



SIGMA-ALDRICH

## Material Safety Data Sheet

Date Printed: 08/31/2004  
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Version 1.40

### Section 1 - Product and Company Information

**Product Name** Acrolein, 90%  
**Product Number** 110221  
**Brand** Aldrich Chemical

**Company** Sigma-Aldrich  
**Street Address** 3050 Spruce Street  
**City, State, Zip, Country** SAINT LOUIS, MO 63103 US  
**Technical Phone:** 314 771 5765  
**Fax:** 800 325 5052  
**Emergency Phone:** 414 273 3850 Ext. 5996

### Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313	EC no	Annex I Index Number
ACROLEIN	107-02-8	Yes	203-453-4	605-008-00-3

**Formula** C3H4O  
**Synonyms** Acraldehyde, Acraldehydeacroleina (Italian), Acroleina (Italian), Acrolein (ACGIH-OSHA), Acroleine (Dutch, French), Acrylaldehyd (German), Acrylaldehyde, Acrylic aldehyde, Akrolein (Czech), Akroleina (Polish), Aldehyde acrylique (French), Aldeide acrilica (Italian), Allyl aldehyde, Aqualin, Aqualine, Crolean, Ethylene aldehyde, Magnacide B, Magnacide H, NSC 8819, 2-Propenal, Prop-2-en-1-al, RCRA waste number P003, Slicicide

### Section 3 - Hazards Identification

#### Emergency Overview

Flammable (USA) Highly Flammable (EU), Highly Toxic (USA) Very Toxic (EU).  
Toxic in contact with skin and if swallowed. Very toxic by inhalation. Causes burns.  
Severe lachrymator. Readily absorbed through skin. Target organ(s): Liver. Cardiovascular system. Eyes. Kidneys.

**HMIS Rating**  
Health: 4\* Flammability: 3 Reactivity: 1

**NFPA Rating**  
Health: 4 Flammability: 3 Reactivity: 1

\*additional chronic hazards present.

### Section 4 - First Aid Measures

**Oral Exposure**  
If swallowed, wash out mouth with water provided person is conscious. Call a physician.

**Inhalation Exposure**  
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

#### Dermal Exposure

In case of contact, immediately wash skin with soap and copious amounts of water.

#### Eye Exposure

In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

### Section 5 - Fire Fighting Measures

**Flammable Hazards:** Yes

#### Explosion Hazards

Vapor may travel considerable distance to source of ignition and flash back.  
Container explosion may occur under fire conditions.

**Flash Point:** -20.2 °F -29 °C

**Explosion Limits:** Lower: 2.8 % Upper: 31 %

**Autoignition Temp:** 220 °C **Flammability:** Yes

#### Extinguishing Media

##### Suitable

Carbon dioxide, dry chemical powder, or appropriate foam.

##### Unsuitable

Water may be effective for cooling, but may not effect extinguishment.

#### Firefighting

##### Protective Equipment

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

##### Specific Hazard(s)

Flammable liquid. Emits toxic fumes under fire conditions.

##### Specific Method(s) of Fire Fighting

Use water spray to cool fire-exposed containers.

### Section 6 - Accidental Release Measures

#### Procedure to be Followed in Case of Leak or Spill

Evacuate area. Shut off all sources of ignition. Use nonsparking tools.

#### Procedure(s) of Personal Precaution(s)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

#### Methods for Cleaning Up

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

### Section 7 - Handling and Storage

#### Handling

##### User Exposure

Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

**Storage****Suitable**

Keep tightly closed. Keep away from heat, sparks, and open flame. Store at 2-8°C

**Special Requirements**

Store under inert gas. May develop pressure. Open carefully. Light sensitive. Heat- and air-sensitive.

**Section 8 - Exposure Controls / PPE****Engineering Controls**

Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

**Personal Protective Equipment****Respiratory**

Government approved respirator.

**Hand**

Compatible chemical-resistant gloves.

**Eye**

Chemical safety goggles.

**General Hygiene Measures**

Remove and wash contaminated clothing promptly. Wash thoroughly after handling.

