

## • SAFETY DATA SHEET

Version 6.16  
Revision Date 11/06/2025  
Print Date 11/07/2025

### SECTION 1. IDENTIFICATION

#### 1.1 Product identifiers

Product name : Crotonaldehyde, mixture of *cis* and *trans*  
Product Number : 27980  
Brand : Aldrich  
Index-No. : 605-009-00-9  
CAS-No. : 4170-30-3

#### 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 number

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

---

### SECTION 2. HAZARDS IDENTIFICATION

#### GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

##### Hazards for the product as supplied

Flammable liquids : Category 2  
Acute toxicity (Oral) : Category 3  
Acute toxicity (Inhalation) : Category 2  
Acute toxicity (Dermal) : Category 3

Aldrich - 27980

Page 1 of 18

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

**Millipore**  
**Sigma**

Skin irritation	: Category 2
Serious eye damage	: Category 1
Germ cell mutagenicity	: Category 2
Carcinogenicity	: Category 2
Specific target organ toxicity - repeated exposure	: Category 2
Short-term (acute) aquatic hazard	: Category 1

### **Other hazards**

None known.

### **GHS label elements**

Hazard pictograms	: 
Signal word	: Danger
Hazard statements	: <p>H225 Highly flammable liquid and vapour.          H301 + H311 Toxic if swallowed or in contact with skin.          H315 Causes skin irritation.          H318 Causes serious eye damage.          H330 Fatal if inhaled.          H335 May cause respiratory irritation.          H341 Suspected of causing genetic defects.          H351 Suspected of causing cancer.          H373 May cause damage to organs through prolonged or repeated exposure.          H400 Very toxic to aquatic life.</p>
Supplemental Hazard Statements	: <p>Corrosive to the respiratory tract.</p>
Precautionary statements	: <p><b>Prevention:</b>          P201 Obtain special instructions before use.          P202 Do not handle until all safety precautions have been read and understood.          P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.          P233 Keep container tightly closed.          P240 Ground and bond container and receiving equipment.</p>

P241 Use explosion-proof electrical/ ventilating/ lighting equipment.  
P242 Use non-sparking tools.  
P243 Take action to prevent static discharges.  
P260 Do not breathe mist or vapours.  
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 and face protection.  
P284 Wear respiratory protection.

**Response:**

P301 + P310 + P330 IF SWALLOWED: Immediately call a POISON CENTER/ doctor. Rinse mouth.  
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.  
P332 + P313 If skin irritation occurs: Get medical advice/ attention.  
P361 + P364 Take off immediately all contaminated clothing and wash it before reuse.  
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.  
P391 Collect spillage.

**Storage:**

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.

**Disposal:**

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

---

### SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

CAS-No. : 4170-30-3

Aldrich - 27980

Page 3 of 18

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

**Millipore  
Sigma**

## Components

Chemical name	CAS No./Unique ID	Concentration (% w/w)	Trade secret
crotonaldehyde	4170-30-3*	>= 80 - <= 100	TSC
butyl hydroxytoluene (BHT)	128-37-0*	>= 0.1 - <= 1	TSC

\* Indicates that the identifier is a CAS No.

TSC- the actual concentration or concentration range is withheld as a trade secret

---

## SECTION 4. FIRST AID MEASURES

General advice : First aiders need to protect themselves. Show this 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.

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

Protection of first-aiders : For personal protection see section 8.

Notes to physician : No data available

---

## SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	: Carbon dioxide (CO2) Foam Dry powder
Unsuitable extinguishing media	: For this substance/mixture no limitations of extinguishing agents are given.
Specific hazards during fire fighting	: Combustible.  Pay attention to flashback.
	Vapours 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.
Hazardous combustion products	: Carbon oxides
Specific extinguishing methods	: No data available
Further information	: Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.
Special protective equipment for fire-fighters	: Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

---

## SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	: Advice for non-emergency personnel: Do not breathe vapours, 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.  
Advice for emergency responders:  
For personal protection see section 8.

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

---

## SECTION 7. HANDLING AND STORAGE

For precautions see section 2.2.

