

Safety Data Sheet

Product name: N,N-Dimethylformamide

CAS No.: 68-12-2

Prepared in accordance with GB/T 16483, GB/T 17519

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: Linyi Tuohui New Materials Co., Ltd.
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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. Continue rinsing.

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: C₃H₇NO
- 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

2

0

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.

Chemizorb). 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

- Appearancecolorless liquid, clear
- Odouramine-like
- Odour Threshold0,329 ppm
- pH7 at 200 g/l at 20 °C
- Melting point/freezing pointMelting point/range: -61 °C
- Initial boiling point and boiling range 153 °C
- Flash point57,5 °C - closed cup - DIN 51755 Part 2
- Evaporation rateNo 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 density0,944 g/mL No data available
- Water solubility1.000 g/l at 20 °C completely miscible
- Partition coefficient: n-octanol/waterlog Pow: -0,85 at 25 °C - Bioaccumulation is not expected.
- Autoignition temperature435 °C at 1.013 hPa - DIN 51794
- Decomposition temperature>350 °C -
- ViscosityViscosity, kinematic: No data available Viscosity, dynamic: 0,86 mPa.s at 20 °C
- Explosive propertiesNo data available
- Oxidizing propertiesNo data available
- λ_{max} : 270 nm A_{max} : 1.00
 λ : 275 nm A_{max} : 0.30
 λ : 295 nm A_{max} : 0.10
 λ : 310 nm A_{max} : 0.05
 λ : 340-400 nm A_{max} : 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**Specific target organ toxicity - repeated exposure****Aspiration hazard****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 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.