**Exposure Limits**

Country	Type	Value
Poland	NDS	0.2 MG/M3
Poland	NDSch	0.5 MG/M3
Poland	NDSP	-

**Exposure Limits, RTECS**

Country	Source	Type	Value
USA	ACGIH	Ceiling concentration	0.1 PPM
USA	MSHA Standard-air	TWA	0.1 PPM (0.25 MG/M3)
USA	OSHA.	PEL	8H TWA 0.1 PPM (0.25 MG/M3)
New Zealand	OEL		
USA	NIOSH	TWASTEL	0.1 PPM 0.3 PPM

**Section 9 - Physical/Chemical Properties****Appearance****Physical State**

Liquid

Molecular Weight: 56.06 AMU

pH	6.0	
BP/BP Range	53 °C	
MP/MP Range	-87 °C	
Freezing Point	N/A	
Vapor Pressure	209.385 mmHg	20 °C
Vapor Density	1.94 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	0.839 g/cm3	
Bulk Density	N/A	
Odor Threshold	0.014 - 9,973 ppm	

Volatle%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	0.35 Pas	20 °C
Surface Tension	24 mN/m	20 °C
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point °F	-20.2 °F	
Flash Point °C	-29 °C	
Explosion Limits	Lower: 2.8 % Upper: 31 %	

Method: closed cup

Method: closed cup

**Flammability**

N/A

Autoignition Temp 220 °C

Refractive Index 1.4025

**Solubility**

Solubility in Water: soluble

Other Solvents: SOLUBLE IN PETROLEUM ETHER, IN ALCOHOL, OXYGENATED SOLVENT, MISCIBLE WITH LOWER

ALCOHOLS,, KETONES, BENZENE, DIETHYL ETHE.

N/A = not available

**Section 10 - Stability and Reactivity****Stability**

Stable

Unstable.

**Conditions to Avoid**

May polymerize on exposure to light. Sensitive to heat. Sensitive to air.

**Materials to Avoid**

Oxidizing agents, Oxygen, Bases, Strong acids.

**Hazardous Decomposition Products****Hazardous Decomposition Products**

Carbon monoxide, Carbon dioxide.

**Hazardous Polymerization****Hazardous Polymerization**

May occur.

**Section 11 - Toxicological Information****Route of Exposure****Skin Contact**

Causes burns.

**Skin Absorption**

Toxic if absorbed through skin. Readily absorbed through skin.

**Eye Contact**

Causes burns. Lachrymator.

**Inhalation**

May be fatal if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.

**Ingestion**

Toxic if swallowed.

**Target Organ(s) or System(s)**

Liver. Cardiovascular system. Lungs. Eyes. Kidneys.

**Signs and Symptoms of Exposure**

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting.

RTECS Number: AS1050000

**Toxicity Data**

Inhalation - Human: 5500 PPB (LCLO)

Inhalation - Human: 153 ppm (LCLO)

Oral - Rat: 26 mg/kg (LD50)

Inhalation - Rat: 18 mg/m3 (LC50)

Intraperitoneal - Rat: 4 MG/KG (LD50)

Subcutaneous - Rat: 50 MG/KG (LD50)

Remarks: Behavioral:General anesthetic.  
Liver:Fatty liver degeneration.

Oral - Mouse: 13.9 mg/kg (LD50)

Remarks: Behavioral:Somnolence (general depressed activity).

Skin and Appendages: Other: Hair.

Nutritional and Gross Metabolic:Weight loss or decreased weight gain.

Inhalation - Mouse: 66 ppm (LC50)

Intraperitoneal - Mouse: 9008 UG/KG (LD50)

Subcutaneous - Mouse: 30 MG/KG (LD50)

Remarks: Behavioral:General anesthetic.  
Liver:Fatty liver degeneration.

Oral - Rabbit: 7 mg/kg (LD50)

Skin - Rabbit: 200 mg/kg (LD50)

**Irritation Data**

Eyes - Human: 0.5 ppm 12M

Skin - Rabbit: 5 mg

Remarks: Open irritation test

Skin - Rabbit: 2 mg 24H

Remarks: Severe irritation effect

Eyes - Rabbit: 1 mg

Remarks: Severe irritation effect

Eyes - Rabbit: 0.05 mg 24H

Remarks: Severe irritation effect

**Chronic Exposure - Carcinogen**

Result: 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 Carcinogen List**

Rating

Group 3

**ACGIH Carcinogen List**

Rating

A4

**Chronic Exposure - Mutagen**

Species	Dose	Route of Application	Cell Type	Mutation test
Human	30 UMOL/L		Other cell types	DNA damage
Human	100 UMOL/L		fibroblast	DNA
Human	5 UMOL/L		lymphocyte	Sister chromatid exchange
Human	200 NMOL/L		fibroblast	Mutation in mammalian somatic cells.
Rat	30 MMOL/L		Other cell types	DNA damage
Rat	500 UG/KG	Intraperitoneal		DNA inhibition
Rat	500 UG/KG	Intraperitoneal		Other mutation test systems
Hamster	10 UMOL/L		ovary	Sister chromatid exchange
Hamster	500 NMOL/L		lung	Mutation in mammalian somatic cells.
Mammal	58 GM/L	3H	lymphocyte	DNA
Mammal	80 UMOL/L		lymphocyte	DNA inhibition