Advice on protection against fire and explosion	: Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.
Advice on safe handling	: Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.
Further information on 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 authorised persons.
Storage class	: 3, Flammable liquids
Recommended storage temperature	: 36 - 46 °F / 2 - 8 °C
Further information on storage stability	: Store under inert gas. Air sensitive.

---

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Aldrich - 27980				

crotonaldehyde	4170-30-3	C	0.3 ppm	ACGIH
		TWA	2 ppm 6 mg/m <sup>3</sup>	NIOSH REL
		TWA	2 ppm 6 mg/m <sup>3</sup>	OSHA Z-1
butyl hydroxytoluene (BHT)	128-37-0	TWA (Inhalable fraction and vapor)	2 mg/m <sup>3</sup>	ACGIH
		TWA	10 mg/m <sup>3</sup>	NIOSH REL

**Engineering measures** : No data available

#### **Personal protective equipment**

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.

Recommended Filter type: Filter A (acc. to DIN 3181) for vapours of organic compounds

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

#### Hand protection

Material : butyl-rubber  
 Break through time : 60 min  
 Glove thickness : 0.3 mm  
 Protective index : Splash contact  
 Manufacturer : Butoject® (KCL 897 / Aldrich Z677647, Size M)

Manufacturer : data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374

Remarks : 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. If used in solution, or mixed with other substances, and under conditions which differ from EN 374,

contact the supplier of the CE 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.

Eye 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

Skin and body protection : Flame retardant antistatic protective clothing.

Hygiene measures : Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

---

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Color : No data available

Odor : Stench.

Odor Threshold : No data available  
pH : No data available

Melting point : No data available

Boiling point/boiling range : 214 - 216 °F / 101 - 102 °C

Flash point : 55 °F / 13 °C  
Method: c.c., closed cup

Evaporation rate : No data available

Flammability (solid, gas) : No data available

Flammability (liquids) : No data available

Burning rate : No data available

Upper explosion limit /  
Upper flammability limit : Upper explosion limit  
15.5 %(V)

Lower explosion limit / Lower flammability limit	: Lower explosion limit 2.1 %(V)
Vapor pressure	: No data available
Relative vapour density	: No data available
Relative density	: No data available
Density	: 0.853 g/mL (68 °F / 20 °C)
Water solubility	: No data available
Partition coefficient: n-octanol/water	: No data available
Autoignition temperature	: 446 °F / 230 °C
Decomposition temperature	: No data available
Viscosity, dynamic	: No data available
Viscosity, kinematic	: No data available
Flow time	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Molecular weight	: 70.09 g/mol
Particle characteristics	
Particle size	: No data available

---

## SECTION 10. STABILITY AND REACTIVITY

Reactivity	: Vapours may form explosive mixture with air.
Chemical stability	: The product is chemically stable under standard ambient conditions (room temperature) .
Contains the following stabiliser(s):	: butyl hydroxytoluene (BHT) (0.1 %) water (1 %)
Possibility of hazardous reactions	: Violent reactions possible with: Oxidizing agents Amines Risk of explosion with:

butadiene  
alkalines  
Nitric acid  
Acids

Conditions to avoid : Warming.

Incompatible materials : No data available

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

---

## **SECTION 11. TOXICOLOGICAL INFORMATION**

### **11.1 Information on toxicological effects**

#### **Acute toxicity**

Acute toxicity estimate Oral - 80 mg/kg  
(Calculation method)

LD50 Oral - Rat - 80 mg/kg

Symptoms: Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract.

Remarks: (RTECS)

Acute toxicity estimate Inhalation - 4 h - 0.5001 mg/l - vapour(Calculation method)

Symptoms: mucosal irritations, Cough, Shortness of breath, damage of respiratory tract, Inhalation may lead to the formation of oedemas in the respiratory tract.

Inhalation: Irritating to respiratory system.

Acute toxicity estimate Dermal - 300 mg/kg  
(Calculation method)

LD50 Dermal - Rabbit - 128 - 324 mg/kg

Remarks: (Lit.)

#### **Skin corrosion/irritation**

Skin - Rabbit

Result: Irritations

Remarks: (IUCLID)

#### **Serious eye damage/eye irritation**

No data available

#### **Respiratory or skin sensitization**

No data available

#### **Germ cell mutagenicity**

Suspected of causing genetic defects.

