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

1.1 Product identifiers

Product name: Acetaldehyde

Product Number: W200301
Brand: Aldrich
Index-No.: 605-003-00-6
CAS-No.: 75-07-0

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 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

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Flammable liquids (Category 1), H224
Eye irritation (Category 2A), H319
Germ cell mutagenicity (Category 2), H341
Carcinogenicity (Category 1B), H350
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335
Short-term (acute) aquatic hazard (Category 3), H402

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

2.2 GHS Label elements, including precautionary statements

Pictogram
Signal Word          Danger

Hazard statement(s)
H224              Extremely flammable liquid and vapor.
H319              Causes serious eye irritation.
H335              May cause respiratory irritation.
H341              Suspected of causing genetic defects.
H350              May cause cancer.
H402              Harmful to aquatic life.

Precautionary statement(s)
P201              Obtain special instructions before use.
P202              Do not handle until all safety precautions have been read and understood.
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.
P261              Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.
P264              Wash skin thoroughly after handling.
P271              Use only outdoors or in a well-ventilated area.
P273              Avoid release to the environment.
P280              Wear protective gloves/ protective clothing/ eye protection/ face protection.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P337 + P313 IF eye irritation persists: Get medical advice/ attention.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 Store in a well-ventilated place. Keep cool.
P405              Store locked up.
P501              Dispose of contents/ container to an approved waste disposal plant.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS
Lachrymator.
May form explosive peroxides.
Photosensitizer.

SECTION 3: Composition/information on ingredients

3.1 Substances
Synonyms : Ethanal

Aldrich - W200301
The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada

Formula: C₂H₄O  
Molecular weight: 44.05 g/mol  
CAS-No.: 75-07-0  
EC-No.: 200-836-8  
Index-No.: 605-003-00-6

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>acetaldehyde</td>
<td>Flam. Liq. 1; Eye Irrit. 2A; Muta. 2; Carc. 1B; STOT SE 3; Aquatic Acute 3; H224, H319, H341, H350, H335, H402</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
   Show this material safety data sheet to the doctor in attendance.
   If inhaled
   After inhalation: fresh air. Call in physician.
   In case of skin contact
   In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Consult a physician.
   In case of eye contact
   After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.
   If swallowed
   After swallowing: immediately make victim drink water (two glasses at most). 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
   Water Foam Carbon dioxide (CO2) Dry powder
   Unsuitable extinguishing media
   For this substance/mixture no limitations of extinguishing agents are given.
5.2 Special hazards arising from the substance or mixture
Carbon oxides
Combustible.
Pay attention to flashback.
Vapors are heavier than air and may spread along floors.
Development of hazardous combustion gases or vapours possible in the event of fire.
Forms explosive mixtures with air at ambient temperatures.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert. For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Advice on safe handling
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Storage conditions
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Keep locked up or in an area accessible only to qualified or authorized persons.
Storage stability
Recommended storage temperature
2 - 8 °C
Handle and store under inert gas. Air and moisture sensitive.

Storage class
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

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

<table>
<thead>
<tr>
<th>Ingredients with workplace control parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>acetaldehyde</td>
</tr>
<tr>
<td>Remarks</td>
</tr>
<tr>
<td>TWA</td>
</tr>
<tr>
<td>C</td>
</tr>
</tbody>
</table>

8.2 Exposure controls

Appropriate engineering controls
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses Tightly fitting safety goggles

Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Full contact
Material: butyl-rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Butoject® (KCL 898)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: butyl-rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested: Butoject® (KCL 898)

**Body Protection**
Flame retardant antistatic protective clothing.

**Respiratory protection**
required when vapours/aerosols are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

**Control of environmental exposure**
Do not let product enter drains. Risk of explosion.

---

**SECTION 9: Physical and chemical properties**

**9.1 Information on basic physical and chemical properties**

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

b) **Odor**
   - pungent

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

d) **pH**
   - 5 at 20 °C (68 °F)

e) **Melting point/freezing point**
   - Melting point/range: -125 °C (-193 °F) - lit.

f) **Initial boiling point and boiling range**
   - 21 °C 70 °F - lit.

g) **Flash point**
   - -38.89 °C (-38.00 °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: 57 % (V)
   - Lower explosion limit: 4 % (V)

k) **Vapor pressure**
   - 1,202 hPa at 25 °C (77 °F)

l) **Vapor density**
   - 1.52 - (Air = 1.0)

m) **Density**
   - 0.785 g/cm3 at 25 °C (77 °F) - lit.
   - Relative density
   - No data available

n) **Water solubility**
   - completely miscible

o) **Partition coefficient: n-octanol/water**
   - log Pow: 0.63 - Bioaccumulation is not expected.
9.2 **Other safety information**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative vapor density</td>
<td>1.52 - (Air = 1.0)</td>
</tr>
</tbody>
</table>

**SECTION 10: Stability and reactivity**

10.1 **Reactivity**
Vapors may form explosive mixture with air.

