1. Product Identification

Synonyms: Dimethyl sulfoxide solution
CAS No.: Not applicable to mixtures.
Molecular Weight: Not applicable to mixtures.
Chemical Formula: Not applicable to mixtures.
Product Codes: 9236

2. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>CAS No</th>
<th>Percent</th>
<th>Hazardous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethylsulfoxide</td>
<td>67-68-5</td>
<td>90%</td>
<td>Yes</td>
</tr>
<tr>
<td>Ethyl Alcohol</td>
<td>64-17-5</td>
<td>10%</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS THE CENTRAL NERVOUS SYSTEM, LIVER, BLOOD, AND REPRODUCTIVE SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. FLAMMABLE LIQUID AND VAPOR.

SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 2 - Moderate
Reactivity Rating: 1 - Slight
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
Storage Color Code: Red (Flammable)
Potential Health Effects
----------------------------------

Inhalation:
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath. May cause allergic reaction in sensitive individuals. Ethanol vapors can produce CNS depression, eye and upper respiratory tract irritation. Symptoms may include burning sensation, headache, dizziness, tremors, nausea and other symptoms similar to ingestion.

Ingestion:
Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea. May cause abdominal pain, drowsiness, chills and chest pains.

Ethyl Alcohol Component:
Dose-related central nervous system depression occurs, ranging from inebriation to anesthesia, narcosis, coma, respiratory failure, and death in significant exposures. Symptoms include headaches, tremors, fatigue, hallucinations, distorted perceptions, and convulsions.

Skin Contact:
Causes irritation to skin. Symptoms include redness, itching, and pain. May cause scaling. Readily absorbed through the skin. Garlic-like taste and odor may develop on the breath and skin. Transient disturbances of color vision, photophobia, headache, diarrhea, and dermatitis may result from skin applications. A good solvent; may result in the increased skin absorption of other more toxic materials.

Eye Contact:
Causes irritation, redness, and pain. May cause blurred vision. Ethanol vapors irritate the eyes. Splashes cause burning and stinging sensation with watering of the eyes and reflex closure of the lids.

Chronic Exposure:
Absorption may affect the blood. Repeated skin application may cause scaling dermatitis. Repeated oral doses may effect the liver and kidneys. Chronic ethanol exposure may affect the central nervous system, liver, blood and reproductive system. Examples of chronic effects include physical dependence, malnutrition, neurological effects (e.g., amnesia, dementia, prolonged sleepiness). Chronic ingestion has been associated with cancers of the esophagus and liver. Repeated or prolonged skin contact may result in drying of the skin and dermatitis. Combined exposure to ethanol and certain other chemicals may result in increased toxic effects.

Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems or impaired liver or kidney function may be more susceptible to the effects of the substance. Topical application enhances dermal absorption of many other chemicals, including drugs and allergens of moderate molecular weight.

4. First Aid Measures

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

Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact:
Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.
5. Fire Fighting Measures

Fire:
Flash point: 58.3°C (136°F) CC
Flammable Liquid and Vapor!

Explosion:
Sealed containers may rupture when heated. Above the flash point, explosive vapor-air mixtures may be formed. Vapor may explode if ignited in an enclosed area. Vapors can flow along surfaces to distant ignition source and flash back. Sensitive to static discharge.

Fire Extinguishing Media:
Most appropriate extinguishers are carbon dioxide and alcohol-resistant foam. Use water in flooding quantities as fog. Water spray may be used to keep fire exposed containers cool. Do not allow water runoff to enter sewers or waterways.

Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Vapors can flow along surfaces to distant ignition source and flash back.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e.g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!

7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Protect from direct sunlight. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Do Not attempt to clean empty containers since residue is difficult to remove. Do not pressurize, cut, weld, braze, solder, drill, grind or expose such containers to heat, sparks, flame, static electricity or other sources of ignition: they may explode and cause injury or death.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
For Ethyl Alcohol:
- OSHA Permissible Exposure Limit (PEL):
  1,000 ppm (TWA)
- ACGIH Threshold Limit Value (TLV):
  1,000 ppm (STE L), A3 - Confirmed animal carcinogen with unknown relevance to humans.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, Industrial Ventilation, A Manual of Recommended Practices, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, wear a supplied air, full-facepiece

