

Safety Data Sheet

N, N-DIMETHYLFORMAMIDE (DMF)

Section 1 - Chemical Product and Company Identification

SDS Name: N, N-Dimethylformamide

Catalog Numbers: O-913-2B

Company Identification: Transene Company, Inc., DBA ROWLEY BIOCHEMICAL, Inc.
10 ELECTRONICS AVENUE
DANVERS, MA 01923

For information, call: 978-739-4883

Emergency Number: 800-424-9300

For CHEMTREC assistance, call: 800-424-9300

Section 2 - Hazards Identification

GHS Classifications Category

H226-Flammable liquids: 3

H312-Acute toxicity, dermal: 4

H319-Serious eye damage/eye irritation: 2A

H332-Acute toxicity, inhalation: 4

H336-Specific target organ toxicity, single exposure: 3

H350-Carcinogenicity: 1B

H360-Reproductive toxicity: 1B

Pictogram or Hazard Symbols and Hazard Statement(s):



Signal word: Danger

Hazard Statements:

H226-Flammable liquid and vapour

H312-Harmful in contact with skin
H319-Causes serious eye irritation
H332-Harmful if inhaled
H336-May cause drowsiness or dizziness
H350-May cause cancer
H360-May damage fertility or the unborn child

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.
P241-Use explosion-proof electrical/ventilating/lighting/equipment.
P242-Use only non-sparking tools.
P243-Take precautionary measures against static discharge.
P261-Avoid breathing dust/fume/gas/mist/vapours/spray.
P264-Wash thoroughly after handling.
P271-Use only outdoors or in a well-ventilated area.
P280-Wear protective gloves/protective clothing/eye protection/face protection.
P281-Use personal protective equipment as required.
P302+P352-If on skin: Wash with plenty of soap and water.
P303+P361+P353-If on skin (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340-If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338-If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308+P313-If exposed or concerned: Get medical advice/attention.
P312-Call a Poison Center/doctor/physician if you feel unwell.
P337+P313-If eye irritation persists: Get medical advice/attention.
P363-Wash contaminated clothing before reuse.
P370+P378-In case of fire: Use dry chemical, carbon dioxide, dry sand, water spray, or alcohol-resistant foam to extinguish.
P403+P233-Store in a well-ventilated place. Keep container tightly closed.
P403+P235-Store in a well-ventilated place. Keep cool.
P405-Store locked up.
P501-Dispose of contents/container in accordance with local/regional/national/international regulations.

Section 3 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent
68-12-2	N,N-Dimethylformamide	≤100

Section 4 - First Aid Measures

Eye Exposure: In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Seek immediate medical attention.

Dermal Exposure: In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Seek medical advice.

Oral Exposure: If swallowed, seek immediate medical advice. Do NOT induce vomiting.

Inhalation Exposure: If inhaled, remove to fresh air. Seek immediate medical attention.

Section 5 - Fire Fighting Measures

General Information: Containers can build up pressure if exposed to heat and/or fire. As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Vapors can travel to a source of ignition and flash back. Will burn if involved in a fire. Flammable Liquid. Can release vapors that form explosive mixtures at temperatures above the flashpoint. Use water spray to keep fire-exposed containers cool. Containers may explode in the heat of a fire.

Extinguishing Media: Use dry chemical, carbon dioxide, dry sand, water spray or alcohol-resistant foam. Use water spray to cool fire-exposed unopened containers. Do NOT use straight streams of water.

Hazardous Combustion Products: Carbon oxides, nitrogen oxides, irritating toxic fumes and gases.

Flash Point: 57.5°C (CC)

Auto ignition Temperature: 435°C at 1,013 hPa

Explosion Limits, Lower: 2.2 vol %

Upper: 15.2 vol %

NFPA Rating: (estimated) Health: 2; Flammability: 2; Instability: 0

NOTE: Static discharge could act as an ignition source.

Section 6 - Accidental Release Measures

Procedure(s) of Personal Precaution(s):

Wear personal protective equipment. Do not ingest or inhale. Do not get on skin or clothing. Do not get in eyes. Ensure adequate ventilation. Keep away from heat. Eliminate all sources of ignition. Take precautionary measures against static discharges.

Methods for Cleaning up: Absorb with sand, earth, or vermiculite. Carefully sweep up and containerize for proper disposal. Eliminate all sources of ignition. Use spark-proof tools and explosion-proof equipment. Do not release to the environment. Do not release to drains.

Section 7 - Handling and Storage

Use care when handling. Use only under a chemical fume hood. Wash thoroughly after handling. Do not get in eyes, on skin, or on clothing. Do not ingest or inhale vapors. Store capped in a cool, dry, well-ventilated place. Keep away from incompatible materials, ignition sources, or open flame. Protect from heat. Store away from direct sunlight. Use only non-sparking tools. Take precautionary measures against static discharges. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded.

NOTE: Static discharge could act as an ignition source.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Personal Protective Equipment

Eyes: Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a respirator's use.

