



**SIGMA-ALDRICH**

## Material Safety Data Sheet

Date Printed: 06/30/2001  
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Version 1.20

### Section 1 - Product and Company Information

|                           |                        |
|---------------------------|------------------------|
| Product Name              | N,N-DIMETHYLFORMAMIDE  |
| Product Number            | D4254                  |
| Brand                     | Sigma Chemical         |
| Company                   | Sigma-Aldrich          |
| Street Address            | 3050 Spruce Street     |
| City, State, Zip, Country | St. Louis, MO 63103 US |
| Technical Phone:          | 3147715765             |
| Fax:                      | 8003255062             |
| Emergency Phone:          | 414 273 3850 Ext.5996  |

### Section 2 - Composition/Information on Ingredient

|                   |                                                                                                                                                                                                                                                                                                                          |          |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Substance Name    | CAS #                                                                                                                                                                                                                                                                                                                    | SARA 313 |
| DIMETHYLFORMAMIDE | 68-12-2                                                                                                                                                                                                                                                                                                                  | Yes      |
| Formula           | C3H7NO                                                                                                                                                                                                                                                                                                                   |          |
| Synonyms          | Dimethylamid kyselinny mravenec (Czech), Dimethylformamid (German), Dimethyl formamide, N,N-Dimethyl formamide, Dimethylformamide (ACGIH/OSHA), N,N-Dimethylmethanamide, Dimethylformamide (Italian), Dimethylformamid (Czech), DMF, DMFA, Dymetylformamid (Polish), N-Formyldimethylamine, NCI-C60913, NSC 5356, U-4224 |          |

### Section 3 - Hazards Identification

**Emergency Overview**  
Toxic.  
May cause harm to the unborn child. Harmful by inhalation and in contact with skin. Irritating to eyes and skin.  
Combustible. Readily absorbed through skin. Target organ(s): Liver, Kidneys.

**HMS Rating**  
Health: 2\*      Flammability: 2      Reactivity: 0

**NFPA Ratings**  
Health: 2      Flammability: 2      Reactivity: 0

\*Chronic hazards present. For additional information on toxicity, please refer to Section 11.

### Section 4 - First Aid Measures

**Oral Exposure**  
If swallowed, wash out mouth with water provided person is conscious. Call a physician immediately.

**Inhalation Exposure**  
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

**Dermal Exposure**  
In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

### Eye Exposure

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assume adequate flushing by separating the eyelids with fingers. Call a physician.

### Section 5 - Fire Fighting Measures

|                    |              |               |
|--------------------|--------------|---------------|
| Flash Point:       | 136.4 °F     | 58 °C         |
| Explosion Limits:  | Lower: 2.2 % | Upper: 15.2 % |
| Autoignition Temp: | 445 °C       |               |

### Extinguishing Media

Suitable  
Carbon dioxide, dry chemical powder, or appropriate foam.

### Firefighting

#### Protective Equipment

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

#### Specific Hazard(s)

Emits toxic fumes under fire conditions.

### Section 6 - Accidental Release Measures

#### Procedure to be Followed in Case of Leak or Spill

Evacuate area.

#### Procedure(s) of Personal Precaution(s)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves. Wear disposable coveralls and discard them after use.

#### Methods for Cleaning Up

Cover with dry lime or soda ash, pick up, keep in a closed container, and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

### Section 7 - Handling and Storage

#### Handling

##### User Exposure

Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

#### Storage

##### Suitable

Keep tightly closed. Keep away from heat and open flame. Store in a cool dry place.

### Section 8 - Exposure Controls / PPE

#### Engineering Controls

Use only in a chemical fume hood. Safety shower and eye bath.

#### Personal Protective Equipment

##### Respiratory

NIOSH/MSHA-approved respirator.

##### Hand

Compatible chemical-resistant gloves.

##### Eye

Chemical safety goggles.

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General Hygiene Measures  
Wash thoroughly after handling. Wash contaminated clothing before reuse. Discard contaminated shoes.

| Exposure Limits, RTECS |                   |                                 |
|------------------------|-------------------|---------------------------------|
| Country                | Source            | Value                           |
| USA                    | ACGIH             | 30 MG/M3 (10 PPM)               |
| USA                    | MSHA Standard-air | 10 PPM (30 MG/M3) (SKIN)        |
| USA                    | OSHA              | 8H TWA 10 PPM (30 MG/M3) (SKIN) |
| New Zealand            | OEL               |                                 |
| USA                    | NIOSH             | 10 PPM (SK)                     |
|                        |                   | check ACGIH TLV                 |

