spectrum
chemicals & laboratory products

A Division of Spectrum Chemical Mfg. Corp.

Dear Customer,

This File Contains Both The ANSI Material Safety Data Sheet and The GHS Safety Data Sheet For The Same Product

Spectrum is currently transitioning all chemical product labeling from the ANSI[1] format to the GHS[2] format (see note below). In order to ensure that you receive complete labeling during the transition, we have included both the ANSI MSDS and the GHS SDS in a single file. The ANSI MSDS is given first, followed by the GHS SDS. Please use whichever matches the container label.

Why It Matters:

The complete precautionary labeling for this chemical consists of BOTH the label on the container AND the matching Material Safety Data Sheet (for ANSI labels) or Safety Data Sheet (for GHS labels). Both elements of the labeling [Label + (M)SDS] are written to be read and understood together, so as to provide complete precautionary information. It is intended for you to read and understood BOTH before handling or using the chemical.

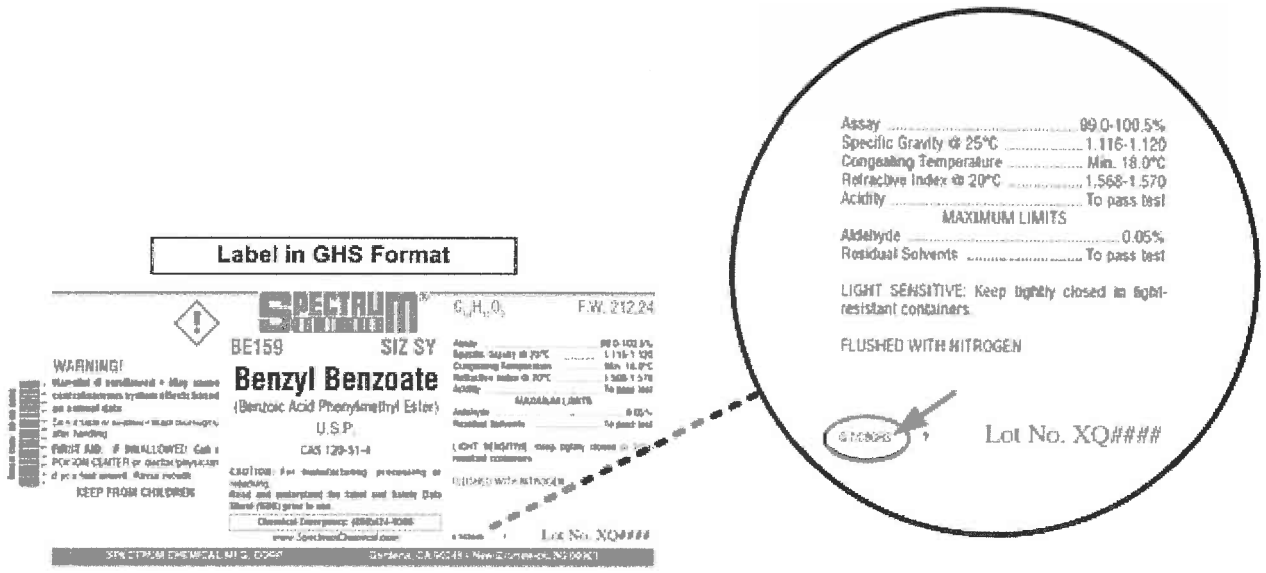
Picking the Right One: 2 Easy Ways To Tell Whether Your Container Has an ANSI Label or a GHS Label

1) GHS labels: any pictogram displayed in the upper left-hand corner will be inside a red diamond.
   ANSI labels: pictograms, if present, will be inside individual black boxes.
2) GHS labels: on the bottom of the right-hand panel of the label, locate the Lot Number.
   Directly to the left will be a string of control characters, followed by a single letter.
   For GHS labels, the string of characters will end in "GHS:"

Label in ANSI Format

CORPORATE OFFICES
14422 South San Pedro Street
Gardena, California 90248
PHONE 310.516.8000
FAX 310.516.9843

