1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers
Product name: Dimethyl sulfoxide

Product Number: D2650
Brand: Sigma
REACH No.: 01-2119431362-50-XXXX
CAS-No.: 67-68-5

1.2 Relevant identified uses of the substance or mixture and uses advised against
Identified uses: Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet
Company: Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO  63103
USA

Telephone: +1 800-325-5832
Fax: +1 800-325-5052

1.4 Emergency telephone number
Emergency Phone #: (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture
GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 4), H227

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements
Pictogram: none
Signal word: Warning

Hazard statement(s)
H227: Combustible liquid

Precautionary statement(s)
P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.
P370 + P378: In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.
P403 + P235: Store in a well-ventilated place. Keep cool.
P501: Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances
Chemical characterization: Natural product
Synonyms: DMSO
Methyl sulfoxide

Formula: C₂H₆OS
Molecular Weight: 78.13 g/mol
CAS-No.: 67-68-5
EC-No.: 200-664-3
Registration number: 01-2119431362-50-XXXX

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl sulfoxide</td>
<td>Flam. Liq. 4; H227</td>
<td>-</td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of 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
Flush eyes with water as a precaution.

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

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11.

4.3 Indication of any immediate medical attention and special treatment needed

no data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

5.2 Special hazards arising from the substance or mixture

Carbon oxides, Sulphur oxides

5.3 Advice for firefighters

Wear self contained breathing apparatus for fire fighting if necessary.

5.4 Further information

Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Avoid breathing vapours, mist or gas. Remove all sources of ignition. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas. For personal protection see section 8.
6.2 **Environmental precautions**  
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 **Methods and materials for containment and cleaning up**  
Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal.

6.4 **Reference to other sections**  
For disposal see section 13.

### 7. HANDLING AND STORAGE

7.1 **Precautions for safe handling**  
Avoid inhalation of vapour or mist.  
Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.  
For precautions see section 2.2.

7.2 **Conditions for safe storage, including any incompatibilities**  
Keep container tightly closed in a dry and well-ventilated place.  
Store under inert gas. Hygroscopic

7.3 **Specific end use(s)**  
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 **Control parameters**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
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</thead>
<tbody>
<tr>
<td>Dimethyl sulfoxide</td>
<td>67-68-5</td>
<td>TWA</td>
<td>250 ppm</td>
<td>USA. Workplace Environmental Exposure Levels (WEEL)</td>
</tr>
</tbody>
</table>

8.2 **Exposure controls**

**Appropriate engineering controls**  
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

**Personal protective equipment**

**Eye/face protection**  
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

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

**Splash contact**  
Material: Nitrile rubber  
Minimum layer thickness: 0.2 mm  
Break through time: 38 min  
Material tested: Dermatril® P (KCL 743 / Aldrich Z677388, Size M)

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

**Body Protection**  
Impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
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).

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

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form: liquid, clear
   Colour: colourless
b) Odour no data available
c) Odour Threshold no data available
d) pH no data available
e) Melting point/freezing point Melting point/range: 16 - 19 °C (61 - 66 °F)
f) Initial boiling point and boiling range 189 °C (372 °F)
g) Flash point 87 °C (189 °F) - closed cup
h) Evaporation rate no data available
i) Flammability (solid, gas) no data available
j) Upper/lower flammability or explosive limits Upper explosion limit: 42 % (V)
   Lower explosion limit: 3.5 % (V)
k) Vapour pressure 0.55 hPa (0.41 mmHg) at 20 °C (68 °F)
l) Vapour density 2.70 - (Air = 1.0)
m) Relative density 1.1 g/mL
n) Water solubility completely miscible
o) Partition coefficient: n-octanol/water log Pow: -2.03
p) Auto-ignition temperature no data available
q) Decomposition temperature no data available
r) Viscosity no data available
s) Explosive properties no data available
t) Oxidizing properties no data available

9.2 Other safety information

Relative vapour density 2.70 - (Air = 1.0)

10. STABILITY AND REACTIVITY

10.1 Reactivity no data available

10.2 Chemical stability
   Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions no data available
10.4 Conditions to avoid
Heat, flames and sparks.

