



# SIGMA-ALDRICH

## Material Safety Data Sheet

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### Section 1 - Product and Company Information

Product Name: Tetrahydrofuran, 99+%, A.C.S. reagent  
Product Number: 360589  
Brand: Aldrich Chemical  
Company: Sigma-Aldrich  
Street Address: 3050 Spruce Street  
City, State, ZIP, Country: SAINT LOUIS, MO 63103 US  
Technical Phone: 314 771 5785  
Fax: 800 325 5052

Emergency Phone: 414 273 3650 Ext. 5996

### Section 2 - Composition/Information on Ingredient

Substance Name: TETRAHYDROFURAN

CAS # 109-99-9

SARA 313 NO.

Formula: C<sub>4</sub>H<sub>8</sub>O  
Synonyms: AgriSynth THF, Butane, 1,4-epoxy-, Butane, alpha,beta-epoxide, Cyclohexanethyleneoxide, Diethylene oxide, 1,4-Epoxybutane, Furan, (dine NO), (dine SO), Cyclohexanone Oxime, EGRA, waste number U213, Tetrahydrofuran (Dutch), Tetrahydrofuran (ACGIH/OSHA), Tetrahydrofuran (French), Tetrahydrofuran (Italian), Tetramethylene oxide.

### Section 3 - Hazards Identification

Emergency Overview: Flammable (USA) Highly Flammable (EU), Harmful. May form explosive peroxides. Harmful if swallowed. Irritating to eyes, respiratory system and skin. Limited evidence of a carcinogenic effect.  
Possible Carcinogen (US): Target organ(s): Central nervous system, Liver.

HMS Rating: Health: 2  
Flammability: 3  
Reactivity: 1  
NFPA Rating: Health: 2  
Flammability: 3  
Reactivity: 1  
\*additional chronic hazards present.  
For additional information on toxicity, please refer to Section 11.

### 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

Peroxide Former: Yes

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

Flash Point: 1.4 °F -17 °C

Explosion Limits: Lower: 1.8 % Upper: 11.8 %

Autoignition Temp: 221 °C Flammability: Yes

Extinguishing Media: Suitable

Carbon dioxide, dry chemical powder, or appropriate foam.

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.

Procedure(s) of Personal Protection(s): Wear respirator, chemical safety goggles, rubber boots, and heavy rubber gloves.

Methods for Cleaning Up: Cover with dry inert 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:

Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

Inhalation - Rat: 21,000 ppm (LC50)  
 Remarks: Behavioral: Sleep,  
 Lungs, Thorax, or Respiration: Respiratory stimulation,  
 Gastrointestinal: Nausea or vomiting.  
 Intra-peritoneal - Rat: 2900 MG/KG (LD50)  
 Intra-peritoneal - Mouse: 1900 MG/KG (LD50)  
 Oral - Guinea pig: 2,300 mg/kg (LD50)

**Chronic Exposure - Carcinogen**

Result: This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Rat - Inhalation: 1800 PPM, 6H/2Y 1

Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Kidney, Ureter, Bladder: Tumors.

Mouse - Inhalation: 1800 PPM, 6H/2Y 1

Result: Tumorigenic: Carcinogenic by RTECS criteria. Liver: Tumors.

**NTP Carcinogen List**

*Exposure*  
 Clear evidence.  
 Some evidence.

*Species*  
 Mouse  
 Rat

*Route*  
 Inhalation  
 Inhalation

**Chronic Exposure - Teratogen**

*Species*  
 Rat  
 Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

*Dose*  
 5000 PPm/6H

*Route of Application*  
 Inhalation

*Exposure Time*  
 (6-12D/PRG)  
 (6-19D/PRG)

**Section 12 - Ecological Information**

**Acute Toxicity Tests**

Test Type  
 LC50 Fish

Species  
 Pimephales promelas (Fathead minnow)

Time:  
 96.0 h

Value:  
 2,160 mg/l

Test Type  
 EC50 Daphnia

Species  
 Daphnia magna

Time:  
 24.0 h

Value:  
 5,990 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. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as the material is highly flammable. Observe all federal, state, and local environmental regulations.

**Section 14 - Transport Information**

DOT

Proper Shipping Name: Tetrahydrofuran  
 UN#: 2056

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**Class: 3**  
**Packing Group: Packing Group II**  
**Hazard Label: Flammable liquid**  
**PIH: Not PIH**

**IATA**  
 Proper Shipping Name: Tetrahydrofuran  
 IATA UN Number: 2056  
 Hazard Class: 3  
 Packing Group: II

**Section 15 - Regulatory Information**

**EU Directive Classification**  
 Symbol of Danger: F+X  
 Indication of Danger  
 Highly Flammable, Irritant.  
 Risk Statements: R: 11 19 36/37  
 Highly flammable. May form explosive peroxides. Irritating to eyes and respiratory system.  
 Safety Statements: S: 16 29 33  
 Keep away from sources of ignition - no smoking. Do not empty into drains. Take precautionary measures against static discharges.

**US Classification and Label Text:**

**Indication of Danger:**  
 Flammable (USA), Highly Flammable (EU), Harmful.  
 Risk Statement:  
 May form explosive peroxides. Harmful if swallowed; irritating to eyes, respiratory system and skin. Limited evidence of a carcinogenic effect.  
**Safety Statements:**  
 Keep away from sources of ignition - no smoking. Take precautionary measures against static discharges. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing.  
**US Statements:**  
 Possible Carcinogen (US): Target organ(s): Central nervous system, Liver.

**United States Regulatory Information:**

SHA# Listed: No

TSCA Inventory Item: Yes

Canada Regulatory Information

WHMIS Classification:

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

DSL: Yes

NDSL: No

**Section 16 - Other Information:**

**Disclaimer:**  
 For field 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. 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 2003 Sigma-Aldrich Co. License granted to make unprinted paper copies for internal use only.

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