Label in GHS Format



[1] American National Standards Institute
[2] Globally Harmonized System for Hazard Communication

Sincerely,

Regulatory Affairs

MATERIAL SAFETY DATA SHEET

NFPA	HMIS	Personal Protective Equipment

See Section 8.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product code:	D2493
Product Name:	DIMETHYL SULFOXIDE-D6, 99.9 ATOM PERCENT D
Chemical Name:	No information available
Synonyms:	Hexadeuterodimethyl Sulfoxide Please note that this product is not radioactive. The data given for this product are those for the corresponding unlabeled material unless specifically indicated otherwise. Health and safety data for the labeled material are generally unavailable, but are assumed to be similar or identical to the corresponding unlabeled material.
Recommended use:	No information available.
CAS #:	2206-27-1
RTECS #	Not available
CI#:	Not available
Formula:	CD3SOVD3
Supplier:	Spectrum Chemicals and Laboratory Products, Inc. 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:	Ibad Tirmiz (East Coast)
Contact Person:	Martin LaBenz (West Coast)

2. HAZARDS IDENTIFICATION

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION! COMBUSTIBLE LIQUID
May cause skin and eye irritation
May cause irritation of respiratory tract

Odor:	Physical state:	Appearance:	Color:
Slight. Sulfurous. Distinctive garlic or oyster-like.	Liquid.	No information available	Clear. Colorless.

OSHA Regulatory Status This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

POTENTIAL HEALTH EFFECTS

Principal Routes of Exposure:
Skin. Ingestion. Eyes.

Acute Potential Health Effects:

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 itiching. 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 diarrhoea. May cause constipation. May cause anorexia. May cause a garlic-onion-oyster smell on the body and on the breath. May cause central nervous system effects. May cause headache. May cause dizziness. May affect the cardiovascular system. May affect respiration. May affect the liver. It may affect the kidneys. May affect the blood. May cause hypoglycemia.

Chronic Potential Health Effects:

Component	Carcinogen Status:
Dimethyl Sulfoxide-d6 99.9 atom % 2206-27-1 (100)	No information available

Target Organs: Kidneys. Skin. Central nervous system.

Mutagenic Effects: May affect genetic material
Mutations in microorganisms
Experiments with bacteria and/or yeast have shown mutagenic effects
Mutagenic effects in mammalian somatic cells

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

Aggravated Medical Conditions: No information available

See Section 11 for additional Toxicological Information

POTENTIAL ENVIRONMENTAL EFFECTS

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS-No.	Weight %
Dimethyl Sulfoxide-d6 99.9 atom %	2206-27-1	100

4. FIRST AID MEASURES

General Advice: Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126)

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

Eye Contact: Flush eye 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.

Notes to Physician: Treat symptomatically

5. FIRE-FIGHTING MEASURES

Flammable Properties

Flashpoint (°C/°F):	87-89 °C/188.6-192.2 °F

Flash Point Tested according to:
Closed cup

Lower Explosion Limit (%):	2.6-3.5%
Upper Explosion Limit (%):	28.5-42%

Autoignition Temperature (°C/°F):	300-301 °C/572-574 °F

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.
Hazardous Combustion Products:	Carbon monoxide; Carbon dioxide; Sulfur oxides; Formaldehyde and Methyl mercaptan may also be formed
Specific hazards:	Combustible material. 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). Container explosion may occur under fire conditions or when heated. Fire may produce irritating, corrosive and/or toxic gases.
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
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.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:
Ensure adequate ventilation. Avoid contact with skin, eyes and 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. Should not be released into the environment. Prevent entry into waterways, sewers, basements or confined areas. In case of large spill, dike if needed. Dike far ahead of liquid spill for later disposal.

Methods for Cleaning Up:
Absorb spill with inert material (e.g. vermiculite, dry sand or earth), then place in a suitable chemical waste container. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

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.

Storage

Technical Measures/Storage Conditions:
Hygroscopic. Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Keep away from heat and sources of ignition. Protect from light. Sensitive to light. Store in light-resistant containers. Store in a segrated and approved area. Store away from incompatible materials.

