1. IDENTIFICATION

Product identifier

Product code: D1046
Product Name: DIMETHYL SULFOXIDE, REAGENT

Other means of identification

Synonyms:
Dimethyl sulphoxide
DMSO
Methane, sulfinylbis-
Methylsulfinylmethane
Methyl Sulfoxide
Sulfinylbis(methane)
Diméthylsulfoxyde (French)
Sulfoxyde diméthylique (French)
Dimetil sulfoxido (Spanish)

CAS #: 67-68-5
RTECS #: PV6210000
CI#: Not available

Recommended use of the chemical and restrictions on use

Uses advised against: No information available

Supplier:
Spectrum Chemical Mfg. Corp
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000

Order Online At: https://www.spectrumchemical.com
Emergency telephone number: Chemtrec 1-800-424-9300
Contact Person: Martin LaBenz (West Coast)
Contact Person: Ibad Tirmiz (East Coast)

2. HAZARDS IDENTIFICATION

Classification

This chemical is considered hazardous according to the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Considered a dangerous substance or mixture according to the Globally Harmonized System (GHS)

<table>
<thead>
<tr>
<th>Serious eye damage/eye irritation</th>
<th>Category 2B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammable liquids</td>
<td>Category 4</td>
</tr>
</tbody>
</table>

Label elements
Warning

Hazard statements
Causes eye irritation
Combustible liquid

Hazards not otherwise classified (HNOC)
Not Applicable

Other hazards
Not available

Precautionary Statements - Prevention
Wash face, hands and any exposed skin thoroughly after handling
Keep away from heat/sparks/open flames/hot surfaces. — No smoking
Wear protective gloves
Wear eye/face protection

In case of fire: Use CO2, dry chemical, or foam to extinguish.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Precautionary Statements - Storage
Store in a well-ventilated place. Keep cool

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide</td>
<td>67-68-5</td>
<td>100</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

First aid measures

General Advice: National Capital Poison Center in the United States can provide assistance if you have a poison emergency and need to talk to a poison specialist. Call 1-800-222-1222.

Skin Contact: Wash off immediately with soap and plenty of water removing all contaminated clothing and shoes. Get medical attention.

Eye Contact: Flush eyes with water for 15 minutes. Get medical attention.

Inhalation: Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Obtain medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms: Ingestion may cause gastrointestinal irritation, nausea, vomiting, and diarrhea
May cause constipation
May cause anorexia
Central nervous system effects
May cause headache
Dizziness
Ataxia
May affect behavior/central nervous system (tremor, convulsions)
Analgesia
May cause cardiovascular effects
It may cause transient photophobia and disturbances of vision
May affect respiration
May cause cyanosis
May affect the liver
It may affect the kidneys
May cause hypoglycemia

Indication of any immediate medical attention and special treatment needed

Notes to Physician: Treat symptomatically.

Protection of first-aiders
First-Aid Providers: Avoid exposure to blood or body fluids. Wear gloves and other necessary protective clothing. Dispose of contaminated clothing and equipment as bio-hazardous waste.

5. FIRE-FIGHTING MEASURES

Extinguishing Media
Suitable Extinguishing Media:
Dry chemical. Carbon dioxide (CO2). Water spray mist or foam.

Unsuitable Extinguishing Media:
High volume water jet. Do not use a solid (straight) water stream as it may scatter and spread fire.

Specific hazards arising from the chemical

Hazardous Combustion Products:

Specific hazards:
Combustible material. May be ignited by heat, sparks or flames. Container explosion may occur under fire conditions or when heated. Vapors may form explosive mixtures with air. Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks). Fire may produce irritating, corrosive and/or toxic gases.

Special Protective Actions for Firefighters

Specific Methods:
Water mist may be used to cool closed containers. For larger fires, use water spray or fog. Cool containers with flooding quantities of water until well after fire is out.

