

RECEIVED  
FEB 18 2013

**SIGMA-ALDRICH**

sigma-aldrich.com

**Material Safety Data Sheet**

Version 4.7  
Revision Date 02/05/2013  
Print Date 02/07/2013

**1. PRODUCT AND COMPANY IDENTIFICATION**

Product name : *N,N*-Dimethylformamide  
Product Number : D4551  
Brand : Sigma  
Supplier : Sigma-Aldrich  
3050 Spruce Street  
SAINT LOUIS MO 63103  
USA  
Telephone : +1 800-325-5832  
Fax : +1 800-325-5052  
Emergency Phone # (For both supplier and manufacturer) : (314) 776-6555  
Preparation Information : Sigma-Aldrich Corporation  
Product Safety - Americas Region  
1-800-521-8956

**2. HAZARDS IDENTIFICATION**

**Emergency Overview**

**OSHA Hazards**

Combustible Liquid, Harmful by skin absorption., Irritant, Teratogen

**Target Organs**

Liver, Kidney, Central nervous system, Cardiovascular system., Blood

**Other hazards which do not result in classification**

Rapidly absorbed through skin.

**GHS Classification**

Flammable liquids (Category 3)  
Acute toxicity, Oral (Category 5)  
Acute toxicity, Inhalation (Category 3)  
Acute toxicity, Dermal (Category 4)  
Skin irritation (Category 3)  
Eye irritation (Category 2A)  
Reproductive toxicity (Category 1B)

**GHS Label elements, including precautionary statements**

Pictogram 

Signal word : Danger

Hazard statement(s)  
H226 : Flammable liquid and vapour.  
H303 : May be harmful if swallowed.  
H312 : Harmful in contact with skin.  
H316 : Causes mild skin irritation.  
H319 : Causes serious eye irritation.  
H331 : Toxic if inhaled.  
H360 : May damage fertility or the unborn child.

**Precautionary statement(s)**

P201 : Obtain special instructions before use. **BY:** .....  
P261 : Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.  
P280 : Wear protective gloves/ protective clothing.  
P305 + P351 + P338 : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P311 : Call a POISON CENTER or doctor/ physician.

**HMIS Classification**

Health hazard: 2  
Chronic Health Hazard: +  
Flammability: 2  
Physical hazards: 0

**NFPA Rating**

Health hazard: 2  
Fire: 2  
Reactivity Hazard: 0

**Potential Health Effects**

Inhalation : May be harmful if inhaled. Causes respiratory tract irritation.  
Skin : Causes skin irritation.  
Eyes : Causes eye irritation.  
Ingestion : May be harmful if swallowed.

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Synonyms : DMF  
Formula : C<sub>3</sub>H<sub>7</sub>NO  
Molecular Weight : 73.09 g/mol

Component	Concentration
<b>N,N-Dimethylformamide</b> Included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH)	
CAS-No.	68-12-2
EC-No.	200-679-5
Index-No.	616-001-00-X
Registration number	01-2119475605-32-XXXX

**4. FIRST AID MEASURES**

**General advice**

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

**If inhaled**

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**

Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

**In case of eye contact**

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**If swallowed**

Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

**5. FIREFIGHTING MEASURES**

**Conditions of flammability**

Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.

69800000

**Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**Special protective equipment for firefighters**

Wear self contained breathing apparatus for fire fighting if necessary.

**Hazardous combustion products**

Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx)

**Further information**

Use water spray to cool unopened containers.

**6. ACCIDENTAL RELEASE MEASURES****Personal precautions**

Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

**Environmental precautions**

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

**Methods and materials for containment and cleaning up**

Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13).

**7. HANDLING AND STORAGE****Precautions for safe handling**

Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

**Conditions for safe storage**

Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Handle and store under inert gas.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION****Components with workplace control parameters**

Components	CAS-No.	Value	Control parameters	Basis
N,N-Dimethylformamide	68-12-2	TWA	10 ppm	USA. ACGIH Threshold Limit Values (TLV)
Remarks	Liver damage Substances for which there is a Biological Exposure Index or Indices (see BEI® section) Not classifiable as a human carcinogen Danger of cutaneous absorption			
		TWA	10 ppm 30 mg/m3	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
Skin notation				
		TWA	10 ppm 30 mg/m3	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
Skin designation The value in mg/m3 is approximate.				
		TWA	10 ppm 30 mg/m3	USA. NIOSH Recommended Exposure Limits
Potential for dermal absorption				

**Personal protective equipment****Respiratory protection**

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Hand protection**

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

**Full contact**

Material: butyl-rubber  
Minimum layer thickness: 0.3 mm  
Break through time: 480 min  
Material tested: Butoject® (KCL 897 / Aldrich Z677647, Size M)

**Splash contact**

Material: Nature latex/chloroprene  
Minimum layer thickness: 0.6 mm  
Break through time: 30 min  
Material tested: Lapren® (KCL 706 / Aldrich Z677558, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374  
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**Eye protection**

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

**Skin and body protection**

Complete suit protecting against chemicals, Flame retardant antistatic protective clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Hygiene measures**

Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

**9. PHYSICAL AND CHEMICAL PROPERTIES****Appearance**

Form liquid, clear  
Colour colourless

**Safety data**

pH 6.7  
Melting point/freezing point Melting point/range: -61 °C (-78 °F)  
Boiling point 153 °C (307 °F)  
Flash point 58 °C (136 °F) - closed cup  
Ignition temperature 445 °C (833 °F)  
Auto-ignition temperature no data available  
Lower explosion limit 2.2 %(V)  
Upper explosion limit 15.2 %(V)

Vapour pressure	3.60 hPa (2.70 mmHg) at 20 °C (68 °F) 5.16 hPa (3.87 mmHg) at 25 °C (77 °F)
Density	0.944 g/mL
Water solubility	completely miscible
Partition coefficient: n-octanol/water	log Pow: -1.01
Relative vapour density	2.52 - (Air = 1.0)
Odour	amine-like
Odour Threshold	no data available
Evaporation rate	no data available

## 10. STABILITY AND REACTIVITY

### Chemical stability

Stable under recommended storage conditions.

