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

1.1 Product identifiers

Product name: Acrolein

Product Number: 110221
Brand: Aldrich
Index-No.: 605-008-00-3
CAS-No.: 107-02-8

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 2), H225
Acute toxicity, Oral (Category 2), H300
Acute toxicity, Inhalation (Category 1), H330
Acute toxicity, Dermal (Category 3), H311
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318
Carcinogenicity (Category 2), H351
Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410
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 vapor.
- H300 + H330 Fatal if swallowed or if inhaled.
- H311 Toxic in contact with skin.
- H314 Causes severe skin burns and eye damage.
- H351 Suspected of causing cancer.
- H410 Very toxic to aquatic life with long lasting effects.

**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.
- P260 Do not breathe mist or vapors.
- P264 Wash skin thoroughly after handling.
- P270 Do not eat, drink or smoke when using this product.
- 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.
- P284 Wear respiratory protection.
- P301 + P310 + P330 IF SWALLOWED: Immediately call a POISON CENTER/ doctor. Rinse mouth.
- P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
- P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
- P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
- P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
- P308 + P313 IF exposed or concerned: Get medical advice/ attention.
- P362 Take off contaminated clothing and wash before reuse.
- P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
- P391 Collect spillage.
- 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
Sensitizing components:
hydroquinone
May produce an allergic reaction.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS
Corrosive to the respiratory tract.

SECTION 3: Composition/information on ingredients

3.1 Substances
Synonyms: 2-Propenal

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylaldehyde</td>
<td>Flam. Liq. 2; Acute Tox. 2; Acute Tox. 1; Acute Tox. 3; Skin Corr. 1B; Eye Dam. 1; Aquatic Acute 1; Aquatic Chronic 1; H225, H300, H330, H311, H314, H318, H400, H410</td>
<td>&lt;= 100 %</td>
</tr>
<tr>
<td>Hydroquinone</td>
<td>Acute Tox. 4; Eye Dam. 1; Skin Sens. 1B; Muta. 2; Carc. 2; Aquatic Acute 1; Aquatic Chronic 1; H302, H318, H317, H341, H351, H400, H410</td>
<td>&gt;= 0.1 - &lt; 1 %</td>
</tr>
</tbody>
</table>
SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

If swallowed
If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible. Do not attempt to neutralise.

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

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>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acrylaldehyde</td>
<td>107-02-8</td>
<td>C</td>
<td>0.1 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
<td></td>
</tr>
<tr>
<td>Remarks</td>
<td></td>
<td></td>
<td></td>
<td>Not classifiable as a human carcinogen</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Danger of cutaneous absorption</td>
<td></td>
</tr>
<tr>
<td>TWA</td>
<td>0.1 ppm</td>
<td></td>
<td></td>
<td>USA. NIOSH Recommended Exposure Limits</td>
<td></td>
</tr>
<tr>
<td>ST</td>
<td>0.3 ppm</td>
<td></td>
<td></td>
<td>USA. NIOSH Recommended Exposure Limits</td>
<td></td>
</tr>
<tr>
<td>TWA</td>
<td>0.1 ppm</td>
<td></td>
<td></td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>0.1 ppm</td>
<td></td>
<td></td>
<td>California permissible exposure limits for chemical contaminants (Title 8, Article 107)</td>
<td></td>
</tr>
<tr>
<td>TWA</td>
<td>0.25 mg/m³</td>
<td></td>
<td></td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
<td></td>
</tr>
<tr>
<td>ST</td>
<td>0.8 mg/m³</td>
<td></td>
<td></td>
<td>USA. NIOSH Recommended Exposure Limits</td>
<td></td>
</tr>
<tr>
<td>TWA</td>
<td>0.25 mg/m³</td>
<td></td>
<td></td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>0.25 mg/m³</td>
<td></td>
<td></td>
<td>California permissible exposure limits for chemical contaminants (Title 8, Article 107)</td>
<td></td>
</tr>
</tbody>
</table>

| Skin                                           | hydroquinone    | 123-31-9 | TWA   | 1 mg/m³ | USA. ACGIH Threshold Limit Values (TLV) |
| Dermal Sensitization                           |                 |          |       |         | Confirmed animal carcinogen with unknown relevance to humans |
| TWA                                           | 2 mg/m³         |          |       | USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants |
| C                                             | 2 mg/m³         |          |       | USA. NIOSH Recommended Exposure Limits          |
| PEL                                           | 2 mg/m³         |          |       | California permissible exposure limits for chemical contaminants (Title 8, Article 107) |

<table>
<thead>
<tr>
<th>Biological occupational exposure limits</th>
<th>Component</th>
<th>CAS-No.</th>
<th>Parameters</th>
<th>Value</th>
<th>Biological specimen</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydroquinone</td>
<td>123-31-9</td>
<td>Methemoglobin</td>
<td>5% Hb</td>
<td>In blood</td>
<td>ACGIH - Biological Exposure Indices (BEI)</td>
<td></td>
</tr>
<tr>
<td>Remarks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>During or at the end of the shift</td>
<td></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). Tightly fitting safety goggles.