Special Protective Equipment for Firefighters:
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.
6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions: Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Avoid contact with skin, eyes and clothing. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Use personal protective equipment. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. All equipment used when handling the product must be grounded.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Methods for containment: Stop leak if you can do it without risk. Absorb spill with inert material (e.g. vermiculite, dry sand or earth). In case of large spill, dike if needed. Dike far ahead of liquid spill for later disposal.

Methods for cleaning up: Use appropriate tools to put the spilled material in a suitable chemical waste disposal container. Use clean non-sparking tools to collect absorbed material. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Precautions for safe handling

Technical Measures/Precautions: Provide sufficient air exchange and/or exhaust in work rooms. Remove all sources of ignition. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from incompatible materials.

Safe Handling Advice: Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Keep away from heat and sources of ignition. Take precautionary measures against static discharges. Do not ingest. Do not breathe vapors or spray mist. Handle in accordance with good industrial hygiene and safety practice.

Conditions for safe storage, including any incompatibilities


Incompatible Materials: Oxidizing agents Acids Bases Alkali Metals Acid chlorides Acid anhydrides Potassium t-butoxide boron compounds Sodium isopropoxide Dinitrogen tetraoxide Carbonyl diisothiocyanate Acetanilide Many acyl, aryl, and nonmetal halides (eg acetyl chloride, benzenesulfonyl chloride, bromobenzoyl actanilide, cyanuric chloride, iodine pentafluoride, Mg(ClO4)2, CH3Br, NiO4, oxalyl chloride, P2O3, phosphorus trichloride,
phosphoryl chloride, silver fluoride, silver difluoride, sodium hydride, sulfur dichloride, disulfur dichloride, sulfuryl chloride, tetrachlorosilane, and thionyl chloride)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

United States

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Canada

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Australia and Mexico

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<th>Mexico</th>
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<td>67-68-5</td>
<td>None</td>
<td>None</td>
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</tbody>
</table>

Appropriate engineering controls

Engineering measures to reduce exposure: Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Individual protection measures, such as personal protective equipment

Personal Protective Equipment

Eye protection: Goggles

Skin and body protection: Long sleeved clothing
Chemical resistant apron
Gloves

Respiratory protection: Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Respiratory protection is not necessary for normal handling. Good room ventilation or use of local exhaust (fume hood) is sufficient. Use a vapor respirator under conditions where exposure to the substance is apparent (e.g. generation of high concentrations of mist or vapor, inadequate ventilation, development of respiratory tract irritation), and engineering controls are not feasible. Be sure to use an approved/certified respirator or equivalent.

Hygiene measures: Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product. When using, do not eat, drink or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

Product code: D1046

Product name: DIMETHYL SULFOXIDE, REAGENT
10. STABILITY AND REACTIVITY

Reactivity
No information available

Chemical stability

Stability: Stable under recommended storage conditions.

Possibility of Hazardous Reactions: Hazardous polymerization does not occur


Incompatible Materials:
- Oxidizing agents
- Acids
- Bases
- Alkali Metals
- Acid chlorides
- Acid anhydrides
- Potassium t-butoxide
- boron compounds
- Sodium isopropoxide

Molecular/Formula weight (g/mole):
78.13

Formula: C2-H6-O-S

Physical state: Liquid

Appearance: No information available.

Color: Clear. Colorless.


Taste: Slightly bitter with a sweet after-taste.

Flashpoint (°C/°F):
89 °C/192.2 °F
95 °C/203 °F

Flash Point Tested according to:
Closed cup
Open cup

Upper Explosion Limit (%):
42%

Lower Explosion Limit (%):
2.6%

Decomposition temperature(°C/°F):
No information available

Boiling point/range(°C/°F):
189 °C/372.2 °F

Evaporation rate:
No information available

Heat of combustion:
No information available

Specific gravity: 1.100

Vapor pressure @ 20°C (kPa):
0.055

VOC content (g/L):
1100

Odor threshold (ppm):
No information available

Partition coefficient (n-octanol/water): -1.35

Viscosity:
No information available

Miscibility:
Miscible with water

Solubility:
- Soluble in Ethanol
- Soluble in Ether
- Soluble in Acetone
- Soluble in Chloroform
- Soluble in Benzene