**Chronic Exposure - Reproductive Hazard**

Species	Dose	Route of Application	Exposure Time
Rat	840 MG/KG	Oral	(MULTIGENERATION)
Result: Effects on Newborn: Growth statistics (e.g., reduced weight gain).			
Rabbit	6 MG/KG	Intravenous	(9D PREG)
Result: Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants).			

**Section 12 - Ecological Information**

No data available.

**Acute Ecotoxicity Tests**

Test Type	Value:
IC50 Algae	
Time: 24.0 h	0.76 - 1.07 mg/l
Test Type	
EC50 Daphnia	
Species	
Daphnia magna	
Time: 48.0 h	0.04 - 0.1 mg/l
Test Type	
LC50 Fish	
Species	
Leuciscus idus	
Time: 48.0 h	0.25 - 2.5 mg/l
Test Type	
LC100 Fish	
Species	
Leuciscus idus	
Time: 48.0 h	0.3 - 4.2 mg/l
Test Type	
LC50 Fish	
Species	
Lepomis macrochirus (Bluegill)	
Time: 96.0 h	0.08 - 0.12 mg/l
Test Type	
LC50 Fish	
Species	
Onchorhynchus mykiss (Rainbow trout)	

Time: 96.0 h  
Value: 0.014 - 0.08 mg/l

### Section 13 - Disposal Considerations

**Appropriate Method of Disposal of Substance or Preparation**  
Contact a licensed professional waste disposal service to dispose of this material.  
Observe all federal, state, and local environmental regulations.

### Section 14 - Transport Information

#### DOT

**Proper Shipping Name:** Acrolein, inhibited  
**UN#:** 1092  
**Class:** 6.1  
**Packing Group:** Packing Group I  
**Hazard Label:** Poison inhalation hazard  
**Hazard Label:** Flammable liquid  
**PIH:** Zone A

#### IATA

**Proper Shipping Name:** Acrolein, stabilized  
**IATA UN Number:** 1092  
**Hazard Class:** 6.1  
**Packing Group:** I  
**Not Allowed - Aircraft:** Not permitted for air transport.

### Section 15 - Regulatory Information

#### EU Directives Classification

**Symbol of Danger:** F T+ N

#### Indication of Danger

Highly Flammable. Very toxic. Dangerous for the environment.

**Risk Statements R:** 11 24/25 26 34 50

Highly flammable. Toxic in contact with skin and if swallowed. Very toxic by inhalation. Causes burns. Very toxic to aquatic organisms.

**Safety Statements S:** 23 26 28 36/37/39 45 61

Do not breathe vapor. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of soap and water. Wear suitable protective clothing, gloves, and eye/face protection. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Avoid release to the environment. Refer to special instructions/safety data sheets.

#### US Classification and Label Text

#### Indication of Danger

Flammable (USA) Highly Flammable (EU). Highly Toxic (USA) Very Toxic (EU).

#### Risk Statements

Toxic in contact with skin and if swallowed. Very toxic by inhalation. Causes burns.

#### Safety Statements

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing, gloves, and eye/face protection. In case of insufficient ventilation, wear suitable respiratory equipment. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

#### US Statements

Severe lachrymator. Readily absorbed through skin. Target organ(s): Liver. Cardiovascular system. Eyes. Kidneys.

#### United States Regulatory Information

**SARA Listed:** Yes

**DemInimis:** 1 %

**Notes:** This product is subject to SARA section 313 reporting requirements.

**TSCA Inventory Item:** Yes

#### Canada Regulatory Information

#### WHMIS Classification

This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

**DSL:** Yes

**NDSL:** No

### Section 16 - Other Information

#### Disclaimer

For R&D use only. Not for drug, household or other uses.

#### Warranty

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 Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.