1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Methanol
Product Number : 322415
Brand : Sigma-Aldrich
Supplier : Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO  63103
USA
Telephone : +1 800-325-5832
Fax : +1 800-325-5052
Emergency Phone # (For both supplier and manufacturer) : (314) 776-6555
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 inhalation., Toxic by ingestion, Toxic by skin absorption

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)
Acute toxicity, Dermal (Category 3)
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.
H301 + H311 + H331 Toxic if swallowed, in contact with skin or if inhaled
H370 Causes damage to organs.

Precautionary statement(s)
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P280 Wear protective gloves/ protective clothing.
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P307 + P311 IF exposed: Call a POISON CENTER or doctor/ physician.

HMIS Classification
Health hazard: 2
Chronic Health Hazard: *
Flammability: 3
Physical hazards: 0

NFPA Rating
Health hazard: 2
Fire: 3
Reactivity Hazard: 0

Potential Health Effects
Inhalation Toxic if inhaled. Causes respiratory tract irritation.
Skin Toxic if absorbed through skin. Causes skin irritation.
Eyes Causes eye irritation.
Ingestion Toxic if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: Methyl alcohol
Formula: CH₄O
Molecular Weight: 32.04 g/mol

<table>
<thead>
<tr>
<th>Component</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td></td>
</tr>
<tr>
<td>CAS-No.</td>
<td>67-56-1</td>
</tr>
<tr>
<td>EC-No.</td>
<td>200-659-6</td>
</tr>
<tr>
<td>Index-No.</td>
<td>603-001-00-X</td>
</tr>
<tr>
<td>Registration number</td>
<td>01-2119433307-44-XXXX</td>
</tr>
</tbody>
</table>

4. 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. 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. FIREFIGHTING 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 flame/hot surface. No smoking.

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

Special protective equipment for firefighters
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 vapours, 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 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.

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>Methanol</td>
<td>67-56-1</td>
<td>TWA</td>
<td>200 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remarks</td>
<td></td>
<td></td>
<td></td>
<td>Headache Eye damage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>250 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Headache Eye damage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>200 ppm 260 mg/m3</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Skin notation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>250 ppm 325 mg/m3</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td></td>
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<td>Skin notation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>200 ppm 260 mg/m3</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>The value in mg/m3 is approximate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>TWA 200 ppm 260 mg/m3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Potential for dermal absorption</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ST 250 ppm 325 mg/m3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Potential for dermal absorption</td>
</tr>
</tbody>
</table>
**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 AXBEK (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).

**Hand 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.

- Full contact
  - Material: butyl-rubber
  - Minimum layer thickness: 0.3 mm
  - Break through time: 480 min
  - Material tested: Butoject® (KCL 897 / Aldrich Z677647, Size M)

- Splash contact
  - Material: Nitrile rubber
  - Minimum layer thickness: 0.4 mm
  - Break through time: 31 min
  - Material tested: Camatril® (KCL 730 / Aldrich Z677442, Size M)

**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 antistatic 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.

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**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance**
- Form: liquid
- Colour: colourless

**Safety data**
- pH: no data available
- Melting point/freezing point: Melting point/range: -98 °C (-144 °F)
- Boiling point: 64.7 °C (148.5 °F)
- Flash point: 9.7 °C (49.5 °F) - closed cup
- Ignition temperature: 455 °C (851 °F)
- Auto-ignition temperature: 455.0 °C (851.0 °F) at 1,013 hPa (760 mmHg)
- Lower explosion limit: 6 %(V)
- Upper explosion limit: 36 %(V)
<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vapour pressure</td>
<td>130.3 hPa (97.7 mmHg) at 20.0 °C (68.0 °F)</td>
</tr>
<tr>
<td></td>
<td>546.6 hPa (410.0 mmHg) at 50.0 °C (122.0 °F)</td>
</tr>
<tr>
<td></td>
<td>169.27 hPa (126.96 mmHg) at 25.0 °C (77.0 °F)</td>
</tr>
<tr>
<td>Density</td>
<td>0.791 g/mL at 25 °C (77 °F)</td>
</tr>
<tr>
<td>Water solubility</td>
<td>completely miscible</td>
</tr>
<tr>
<td>Partition coefficient:</td>
<td>log Pow: -0.77</td>
</tr>
<tr>
<td>n-octanol/water</td>
<td>Relative vapour density</td>
</tr>
<tr>
<td></td>
<td>1.11</td>
</tr>
<tr>
<td>Odour</td>
<td>pungent</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>no data available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>no data available</td>
</tr>
</tbody>
</table>

### 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**
Acid chlorides, Acid anhydrides, Oxidizing agents, Alkali metals, Reducing agents, Acids