Product code: D1046
Product name: DIMETHYL SULFOXIDE, REAGENT
Dinitrogen tetraoxide
Carbonyl diisothiocyanate
Acetanilide
Many acyl, aryl, and nonmetal halides (eg acetyl chloride, benzenesulfonyl chloride, bromobenzoyl actanilide, cyanuric chloride, iodine pentafluoride, Mg(ClO4)2, CH3Br, NiO4, oxalyl chloride, P2O3, phosphorus trichloride, phosphoryl chloride, silver fluoride, silver difluoride, sodium hydride, sulfur dichloride, disulfur dichloride, sulfurylchloride, tetrachlorosilane, and thionyl chloride)

**Hazardous decomposition products:**

**Other Information**
**Corrosivity:** No information available

Special Remarks on Corrosivity: No information available

### 11. TOXICOLOGICAL INFORMATION

**Information on likely routes of exposure**

**Principal Routes of Exposure:**
Skin. Ingestion. Eyes.

**Acute Toxicity**

**Component Information**

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</thead>
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<tr>
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<td>28300 mg/kg Oral LD50 Rat; 14500 mg/kg Oral LD50 Rat</td>
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<tr>
<td><strong>LD50/oral/mouse</strong> =</td>
<td>7920-21400 mg/kg</td>
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<td><strong>LD50/dermal/rabbit</strong> =</td>
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<tr>
<td><strong>LC50/inhalation/rat</strong> =</td>
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<tr>
<td><strong>LC50/inhalation/mouse</strong> =</td>
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<td><strong>Other LD50 or LC50information</strong> =</td>
<td>17400 mg/kg LD50 oral Rat</td>
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<tr>
<td><strong>28300 mg/kg LD50 oral Rat</strong></td>
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</tr>
</tbody>
</table>

**Product Information**

**LD50/oral/rat** =
VALUE- Acute Tox Oral = 14500 mg/kg

**LD50/oral/mouse** =
Value - Acute Tox Oral = 7920 mg/kg

**LD50/dermal/rabbit**
VALUE-Acute Tox Dermal = No information available

**LD50/dermal/rat**
VALUE - Acute Tox Dermal = 40000 mg/kg

**LC50/inhalation/rat**
VALUE-Vapor = No information available

**Product code:** D1046 **Product name:** DIMETHYL SULFOXIDE, REAGENT
VALUE-Gas = No information available
VALUE-Dust/Mist = No information available
VALUE-Vapor = No information available
VALUE - Gas = No information available
VALUE - Dust/Mist = No information available

**Symptoms**

**Skin Contact:** May cause skin irritation. Mild skin irritation. May cause burning or stinging sensation, redness of the skin, inflammation of the skin. May cause itching. May cause urticaria (hives). Dimethyl Sulfoxide readily penetrates the skin and may carry other dissolved chemicals into the body. Skin absorption of DMSO may result in garlic-like breath and body odor. If absorbed through skin it may cause systemic effects with symptoms similar to those of ingestion. May cause dyspnea (shortness of breath and difficulty breathing) and cyanosis.

**Eye Contact:** May cause eye irritation. Mild eye irritation. May cause temporary burning sensation and vasodilation. May cause conjunctivitis. May cause conjunctival redness. May cause cataracts. May cause corneal opacity. It may cause transient photophobia and disturbances of vision.

**Inhalation** May cause irritation of respiratory tract. Inhalation of a high concentration of vapors may cause headache, dizziness, and sedation.