10.2 **Chemical stability**
The product is chemically stable under standard ambient conditions (room temperature). Avoid exposure to air any longer than necessary so as to prevent peroxide formation.

10.3 **Possibility of hazardous reactions**
No data available

10.4 **Conditions to avoid**
Warming.

10.5 **Incompatible materials**
rubber, various plastics

10.6 **Hazardous decomposition products**
In the event of fire: see section 5

**SECTION 11: Toxicological information**

11.1 **Information on toxicological effects**

**Acute toxicity**
- Oral: No data available
- Inhalation: No data available
- Dermal: No data available

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

**Serious eye damage/eye irritation**
- Eyes - Rabbit
  - Result: Severe irritations
  - Remarks: (RTECS)
  - Remarks: Lacrimal irritation due to vapours. conjunctivitis
Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: negative
(OECD Test Guideline 406)

Germ cell mutagenicity
Suspected of causing genetic defects.
Test Type: Ames test
Test system: Escherichia coli/Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Result: negative
Remarks: (ECHA)

Carcinogenicity
Presumed to have carcinogenic potential for humans
IARC: 2B - Group 2B: Possibly carcinogenic to humans (acetaldehyde)
1 - Group 1: Carcinogenic to humans (acetaldehyde)
IARC: 2B - Group 2B: Possibly carcinogenic to humans (acetaldehyde)
1 - Group 1: Carcinogenic to humans (acetaldehyde)
NTP: RAHC - Reasonably anticipated to be a human carcinogen (acetaldehyde)
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
No data available
Specific target organ toxicity - single exposure
May cause respiratory irritation.
Specific target organ toxicity - repeated exposure
No data available
Aspiration hazard
No data available

11.2 Additional Information
RTECS: AB1925000
Blurred vision, Unconsciousness, Headache, Vomiting, Nausea, Pulmonary edema. Effects may be delayed. Convulsions, sneezing, Cough, Shortness of breath
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.
Liver - Irregularities - Based on Human Evidence
Liver - Irregularities - Based on Human Evidence

SECTION 12: Ecological information

12.1 Toxicity
Toxicity to fish static test LC50 - Pimephales promelas (fathead minnow) - 31 mg/l - 96 h
Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates
static test EC50 - Daphnia magna (Water flea) - ca. 48.3 mg/l - 48 h
Remarks: (ECHA)

Toxicity to algae
static test ErC50 - Pseudokirchneriella subcapitata - > 100 mg/l - 72 h
(OECD Test Guideline 201)
static test EC10 - Pseudokirchneriella subcapitata - > 100 mg/l - 72 h
(OECD Test Guideline 201)

12.2 Persistence and degradability
Biodegradability
aerobic Biochemical oxygen demand - Exposure time 14 d
Result: 80 % - Readily biodegradable.
(OECD Test Guideline 301C)

12.3 Bioaccumulative potential
No data available

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 Endocrine disrupting properties
No data available

12.7 Other adverse effects
No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

**Product**
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information

**DOT (US)**

<table>
<thead>
<tr>
<th>UN number</th>
<th>Class</th>
<th>Packing group</th>
</tr>
</thead>
<tbody>
<tr>
<td>1089</td>
<td>3</td>
<td>I</td>
</tr>
</tbody>
</table>
Proper shipping name: Acetaldehyde
Reportable Quantity (RQ): 1000 lbs
Poison Inhalation Hazard: No

**IMDG**

<table>
<thead>
<tr>
<th>UN number</th>
<th>Class</th>
<th>Packing group</th>
<th>EMS-No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1089</td>
<td>3</td>
<td>I</td>
<td>F-E, S-D</td>
</tr>
</tbody>
</table>
Proper shipping name: ACETALDEHYDE
SECTION 15: Regulatory information

SARA 302 Components
This material does not contain any components with a section 302 EHS TPQ.

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

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>acetaldehyde</td>
<td>75-07-0</td>
<td>2013-02-08</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>
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</thead>
<tbody>
<tr>
<td>acetaldehyde</td>
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Pennsylvania Right To Know Components

<table>
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<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4,6-trimethyl-1,3,5-trioxane</td>
<td>123-63-7</td>
<td>2007-07-01</td>
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</tbody>
</table>

California Prop. 65 Components
, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.acetaldehyde

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
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<tbody>
<tr>
<td>acetaldehyde</td>
<td>75-07-0</td>
<td>2007-09-28</td>
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</tbody>
</table>

SECTION 16: Other information

Further information
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.

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