**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**
  - LDLO Oral - Human - 143 mg/kg
  - Remarks: Lungs, Thorax, or Respiration:Dyspnea. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.
  - LD50 Oral - rat - 1,187 - 2,769 mg/kg

- **Inhalation LC50**
  - LC50 Inhalation - rat - 4 h - 128.2 mg/l
  - LC50 Inhalation - rat - 6 h - 87.6 mg/l

- **Dermal LD50**
  - LD50 Dermal - rabbit - 17,100 mg/kg

**Other information on acute toxicity**
no data available

**Skin corrosion/irritation**
Skin - rabbit - No skin irritation

**Serious eye damage/eye irritation**
Eyes - rabbit - No eye irritation

**Respiratory or skin sensitisation**
Maximisation Test - guinea pig - OECD Test Guideline 406 - Does not cause skin sensitisation.

**Germ cell mutagenicity**
Genotoxicity in vitro - Ames test - S. typhimurium - with and without metabolic activation - negative
Genotoxicity in vitro - in vitro assay - fibroblast - negative
Mutation in mammalian somatic cells.
Genotoxicity in vivo - mouse - male and female - Intraperitoneal - negative

**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**

Fertility classification not possible from current data.

**Teratogenicity**

Damage to fetus not classifiable

**Specific target organ toxicity - single exposure (Globally Harmonized System)**

Causes damage to organs.

**Specific target organ toxicity - repeated exposure (Globally Harmonized System)**

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

**Aspiration hazard**

No aspiration toxicity classification

**Potential health effects**

<table>
<thead>
<tr>
<th>Inhalation</th>
<th>Toxic if inhaled. Causes respiratory tract irritation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingestion</td>
<td>Toxic if swallowed.</td>
</tr>
<tr>
<td>Skin</td>
<td>Toxic if absorbed through skin. Causes skin irritation.</td>
</tr>
<tr>
<td>Eyes</td>
<td>Causes eye irritation.</td>
</tr>
</tbody>
</table>

**Signs and Symptoms of Exposure**

Methyl alcohol may be fatal or cause blindness if swallowed.
Effects due to ingestion may include:, Headache, Dizziness, Drowsiness, metabolic acidosis, Coma, Seizures.
Symptoms may be delayed., Damage of the; Liver, Kidney

**Synergistic effects**

no data available

**Additional Information**

RTECS: PC1400000

**12. ECOLOGICAL INFORMATION**

**Toxicity**

<table>
<thead>
<tr>
<th>Toxicity to fish</th>
<th>mortality LC50 - Lepomis macrochirus (Bluegill) - 15,400.0 mg/l - 96 h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NOEC - Oryzias latipes - 7,900 mg/l - 200 h</td>
</tr>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates</td>
<td>EC50 - Daphnia magna (Water flea) - &gt; 10,000.00 mg/l - 48 h</td>
</tr>
<tr>
<td>Toxicity to algae</td>
<td>Growth inhibition EC50 - Scenedesmus capricornutum (fresh water algae) - 22,000.0 mg/l - 96 h</td>
</tr>
</tbody>
</table>

**Persistence and degradability**
Biodegradability

aerobic
Result: 72 % - rapidly biodegradable

Bioaccumulative potential

Bioaccumulation
Cyprinus carpio (Carp) - 72 d at 20 ºC
Bioconcentration factor (BCF): 1.0

Mobility in soil

Will not adsorb on soil.

PBT and vPvB assessment

Results of PBT assessment
This substance is not considered to be persistent, bioaccumulating nor toxic (PBT). This substance is not considered to be very persistent nor very bioaccumulating (vPvB).

Other adverse effects

Biochemical Oxygen Demand (BOD)
600 - 1,120 mg/g

Chemical Oxygen Demand (COD)
1,420 mg/g

Additional ecological information
Avoid release to the environment.

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: 1230  Class: 3  Packing group: II
Proper shipping name: Methanol
Reportable Quantity (RQ): 5000 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 1230  Class: 3 (6.1)  Packing group: II  EMS-No: F-E, S-D
Proper shipping name: METHANOL
Marine pollutant: No

IATA
UN number: 1230  Class: 3 (6.1)  Packing group: II
Proper shipping name: Methanol

15. REGULATORY INFORMATION

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

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:

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>67-56-1</td>
</tr>
</tbody>
</table>
SARA 311/312 Hazards
Fire Hazard, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>67-56-1</td>
<td>2007-07-01</td>
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</tbody>
</table>

Pennsylvania Right To Know Components

<table>
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<tr>
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<tbody>
<tr>
<td>Methanol</td>
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</table>

New Jersey Right To Know Components

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<tr>
<td>Methanol</td>
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<td>2007-07-01</td>
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</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

Further information
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