### Possibility of hazardous reactions

no data available

### Conditions to avoid

Heat, flames and sparks.

### Materials to avoid

Strong oxidizing agents

### Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Carbon oxides, nitrogen oxides (NOx)

Other decomposition products - no data available

## 11. TOXICOLOGICAL INFORMATION

### Acute toxicity

#### Oral LD50

LD50 Oral - rat - 2,800 mg/kg

#### Inhalation LC50

LC50 Inhalation - rat - 4 h - 9 - 15 mg/l

#### Dermal LD50

LD50 Dermal - rabbit - 1,500 mg/kg

#### Other information on acute toxicity

no data available

### Skin corrosion/irritation

Skin - Human - Mild skin irritation - 24 h

### Serious eye damage/eye irritation

Eyes - rabbit - Moderate eye irritation

### Respiratory or skin sensitisation

no data available

### Germ cell mutagenicity

Genotoxicity *in vitro* - mouse - lymphocyte

Mutation in mammalian somatic cells.

### Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC:	3 - Group 3: Not classifiable as to its carcinogenicity to humans (N,N-Dimethylformamide)
NTP:	No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

### Reproductive toxicity

no data available

### Teratogenicity

May cause congenital malformation in the fetus.

Presumed human reproductive toxicant

### Specific target organ toxicity - single exposure (Globally Harmonized System)

no data available

### Specific target organ toxicity - repeated exposure (Globally Harmonized System)

no data available

### Aspiration hazard

no data available

### Potential health effects

<b>Inhalation</b>	May be harmful if inhaled. Causes respiratory tract irritation.
<b>Ingestion</b>	May be harmful if swallowed.
<b>Skin</b>	Causes skin irritation.
<b>Eyes</b>	Causes eye irritation.

### Signs and Symptoms of Exposure

Warning: intolerance for alcohol can occur up to 4 days after dimethylformamide exposure. N,N-dimethylformamide is considered to be a potent liver toxin., Vomiting, Diarrhoea, Abdominal pain, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

### Synergistic effects

no data available

### Additional Information

RTECS: LQ2100000

## 12. ECOLOGICAL INFORMATION

### Toxicity

Toxicity to fish	LC50 - Oncorhynchus mykiss (rainbow trout) - 9,000 - 13,000 mg/l - 96 h
	LC50 - Lepomis macrochirus (Bluegill) - 6,700 - 7,500 mg/l - 96 h
	LC50 - Pimephales promelas (fathead minnow) - 10,400 - 10,800 mg/l - 96 h
	LC50 - Oncorhynchus mykiss (rainbow trout) - 9,800 mg/l - 96 h
	LC50 - Lepomis macrochirus (Bluegill) - 6,300 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates	LC50 - Pimephales promelas (fathead minnow) - 10,600 mg/l - 96 h
	EC50 - Daphnia magna (Water flea) - 9,600 - 13,100 mg/l - 48 h
	EC50 - Daphnia magna (Water flea) - 15,700 mg/l - 48 h

Toxicity to algae LC50 - Desmodesmus subspicatus (green algae) - > 500 mg/l - 96 h

**Persistence and degradability**

Biodegradability Result: > 90 % - Readily biodegradable.

**Bioaccumulative potential**

no data available

**Mobility in soil**

no data available

**PBT and vPvB assessment**

no data available

**Other adverse effects**

no data available

---

**13. DISPOSAL CONSIDERATIONS**

**Product**

Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

**Contaminated packaging**

Dispose of as unused product.

---

**14. TRANSPORT INFORMATION**

**DOT (US)**

UN number: 2265 Class: 3 Packing group: III

Proper shipping name: N,N-Dimethylformamide

Reportable Quantity (RQ): 100 lbs

Marine pollutant: No

Poison Inhalation Hazard: No

**IMDG**

UN number: 2265 Class: 3 Packing group: III

EMS-No: F-E, S-D

Proper shipping name: N,N-DIMETHYLFORMAMIDE

Marine pollutant: No

**IATA**

UN number: 2265 Class: 3 Packing group: III

Proper shipping name: N,N-Dimethylformamide

---

**15. REGULATORY INFORMATION**

**OSHA Hazards**

Combustible Liquid, Harmful by skin absorption., Irritant, Teratogen

**SARA 302 Components**

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**SARA 313 Components**

The following components are subject to reporting levels established by SARA Title III, Section 313:

	CAS-No.	Revision Date
N,N-Dimethylformamide	68-12-2	2007-07-01

**SARA 311/312 Hazards**

Fire Hazard, Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components**

	CAS-No.	Revision Date
N,N-Dimethylformamide	68-12-2	2007-07-01

**Pennsylvania Right To Know Components**

	CAS-No.	Revision Date
N,N-Dimethylformamide	68-12-2	2007-07-01

**New Jersey Right To Know Components**

	CAS-No.	Revision Date
N,N-Dimethylformamide	68-12-2	2007-07-01

**California Prop. 65 Components**

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

---

**16. OTHER INFORMATION**

**Further information**

Copyright 2013 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only. The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See [www.sigma-aldrich.com](http://www.sigma-aldrich.com) and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.