**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
- **b)** Odor: No data available
- **c)** Odor Threshold: 0.014 ppm
- **d)** pH: 6 at 100 g/l at 25 °C (77 °F)
- **e)** Melting point/freezing point: Melting point/range: -87 °C (-125 °F) - lit.
- **f)** Initial boiling point and boiling range: 53 °C 127 °F - lit.
- **g)** Flash point: -29 °C (-20 °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: 31 % (V)
  Lower explosion limit: 2.8 % (V)
- **k)** Vapor pressure: 1,090 hPa at 55 °C (131 °F)
  279.2 hPa at 20 °C (68 °F)
- **l)** Vapor density: 1.94 - (Air = 1.0)
- **m)** Density: 0.839 g/cm3 at 25 °C (77 °F) - lit.
Relative density: No data available

n) Water solubility: 208 g/l at 20 °C (68 °F) - completely soluble

o) Partition coefficient: 
n-octanol/water
  log Pow: -0.01 - Bioaccumulation is not expected.

p) Autoignition temperature: 220 °C (428 °F)

q) Decomposition temperature: No data available

r) Viscosity: No data available

s) Explosive properties: No data available

t) Oxidizing properties: none

9.2 Other safety information

Surface tension: 27.6 mN/m at 20 °C (68 °F)

Relative vapor density: 1.94 - (Air = 1.0)

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).

Contains the following stabilizer(s):
hydroquinone (>=0.25 - <=0.35 %)

10.3 Possibility of hazardous reactions

No data available

10.4 Conditions to avoid

May polymerize on exposure to light. Air Heat. Warming.

10.5 Incompatible materials

Oxidizing agents, Oxygen, Bases, Strong acids

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**
Acute toxicity estimate Oral - 26 mg/kg
(Calculation method)
LD50 Oral - Mouse - male - 13.9 mg/kg
(OECD Test Guideline 401)
LD50 Oral - Rat - 26 mg/kg
Acute toxicity estimate Inhalation - 4 h - 0.058 mg/l - vapor(Calculation method)

LC50 Inhalation - Hamster - male and female - 4 h - 0.058 mg/l - vapor

Remarks: (ECHA)
Inhalation: Corrosive to respiratory system.
Acute toxicity estimate Dermal - 300 mg/kg
(Calculation method)
Acute toxicity estimate Dermal - 300 mg/kg
(Expert judgment)
Dermal: No data available
No data available

**Skin corrosion/irritation**
Remarks: Causes skin burns.
Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

**Serious eye damage/eye irritation**
Remarks: Causes serious eye damage.

**Respiratory or skin sensitization**
No data available

**Germ cell mutagenicity**
Test Type: Ames test
Test system: S. typhimurium
Metabolic activation: with and without metabolic activation
Result: negative
Remarks: (ECHA)
Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Result: negative
Remarks: (ECHA)
Test Type: sister chromatid exchange assay
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Result: negative
Remarks: (ECHA)
Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Result: negative
Remarks: (ECHA)
Test Type: Chromosome aberration test  
Species: Rat  
Cell type: Bone marrow  
Application Route: Intraperitoneal

Result: negative  
Remarks: (ECHA)

**Carcinogenicity**
This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: 2A - Group 2A: Probably carcinogenic to humans (Acrylaldehyde)
NTP: No ingredient 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**
No data available

**Specific target organ toxicity - single exposure**
Corrosive to the respiratory tract.

Remarks: No data available

**Specific target organ toxicity - repeated exposure**
No data available

**Aspiration hazard**
No data available

**11.2 Additional Information**

RTECS: AS1050000  
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., Cough, Shortness of breath, Headache, Nausea  
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

**SECTION 12: Ecological information**

**12.1 Toxicity**

Toxicity to fish: semi-static test LC50 - Pimephales promelas (fathead minnow) - 0.019 mg/l - 96 h  
(OECD Test Guideline 203)

Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna (Water flea) - 0.03 mg/l - 48 h  
Remarks: (ECOTOX Database)
Toxicity to algae: static test ErC50 - Desmodesmus subspicatus (green algae) - 0.061 mg/l - 72 h
Remarks: (ECHA)

Toxicity to bacteria: EC50 - activated sludge - ca. 400 mg/l - 30 min
Remarks: (ECHA)

Toxicity to fish (Chronic toxicity): flow-through test NOEC - Pimephales promelas (fathead minnow) - 0.011 mg/l - 60 d
Remarks: (ECHA)

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity): flow-through test NOEC - Daphnia magna (Water flea) - 0.017 mg/l - 64 d
Remarks: (ECHA)

12.2 Persistence and degradability
Biodegradability: aerobic - Exposure time 7 d
Result: 100 % - Readily biodegradable.
Remarks: (ECHA)

12.3 Bioaccumulative potential
Bioaccumulation: Lepomis macrochirus - 28 d - 13.1 µg/l(Acrylaldehyde)
Bioconcentration factor (BCF): 344

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)**
- UN number: 1092  Class: 6.1 (3)  Packing group: I
- Proper shipping name: Acrolein, stabilized
- Reportable Quantity (RQ): 1 lbs
- Marine pollutant: yes
- Poison Inhalation Hazard: Hazard Zone A

**IMDG**
- UN number: 1092  Class: 6.1 (3)  Packing group: I  EMS-No: F-E, S-D
- Proper shipping name: ACROLEIN, STABILIZED
- Marine pollutant: yes
- Marine pollutant: yes

**IATA**
- UN number: 1092  Class: 6.1 (3)
- Proper shipping name: Acrolein, stabilized
- IATA Passenger: Not permitted for transport
- IATA Cargo: Not permitted for transport

SECTION 15: Regulatory information

**SARA 302 Components**
- Acrylaldehyde  CAS-No. 107-02-8  Revision Date 2007-07-01

**SARA 313 Components**
The following components are subject to reporting levels established by SARA Title III, Section 313:
- Acrylaldehyde  CAS-No. 107-02-8  Revision Date 2007-07-01

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

**Massachusetts Right To Know Components**
- Acrylaldehyde  CAS-No. 107-02-8  Revision Date 2007-07-01
- hydroquinone  123-31-9  2007-03-01

**Pennsylvania Right To Know Components**
- Acrylaldehyde  CAS-No. 107-02-8  Revision Date 2007-07-01
- hydroquinone  123-31-9  2007-03-01
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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