Test Type: Mutagenicity (mammal cell test): micronucleus.

Result: negative

Remarks: (National Toxicology Program)

Test Type: Ames test

Test system: Salmonella typhimurium

Result: positive

Remarks: (National Toxicology Program)

#### **Carcinogenicity**

IARC: 2B - Group 2B: Possibly carcinogenic to humans (crotonaldehyde)

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**

No data available

#### **Specific target organ toxicity - single exposure**

May cause respiratory irritation.

#### **Specific target organ toxicity - repeated exposure**

May cause damage to organs through prolonged or repeated exposure.

#### **Aspiration hazard**

No data available

### **11.2 Additional Information**

RTECS: GP9499000

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting

After absorption:

Headache

Dizziness

somnolence

Kidney injury may occur.

Other dangerous properties can not be excluded.

This substance should be handled with particular care.

---

### **SECTION 12. ECOLOGICAL INFORMATION**

#### **Ecotoxicity**

#### **Components:**

#### **crotonaldehyde:**

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 0.65 mg/l  
Exposure time: 96 h  
Remarks: (IUCLID)

Toxicity to daphnia and other aquatic : EC50 (Daphnia magna (Water flea)): 2 mg/l  
Exposure time: 48 h

invertebrates	Remarks: (IUCLID)
Toxicity to algae/aquatic plants	: IC50 (algae): 0.88 mg/l Exposure time: 72 h Remarks: (External MSDS)
M-Factor (Acute aquatic toxicity)	: 1
Toxicity to microorganisms	: EC10 (Bacteria): 14 mg/l Exposure time: 72 h Remarks: (Lit.)
	: EC5 (E.coli): 15,000 mg/l Remarks: (Lit.) (maximum permissible toxic concentration)

### **Ecotoxicology Assessment**

Chronic aquatic toxicity : This product has no known ecotoxicological effects.

### **butyl hydroxytoluene (BHT):**

Toxicity to fish	: LC50 (Danio rerio (zebra fish)): > 0.57 mg/l End point: mortality Exposure time: 96 h Test Type: semi-static test Analytical monitoring: yes Method: Directive 67/548/EEC, Annex V, C.1. GLP: yes
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 0.48 mg/l End point: Immobilization Exposure time: 48 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 202 GLP: yes
Toxicity to algae/aquatic plants	: ErC50 (Desmodesmus subspicatus (green algae)): > 0.4 mg/l Exposure time: 72 h Test Type: static test Analytical monitoring: yes Method: Regulation (EC) No. 440/2008, Annex, C.3 GLP: yes
Toxicity to fish (Chronic toxicity)	: NOEC (Oryzias latipes): 0.053 mg/l Exposure time: 30 d Method: OECD Test Guideline 210 GLP: yes

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: EC50 (Daphnia magna (Water flea)): 0.096 mg/l End point: reproduction rate Exposure time: 21 d Method: OECD Test Guideline 211 GLP: yes
Toxicity to microorganisms	: EC50 (activated sludge): > 10,000 mg/l Exposure time: 3 h Test Type: static test Method: OECD Test Guideline 209 GLP: yes

### **Ecotoxicology Assessment**

Acute aquatic toxicity	: no acute aquatic toxicity
Chronic aquatic toxicity	: Very toxic to aquatic life with long lasting effects.

### **Persistence and degradability**

#### **Components:**

##### **crotonaldehyde:**

Biodegradability	: Result: Not readily biodegradable. Biodegradation: 30 % Exposure time: 28 d Method: OECD Test Guideline 301E
	: Result: Readily eliminated from water Biodegradation: > 95 % Exposure time: 21 d Method: OECD Test Guideline 302B

### **Bioaccumulative potential**

#### **Components:**

##### **butyl hydroxytoluene (BHT):**

Partition coefficient: n-octanol/water	: log Pow: 5.1 GLP: yes Remarks: Potential bioaccumulation (ECHA)
--	---

### **Mobility in soil**

No data available

### **Other adverse effects**

#### **Product:**

Ozone-Depletion Potential	: Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was
---------------------------	---

Aldrich - 27980

Page 13 of 18

manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

### **Components:**

#### **butyl hydroxytoluene (BHT):**

Results of PBT and vPvB assessment	: Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.
Additional ecological information	: Discharge into the environment must be avoided.