10.5 Incompatible materials
Acid chlorides, Phosphorus halides, Strong acids, Strong oxidizing agents, Strong reducing agents

10.6 Hazardous decomposition products
Other decomposition products - no data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - rat - 14,500 mg/kg
LC50 Inhalation - rat - 4 h - 40250 ppm
LD50 Dermal - rabbit - > 5,000 mg/kg
no data available

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
no data available

Respiratory or skin sensitisation
no data available

Germ cell mutagenicity
mouse
lymphocyte
Cytogenetic analysis
mouse
lymphocyte
Mutation in mammalian somatic cells.

rat
Cytogenetic analysis

mouse
DNA damage

Carcinogenicity
Carcinogenicity - rat - Oral
Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Skin and Appendages: Other: Tumors.

Carcinogenicity - mouse - Oral
Tumorigenic:Equivocal tumorigenic agent by RTECS criteria. Leukaemia Skin and Appendages: Other: Tumors.

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.

Reproductive toxicity
Reproductive toxicity - rat - Intraperitoneal
Effects on Fertility: Abortion.

Reproductive toxicity - rat - Intraperitoneal
Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).

Reproductive toxicity - rat - Subcutaneous
Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).
Effects on Fertility: Litter size (e.g., # fetuses per litter; measured before birth).

Reproductive toxicity - mouse - Oral
Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea). Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Developmental Toxicity - mouse - Intraperitoneal
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Specific Developmental Abnormalities: Musculoskeletal system.

Specific target organ toxicity - single exposure
no data available

Specific target organ toxicity - repeated exposure
no data available

Aspiration hazard
no data available

Additional Information
RTECS: PV6210000
Effects due to ingestion may include: Nausea, Fatigue, Headache
Eyes - Eye disease - Based on Human Evidence
Eyes - Eye disease - Based on Human Evidence

12. ECOLOGICAL INFORMATION

12.1 Toxicity
Toxicity to fish
LC50 - Pimephales promelas (fathead minnow) - 34,000 mg/l - 96 h
LC50 - Oncorhynchus mykiss (rainbow trout) - 35,000 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates
EC50 - Daphnia pulex (Water flea) - 27,500 mg/l

12.2 Persistence and degradability
no data available

12.3 Bioaccumulative potential
no data available

12.4 Mobility in soil
no data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
no data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
Product
This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber. Offer surplus and non-recyclable solutions to a licensed disposal company.
Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
NA-Number: 1993 Class: NONE Packing group: III
Proper shipping name: Combustible liquid, n.o.s. (Dimethyl sulfoxide) (Dimethyl sulfoxide)
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

REACH No. : 01-2119431362-50-XXXX

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
SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Fire Hazard, Chronic Health Hazard

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl sulfoxide</td>
<td>67-68-5</td>
<td>2007-03-01</td>
</tr>
</tbody>
</table>

New Jersey Right To Know Components

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl sulfoxide</td>
<td>67-68-5</td>
<td>2007-03-01</td>
</tr>
</tbody>
</table>

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

<table>
<thead>
<tr>
<th>H227 Rating</th>
<th>Description</th>
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<tr>
<td>Flam. Liq.</td>
<td>Flammable liquids</td>
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HMIS Rating

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<th>Health hazard</th>
<th>Chronic Health Hazard</th>
<th>Flammability</th>
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<tbody>
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<td>*</td>
<td>2</td>
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</table>

NFPA Rating

<table>
<thead>
<tr>
<th>Health hazard</th>
<th>Fire Hazard</th>
<th>Reactivity Hazard</th>
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<tbody>
<tr>
<td>0</td>
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</table>
Further information
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Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956

Version: 3.11                  Revision Date: 02/21/2014            Print Date: 03/03/2014