1. PRODUCT AND COMPANY IDENTIFICATION

1.1  Product identifiers

Product name  :  Ethanol

Product Number : 16368
Brand           : Sigma-Aldrich
Index-No.       : 603-002-00-5

CAS-No.         : 64-17-5

1.2  Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis 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 #: +1-703-527-3887 (CHEMTREC)

2. HAZARDS IDENTIFICATION

2.1  Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable liquids (Category 2), H225
Eye irritation (Category 2A), H319

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

2.2  GHS Label elements, including precautionary statements

Pictogram

Signal word   : Danger

Hazard statement(s)
H225           : Highly flammable liquid and vapour.
H319           : Causes serious eye irritation.

Precautionary statement(s)
P210           : Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233           : Keep container tightly closed.
P240           : Ground/bond container and receiving equipment.
P241           : Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242           : Use only non-sparking tools.
P243           : Take precautionary measures against static discharge.
P264           : Wash skin thoroughly after handling.
P280           : Wear protective gloves/ eye protection/ face protection.
P303 + P361 + P353 : IF ON SKIN (or hair): Take off immediately all contaminated clothing.
Rinse skin with water/shower. **P305 + P351 + P338**

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. **P337 + P313**

If eye irritation persists: Get medical advice/attention. **P337 + P313**

In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish. **P370 + P378**

Store in a well-ventilated place. Keep cool. **P403 + P235**

Dispose of contents/container to an approved waste disposal plant. **P501**

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

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

#### 3.1 Substances

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>Flam. Liq. 2; Eye Irrit. 2A; H225, H319</td>
<td>90 - 100 %</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**
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.

#### 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**
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

#### 5.2 Special hazards arising from the substance or mixture

No data available
5.3 **Advice for firefighters**  
Wear self-contained breathing apparatus for firefighting 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**  
Use personal protective equipment. 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.  
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).

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

7. **HANDLING AND STORAGE**

7.1 **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.  
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. Containers which are opened must be carefully resealed and kept upright to prevent leakage.  
Storage class (TRGS 510): 3: Flammable liquids

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>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>64-17-5</td>
<td>TWA</td>
<td>1,000 ppm</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,900 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL</td>
<td>1,000 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1,900 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

Remarks: The value in mg/m³ is approximate.  
Upper Respiratory Tract irritation  
Confirmed animal carcinogen with unknown relevance to humans
### 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**
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 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: 0.2 mm
  - Break through time: 38 min
  - Material tested: Dermatrix® P (KCL 743 / Aldrich Z677388, Size M)

**Body Protection**
Impervious clothing, 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.

**Respiratory protection**
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose 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: -114 °C (-173 °F) - lit. |
f) Initial boiling point and boiling range 78 °C (172 °F) - lit.  
g) Flash point 14.0 °C (57.2 °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: 19 % (V)  
  Lower explosion limit: 3.3 % (V)  
k) Vapour pressure 59.5 hPa (44.6 mmHg) at 20.0 °C (68.0 °F)  
l) Vapour density No data available  
m) Relative density 0.789 g/cm3 at 25 °C (77 °F)  
n) Water solubility completely soluble  
o) Partition coefficient: n-octanol/water log Pow: -0.349 at 24 °C (75 °F)  
p) Auto-ignition temperature 363.0 °C (685.4 °F)  
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  
No data available  

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  
Vapours may form explosive mixture with air.  

10.4 Conditions to avoid  
Heat, flames and sparks.  

10.5 Incompatible materials  
Alkali metals, Oxidizing agents, Peroxides  

10.6 Hazardous decomposition products  
Hazardous decomposition products formed under fire conditions. - Carbon oxides  
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 - male and female - 10,470 mg/kg  
(OECD Test Guideline 401)  
LC50 Inhalation - Rat - male and female - 4 h - 124.7 mg/l  
(OECD Test Guideline 403)  
LC50 Inhalation - Rat - 4 h - 30,000 mg/l
No data available

**Skin corrosion/irritation**
Skin - Rabbit
Result: No skin irritation
(OECD Test Guideline 404)

**Serious eye damage/eye irritation**
Eyes - Rabbit
Result: Causes serious eye irritation.
(OECD Test Guideline 405)

**Respiratory or skin sensitisation**
Sensitisation test:
Result: negative
Remarks: (IUCLID)

**Germ cell mutagenicity**
Ames test
Salmonella typhimurium
Result: negative

In vitro mammalian cell gene mutation test
Mouse lymphoma test
Result: negative

**Carcinogenicity**
Carcinogenicity - Mouse - Oral

   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.
   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 on OSHA’s list of regulated carcinogens.

**Reproductive toxicity**
Reproductive toxicity - Human - female - Oral
Effects on Newborn: Apgar score (human only). Effects on Newborn: Other neonatal measures or effects. Effects on Newborn: Drug dependence.

**Specific target organ toxicity - single exposure**

**Specific target organ toxicity - repeated exposure**

**Aspiration hazard**
No data available

**Additional Information**
RTECS: KQ6300000
irritant effects, respiratory paralysis, Dizziness, narcosis, inebriation, euphoria, Nausea, Vomiting

Stomach - Irregularities - Based on Human Evidence
Stomach - Irregularities - Based on Human Evidence

---

**12. ECOLOGICAL INFORMATION**

**12.1 Toxicity**

Toxicity to fish
flow-through test LC50 - Pimephales promelas (fathead minnow) - 15.3 mg/l - 96 h
Toxicity to daphnia and other aquatic invertebrates

LC50 - Ceriodaphnia dubia (water flea) - 5,012 mg/l - 48 h

NOEC - Daphnia magna (Water flea) - 9.6 mg/l - 9 d

Toxicity to algae

EC50 - Chlorella vulgaris (Fresh water algae) - 275 mg/l - 72 h

( OECD Test Guideline 201)

12.2 Persistence and degradability

Biodegradability aerobic - Exposure time 15 d

Result: 95 % - Readily biodegradable.

( OECD Test Guideline 301E)

12.3 Bioaccumulative potential

Due to the distribution coefficient n-octanol/water, accumulation in organisms is not expected.

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

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: 1170 Class: 3 Packing group: II

Proper shipping name: Ethanol

Reportable Quantity (RQ):

Poison Inhalation Hazard: No

IMDG

UN number: 1170 Class: 3 Packing group: II

Proper shipping name: ETHANOL

EMS-No: F-E, S-D

IATA

UN number: 1170 Class: 3 Packing group: II

Proper shipping name: Ethanol

15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

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, Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components
Ethanol  
CAS-No.  64-17-5  
Revision Date  1993-04-24

**Pennsylvania Right To Know Components**

Ethanol  
CAS-No.  64-17-5  
Revision Date  1993-04-24

**New Jersey Right To Know Components**

Ethanol  
CAS-No.  64-17-5  
Revision Date  1993-04-24

**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.

- **Eye Irrit.**  
  Eye irritation
- **Flam. Liq.**  
  Flammable liquids
- **H225**  
  Highly flammable liquid and vapour.
- **H319**  
  Causes serious eye irritation.

Further information

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**Preparation Information**

Sigma-Aldrich Corporation  
Product Safety – Americas Region  
1-800-521-8956

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Revision Date: 06/22/2018  
Print Date: 06/22/2019