SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 **Product identifiers**

<table>
<thead>
<tr>
<th><strong>Product name</strong></th>
<th><strong>Ethanol</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product Number</strong></td>
<td>46139</td>
</tr>
<tr>
<td><strong>Brand</strong></td>
<td>Sigma-Aldrich</td>
</tr>
<tr>
<td><strong>Index-No.</strong></td>
<td>603-002-00-5</td>
</tr>
<tr>
<td><strong>REACH No.</strong></td>
<td>01-2119457610-43-XXXX</td>
</tr>
<tr>
<td><strong>CAS-No.</strong></td>
<td>64-17-5</td>
</tr>
</tbody>
</table>

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 Inc.
  3050 SPRUCE ST
  ST. LOUIS MO  63103
  UNITED STATES

- **Telephone**: +1 314 771-5765
- **Fax**: +1 800 325-5052

1.4 **Emergency telephone**

- **Emergency Phone #**: 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 **Classification of the substance or mixture**

**Classification according to Regulation (EC) No 1272/2008**

- Flammable liquids (Category 2), H225
- Eye irritation (Category 2), H319

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

2.2 **Label elements**

**Labelling according Regulation (EC) No 1272/2008**

- **Pictogram**
- **Signal word**: Danger
Hazard statement(s)
H225 Highly flammable liquid and vapor.
H319 Causes serious eye irritation.

Precautionary statement(s)
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Supplemental Hazard Statements none

2.3 Other hazards
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances
Synonyms: Ethyl alcohol

<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. 2; H225, H319 Concentration limits: &gt;= 50 %: Eye Irrit. 2A, H319;</td>
<td>&lt;= 100 %</td>
</tr>
</tbody>
</table>

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

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
Consult a physician. Show this material safety data sheet to the doctor in attendance.

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

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Dry powder
Dry sand

Unsuitable extinguishing media
Do NOT use water jet.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Combustible.

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.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors 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 non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapor 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. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store in cool place.

Hygroscopic.

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

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

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.

The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.

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: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 EC 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, 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 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.

---

**SECTION 9: Physical and chemical properties**

9.1 Information on basic physical and chemical properties

- **a)** Appearance  
  Form: liquid  
  Color: colorless

- **b)** Odor  
  pungent

- **c)** Odor Threshold  
  No data available

- **d)** pH  
  7.0 at 10 g/l at 20 °C

- **e)** Melting point/freezing point  
  Melting point/freezing point: -144.0 °C at 1.013,25 hPa

- **f)** Initial boiling point and boiling range  
  78.29 °C at 1.013 hPa

- **g)** Flash point  
  13 °C - 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: 13.5 % (V)  
  Lower explosion limit: 2.5 % (V)

- **k)** Vapor pressure  
  0.57 hPa at 19.6 °C

- **l)** Vapor density  
  1.6

- **m)** Relative density  
  0.79 g/cm3 at 20 °C

- **n)** Water solubility  
  1.000 g/l at 20 °C - completely miscible

- **o)** Partition coefficient: n-octanol/water  
  Log Pow: -0.35 at 24 °C - Bioaccumulation is not expected.

- **p)** Autoignition temperature  
  455 °C  
  at 1.013 hPa - DIN 51794

- **q)** Decomposition temperature  
  Distillable in an undecomposed state at normal pressure.
r) Viscosity No data available
s) Explosive properties No data available
t) Oxidizing properties No data available

### 9.2 Other safety information

- Conductivity: $< 1 \, \mu\text{S/cm}$
- Surface tension: $72.75 \, \text{mN/m at } 20\, ^\circ\text{C}$
- Relative vapor density: 1.6

### SECTION 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
rubber, various plastics

10.6 Hazardous decomposition products
Other decomposition products - No data available
Hazardous decomposition products formed under fire conditions. - Carbon oxides
In the event of fire: see section 5

### SECTION 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)

#### Skin corrosion/irritation
- Skin - Rabbit
  Result: No skin irritation - 24 h
  (OECD Test Guideline 404)

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

#### Respiratory or skin sensitization
- Maximization Test - Guinea pig
Result: negative  
(OECD Test Guideline 406)  
Remarks: (in analogy to similar products)

**Germ cell mutagenicity**  
Ames test  
Salmonella typhimurium  
Result: negative  
In vitro mammalian cell gene mutation test  
mouse lymphoma cells  
Result: negative  
OECD Test Guideline 478  
Mouse - male  
Result: Positive results were obtained in some in vivo tests.

**Carcinogenicity**  
IARC: No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**Reproductive toxicity**  
No data available

**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**  
Repeated dose toxicity - Rat - male - Oral - NOAEL (No observed adverse effect level) - 1.730 mg/kg - LOAEL (Lowest observed adverse effect level) - 3.200 mg/kg  
RTECS: KQ6300000

irritant effects, respiratory paralysis, Dizziness, narcosis, inebriation, euphoria, Nausea, Vomiting  
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

**SECTION 12: Ecological information**

**12.1 Toxicity**  
Toxicity to fish  
flow-through test LC50 - Pimephales promelas (fathead minnow) - 15.300 mg/l - 96 h  
(US-EPA)

Toxicity to daphnia and other aquatic invertebrates  
static test LC50 - Ceriodaphnia dubia (water flea) - 5.012 mg/l - 48 h  
Remarks: (ECHA)

Toxicity to algae  
static test ErC50 - Chlorella vulgaris (Fresh water algae) - 275 mg/l - 72 h  
(OECD Test Guideline 201)
Toxicity to bacteria: static test IC50 - activated sludge - > 1.000 mg/l - 3 h (OECD Test Guideline 209)

12.2 Persistence and degradability
Biodegradability: aerobic - Exposure time 15 d
Result: ca. 95 % - Readily biodegradable. (OECD Test Guideline 301E)

Biochemical Oxygen Demand (BOD)
- 930 - 1.670 mg/g
- Remarks: (Lit.)

Theoretical oxygen demand
- 2.100 mg/g
- Remarks: (Lit.)

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
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects
- Additional ecological information: No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Waste material must be disposed of in accordance with the Directive on waste 2008/98/EC as well as other national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

Contaminated packaging
Dispose of as unused product.

SECTION 14: Transport information

14.1 UN number
- ADR/RID: 1170
- IMDG: 1170
- IATA: 1170

14.2 UN proper shipping name
- ADR/RID: ETHANOL
- IMDG: ETHANOL
- IATA: Ethanol

14.3 Transport hazard class(es)
- ADR/RID: 3
- IMDG: 3
- IATA: 3

14.4 Packaging group
- ADR/RID: II
- IMDG: II
- IATA: II
14.5 Environmental hazards
ADR/RID: no  IMDG Marine pollutant: no  IATA: no

14.6 Special precautions for user
No data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.
REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII)

15.2 Chemical Safety Assessment
A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.
H225 Highly flammable liquid and vapor.
H319 Causes serious eye irritation.

Further information
Copyright 2020 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.
The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

The branding on the header and/or footer of this document may temporarily not visually match the product purchased as we transition our branding. However, all of the information in the document regarding the product remains unchanged and matches the product ordered. For further information please contact mlsbranding@sial.com.