**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

**Eye Protection:**
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

9. **Physical and Chemical Properties**

**Appearance:**
Clear, colorless liquid.

**Odor:**
Garlic-like odor.

**Solubility:**
Miscible in water.

**Specific Gravity:**
No information found.

**pH:**
No information found.

**% Volatiles by volume @ 21C (70F):**
No information found.

**Boiling Point:**
No information found.

**Melting Point:**
No information found.

**Vapor Density (Air=1):**
No information found.

**Vapor Pressure (mm Hg):**
No information found.

**Evaporation Rate (BuAc=1):**
No information found.

---

10. **Stability and Reactivity**

**Stability:**
Stable under ordinary conditions of use and storage.

**Hazardous Decomposition Products:**
Upon heating above 100C (212F), sulfur dioxide is evolved from this substance. Hazardous thermo-oxidative degradation products from DMSO include formaldehyde, methyl mercaptan and sulfur dioxide.

**Hazardous Polymerization:**
Will not occur.

**Incompatibilities:**
Strong oxidants, acylhalides, arylhalides, bromobenzoyl acetonilide, magnesium perchlorate, perchloric acid and sodium hydroxide. Ethyl Alcohol is incompatible with strong oxidizing agents, perchlorates, aluminum, alkali metals, acetyl chloride, calcium hypochlorite, chlorine oxides, mercuric nitrate, hydrogen peroxide, nitric acid, bromine pentafluoride, chromyl chloride, permanganic acid, uranium hexafluoride, acetyl bromide. Inignites on contact with phosphorous (III) oxide; platinum; disulfuric acid + nitric acid; potassium tert-butoxide + acids. Will ignite and then explode on contact with acetic anhydride + sodium hydrogen sulfate. Forms explosive products in reaction with silver nitrate; ammonia + silver; silver (I) oxide + ammonia or hydrazine.

**Conditions to Avoid:**
Heat, flames, ignition sources and incompatibles.
11. Toxicological Information

Dimethyl sulfoxide: Oral rat LD50: 14,500 mg/Kg. Irritation data (std Draize, rabbit): Skin = 500 mg/24 hour, mild; Eye = 500 mg/24 hour, mild. Investigated as a tumorigen, mutagen, reproductive effector.
For Ethyl Alcohol: LD50 oral rat 7060 mg/kg; LC50 inhalation rat 20,000 ppm/10H; Irritation skin rabbit, std Draize, 20 mg/24H, moderate; Irritation eye rabbit, std Draize, 500 mg/24H, mild.

---
\Cancer Lists\-----------------------------------------------

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<tr>
<th>Ingredient</th>
<th>NTP Known</th>
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<td>No</td>
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<tr>
<td>Ethyl Alcohol (64-17-5)</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
</tbody>
</table>

12. Ecological Information

Environmental Fate:
When released into the soil, this material is not expected to biodegrade. When released into the soil, this material may leach into groundwater. When released into the soil, this material may evaporate to a moderate extent.
When released into water, this material may evaporate to a moderate extent. This material is not expected to significantly bioaccumulate. When released into the air, this material may be moderately degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition.

Environmental Toxicity:
Ethyl Alcohol Component:
The LC50/96-hour values for fish are over 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

To be determined.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\-----------------------------------------------

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>TSCA</th>
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--------\Chemical Inventory Status - Part 2\-----------------------------------------------

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### Federal, State & International Regulations - Part 1

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### Federal, State & International Regulations - Part 2

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Chemical Weapons Convention: No  
TSCA 12(b): No  
CDTA: No  
SARA 311/312: Acute: Yes  Chronic: Yes  
Fire: Yes  Pressure: No  
Reactivity: No  
(Mixture / Liquid)

*Australian Hazchem Code:* None allocated.  
*Poison Schedule:* S6  
*WHMIS:* This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

### 16. Other Information

**NFPA Ratings:**  
Health: 1  Flammability: 2  Reactivity: 0

**Label Hazard Warning:**  
WARNING! HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. AFFECTS THE CENTRAL NERVOUS SYSTEM, LIVER, BLOOD, AND REPRODUCTIVE SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. FLAMMABLE LIQUID AND VAPOR.

**Label Precautions:**  
Avoid breathing vapor or mist.  
Keep container closed.  
Use only with adequate ventilation.  
Avoid contact with eyes, skin and clothing.  
Wash thoroughly after handling.  
Keep away from heat and flame.

**Label First Aid:**  
If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

**Product Use:**  
Laboratory Reagent.
Disclaimer:

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Prepared by: Environmental Health & Safety