Incompatible Materials:
Oxidizing agents. Reducing 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, sulfurylchloride, tetrachlorosilane, and thionyl chloride).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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.

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.

National occupational exposure limits

United States

U.S Occupational Exposure Limits:

Components	OSHA	NIOSH	ACGIH	AIHA WHEEL
Dimethyl Sulfoxide-d6 99.9 atom % - 2206-27-1	None	None	None	None

Canada

Canada Occupational Exposure Limits: Not determined

Components	Alberta	British Columbia	Ontario	Quebec
Dimethyl Sulfoxide-d6 99.9 atom % 2206-27-1	None	None	None	None

Australia and Mexico

Occupational Exposure Limits for Australia and Mexico: Not determined

Components	Australia	Mexico
Dimethyl Sulfoxide-d6 99.9 atom % 2206-27-1	None	None

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:
Liquid.

Appearance:
No information available

Color:
Clear. Colorless.

Odor:
Slight. Sulfurous. Distinctive garlic or oyster-like.

Taste
No information available

Molecular/Formula weight:
87.14

Flash point (°C):
87

Lower Explosion Limit (%):
2.6-3.5%

Upper Explosion Limit (%):
28.5-42%

Autoignition Temperature (°C/°F):
300-301 °C/572-574 °F

Melting point/range(°C/°F):
No information available

Boiling point/range(°C/°F):
189 °C/372°F

pH:
No information available

Specific gravity:
No information available

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

Density (g/cm3):
No information available

Bulk density:
No information available

Vapor pressure @ 20°C (kPa):
0.055

Evaporation rate:
No information available

Vapor density:
2.71

VOC content (g/L):
No information available

Odor threshold (ppm):
No information available

Partition coefficient (n-octanol/water):
No information available

Miscibility:
Completely miscible with water

Solubility:
No information available

10. STABILITY AND REACTIVITY

Stability: Stable at normal conditions

Conditions to avoid: Heat. Ignition sources. Exposure to light. Exposure to moisture. Exposure to moist air.

Incompatible Materials: Oxidizing agents. Reducing 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, sulfurylchloride, tetrachlorosilane, and thionyl chloride).

Hazardous decomposition products: When heated to decomposition it emits toxic fumes. Carbon monoxide. Carbon dioxide. Sulphur oxides. Formaldehyde. Methyl mercaptan. Dimethyl sulfide.

Possibility of Hazardous Reactions: Dimethyl Sulfoxde forms a violently or explosive reation with the following: Acethyl Chloride, Benzenesulfonyl chloride, Bromobenzoyl acetanilide, Cyanuric chloride, Disulfur dichloride, Iodine pentafluoride, Oxalyl chloride, Magnesium perchlorate, Bromomethane, Diphosphorus trioxide, Phosphorous trichloride, Phosphoryl chloride, Silver difluoride, Sodium hydride, Sulfur dichloride, Tetrachlorosilane, Thionyl chloride, Boron compounds, 4(4'-Bromobenzoyl)acetanilide, Carbonyl diisothiocyanate; Copper + trichloroacetic acid, Dinitrogen tetraoxide, metal alkoxides, Trifluoroacetic acid anhydride, Aluminum perchlorate, Iron (III) nitrate; Sodium perchlorate
Dimethyl sulfoxide is incompatible with Perchloric acid, Periodic acid, Sulfur trioxide, metal oxosalts

