chrip/chrip_search/systemTop)
GHS Classification Guidance for Enterprises 2019 Revised Edition (Ver. 2.1) (May. 2024, METI)

Abbreviations and acronyms

ACGIH - American Conference of Governmental Industrial Hygienists;
anh - anhydride;
ATE - Acute Toxicity Estimate;
BCF - Bioconcentration Factor;
BOD - Biochemical Oxygen Demand;
Cat. - Category;
Ceiling-C - Ceiling value;
COD - Chemical Oxygen Demand;
CSCL - Chemical Substances Control Law in Japan;
DSEN - Dermal Sensitization;
EC No. - The European Community number;
EC50 - Effective Concentration 50;
ENCS - Existing and New Chemical Substances Inventory under CSCL
EPA - US Environmental Protection Agency;
EU - European Union;
GHS - Globally Harmonized System of Classification and Labelling of Chemicals;
IARC - International Agency for Research on Cancer;
IATA - International Air Transport Association;
IBC Code - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk;
IMDG Code - International Maritime Dangerous Goods Code;
ISHA - Industrial Safety and Health Act in Japan;
JSOH - Japan Society for Occupational Health;
LC50 - Lethal Concentration 50;
LD50 - Lethal Dose 50;
logPow - n-Octanol/water Partition Coefficient;
MARPOL - International Convention for the Prevention of Pollution from Ships;
METI - Ministry of Economy, Trade and Industry in Japan;
MHLW - Ministry of Health, Labour and Welfare in Japan;
MOE - Ministry of the Environment in Japan
NOEC - No Observed Effect Concentration;
NTP - US National Toxicology Program;
REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No.1907/2006;
RSEN - Respiratory Sensitization;
Skin - Danger of cutaneous absorption;
STEL - Short-term Exposure Limit;
STOT - Specific target organ toxicity;

SVHC - Substance of Very High Concern under REACH;
TWA - time-weighted average;
UN - United Nations;
UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods;

General Disclaimer

The information relates to this specific material. It may not be valid for this material, if used in combination with any other materials or in any process. It is the user's responsibility to satisfy him-selves as to the suitability and completeness of this information for his own particular use.

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 FY2024).