Exposure Limits:

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
N,N-Dimethylformamide CAS#68-12-2	5 ppm TWA (skin)	10 ppm TWA 30 mg/m ³ TWA 500 ppm IDLH	10 ppm TWA 30 mg/m ³ TWA

OSHA Vacated PELs: N,N-Dimethylformamide: 10 ppm TWA; 30 mg/m³ TWA

Section 9 - Physical and Chemical Properties

Physical State: Liquid

Appearance: Clear, colorless

Odor: Amine-like

Vapor Pressure: 4.9 mbar at 20°C

Odor threshold: 0.329 ppm

Vapor Density: 2.52 (Air=1.0)

pH: 6.5-8.5 at 20°C (20% Aqueous Solution)
Relative density: Not available
Melting point/freezing point: -61°C
Solubility: Soluble in water
Boiling Point: 153°C
Flash point: 57.5°C (CC)
Evaporation Rate: 0.17
Flammability (solid, gas): Not applicable
Partition coefficient: n-octanol/water: log Pow: -0.85 at 25°C
Auto-ignition temperature: 435°C at 1013 hPa
Decomposition temperature: >350°C
Viscosity: 0.8 mPa.s at 20°C
Specific Gravity/Density: 0.945

NOTE: Static discharge could act as an ignition source.

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Incompatible materials, heat, flame, and sparks. Keep away from open flames, hot surfaces, and sources of ignition.

Incompatibilities with Other Materials: Strong oxidizing agents, halogens, halogenated compounds, reducing agents, various plastics, copper, copper alloys, and tin.

Hazardous reactions are possible with: Alkali metals, halogens, halides, reducing agents, triethylaluminum, nitrates, metallic oxides, halogenated hydrocarbons, isocyanates, sodium, sodium borohydride, hydrides.

Toxic gas formation and/or explosion risk with: Azides, bromine, chlorine, chromium(VI) oxide, potassium permanganate, triethylaluminum, chlorates, halogenated hydrocarbons, iron.

Hazardous Decomposition Products: Carbon oxides, nitrogen oxides, irritating toxic fumes and gases.

Section 11 - Toxicological Information

CAS#68-12-2 N,N-Dimethylformamide: RTECS#: LQ2100000

LD50 Oral: 3040 mg/kg (rat)

LD50 Dermal: 1500 mg/kg (rabbit)

LC50 Dermal: 3.2 g/kg (rat)

LC50 Inhalation: >5.58 mg/L 4h (rat)

Carcinogenicity: N,N-Dimethylformamide CAS#68-12-2 is not listed by NTP, or OSHA. N,N-Dimethylformamide is listed by IARC (Group 2A, Probably Carcinogenic to Humans), ACGIH (A3, Animal Carcinogen), and California Prop. 65 as a carcinogen.

Epidemiology: Not available

Teratogenicity: Teratogenic effects have occurred in experimental animals.

Reproductive Effects: Experiments have shown reproductive toxicity on laboratory animals.

Developmental Effects: May damage the unborn child. Developmental effects have occurred in experimental animals.

Neurotoxicity: Not available

Mutagenicity: Not available

Specific Target Organ Toxicity, Single Exposure: Respiratory system and central nervous system.

Specific Target Organ Toxicity, Repeated Exposure: Not available

Note: May be harmful if absorbed through the skin. Gastrointestinal discomfort. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Warning: Intolerance for alcohol can occur up to 4 days after Dimethylformamide exposure. N,N-Dimethylformamide is considered to be a potent liver and kidney toxin.

The toxicological properties of this material have not been thoroughly investigated.

Section 12 - Ecological Information

Ecotoxicity: Do not release to the environment. Do not release to drains.

CAS#68-12-2 N,N-Dimethylformamide:

LC50, freshwater fish: 10.6 g/L 96h (pimephales promelas)

LC50, freshwater fish: 9.8 g/L 96h (oncorhynchus mykiss)

LC50, freshwater fish: 6.3 g/L 96h (lepomis macrochirus)

EC50, freshwater algae: 7500 mg/L 96h

EC50, water flea: 7500 mg/L 48h

EC50, microtox: 2000 mg/L 5min

EC50, microtox: 570 mg/L 240h

Persistence and degradability: Persistence is unlikely, will likely degrade over time.

Bio-accumulative potential: Not available.

Mobility: Will likely be mobile in the environment due to its water solubility.

Section 13 - Disposal Considerations

DISPOSAL: Dispose of in accordance with all federal, state, and local regulations.

Section 14 - Transport Information

DOT

Proper shipping name: N,N-Dimethylformamide

UN2265

PG III

Hazard class 3 (flammable)

Section 15 - Regulatory Information

Canada Regulatory Information

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the SDS contains all the information required by the CPR.

Section 16 - Additional Information

SDS Creation Date: 2-2-12

Revision #1. 2-26-14 YM

Revision #2. 4-13-17

Revision #3. 4-4-22

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