**Ingestion** Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. May cause constipation. May cause abdominal pain. May cause decreased appetite or anorexia. May affect respiration (difficult or labored breathing resulting in shortness of breath). May affect respiration (respiratory depression). May affect urinary system (kidneys). May cause increase in urine volume. May affect blood (changes in serum composition). It may affect the blood (anemia, eosinophilia). It may affect the brain. May affect the cardiovascular system (vasodilation, hypotension, tachycardia, chest pain). May affect behavior/central nervous system (ataxia). May affect behavior/central nervous system (muscle weakness, convulsions). May affect behavior/central nervous system (dizziness, headache). May affect behavior/central nervous system (fatigue, sedation, tremor). May cause hypoglycemia (low blood sugar), which is characterized by symptoms such as blurred vision, chills, cold sweat, dizziness, drowsiness, shaking, rapid heart rate, confusion, weakness, headache, fainting, hunger, tingling of the hands or feet. May affect liver.

**Aspiration hazard** No information available.

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

**Chronic Toxicity** Prolonged or repeated ingestion may cause nausea, vomiting, loss of appetite. Prolonged or repeated ingestion may affect the blood (changes in red blood cell count). Prolonged or repeated ingestion may affect the blood (normocytic anemia). Prolonged or repeated ingestion may affect the kidneys (polyuria (increase in urine volume, hematuria (blood in the urine), tubular necrosis). Prolonged skin contact may cause skin irritation and/or dermatitis. Chronic exposure may cause drying and scaling of the skin.

**Sensitization:** No information available.

**Mutagenic Effects:** May affect genetic material Mutations in microorganisms

**Product code:** D1046
**Product name:** DIMETHYL SULFOXIDE, REAGENT
Experiments with bacteria and/or yeast have shown mutagenic effects in mammalian somatic cells.

**Carcinogenic effects:** Equivocal tumorigenic agent by Registry of Toxic Effects of Chemical Substances (RTECS) criteria.

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>IARC</th>
<th>ACGIH - Carcinogens</th>
<th>NTP</th>
<th>OSHA HCS - Carcinogens</th>
<th>Australia - Notifiable Carcinogenic Substances</th>
<th>Australia - Prohibited Carcinogenic Substances</th>
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</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide</td>
<td>67-68-5</td>
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<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
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</table>

ACGIH (American Conference of Governmental Industrial Hygienists)
IARC (International Agency for Research on Cancer)
NTP (National Toxicology Program)
OSHA (Occupational Safety and Health Administration of the US Department of Labor)

**Reproductive toxicity**
No data is available

Reproductive Effects: No information available
Developmental Effects: No information available
Teratogenic Effects: Showed teratogenic effects in animal experiments
Dimethyl Sulfoxide (DMSO) has been associated with teratogenic and/or embryotoxic effects in animals (hamster, mouse, rat), particularly when administered parenterally (intraperitoneal or intravenous routes). DMSO has not been shown to be teratogenic or embryotoxic via oral or dermal routes at dose levels that do not produce overt maternal toxicity.
No data in humans was available to evaluate the effects of exposure on development.

Specific Target Organ Toxicity
STOT - single exposure: No information available.
STOT - repeated exposure: No information available.
Target Organs: Kidneys. Skin. Central nervous system.

**12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

*Dimethyl Sulfoxide - 67-68-5*

**Freshwater Algae Data:** 12350 - 25500 mg/L EC50 Skeletonema costatum 96 h
**Freshwater Fish Species Data:** 34000 mg/L LC50 Pimephales promelas 96 h 1 33 - 37 g/L LC50 Oncorhynchus mykiss 96 h static 1 40 g/L LC50 Lepomis macrochirus 96 h static 1 41.7 g/L LC50 Cyprinus carpio 96 h 1
**Water Flea Data:** 7000 mg/L EC50 Daphnia species 24 h

Persistence and degradability: Readily biodegradable
Bioaccumulative potential: Potential for bioconcentration in aquatic organisms is low.
Mobility: It is expected to have very high mobility based on estimated Koc.

**13. DISPOSAL CONSIDERATIONS**

Product code: D1046
Product name: DIMETHYL SULFOXIDE, REAGENT
**Disposal Methods**

**Waste from residues / unused products:**
Waste must be disposed of in accordance with Federal, State and Local regulation.