Polymerization: Hazardous polymerization does not occur

Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Component Information

Dimethyl Sulfoxide-d6 99.9 atom % - 2206-27-1

LD50/oral/rat = 14500 mg/kg (LD50 oral Rat for Dimethyl Sulfoxide (CAS no. 67-68-5))
LD50/oral/mouse = 7920-21400 mg/kg (LD50 oral Mouse for Dimethyl Sulfoxde (CAS no. 67-68-5))
LD50/dermal/rat = 40000 mg/kg (LD50 dermal Rat for Dimethyl Sulfoxide (CAS no. 67-68-5))
LD50/dermal/rabbit = No information available
LC50/inhalation/rat = >1600 mg/m^3 4 hr (LC50 Rat for Dimethyl Sulfoxide (CAS no. 67-68-5))
LC50/inhalation/mouse = No infomation available
Other LD50 or LC50information = 17400 mg/kg LD50 oral Rat (For Dimethyl Sulfoxide (CAS no. 67-68-5))
28300 mg/kg LD50 oral Rat (For Dimethyl Sulfoxide (CAS no. 67-68-5))

Product Information

LC50/inhalation/rat No information available
LC50/Inhalation/mouse No information available
LD50/dermal/rabbit No information available
LD50/dermal/rat No information available
LD50/oral/mouse = No information available
LD50/oral/rat = No information available

Local Effects

Skin irritation: May cause skin irritation. Mild skin irritation. May cause burning sensation or stinging, redness, and inflammation of the skin. May cause urticaria (hives). May cause itching.

Eye irritation: Contact with eyes may cause irritation. Mild eye irritation. May cause conjunctival irritation.

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 diarrhoea
May cause constipation
May cause abdominal pain
May cause decreased appetite or anorexia
May cause cyanosis
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
It may affect the blood (anemia, eosinophilia)
It may affect the brain
May affect blood (changes in serum composition)
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 (analgesia, 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

Sensitization:

No information available

Chronic Toxicity

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.

Carcinogenic effects:

Equivocal tumorigenic agent by Registery of Toxic Effects of Chemical Substances (RTECS) criteria

Components	NTP	IARC	OSHA HCS - Carcinogens	ACGIH - Carcinogens	Australia - Prohibited Carcinogenic Substances	Australia - Notifiable Carcinogenic Substances
Dimethyl Sulfoxide-d6 99.9 atom %	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

Mutagenic Effects:

May affect genetic material
Mutations in microorganisms
Experiments with bacteria and/or yeast have shown mutagenic effects
Mutagenic effects in mammalian somatic cells

Reproductive Effects:

Experiments have shown reproductive toxicity effects on laboratory animals
May cause adverse reproductive effects based on animal data
No information on reproductive toxicity effects on humans was found

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.

Target Organs: Kidneys. Skin. Central nervous system.

12. ECOLOGICAL INFORMATION

ECOTOXICITY

Toxicity to terrestrial and aquatic plants and animals: No information available

Ecotoxicity effects: No data available.

Aquatic toxicity: No information available

Mobility: No information available

Persistence and degradability: No information available

Bioaccumulative potential: No information available

13. DISPOSAL CONSIDERATIONS

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	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Dimethyl Sulfoxide-d6 99.9 atom %	None	None	None	None

14. TRANSPORT INFORMATION

DOT

UN-No: Not Regulated
Proper Shipping Name: No information available
Hazard Class: No information available
Packing Group: None
Subsidiary Risk: Not applicable
Marine Pollutant No data available
ERG No: No information available
DOT RQ (lbs): No information available

TDG (Canada)

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
Description: No information available

ADR

UN-No:	No information available
Proper Shipping Name:	No information available
Hazard Class:	No information available
Packing Group:	No information available
Subsidiary Risk:	No information available
Classification Code:	No information available
Description:	No information available
CEFIC Tremcard No:	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
Description:	No information available
IMDG Page:	No information available
Marine Pollutant	No information available
MFAG:	No information available
Maximum Quantity:	No information available

RID

UN-No:	No information available
Proper Shipping Name:	No information available
Hazard Class:	No information available
Packing Group:	No information available
Subsidiary Risk:	No information available
Classification Code:	No information available
Description:	No information available

ICAO

UN-No:	No information available
Proper Shipping Name:	No information available
Hazard Class:	No information available
Packing Group:	No information available
Subsidiary Risk:	No information available
Description:	No information available

IATA

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
Description:	No information available

