

Chemical Safety Data Sheet MSDS / SDS

N,N-Dimethylformamide

Revision Date:2025-01-11 Revision Number:1

SECTION 1: Identification of the substance/mixture and of the company/undertaking**Product identifier**

Product name : N,N-Dimethylformamide
CBnumber : CB2854115
CAS : 68-12-2
EINECS Number : 200-679-5
Synonyms : DMF, Dimethylformamide

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

Relevant identified uses : For R&D use only. Not for medicinal, household or other use.
Uses advised against : none

Company Identification

Company : Chemicalbook
Address : Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing
Telephone : 400-158-6606

SECTION 2: Hazards identification**GHS Label elements, including precautionary statements**

Symbol(GHS)



Signal word

Danger

Precautionary statements

P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/sparks/open flames/hot surfaces. — No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Wash hands thoroughly after handling.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.

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

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

P303+P361+P353 IF ON SKIN (or hair): Remove/Take off Immediately all contaminated clothing. Rinse SKIN with water/shower.

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

Continuerinsing.

P307+P311 IF exposed: call a POISON CENTER or doctor/physician.

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

P370+P378 In case of fire: Use ... for extinction.

P403+P233 Store in a well-ventilated place. Keep container tightly closed.

P405 Store locked up.

P501 Dispose of contents/container to.....

Hazard statements

H226 Flammable liquid and vapour

H302 Harmful if swallowed

H312 Harmful in contact with skin

H318 Causes serious eye damage

H319 Causes serious eye irritation

H331 Toxic if inhaled

H332 Harmful if inhaled

H341 Suspected of causing genetic defects

H360 May damage fertility or the unborn child

H370 Causes damage to organs

H372 Causes damage to organs through prolonged or repeated exposure

Disposal

WARNING.Cancer - <https://oehha.ca.gov/proposition-65/chemicals/nn-dimethylformamide>

SECTION 3: Composition/information on ingredients

Substance

| | |
|--------------|------------------------------------|
| Product name | : N,N-Dimethylformamide |
| Synonyms | : DMF, Dimethylformamide |
| CAS | : 68-12-2 |
| EC number | : 200-679-5 |
| MF | : C ₃ H ₇ NO |
| MW | : 73.09 |

SECTION 4: First aid measures

Description of first aid measures

General advice

Show this material safety data sheet to the doctor in attendance.

If inhaled

After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact

In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

In case of eye contact

After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

If swallowed

After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing media

Water Foam Carbon dioxide (CO₂) Dry powder

Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

Special hazards arising from the substance or mixture

Carbon oxides Nitrogen oxides (NO_x) Combustible.

Vapors are heavier than air and may spread along floors. Forms explosive mixtures with air at elevated temperatures.

Development of hazardous combustion gases or vapours possible in the event of fire.

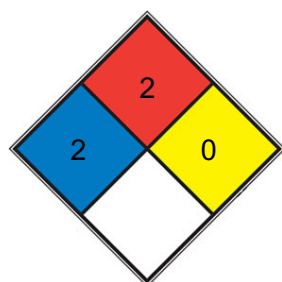
Advice for firefighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information

Remove container from danger zone and cool with water. Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

NFPA 704



■ HEALTH 2 Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury (e.g. [diethyl](#)

[ether](#), ammonium phosphate, iodine)

Must be moderately heated or exposed to relatively high ambient temperature before ignition can occur and multiple finely

☒ FIRE 2 divided suspended solids that do not require heating before ignition can occur. Flash point between 37.8 and 93.3 °C (100 and 200 °F). (e.g. diesel fuel, [sulfur](#))

☒ REACT 0 Normally stable, even under fire exposure conditions, and is not reactive with water (e.g. helium, [N2](#))

☐ SPEC.

☐ HAZ.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition.

Evacuate the danger area, observe emergency procedures, consult an expert. For personal protection see section 8.

Environmental precautions

Do not let product enter drains. Risk of explosion.

Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g.

Chemisorb?). Dispose of properly. Clean up affected area.

Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

Precautions for safe handling

Advice on safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

For precautions see section 2.2.

Conditions for safe storage, including any incompatibilities

Storage conditions

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Keep locked up or in an area accessible only to qualified or authorized persons.

Handle and store under inert gas.

Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

control parameter

Hazard composition and occupational exposure limits

Does not contain substances with occupational exposure limits.

Exposure controls

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Full contact

Material: butyl-rubber

Minimum layer thickness: 0,7 mm Break through time: 480 min Material tested: Butoject? (KCL 898)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Splash contact Material: Viton?

Minimum layer thickness: 0,7 mm Break through time: 240 min

Material tested: Vitoject? (KCL 890 / Aldrich Z677698, Size M)

Body Protection

Flame retardant antistatic protective clothing.

Respiratory protection

Recommended Filter type: Filter A-(P2)

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer.

These measures have to be properly documented.

Control of environmental exposure

Do not let product enter drains. Risk of explosion.

