



Material Safety Data Sheet

Section I: Identification & Information

Name: Tetrahydrofuran
Chemical Family: Cycloaliphatic Ether

Synonyms: THF, Tetramethylene Oxide, 1,4-Epoxy-Butane,
Butylene Oxide, Cyclotetramethylene Oxide, Diethylene
Oxide, 1,4-Epoxybutane, Furanidine, Hydrofuran,
Oxacyclopentane, Oxolane

Formula: C_4H_8O M.W.: 72.11

DOT Proper Shipping Name: Tetrahydrofuran
DOT Identification No.: UN2056 CAS No.: 109-99-9
DOT Hazard Class: Flammable Liquid

Section II: Physical Properties

Appearance: Clear, colorless liquid
Vapor Pressure @ 20°C: 143mmHg
Percent Volatile by Volume: ca 100
Evaporation Rate (BuAc =1): <1
Boiling Point: 65°C-67°C
Solubility in Water: @20°C complete

Odor: Ether-like odor
Vapor Density (air=1): 2.5
Specific Gravity ($H_2O=1$): @20°C 0.89
Stability: stable
Freezing point: -108.5°C
Water Reactive: n/a

Section III: Reactivity Hazard Data

Hazardous polymerization may occur.

Conditions to avoid: Heat, sparks, open flames, open containers, poor ventilation.

Materials to avoid: Oxidizing agents and strong acids and bases.

Hazardous decomposition products: Incomplete combustion can generate carbon monoxide and other toxic vapors. Explosive peroxides can form after standing or upon exposure to air or direct sunlight.

Section IV: Fire and Explosion Hazard Data

Flash Point: -17°C 1°F Auto ignition temperature: 321°C 610°F
Flammable Limits in air % by volume: Lower limit: 1.8 Upper limit: 11.8

Extinguishing Media: dry chemical, CO₂, water mist or fog, alcohol foam

Special Fire Fighting Procedures: Wear full protective clothing and self-contained breathing apparatus. Heat will build pressure and may rupture closed storage containers. Keep fire-exposed containers cool with water spray.

Unusual Fire and Explosion Hazards: Very volatile and extremely flammable. Can form heat sensitive peroxides which could explode during concentration or evaporation. Do not concentrate if peroxide concentrations are above 5ppm or 0.05%. Vapor may travel considerable distance to source of ignition and flash back.

Section V: Hazardous Ingredients

Tetrahydrofuran ca 100%

Occupational Exposure Limits:

OSHA PEL=8H TWA 200ppm ACGIH TLV-TWA=200ppm;STEL=250ppm

IDLH: 2,000ppm

Butylated hydroxytoluene (if stabilized) 250ppm TLV not listed CAS# 128-37-0

Section VI: Toxicity and Health Hazard Data

See Registry of Toxic Effects of Chemical Substances (RTECS).

Tetrahydrofuran is not listed as a carcinogen by IARC, NTP, OSHA, or ACGIH.

Primary routes of entry: Inhalation, skin absorption, ingestion.

- Ingestion: Systemic effects similar to inhalation.
- Eye contact: Liquid and high vapor concentration can cause irritation.
- Skin contact: Prolonged and repeated contact can cause irritation and dermatitis through defatting of the skin.
- Inhalation: Exposure can cause nausea, dizziness, headache and central nervous system depression. Vapors can be irritating to the mucous membranes and upper respiratory tract.

Effects of overexposure: Nausea, dizziness, headache, and narcosis. Liver and kidney damage can occur from chronic exposure.

Medical Condition Aggravated by Exposure: Preclude from exposure those individuals susceptible to dermatitis.

Target Organs: Liver, Kidneys and Central Nervous System

Emergency First Aid:

- Ingestion: Call poison control center for assistance. Get emergency medical assistance. Never induce vomiting or give anything by mouth to a victim who is unconscious or having convulsions.
- Eye contact: Rinse with copious amounts of water for at least 15 minutes. Get emergency medical assistance.
- Skin contact: Flush thoroughly with water for at least 15 minutes. Wash affected skin with soap and water. Remove contaminated clothes and shoes. Wash clothing before reuse and discard contaminated shoes. Get emergency medical assistance.
- Inhalation: Immediately remove to fresh air. If not breathing, give artificial respiration. Get emergency medical assistance.

Section VII: Special Protection

Ventilation: Adequate ventilation is required to protect personnel from exposure to chemical vapors exceeding the PEL and to minimize fire hazards. The choice of ventilation equipment, either local or general, will depend on the conditions of use, quantity of material, and other operating procedures.

Respiratory Protection: Use approved respiratory equipment. Follow NIOSH and equipment manufacturer's recommendations to determine appropriate equipment.

Skin Protection: Protective gloves and clothing are recommended. The choice of material must be based on chemical resistance and other user requirements. Individuals who are acutely and specifically sensitive to tetrahydrofuran may require additional protective equipment.

Eye Protection: Laboratory safety glasses are minimum protection. Goggles are preferred and may be necessary depending on quantity of material and conditions of use.

Emergency eye wash fountains and safety showers should be available in the vicinity of any potential exposure. Ground and bond metal containers to minimize sparks.

Section VIII: Spill and Disposal Procedures

If a spill occurs, protect from ignition. Wear protective clothing and use approved respiration equipment. Absorb spilled material in an absorbent recommended for solvent spills and remove to a safe location for disposal by approved methods. Use nonsparking tools. If released to the environment, comply with all regulatory notification requirements.

Waste Disposal: Dispose of tetrahydrofuran as an EPA hazardous waste.

Section IX: Storage

Tetrahydrofuran should be protected from temperature extremes and direct sunlight. Proper storage of tetrahydrofuran must be determined based on other materials stored and their hazards and potential chemical incompatibility. In general, tetrahydrofuran should be stored in an acceptably protected and secure flammable liquid storage room. Periodically check for peroxides in stored material and prior to use, especially before concentration or heating.

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Key:

ca: Approximately

PEL: Permissible Exposure Level

STEL: Short Term Exposure Level

TWA: Time Weighted Average

IDLH: Immediately Dangerous to Life and Health

BuAc: Butyl Acetate

TLV: Threshold Limit Value

n/a: not available