15. REGULATORY INFORMATION

International Inventories

Components	U.S. TSCA	Philippines (PICCS)	KOREA KECL	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
Dimethyl Sulfoxide-d6 99.9 atom %	Not Listed	Present	Present KE-11860	Not present	Present	Present	Present 218-617-0

U.S. Regulations

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

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)

Components	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
Dimethyl Sulfoxide-d6 99.9 atom %	Not Listed	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Components	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting *de minimis*
Dimethyl Sulfoxide-d6 99.9 atom %	None	None	None	None	None

U.S. TSCA

Components	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Dimethyl Sulfoxide-d6 99.9 atom %	Not Applicable	Not Applicable

Canada

WHMIS hazard class:
B3 Combustible liquid

Canada Controlled Products Regulation:
This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Inventory

Components	Canada (DSL)	Canada (NDSL)
Dimethyl Sulfoxide-d6 99.9 atom %	Present	Not Listed

Components	CEPA Schedule I - Toxic Substances	CEPA - 2010 Greenhouse Gases Subject to Manditory Reporting
Dimethyl Sulfoxide-d6 99.9 atom %	Not listed	Not listed

EU Classification

R-phrase(s)
not determined

S -phrase(s)
none

Components	Classification	Concentration Limits:	Safety Phrases
Dimethyl Sulfoxide-d6 99.9 atom %		No information	

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

Indication of danger:
Not dangerous

16. OTHER INFORMATION

The MSDS format complies with ANSI Z400.1/Z129.1-2010 standards.

Preparation Date: 26-Jan-2015

Reason for revision: Not applicable

Prepared by: Sonia Owen

Literature reference: No information available

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) 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 MSDS. The physical properties reported in this MSDS 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 MSDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.

SAFETY DATA SHEET

Preparation Date: 1/26/2015 **Revision Date:** 1/26/2015 **Revision Number:** G1

Product identifier

Product code: D2493
Product Name: DIMETHYL SULFOXIDE-D6, 99.9 ATOM PERCENT D

Other means of identification

Synonyms: Hexadeuterodimethyl Sulfoxide
Please note that this product is not radioactive. The data given for this product are those for the corresponding unlabeled material unless specifically indicated otherwise. Health and safety data for the labeled material are generally unavailable, but are assumed to be similar or identical to the corresponding unlabeled material.
CAS #: 2206-27-1
RTECS # Not available
CI#: Not available

Recommended use of the chemical and restrictions on use

Recommended use: No information available.
Uses advised against No information available

Supplier:
Spectrum Chemicals and Laboratory Products, Inc.
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 by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

Serious eye damage/eye irritation	Category 2B
Flammable liquids	Category 4

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/protective clothing/eye protection/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

Components	CAS-No.	Weight %	Trade Secret
Dimethyl Sulfoxide-d6 99.9 atom % 2206-27-1	2206-27-1	100	*

4. FIRST AID MEASURES

First aid measures

General Advice: Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126)

4. FIRST AID MEASURES

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

Eye Contact: Flush eye 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 diarrhoea. 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: Carbon monoxide; Carbon dioxide; Sulfur oxides; Formaldehyde and Methyl mercaptan may also be formed

Specific hazards: Combustible material. 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). Container explosion may occur under fire conditions or when heated. 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. Avoid contact with skin, eyes and 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 Should not be released into the environment. Prevent entry into waterways, sewers, basements or confined areas. In case of large spill, dike if needed. Dike far ahead of liquid spill for later disposal.

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).

Methods for cleaning up Clean contaminated surface thoroughly. Use appropriate tools to put the spilled material in a suitable chemical waste disposal container.

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

Technical Measures/Storage Conditions:
Hygroscopic. Keep container tightly closed in a dry and well-ventilated place. Store at room temperature in the original container. Keep away from heat and sources of ignition. Protect from light. Sensitive to light. Store in light-resistant containers. Store in a segrated and approved area. Store away from incompatible materials.