Exposure limits

NIOSH REL: TWA 10 ppm (30 mg/m³), IDLH 500 ppm; OSHA PEL: TWA 10 ppm; ACGIH TLV: TWA 10 ppm (adopted).

SECTION 9: Physical and chemical properties

Information on basic physicochemical properties

| | |
|--|---|
| Appearance | colorless liquid, clear |
| Odour | amine-like |
| Odour Threshold | 0,329 ppm |
| pH | 7 at 200 g/l at 20 °C |
| Melting point/freezing point | Melting point/range: -61 °C |
| Initial boiling point and boiling range | 153 °C |
| Flash point | 57,5 °C - closed cup - DIN 51755 Part 2 |
| Evaporation rate | No data available |
| Flammability (solid, gas) | No data available |
| Upper/lower flammability or explosive limits | Upper explosion limit: 16 %(V) Lower explosion limit: 2,2 %(V) |
| Vapour pressure | 3,77 hPa at 20 °C |
| Vapour density | 2,52 - (Air = 1.0) |
| Relative density | 0,944 g/mL No data available |
| Water solubility | 1.000 g/l at 20 °C completely miscible |
| Partition coefficient: n-octanol/water | log Pow: -0,85 at 25 °C - Bioaccumulation is not expected. |
| Autoignition temperature | 435 °C at 1.013 hPa - DIN 51794 |
| Decomposition temperature | >350 °C - |
| Viscosity | Viscosity, kinematic: No data available Viscosity, dynamic: 0,86 mPa.s at 20 °C |
| Explosive properties | No data available |
| Oxidizing properties | No data available |
| λ_{max} | λ : 270 nm Amax: 1.00 λ : 275 nm Amax: 0.30 λ : 295 nm Amax: 0.10 λ : 310 nm Amax: 0.05 λ : 340-400 nm Amax: 0.01 |

Other safety information

Relative vapor density
2,52 - (Air = 1.0)

SECTION 10: Stability and reactivity

Reactivity

Vapor/air-mixtures are explosive at intense warming.

Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

Possibility of hazardous reactions

Violent reactions possible with:

Alkali metals halogens halides Reducing agents

triethylaluminium nitrates

metallic oxides nonmetallic oxides Halogenated hydrocarbon Isocyanates

sodium

Sodium borohydride hydrides

Oxidizing agents Oxides of phosphorus

A risk of explosion and/or of toxic gas formation exists with the following substances: azides

Bromine Chlorine

chromium(VI) oxide potassium permanganate triethylaluminium chlorates

Halogenated hydrocarbon with

Iron

Conditions to avoid

Heating.

Incompatible materials

various plastics, Copper, Copper alloys, Tin

Hazardous decomposition products

In the event of fire: see section 5

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity

LD50 Oral - Rat - male and female - 3.010 mg/kg (OECD Test Guideline 401)

Symptoms: Gastrointestinal disturbance

Acute toxicity estimate Inhalation - 4 h - 11,1 mg/l (Expert judgment)

Remarks: (Regulation (EC) No 1272/2008, Annex VI) LD50 Dermal - Rabbit - 1.500 mg/kg

Remarks: (Regulation (EC) No 1272/2008, Annex VI) (IUCLID)

Skin corrosion/irritation

Skin - Rabbit

Result: No skin irritation - 20 h Remarks: (ECHA)

Serious eye damage/eye irritation

Eyes - Rabbit Result: Eye irritation Remarks: (ECHA)

(Regulation (EC) No 1272/2008, Annex VI)

Respiratory or skin sensitization

(OECD Test Guideline 406)

Germ cell mutagenicity

Test Type: sister chromatid exchange assay Test system: Chinese hamster ovary cells

Metabolic activation: with and without metabolic activation Result: negative

Remarks: (ECHA)

Test Type: unscheduled DNA synthesis assay Test system: human diploid fibroblasts

Metabolic activation: with and without metabolic activation Result: negative

Remarks: (ECHA) Test Type: Ames test

Test system: Salmonella typhimurium

Metabolic activation: with and without metabolic activation Result: negative

Remarks: (ECHA)

Test Type: Micronucleus test Species: Mouse

Cell type: Bone marrow

Application Route: Intraperitoneal injection

Result: negative Remarks: (ECHA)

Test Type: dominant lethal test Species: Rat

Application Route: Inhalation Result: negative

Remarks: (ECHA)

Test Type: dominant lethal test Species: Mouse

Application Route: Intraperitoneal Result: negative

Remarks: (ECHA)

Test Type: Micronucleus test Species: Mouse

Application Route: Intraperitoneal Result: negative

Remarks: (ECHA)

Carcinogenicity

No data available

Reproductive toxicity

May damage the unborn child.