#### Section 9 - Physical/Chemical Properties

| Appearance                 | Physical State                | Color                      | Form         |
|----------------------------|-------------------------------|----------------------------|--------------|
| Liquid                     |                               | Colorless                  | Clear liquid |
| Molecular Weight: 76.1 AMU |                               |                            |              |
| Property                   | Value                         | At Temperature or Pressure |              |
| pH                         | N/A                           |                            |              |
| BP/SP Range                | 153 - 155 °C                  |                            |              |
| MP/MP Range                | -61 °C                        |                            |              |
| Freezing Point             | N/A                           |                            |              |
| Vapor Pressure             | 2.7 mmHg                      | 20 °C                      |              |
| Vapor Density              | 2.5 g/l                       |                            |              |
| Saturated Vapor Conc.      | N/A                           |                            |              |
| SG/Density                 | 0.948 g/cm3                   |                            |              |
| Bulk Density               | N/A                           |                            |              |
| Odor Threshold             | N/A                           |                            |              |
| Volatiles                  | N/A                           |                            |              |
| VOC Content                | N/A                           |                            |              |
| Water Content              | N/A                           |                            |              |
| Solvent Content            | N/A                           |                            |              |
| Evaporation Rate           | N/A                           |                            |              |
| Viscosity                  | N/A                           |                            |              |
| Partition Coefficient      | N/A                           |                            |              |
| Decomposition Temp.        | N/A                           |                            |              |
| Flash Point °F             | 136.4 °F                      |                            |              |
| Flash Point °C             | 58 °C                         |                            |              |
| Explosion Limits           | Lower: 2.2 %<br>Upper: 15.2 % |                            |              |
| Autoignition Temp          | 445 °C                        |                            |              |
| Refractive Index           | 1.43                          |                            |              |
| Solubility                 | N/A                           |                            |              |

#### Section 10 - Stability and Reactivity

|                                  |                                                                                         |
|----------------------------------|-----------------------------------------------------------------------------------------|
| Stability                        | Stable                                                                                  |
| Stable                           | Stable.                                                                                 |
| Materials to Avoid               | Strong oxidizing agents.                                                                |
| Hazardous Decomposition Products | Hazardous Decomposition Products                                                        |
| Hazardous Decomposition Products | Thermal decomposition may produce carbon monoxide, carbon dioxide, and nitrogen oxides. |
| Hazardous Polymerization         | Hazardous Polymerization                                                                |
| Hazardous Polymerization         | Will not occur.                                                                         |

#### Section 11 - Toxicological Information

| Route of Exposure | Remarks                                                                                         |
|-------------------|-------------------------------------------------------------------------------------------------|
| Skin Contact      | Causes skin irritation.                                                                         |
| Skin Absorption   | Readily absorbed through skin. Harmful if absorbed through skin.                                |
| Eye Contact       | Causes eye irritation.                                                                          |
| Inhalation        | Material may be irritating to mucous membranes and upper respiratory tract. Harmful if inhaled. |
| Ingestion         | May be harmful if swallowed.                                                                    |

Target Organ(s) or System(s)  
Liver, Kidneys, Central nervous system, Cardiovascular system, Blood.

#### Signs and Symptoms of Exposure

Warning: Irritation for alcohol can occur up to 4 days after dimethylformamide exposure. N,N-dimethylformamide is considered to be a potent liver toxin. Exposure can cause: Stomach pains, vomiting, diarrhea. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

RTECS Number: LQ2100000

#### Toxicity Data

|                                                                       |  |
|-----------------------------------------------------------------------|--|
| Oral - Rat: 2,800 mg/kg (LD50)                                        |  |
| Intraperitoneal - Rat: 1,400 MG/KG (LD50)                             |  |
| Remarks: Behavioral:Somnolence (general depressed activity).          |  |
| Behavioral:Muscle weakness.                                           |  |
| Nutritional and Gross Metabolic:Weight loss or decreased weight gain. |  |
| Subcutaneous - Rat: 3800 MG/KG (LD50)                                 |  |
| Intravenous - Rat: 2 GM/KG (LD50)                                     |  |
| Oral - Mouse: 3,700 mg/kg (LD50)                                      |  |
| Remarks: Behavioral:Somnolence (general depressed activity).          |  |
| Behavioral:Excitement.                                                |  |
| Behavioral:Muscle contraction or spasticity.                          |  |
| Inhalation - Mouse: 9,400 mg/m3 (LC50)                                |  |
| Remarks: Behavioral:Convulsions or effect on seizure threshold.       |  |
| Behavioral:Muscle weakness.                                           |  |
| Lungs, Thorax, or Respiration:Dyspnea.                                |  |
| Intraperitoneal - Mouse: 650 MG/KG (LD50)                             |  |
| Subcutaneous - Mouse: 4500 MG/KG (LD50)                               |  |
| Intravenous - Mouse: 2500 MG/KG (LD50)                                |  |
| Intramuscular - Mouse: 3900 MG/KG (LD50)                              |  |
| Intravenous - Dog: 470 MG/KG (LD50)                                   |  |
| Intraperitoneal - Cat: 500 MG/KG (LD50)                               |  |
| Remarks: Liver:Other changes.                                         |  |
| Kidney, Ureter, Bladder:Other changes in urine composition.           |  |
| Blood:Changes in cell count (unspecified).                            |  |
| Oral - Rabbit: 5,000 mg/kg (LD50)                                     |  |
| Skin - Rabbit: 4,720 mg/kg (LD50)                                     |  |
| Intraperitoneal - Rabbit: 1 GM/KG (LD50)                              |  |
| Remarks: Liver:Other changes.                                         |  |
| Kidney, Ureter, Bladder:Other changes in urine composition.           |  |
| Blood:Changes in cell count (unspecified).                            |  |

