SIGMA-ALDRICH

Material Safety Data Sheet

Version 3.3
Revision Date 10/10/2007
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1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: N,N-Dimethylformamide
Product Number: 227056
Brand: Aldrich
Company: Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO  63103
USA
Telephone: +1 800-325-5832
Fax: +1 800-325-5652
Emergency Phone #: (314) 776-6555

2. COMPOSITION/INFORMATION ON INGREDIENTS

Formula: C3H7NO
Molecular Weight: 73.09 g/mol

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>N,N-Dimethylformamide</td>
<td>68-12-2</td>
<td>200-879-5</td>
<td>616-001-00-X</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

Emergency Overview
OSHA Hazards: Combustible Liquid, Inert, Teratogen
Target Organs: Kidney, Liver, Blood, Cardiovascular system, Central nervous system

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.

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. 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
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIRE-FIGHTING MEASURES

Flammable properties
Flash point: 58 °C (136 °F) - closed cup
Ignition temperature: 445 °C (833 °F)
Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for fire-fighters
Wear self-contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

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

Methods for cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Handling
Avoid exposure - obtain special instructions before use. Avoid inhalation of vapour or mist. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

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.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Update</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>N,N-Dimethylformamide</td>
<td>68-12-2</td>
<td>TWA</td>
<td>10 ppm</td>
<td>30 mg/m³</td>
<td>1994-09-01</td>
</tr>
</tbody>
</table>
### 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.

**Eye protection**
Safety glasses.

**Skin and body protection**
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

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

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Form</th>
<th>Liquid, clear</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Colour</td>
<td>colourless</td>
</tr>
<tr>
<td></td>
<td>Odour</td>
<td>amine-like</td>
</tr>
<tr>
<td>Safety data</td>
<td>pH</td>
<td>6.7</td>
</tr>
<tr>
<td></td>
<td>Melting point</td>
<td>-61 °C (-78 °F)</td>
</tr>
</tbody>
</table>

### Boiling point
- 153 °C (307 °F) at 1,013 hPa (760 mmHg)

### Flash point
- 58 °C (136 °F) - closed cup

### Ignition temperature
- 445 °C (833 °F)

### 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
- 0.948 g/cm³

### Water solubility
- completely miscible

### Partition coefficient
- log Pow: -1.01

### Relative Vapour density
- (Air = 1.0)

### 10. STABILITY AND REACTIVITY

**Storage stability**
Stable under recommended storage conditions.

**Materials to avoid**
Strong oxidizing agents.

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

### 11. TOXICOLOGICAL INFORMATION

**Acute toxicity**
LD50 Oral - rat - 9,800 mg/kg
LD50 Dermal - rabbit - 4,720 mg/kg

**Irritation and corrosion**
Skin - Human - Mild skin irritation - 24 h
Eyes - rabbit - Moderate eye irritation

**Sensitisation**
No data available

**Chronic exposure**
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:**
- No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible, or confirmed human carcinogen by IARC.

**ACGIH:**
- No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

**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.

**Genotoxicity in vitro:**
- Mouse - lymphocyte
Mutation in mammalian somatic cells. May cause congenital malformation in the fetus.

**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.

**Potential Health Effects**

- **Inhalation:** May be harmful if inhaled. Causes respiratory tract irritation.
- **Skin:** May be harmful if absorbed through skin. Causes skin irritation.
- **Eyes:** Causes eye irritation.
- **Ingestion:** May be harmful if swallowed.
- **Target Organs:** Kidney, Liver, Blood, Cardiovascular system, Central nervous system.

**12. ECOLOGICAL INFORMATION**

**Elimination Information (persistence and degradability)**

No data available

**Ecotoxity effects**

- Toxicity to fish:
  - LC50 - Oncorhynchus mykiss (rainbow trout) - 9,000 - 13,000 mg/l - 96 h
  - LC50 - Lepomis macrochirus (Bluegill) - 9,700 - 7,500 mg/l - 96 h
  - LC50 - Pimephales promelas (fathead minnow) - 10,400 - 10,800 mg/l - 96 h

- Toxicity to daphnia and other aquatic invertebrates:
  - EC50 - Daphnia magna (Water flea) - 9,600 - 13,100 mg/l - 48 h

Further information on ecology

No data available

**13. DISPOSAL CONSIDERATIONS**

**Product**

This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Observe all federal, state, and local environmental regulations. 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

**IMDG**

- UN-Number: 2265
- Class: 3
- Packing group: III
- Proper shipping name: N,N-DIMETHYLFORMAMIDE
- EMS-No: F,E, S-D

**IATA**

- UN-Number: 2265
- Class: 3
- Packing group: III

Proper shipping name: N,N-Dimethylformamide

**15. REGULATORY INFORMATION**

**OSHA Hazards**

Combustible Liquid, Irritant, Teratogen

**TSCA Status**

On TSCA Inventory

**DSL Status**

All components of this product are on the Canadian DSL list.

**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**

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**SARA 311/312 Hazards**

Pike Hazard, Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components**

- N,N-Dimethylformamide
- CAS-No. 68-12-2
- Revision Date 1995-01-01

**Pennsylvania Right To Know Components**

- N,N-Dimethylformamide
- CAS-No. 68-12-2
- Revision Date 1995-01-01

**New Jersey Right To Know Components**

- N,N-Dimethylformamide
- CAS-No. 68-12-2
- Revision Date 1995-01-01

**California Prop. 65 Components**

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

**16. OTHER INFORMATION**

Further information

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