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Toxicity

LD50 in mice, rats (ml/kg): 6.8, 7.6 orally; 6.2, 4.7 i.p. (Bartsch)

SECTION 12: Ecological information

Toxicity**Toxicity to fish**

flow-through test LC50 - Lepomis macrochirus (Bluegill sunfish) -

7.100 mg/l - 96 h (US-EPA)

Toxicity to daphnia and other aquatic invertebrates

static test EC50 - *Daphnia magna* (Water flea) - 13.100 mg/l - 48 h (OECD Test Guideline 202)

Toxicity to algae

static test ErC50 - *Desmodesmus subspicatus* (green algae) - >

1.000 mg/l - 72 h (DIN 38412)

Toxicity to bacteria

static test EC50 - *Vibrio fischeri* - 12.300 - 17.500 mg/l - 5 min Remarks: (ECHA)

Persistence and degradability

Biodegradability aerobic - Exposure time 21 d

Result: 100 % - Readily biodegradable. (OECD Test Guideline 301E)

Biochemical Oxygen Demand (BOD)

Theoretical oxygen demand

900 mg/g Remarks: (Lit.)

1.863 mg/g Remarks: (Lit.)

Bioaccumulative potential

Bioaccumulation *Cyprinus carpio* (Carp) - 56 d

at 25 °C - 0,002 mg/l(N,N-dimethylformamide)

Bioconcentration factor (BCF): 0,3 - 1,2 (OECD Test Guideline 305C)

Remarks: Does not significantly accumulate in organisms.

Mobility in soil

No data available

Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Toxics Screening Level

The initial threshold screening level (ITSL) for N,N-Dimethylformamide (DMF) is 30 µg/m³ with an annual averaging time (AT). The ITSL was established on 8/23/90, at 30 µg/m³ with a 24-hr AT as per the default AT (Rule 232(2)(b)).

Other adverse effects

Stability in water - ca.50 d

Remarks: reaction with hydroxyl radicals(calculated)(Lit.)

SECTION 13: Disposal considerations

Waste treatment methods

Product

See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

Incompatibilities

Though stable at normal temperatures and storage conditions, DMF may react violently with halogens, acyl halides, strong oxidizers, and polyhalogenated compounds in the presence of iron. Decomposition products include toxic gases and vapors such as dimethylamine and carbon monoxide. DMF will attack some forms of plastics, rubber, and coatings.

Waste Disposal

Excess DMF and waste material containing this substance should be placed in an appropriate container, clearly labeled, and handled according to your institution's waste disposal guidelines.

SECTION 14: Transport information

UN number

ADR/RID: 2265 IMDG: 2265 IATA: 2265

UN proper shipping name

| | | |
|------|--|-----------|
| | ADR/RID: N,N-DIMETHYLFORMAMIDE IMDG: N,N-DIMETHYLFORMAMIDE | |
| | IATA: N,N-Dimethylformamide | |
| 14.3 | Transport hazard class(es) | |
| | ADR/RID: 3 IMDG: 3 | IATA: 3 |
| 14.4 | Packaging group | |
| | ADR/RID: III IMDG: III | IATA: III |
| 14.5 | Environmental hazards | |
| | ADR/RID: no IMDG Marine pollutant: no | IATA: no |
| 14.6 | Special precautions for user | |
| | No data available | |

SECTION 15: Regulatory information

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

Regulations on the Safety Management of Hazardous Chemicals

China Catalog of Hazardous chemicals 2015: Listed. website: <https://www.mem.gov.cn/>

Measures for Environmental Management of New Chemical Substances

Chinese Chemical Inventory of Existing Chemical Substances (China IECSC): Listed. website: <https://www.mee.gov.cn/>

EC Inventory: Listed.

European Inventory of Existing Commercial Chemical Substances (EINECS): Listed. website: <https://echa.europa.eu/>

Korea Existing Chemicals List (KECL): Listed. website: <http://ncis.nier.go.kr>

New Zealand Inventory of Chemicals (NZIoC): Listed. website: <https://www.epa.govt.nz/>

Philippines Inventory of Chemicals and Chemical Substances (PICCS): Listed. website: <https://emb.gov.ph/>

United States Toxic Substances Control Act (TSCA) Inventory: Listed. website: <https://www.epa.gov/>

Vietnam National Chemical Inventory: Listed. website: <https://chemicaldata.gov.vn/>

SECTION 16: Other information

Abbreviations and acronyms

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

CAS: Chemical Abstracts Service

EC50: Effective Concentration 50%

IATA: International Air Transportation Association

IMDG: International Maritime Dangerous Goods

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

STEL: Short term exposure limit

TWA: Time Weighted Average

References

【1】 CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

【2】 ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

【3】 ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

【4】 eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website:

http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

【5】 ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>

【6】 Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

【7】 HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

【8】 IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

【9】 IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

【10】 Sigma-Aldrich, website: <https://www.sigmaaldrich.com/>

Other Information

The symptoms of poisoning do not become manifest until a few hours or even days have passed. Use of alcoholic beverages enhances the harmful effect.

Disclaimer:

The information in this MSDS is only applicable to the specified product, unless otherwise specified, it is not applicable to the mixture of this product and other substances. This MSDS only provides information on the safety of the product for those who have received the appropriate professional training for the user of the product. Users of this MSDS must make independent judgments on the applicability of this SDS. The authors of this MSDS will not be held responsible for any harm caused by the use of this MSDS.