---

## **SECTION 13. DISPOSAL CONSIDERATIONS**

### **Disposal methods**

Waste from residues	: 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.
---------------------	--

---

## **SECTION 14. TRANSPORT INFORMATION**

### **International Regulations**

#### **IATA-DGR**

Not permitted for transport

#### **IMDG-Code**

UN number	: UN 1143
Proper shipping name	: CROTONALDEHYDE, STABILIZED
Class	: 6.1
Subsidiary risk	: 3
Packing group	: I
Labels	: 6.1 (3)
EmS Code	: F-E, <u>S-D</u>
Marine pollutant	: yes

#### **Transport in bulk according to IMO instruments**

Not applicable for product as supplied.

### **National Regulations**

#### **49 CFR Road**

UN/ID/NA number	: UN 1143
Proper shipping name	: Crotonaldehyde, stabilized
Class	: 6.1
Subsidiary risk	: 3

Aldrich - 27980

Page 14 of 18

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

**Millipore  
Sigma**

Packing group : I  
Labels : Division 6.1 - Poison inhalation hazard, Class 3 -  
Flammable liquids  
ERG Code : 131P  
Marine pollutant : no  
  
Poison Inhalation Hazard : Hazard Zone B

## **Special precautions for user**

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

## **SECTION 15. REGULATORY INFORMATION**

## **CERCLA Reportable Quantity**

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
crotonaldehyde	4170-30-3	100	100

## **SARA 304 Extremely Hazardous Substances Reportable Quantity**

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
crotonaldehyde	4170-30-3	100	100

**SARA 302 Extremely Hazardous Substances Threshold Planning Quantity**

Components	CAS-No.	Component TPQ (lbs)
crotonaldehyde	4170-30-3	1000

**SARA 311/312  
Hazards** : Fire Hazard  
Acute Health Hazard  
Chronic Health Hazard

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

crotonaldehyde 4170-30-3 >= 90 - <= 100 %

## **Clean Air Act**

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

The following chemical(s) are listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F):

crotonaldehyde 4170-30-3 >= 90 - <= 100 %

The following chemical(s) are listed under the U.S. Clean Air Act Section 111 SOCMIs Intermediate or Final VOC's (40 CFR 60.489):

crotonaldehyde 4170-30-3 >= 90 - <= 100 %

## **Clean Water Act**

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

crotonaldehyde 4170-30-3 >= 90 - <= 100 %

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

crotonaldehyde 4170-30-3 >= 90 - <= 100 %

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

This product does not contain any priority pollutants related to the U.S. Clean Water Act

## **US State Regulations**

### **Massachusetts Right To Know**

crotonaldehyde 4170-30-3

### **Pennsylvania Right To Know**

crotonaldehyde 4170-30-3

### **Maine Chemicals of High Concern**

Product does not contain any listed chemicals

### **Vermont Chemicals of High Concern**

Product does not contain any listed chemicals

### **Washington Chemicals of High Concern**

Product does not contain any listed chemicals

### **The components of this product are reported in the following inventories:**

TSCA : All substances listed as active on the TSCA inventory

### **TSCA list**

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

---

## **SECTION 16. OTHER INFORMATION**

### **Full text of other abbreviations**

ACGIH	: USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	: USA. NIOSH Recommended Exposure Limits
OSHA Z-1	: USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	: 8-hour, time-weighted average
ACGIH / C	: Ceiling limit
NIOSH REL / TWA	: Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA Z-1 / TWA	: 8-hour time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response,

Aldrich - 27980

Page 16 of 18

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

**Millipore  
Sigma**

Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonised System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organisation; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardisation; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organisation for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. 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](http://www.sigma-aldrich.com) and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

Copyright 2025 Sigma-Aldrich Co. LLC. License granted to make unlimited paper copies for internal use only.

Revision Date : 11/06/2025

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](mailto:mlsbranding@sial.com).