**Contaminated packaging:**
Empty containers should be taken for local recycling, recovery or waste disposal

### Components

<table>
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<tr>
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<tbody>
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<td>None</td>
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</table>

### 14. TRANSPORT INFORMATION

**DOT**

- **UN-No:** Not Regulated
- **Proper Shipping Name:** No information available
- **Hazard Class:** No information available
- **Subsidiary Class:** No information available
- **Packing Group:** No information available
- **Emergency Response Guide Number:** No information available
- **Marine Pollutant:** No data available
- **DOT RQ (lbs):** No information available
- **Special Provisions:** No Information available
- **Symbol(s):** No information available
- **Description:** No information available

**TDG (Canada)**

- **UN-No:** Not Regulated
- **Proper Shipping Name:** No information available
- **Hazard Class:** No information available
- **Subsidiary Risk:** No information available
- **Packing Group:** No information available
- **Marine Pollutant:** No Information available
- **Description:** No information available

**ADR**

- **UN-No:** Not Regulated
- **Proper Shipping Name:** No information available
- **Hazard Class:** No information available
- **Packing Group:** No information available
- **Subsidiary Risk:** No information available

**IMO / IMDG**

- **UN-No:** Not Regulated
- **Proper Shipping Name:** No information available
- **Hazard Class:** No information available
- **Packing Group:** No information available
- **Subsidiary Risk:** No information available

**RID**

- **UN-No:** Not Regulated
- **Proper Shipping Name:** No information available
- **Hazard Class:** No information available
- **Subsidiary Risk:** No information available
- **Packing Group:** No information available

**Product code:** D1046  
**Product name:** DIMETHYL SULFOXIDE, REAGENT
ICAO
UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Subsidiary Risk: No information available
Packing Group: No information available

IATA
UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Subsidiary Risk: No information available
Packing Group: No information available
ERG Code: No information available
Special Provisions: No information available

15. REGULATORY INFORMATION

International Inventories

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U.S. Regulations

Dimethyl Sulfoxide
- New Jersey RTK Hazardous Substance List: 4145
- FDA - Direct Food Additives: 21 CFR 172.869 (residual)
- FDA - 21 CFR - Total Food Additives: 172.859, 177.1655, 177.2440


Chemicals Known to the State of California to Cause Cancer:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

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CERCLA/SARA

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<th>Section 302 Extremely Hazardous Substances and RQs</th>
<th>Section 313 - Chemical Category</th>
<th>Section 313 - Reporting de minimis</th>
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U.S. TSCA

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<th>TSCA 8(d) - Health and Safety Reporting</th>
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Canada

WHIMIS 2015 - GHS Classifications

WHIMIS 2015 Hazard Classification Information:

Component 
Dimethyl Sulfoxide 
67-68-5 (100)

WHMIS 2015 Hazard Classification 
Flammable liquids - Category 4: H227 Combustible liquid.

Canada Hazardous Products Regulation This product has been classified according to the hazard criteria of the HPR (Hazardous Products Regulation) and the SDS contains all of the information required by the HPR

Components

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EU Classification

EU GHS - SV - CLP 1272/2008

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EU - CLP (1272/2008)

R-phrase(s)
Not determined

S-phrase(s)
none

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<th>Classification</th>
<th>Concentration Limits:</th>
<th>Safety Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl Sulfoxide</td>
<td>67-68-5</td>
<td></td>
<td>No information</td>
<td></td>
</tr>
</tbody>
</table>

The product is classified in accordance with Annex VI to Directive 67/548/EEC

Indication of danger:
not determined

16. OTHER INFORMATION

Preparation Date: 9/15/2014
Revision Date: 9/13/2018
Prepared by: Sonia Owen

Product code: D1046  Product name: DIMETHYL SULFOXIDE, REAGENT
Disclaimer: All chemicals may pose unknown hazards and should be used with caution. This Safety Data Sheet (SDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. The physical properties reported in this SDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user’s responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

End of Safety Data Sheet