Incompatible Materials:
Oxidizing agents. Reducing 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, sulfurylchloride, tetrachlorosilane, and thionyl chloride).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

National occupational exposure limits

U.S Occupational Exposure Limits:

United States

Components	OSHA	NIOSH	ACGIH	AIHA WHEEL

Dimethyl Sulfoxide-d6 99.9 atom % - 2206-27-1	None	None	None	None

Canada

Canada Occupational Exposure Limits: Not determined

Components	Alberta	British Columbia	Ontario	Quebec
Dimethyl Sulfoxide-d6 99.9 atom % - 2206-27-1	None	None	None	None

Australia and Mexico

Occupational Exposure Limits for Australia and Mexico: Not determined

Components	Australia	Mexico
Dimethyl Sulfoxide-d6 99.9 atom % 2206-27-1	None	None

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:
Liquid.

Appearance:
No information available

Color:
Clear. Colorless.

Odor:
Slight. Sulfurous. Distinctive garlic or oyster-like.

Taste
No information available

Formula:
CD3SOVD3

Molecular/Formula weight:
87.14

Flash point (°C):
87

Flashpoint (°C/°F):
87-89 °C/188.6-192.2 °F

Flash Point Tested according to:
Closed cup

Lower Explosion Limit (%):
2.6-3.5%

Upper Explosion Limit (%):
28.5-42%

Autoignition Temperature (°C/°F):
300-301 °C/572-574 °F

pH:
No information available

Melting point/range(°C/°F):
No information available

Boiling point/range(°C/°F):
189 °C/372°F

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

Specific gravity:
No information available

Density (g/cm3):
No information available

Bulk density:
No information available

Vapor pressure @ 20°C (kPa):
0.055

Evaporation rate:
No information available

Vapor density:
2.71

VOC content (g/L):
No information available

Odor threshold (ppm):
No information available

Partition coefficient (n-octanol/water):
No information available

Viscosity:
No information available

Miscibility:
Completely miscible with water

Solubility:
No information available

10. STABILITY AND REACTIVITY

Reactivity
No information available

Chemical stability

Stability: Stable at normal conditions

Possibility of Hazardous Reactions: Hazardous polymerization does not occur

Conditions to avoid: Heat. Ignition sources. Exposure to light. Exposure to moisture. Exposure to moist air.

Incompatible Materials: Oxidizing agents. Reducing 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, sulfurylchloride, tetrachlorosilane, and thionyl chloride).

Hazardous decomposition products: When heated to decomposition it emits toxic fumes. Carbon monoxide. Carbon dioxide. Sulphur oxides. Formaldehyde. Methyl mercaptan. Dimethyl sulfide.

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

Dimethyl Sulfoxide-d6 99.9 atom % - 2206-27-1

LD50/oral/rat = 14500 mg/kg (LD50 oral Rat for Dimethyl Sulfoxide (CAS no. 67-68-5))
LD50/oral/mouse = 7920-21400 mg/kg (LD50 oral Mouse for Dimethyl Sulfoxde (CAS no. 67-68-5))
LD50/dermal/rabbit = No information available
LD50/dermal/rat = 40000 mg/kg (LD50 dermal Rat for Dimethyl Sulfoxide (CAS no. 67-68-5))
LC50/inhalation/rat = >1600 mg/m^3 4 hr (LC50 Rat for Dimethyl Sulfoxide (CAS no. 67-68-5))
LC50/inhalation/mouse = No infomation available
Other LD50 or LC50information = 17400 mg/kg LD50 oral Rat (For Dimethyl Sulfoxide (CAS no. 67-68-5))
28300 mg/kg LD50 oral Rat (For Dimethyl Sulfoxide (CAS no. 67-68-5))

Product Information

LD50/oral/rat =
VALUE- Acute Tox Oral = No information available

LD50/oral/mouse =
Value - Acute Tox Oral = No information available

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

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

LC50/inhalation/rat
VALUE-Vapor = No information available
VALUE-Gas = No information available
VALUE-Dust/Mist = No information available

LC50/Inhalation/mouse
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 itiching. 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 diarrhoea 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 (analgesia, 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 Experiments with bacteria and/or yeast have shown mutagenic effects Mutagenic effects in mammalian somatic cells

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

Components	ACGIH - Carcinogens	IARC	NTP	OSHA HCS - Carcinogens	Australia - Prohibited Carcinogenic Substances	Australia - Notifiable Carcinogenic Substances
Dimethyl Sulfoxide-d6 99.9 atom %	Not listed	Not listed	Not listed	Not listed	Not listed	Not listed

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

Ecotoxicity effects: No data available.

