1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Methanol-d₄

Product Number: 236985

Brand: Aldrich

Supplier: Sigma-Aldrich

Telephone: +1 800-325-6832

Fax: +1 800-325-5052

Emergency Phone #: (For both supplier and manufacturer)

Preparation Information: Sigma-Aldrich Corporation

Product Safety - Americas Region

1-800-521-8956

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Flammable liquid, Target Organ Effect, Toxic by ingestion, Toxic by skin absorption, Irritant

Target Organs
Eyes, Kidney, Liver, Heart, Central nervous system

GHS Classification
Flammable liquids (Category 2)
Acute toxicity, Oral (Category 3)
Acute toxicity, Inhalation (Category 3)
Skin Irritation (Category 2)
Eye Irritation (Category 2A)
Specific target organ toxicity - single exposure (Category 1)

GHS Label elements, including precautionary statements

Pictogram

Signal word: Danger

Hazard statement(s)

H225: Highly flammable liquid and vapour
H226: Toxic if swallowed or in contact with skin.
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H331: Toxic if inhaled.
H370: Causes damage to organs.

Precautionary statement(s)

P201: Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P260: Do not breathe dust/fume/gas/mist/vapours/spray.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: Methyl-d₄ alcohol

Formula: C₅H₁₂O

Molecular Weight: 36.07 g/mol

CAS-No: EC-No. Index-No. Concentration

[2H₄] Methanol

811-99-3

212.37 g/L

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of danger 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. Take victim immediately to hospital. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

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

5. FIRE-FIGHTING MEASURES

Conditions of flammability
Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flames/hot surface. No smoking.

Suitable extinguishing media
Use water spray. alcohol-resistant foam, dry chemical or carbon dioxide.

Special protective equipment for fire-fighters
Wear self-contained breathing apparatus for fire fighting if necessary.
Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - Carbon oxides

Further information
Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

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 a container for disposal according to local regulations (see section 13).

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Use explosion-proof equipment. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Store under inert gas. Hygroscopic.

8. EXPOSURE CONTROLS: PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2H4)Methanol</td>
<td>811-98-3</td>
<td>TWA 200 ppm</td>
<td>250 mg/m³</td>
<td>USA, Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
</tbody>
</table>

Remarks
The value in mg/m³ is approximate.

<table>
<thead>
<tr>
<th></th>
<th>TWA 200 ppm</th>
<th>USA, ACGIH Threshold Limit Values (TLV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache</td>
<td>Eye damage</td>
<td>Substances for which there is a Biological Exposure Index or Indices (see BEI9 section) Danger of cutaneous absorption</td>
</tr>
<tr>
<td>STEL</td>
<td>250 ppm</td>
<td>USA, ACGIH Threshold Limit Values (TLV)</td>
</tr>
</tbody>
</table>

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<tr>
<th></th>
<th>TWA 200 ppm</th>
<th>280 mg/m³</th>
<th>USA OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin irritation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEL</td>
<td>250 ppm</td>
<td>325 mg/m³</td>
<td>USA, OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.100</td>
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</table>

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<tr>
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<th>TWA 200 ppm</th>
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<th>USA, NIOSH Recommended Exposure Limits</th>
</tr>
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</table>

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Form
Liquid

Colour
No data available

Safety data
pH
No data available

Melting point/freezing point
No data available

Boiling point
65.4 °C (149.7 °F) - b.p.

Flash point
11 °C (51 °F) - closed cup

Ignition temperature
385 °C (725 °F)

Autoignition temperature
No data available

Lower explosion limit
6 % (V)

Upper explosion limit
36 % (V)

Vapour pressure
546.6 hPa (410.0 mmHg) at 50.0 °C (122.0 °F)

Density
0.886 g/ml at 25 °C (77 °F)

Water solubility
No data available

Partition coefficient n-octanol/water
No data available

Relative vapour density
No data available

Potential for dermal absorption

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Potential for dermal absorption

Personal protective equipment

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 CE (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.

Eye protection
Face shield and safety glasses. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

Skin and body protection
Complete suit protecting against chemicals. Flame retardant anti-static protective clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.
10. STABILITY AND REACTIVITY

- Chemical stability: Stable under recommended storage conditions.
- Possibility of hazardous reactions: Vapours may form explosive mixture with air. Conditions to avoid: Heat, flames and sparks. Extremes of temperature and direct sunlight.
- Materials to avoid: Acids, Acid Chlorides, Acid anhydrides, Oxidizing agents, Alkali metals, Reducing agents.
- Hazardous decomposition products: Hazardous decomposition products formed under fire conditions. - Carbon oxides.
- Other decomposition products: No data available.

11. TOXICOLOGICAL INFORMATION

- Acute toxicity:
  - Oral LD50: LD50 Oral - rat: 5,028 mg/kg
  - Inhalation LC50: LC50 Inhalation - rat: 4 h - 64000 ppm
  - Dermal LD50: LD50 Dermal - rabbit: 15,800 mg/kg
- Other Information on acute toxicity: No data available.

- Skin corrosion/irritation: Skin - rabbit: Skin irritation - 24 h
- Serious eye damage/eye irritation: Eyes - rabbit: Eye irritation
- Respiratory or skin sensitization: No data available.
- Germ cell mutagenicity: No data available.

- Carcinogenicity:
  - 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: No data available.

- Teratogenicity: No data available.

- Specific target organ toxicity - single exposure (Globally Harmonized System): Causes damage to organs.
- Specific target organ toxicity - repeated exposure (Globally Harmonized System): No data available.
- Aspiration hazard: No data available.
- Potential health effects:
  - Inhalation: May be harmful if inhaled. Causes respiratory tract irritation.
  - Ingestion: Toxic if swallowed.
  - Skin: Toxic if absorbed through skin. Causes skin irritation.
  - Eyes: Causes eye irritation.

- Signs and Symptoms of Exposure: Weakness, Confusion, Drowsiness, Unconsciousness, May cause convulsions, Dizziness, Gastrointestinal disturbance, Nausea, Headache, Vomiting, Warning: contains methanol. May be fast or cause blindness if swallowed. Cannot be made nonpoisonous.

- Synergistic effects: No data available.

- Additional Information: RTECS: Not available.

12. ECOLOGICAL INFORMATION

- Toxicity:
  - Toxicity to fish: LC50 - Oncorhyncus mykiss (rainbow trout): 19,000 mg/l - 96 h
  - Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna (Water flea): 24,500 mg/l - 48 h

- Persistence and degradability: No data available.
- Biaccumulative potential: No data available.
- Mobility in soil: No data available.
- PBT and vPvB assessment: No data available.
- Other adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

- Product: Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

- Contaminated packaging: Dispose of as unused product.
14. TRANSPORT INFORMATION

DOT (US)
UN number: 1239  Class: 3  Packing group: II
Proper shipping name: Methanol
Reportable Quantity (REQ): 5000 lbs
Marine pollutant: No
 Poison Inhalation hazard: No

IMDG
UN number: 1239  Class: 3 (6.1)  Packing group: II  EMS-No: F-E, S-D
Proper shipping name: METHANOL
Marine pollutant: No

IATA
UN number: 1239  Class: 3  Packing group: II
Proper shipping name: Methanol

15. REGULATORY INFORMATION

OSHA Hazards
Flammable liquid, Target Organ Effect, Toxic by ingestion, Toxic by skin absorption, Irritant

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
The following components are subject to reporting levels established by SARA Title III, Section 313:

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SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

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Pennsylvania Right To Know Components

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New Jersey Right To Know Components

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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

Further Information
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The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a
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