Persistence and degradability: No information available

Bioaccumulative potential: No information available

Mobility: No information available

13. DISPOSAL CONSIDERATIONS

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	RCRA - F Series Wastes	RCRA - K Series Wastes	RCRA - P Series Wastes	RCRA - U Series Wastes
Dimethyl Sulfoxide-d6 99.9 atom %	None	None	None	None

14. TRANSPORT INFORMATION

DOT

UN-No:	Not Regulated
Proper Shipping Name:	No information available
Hazard Class:	No information available
Subsidiary Risk:	Not applicable
Packing Group:	None
ERG No:	No information available
Marine Pollutant	No data available
DOT RQ (lbs):	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
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
Classification Code:	No information available
Description:	No information available
CEFIC Tremcard No:	No information available

IMO / IMDG

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
Description:	No information available
IMDG Page:	No information available
Marine Pollutant	No information available
MFAG:	No information available
Maximum Quantity:	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
Classification Code:	No information available
Description:	No information available

ICAO

UN-No:	Not Regulated
Proper Shipping Name:	No information available

14. TRANSPORT INFORMATION

Hazard Class: No information available
Subsidiary Risk: No information available
Packing Group: No information available
Description: 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
Description: No information available

15. REGULATORY INFORMATION

International Inventories

Components	U.S. TSCA	KOREA KECL	Philippines (PICCS)	Japan ENCS	CHINA	Australia (AICS)	EINECS-No.
Dimethyl Sulfoxide-d6 99.9 atom %	Not Listed	Present KE-11860***	Present***	Not present	Present***	Present***	Present 218-617-0***

U.S. Regulations

California Prop. 65: Safe Drinking Water and Toxic Enforcement Act of 1986.

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)

Components	Carcinogen	Developmental Toxicity	Male Reproductive Toxicity	Female Reproductive Toxicity:
Dimethyl Sulfoxide-d6 99.9 atom %	Not Listed	Not Listed	Not Listed	Not Listed

CERCLA/SARA

Components	CERCLA - Hazardous Substances and their Reportable Quantities	Section 302 Extremely Hazardous Substances and TPQs	Section 302 Extremely Hazardous Substances and RQs	Section 313 - Chemical Category	Section 313 - Reporting *de minimis*
Dimethyl Sulfoxide-d6 99.9 atom %	None	None	None	None	None

U.S. TSCA

Components	TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)	TSCA 8(d) -Health and Safety Reporting
Dimethyl Sulfoxide-d6 99.9 atom %	Not Applicable	Not Applicable

Canada

WHMIS hazard class:
B3 Combustible liquid

Canada Controlled Products Regulation:
This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

Inventory

Components	Canada (DSL)	Canada (NDSL)
Dimethyl Sulfoxide-d6 99.9 atom %	Present***	Not Listed

Components	CEPA Schedule I - Toxic Substances	CEPA - 2010 Greenhouse Gases Subject to Manditory Reporting
Dimethyl Sulfoxide-d6 99.9 atom %	Not listed	Not listed

EU Classification

R-phrase(s)
not determined

S -phrase(s)
none

Components	Classification	Concentration Limits:	Safety Phrases
Dimethyl Sulfoxide-d6 99.9 atom %		No information	

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

Indication of danger:
Not dangerous

16. OTHER INFORMATION

16. OTHER INFORMATION

NFPA	HMIS	Personal Protective Equipment

Preparation Date: 1/26/2015
Revision Date: 1/26/2015
Prepared by: Sonia Owen

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